Customized Web Solution for the Loveland Chamber of Commerce

By

David Imhoff and Andrew Coleman

Submitted to
the Faculty of the Information Technology Program
in Partial Fulfillment of the Requirements for
the Degree of Bachelor of Science
in Information Technology

University of Cincinnati
College of Applied Science

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Andrew Coleman                  Date

David Imhoff                    Date

Dr. Sam Geonetta, Faculty Advisor Date

Dr. Hazem Said, Department Head  Date
Acknowledgements

We would like to give special thanks to the women of the Loveland Area Chamber of Commerce for trusting and believing in two aspiring college students the duration of the project. We would like to give special thanks to Peg Sheffield who gave us all of the Chamber information and Chamber business processes we needed to successfully execute the project, and sat in on many technical conversations with no complaint. We would like to give special thanks to Chamber member John Daniel, president of Swordfish Computer Solutions, for providing valuable industry insight where and when it was needed most; also for providing a test server to run the project on. We would also like to thank all of the professors, faculty, and staff at the University of Cincinnati for providing us with the knowledge and opportunity to do this project in the first place. Finally, we give special thanks to our friends and family who have given us support and patience in the many hours we’ve needed it most.
Abstract

The Customized Web Application for the Loveland Area Chamber of Commerce is a Web application that will save an enormous amount of time by significantly reducing the time it takes to edit or create a Web page for the non-technical staff. By integrating the Web site with third party software known as ChamberMaster, the clients will also be able to have their users update their information on their own, removing almost all data entry needs for the staff, as well as accept payments for dues and revenue from advertising quicker and easier by taking them online. After the completion of this project, the client will also have continuing technical support from the ChamberMaster support staff, ensuring the long term success of the project.
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1. Statement of Problem

1.1 Introduction

The Loveland Chamber of Commerce has an existing Web site consisting of several static Web pages that interface with a software package called ChamberWeblink. This package gives Chamber staff the ability to create and maintain a directory of local businesses that a user can browse and search. This system has been in use by the Loveland Chamber of Commerce for five years. It has been a great asset to the city by helping attract new residents and businesses, but there are several drawbacks.

1.2 Problem Need

The data for the online directory on the Web site must be manually entered and edited into a Microsoft Access database as well as manually updated to the Web site. This is time consuming and creates a great deal of extra work for the client (9). Another drawback to the current system is the inability of potential members to join the Chamber of Commerce online. The existing Web site has a PDF attachment that can be downloaded and mailed. The biggest drawback of the current system is the inability to correctly maintain the Web site in a timely manner. One member of the staff has tried to solve this problem by attending an HTML class at Raymond Walters campus of the University of Cincinnati. When asked about how successful the approach has been the staff member stated that it is extremely time consuming and she cannot keep up with the changes that need to be made to the Web site (9). The staff simply does not have the time or expertise to maintain their Web site in its current state.

A Web site for the Chamber of Commerce is a valuable tool that can attract new businesses, residents, and inform everyone in the community of upcoming events. The
Web site also gives the community many other benefits including allowing several local businesses the ability to attract customers through advertising and notifying residents of new jobs available in the area through the job openings page.

The client previously looked into hiring a consultant to redesign the Web site, as well as to create a back end Web application to take care of the data entry and payment processing. The proposals they received from several companies looked good but the price tag was too high for their budget.

There is a need to create a customized content management system for the Loveland Chamber of Commerce that enables the non-technical staff to update and maintain its Web site in a timely manner. The new content management system enables the client to upload pictures and documents, create or delete Web Pages, and collect non-dues revenue though an advertising section. The new Web site will interface with ChamberMaster software (2), which gives the client all of the new data functionality that the Chamber needs while alleviating the need to perform maintenance on the database system itself. The ChamberMaster software furnishes the client with the ongoing technical support that is critical.

2. Description of the Solution

The project team created a customized Web solution that the Loveland Chamber of Commerce uses to modify and enhance its Web site. This application’s primary emphasis is on Web development and database. The project involves the use and modification of the Joomla Content Management System as well as the implementation and customization of the ChamberMaster software application. The functionality lets the non-technical staff of the Loveland Chamber of Commerce change content in all areas of
the Web site and add new pages. They are able to upload files and pictures as well. This application is module-based using Joomla as the content management system framework and ChamberMaster software for the backend data manipulation and storage. Joomla is an open source project that is licensed under the GNU/GPL license, which works well to offset the monthly cost of the ChamberMaster software (6). Many things implemented to customize these two systems into one cohesive application.

The “Customized Web Solution for the Loveland Chamber of Commerce” project has encompasses the following:

- Development of a new look and feel for the Web site.
- Refinement of the navigation structure of the existing Web site to include the added functionality.
- Modification of existing modules in Joomla to make them specific for the needs of the Loveland Chamber of Commerce.
- Modification and configuration of the ChamberMaster modules to make them work cohesively with the Joomla framework.
- Creation of new modules for the client, including
  - Chamber Store
  - Virtual Tour
  - Communication Forms
- Development of help/training documents.

2.1 User Profiles

The audience of the Loveland Chamber of Commerce Web site is diverse. The project team carefully constructed the navigation structure and user interface to accommodate the most users in the best way possible. There are six user groups that interact with the Web site. These groups are:

- Chamber Staff:
The Chamber staff has full administrative privileges. They are able to create new users, delete existing users, and maintain the Web site. The Web site maintenance is done using a rich text editor within the back-end of the content management system. The ability to upload files is available to these users. Individuals with this role are required to learn to use the Joomla administration interface, which manages all built-in Joomla functionality and all custom functionality.

- Chamber Members:
  Chamber members use the Web site to update their information, pay their Chamber dues, and check the event calendar. Chamber members follow a link to login to the Web site. Once a Chamber member is logged in, he/she is sent to an abbreviated version of the Web site to quickly complete Chamber member related tasks. This role requires that the user be familiar with online forms.

- Loveland Residents:
  Loveland residents visit the Web site to search for a business in the business directory, check the event calendar, and register for the next Chamber event. This role requires no technical expertise other than being able to use the Internet.

- Potential Chamber Members:
  Potential Chamber members visit the Web site to learn about membership benefits, read about chamber programs, and to join the chamber. This role requires no technical experience but familiarity with the Internet.

- Potential Loveland Residents:
  Potential Loveland residents visit the Web site to learn about Loveland. The user is able to view information about the history of Loveland, parks and recreation details,
and more. The user is also able to request a relocation packet and view the business directory. This role requires no technical expertise other than being able to use the Internet.

- Potential Loveland Businesses:
  Potential owners of new Loveland businesses are able to request a relocation packet, search the business directory, and learn about Chamber benefits. This role requires no technical expertise other than being able to use the Internet.

2.2 Design Protocols

The Loveland Chamber of Commerce Web Application has several components that interact with each other to perform various tasks. Two separate databases in two separate locations work in conjunction with the Web server to store the data. One database holds all data related to the ChamberMaster application. This includes event calendar data and information related to the business directory. A separate database is used to store all Web site content, indexed data for the site search function, and all data used in the creation of the e-commerce and virtual tour modules. Figure 1 shows a use-case diagram of the system’s functionality.
3. Deliverables

The *Customized Web Solution for the Loveland Chamber of Commerce* project includes the following deliverables:

- Development of a new look and feel for the Chamber’s Web site.
- Development of an improved, more intuitive navigation structure by including elements from the existing Web site and offering added functionality.
- Development of custom modules and components including:
o E-commerce store modules
o Virtual tour modules

- Modification and configuration of the ChamberMaster modules to make them work cohesively with the Joomla framework.
- Development of help and training documents for those who have to use and maintain the site.

4. Design and Development

4.1 Timeline

<table>
<thead>
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<th>Task Name</th>
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<th>Finish</th>
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<td>Research Project Background</td>
<td>Mon 11/6/06</td>
<td>Mon 11/13/06</td>
</tr>
<tr>
<td>2</td>
<td>Final Proposal</td>
<td>Mon 11/13/06</td>
<td>Mon 11/27/06</td>
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<td>3</td>
<td>Interface Design</td>
<td>Mon 11/27/06</td>
<td>Fri 1/12/07</td>
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<td>Interface Design Complete</td>
<td>Fri 1/12/07</td>
<td>Fri 1/12/07</td>
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<td>5</td>
<td>Create User Modules</td>
<td>Mon 1/8/07</td>
<td>Mon 2/19/07</td>
</tr>
<tr>
<td>6</td>
<td>Create Administration Modules</td>
<td>Mon 2/5/07</td>
<td>Fri 3/2/07</td>
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<tr>
<td>7</td>
<td>Integrating ChamberMaster Softare</td>
<td>Tue 2/20/07</td>
<td>Wed 2/28/07</td>
</tr>
<tr>
<td>8</td>
<td>Setup Payment Gateway</td>
<td>Thu 3/1/07</td>
<td>Wed 3/7/07</td>
</tr>
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<td>Create Payment Modules</td>
<td>Mon 2/26/07</td>
<td>Wed 3/7/07</td>
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<td>10</td>
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<td>Wed 3/7/07</td>
<td>Wed 3/7/07</td>
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<td>11</td>
<td>Write Design Freeze</td>
<td>Wed 3/7/07</td>
<td>Thu 3/15/07</td>
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<td>Fri 3/16/07</td>
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<td>13</td>
<td>User Acceptance Testing</td>
<td>Mon 3/19/07</td>
<td>Fri 3/30/07</td>
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<td>Application Documentation</td>
<td>Mon 3/26/07</td>
<td>Fri 4/13/07</td>
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<td>Wed 5/16/07</td>
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<td>17</td>
<td>Final Presentation</td>
<td>Thu 5/31/07</td>
<td>Thu 5/31/07</td>
</tr>
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</table>

Figure 2: Timeline

4.1.1 Senior Design I Accomplishments

During Senior Design I the project team accomplished the following:

- Research existing Chamber of Commerce Web sites.
- Develop timetable for project.
- Develop a draft design scheme for the Web site.
• Understand the Chamber’s business processes

The first quarter of senior design was used for research. The project team used this time to find and evaluate existing Chamber of Commerce Web sites. In doing this, the project team gained invaluable insight into how a Chamber of Commerce operates. The project team also spent time focusing on what to develop and facilitate. Through an intensive design exercise and extensive meeting with the Chamber employees, the team was able to prioritize the information the Chamber was to display on the Web site.

4.1.2 Senior Design II Accomplishments

During Senior Design II the project team accomplished the following:

• Finalized the Chamber store
• Finalized the design scheme
• Began filming the virtual tour footage

The second quarter of senior design was used to set the framework for the Web site. The design scheme was developed using the information we gathered in the research process. An important part of the design is the ability for a user to interact with any information that they are looking at on the screen. The addition of Next Steps and Tools and Resources allow the users to have this added interactivity. The Chamber Store was developed and brought into beta during this quarter. The store was coded in PHP and uses Authorize.net as a merchant account. Another important accomplishment was to compile a list of spots to film in Loveland and film them. This proved more difficult than expected due to inclement weather conditions.
4.1.3 Senior Design III Accomplishments

During Senior Design III the project team accomplished the following:

- Finish virtual tour
- Develop and implement color scheme
- Communication forms
- ChamberMaster integration

The final quarter of senior design was used to wrap up all loose ends on the Web site. The project team had a great start on what needed to be accomplished during senior design II. However there was still significant work to be done. The Virtual Tour was to be shot, edited, and published to Flash video. The color scheme of the Web site was an issue. The Chamber employees could not decide on a color scheme. This proved to be a valuable learning experience. Managing a project is essentially managing people, and the color scheme was an executive decision made by the project team after scope creep started to develop. Another vital part of the project was the custom communication forms. This allows Web site visitors to interact directly with the Chamber through Web forms that shoot e-mails to Chamber employees. Finally, the integration of member management software ChamberMaster was completed.

4.2 Budget

The budget for this project including the items listed above in the Technical Details section is described below in Figure 1. The retail cost of this project would be $3,618 but the UC College of Applied Science computer lab provided several items. The actual cost of this project is $1,185.00.
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Hosting</td>
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<td>$235.00</td>
</tr>
<tr>
<td>Windows XP</td>
<td>Provided by the IT computer lab</td>
<td>149.99</td>
</tr>
<tr>
<td>PHP 5</td>
<td>Provided free as open source</td>
<td>0.00</td>
</tr>
<tr>
<td>MySQL 5.0.27</td>
<td>1 Server License</td>
<td>495.00</td>
</tr>
<tr>
<td>Joomla 1.0.11</td>
<td>Provided free as indicated by the GNU/GPL license</td>
<td>0.00</td>
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<tr>
<td>Apache Web Server 2.0.59</td>
<td>Provided free as open source</td>
<td>599.00</td>
</tr>
<tr>
<td>Adobe Photoshop 6.0</td>
<td>Provided by the IT computer lab</td>
<td>1,189.95</td>
</tr>
<tr>
<td>ChamberMaster Software</td>
<td>$600 yearly, $350 setup</td>
<td>950.00</td>
</tr>
<tr>
<td><strong>Retail Total</strong></td>
<td></td>
<td><strong>$3,618.94</strong></td>
</tr>
</tbody>
</table>

**Table 1: Budget**

### 4.3 Project Resources and Logistics

Throughout the duration of this project most of the resources were available on the Internet as soon as they were setup. The team was able to work on project anywhere there was an Internet connection. There are also a number of help documents on the Web sites of each respective product that was used, as well as the ChamberMaster customer support team who assisted the project team with integration issues. The project team planned and executed a timeline for successful project completion as shown in Table 1.

### 4.4 Technical Details

This application was created using many different tools. These tools include the following:
Hardware

- Server provided at Swordfish Computer Solutions Web Hosting
  The Server was used to create this project. It has all the programs installed and hardware needed to complete it.

- Server provided at ChamberMaster
  This server contains the MySql database as well as the ChamberMaster software.

Software

- Windows XP
- Apple OS X
- PHP 5
- MySql 5.0.27
- Apache Web Server 2.0.59
- Joomla 1.0.11
- ChamberMaster
- Adobe Photoshop CS2

5 Proof of Design

5.1 Joomla Content Management System Overview

The Joomla Content Management System (CMS) is a free, open source content management system written in PHP for publishing content on the Web. Joomla consists of many different parts that are designed to be as modular as possible, allowing for easy integration of foreign software. The project team chose to leverage an existing CMS rather than build a CMS from the ground up based on the research done during Senior Design I. The Loveland Chamber ultimately gave the order to leverage the Joomla CMS.

5.2 ChamberMaster Product Overview

ChamberMaster is chamber management software specifically for Chambers of Commerce. The ChamberMaster software, which gives the Chamber all of the new data functionality that they need, also alleviates the need to perform maintenance on the
database system itself. The ChamberMaster software furnishes the client with the ongoing technical support that is critical to the success of the project.

5.2.1 Events Module

The Events Module (Figure 3) is functionality that is built into the ChamberMaster software. It provides a comprehensive events management system with online registration. The events module accepts credit card payments along with event registration. The module automatically sends and tracks registrations, and sends reminder e-mails. Finally, this module can send members automatic notifications of newly added events.

The Loveland Chamber of Commerce is not choosing to use the online credit card payments at this time because the only payment method available is through PayPal.

Figure 3: Events Module
5.2.2 Business Directory Module

The Business Directory Module (Figure 4) provides a browseable, indexed list of Loveland businesses and services. The ChamberMaster software interacts with a mySQL database on the back-end and pulls this information into a Web form. A user can browse alphabetically, categorically, or enter his/her search string query. Results are queried against the database and displayed in a result pane. From here users can click a result and all the business information appears in a new window. If the Chamber member has a Web site of their own, the business card window will provide a link to that business.

Figure 4: Business Directory module

5.2.3 Member Login/Management

The real benefit of ChamberMaster is in the member management functionality of the software. The software alleviates the burden of updating member information by providing members the functionality to login and edit their information themselves. This
also gives the members more power to advertise their businesses and provide ‘hot deals’ to other Chamber members. The Chamber staff calculated that they spent a few weeks out of every year gathering, editing, and updating member information, and this module eliminates the need for these weeks of work.

Figure 5: Chamber Login Module

5.3 Custom Modules

The Chamber required functionality that was not provided by ChamberMaster. The project team met this need and provided an easy and effective way for the Chamber to sell its items online, promote the city of Loveland online, and also a way for Web site visitors to contact the Chamber over the Web, without making the e-mail addresses publicly available and susceptible to Internet spiders, crawlers, and other SPAM.
5.3.1 Chamber Store

The Chamber Store is a custom PHP shopping cart that sends checkout data to Authorize.net. The store was designed with simplicity in mind since the Chamber only sells four items. The administration interface was also kept simple and intuitive. The Chamber Store was initially designed to transmit credit card and checking data via SSL to ensure security. This requirement was later dropped as a result of the Chamber's decision to discontinue sales of several items. The project team modified the Chamber Store to meet the deliverables set at the project's start by keeping the shipping cart active while only processing test data. The shopping cart is still a secure module due to the project team's use of Authorize.net’s "SIM" integration. This integration method makes use of a payment form that is hosted on the Authorize.net servers, which eliminates unsecured data transmission.

![Chamber Store](image_url)

Figure 6: Chamber Store
5.3.2 Virtual Tour

The Virtual Tour (Figure 8), also referred to as the walking tour, is a way for the user to see the main sights of Loveland, Ohio (OH) without having to leave the comfort of their computer chair. Initially this was to be a slideshow of pictures and text, but the Chamber later decided to enhance the experience with a video tour of Loveland.

The project team captured video footage of the Loveland area. In a prior meeting the project team had compiled a list of the places that needed to be captured on film, and also a list of Chamber businesses to try and promote with the video. The video captured was then transferred from tape to digital format. The footage was edited and a
soundtrack was added using Final Cut Pro HD and Apple Soundtrack.

The project team consulted Dr. Geonetta in how best to display the video on the Web site. Flash video is the industry standard and the team proceeded to convert the video to Flash. The final Flash video was posted on the Web site as a tool and resource under the About Loveland subpage.

**Figure 8: Virtual Tour**

### 5.3.3 Contact Forms

The Web site uses four separate contact forms to facilitate communication for the Chamber.

- General Contact Form - This form is a non-specific method of emailing
the Chamber.

**Contact Us**

Loveland Area Chamber of Commerce  
The Bauer House  
442 W Loveland Avenue  
Loveland, OH 45140  

Phone: 513-683-1544  
Fax: 513-683-5449  
Email: info@lovelandchamber.org

You may also contact us via the following form. A Chamber staff member will respond as soon as possible. Thank you for contacting the Loveland Area Chamber of Commerce.

- First Name:  
- Last Name:  
- Company Name:  
- Street Address:  
- City:  
- State:  
- Zip Code:  
- Email Address:  
- Phone Number:  
- Preferred Method of Contact:  
- Nature of Request:  
- Question/Comment:

**Figure 9: General Contact Form**

- Relocation Form - This form lets the Chamber know that the user is thinking about relocating to the area. The Chamber receives an email and prepares a relocation kit to send to the potential resident.
Figure 10: Relocation Request Form

- Visitor Form - Similar to the Relocation Form, but the user is requesting a packet tailored toward visitors to the area.

Figure 11: Visitor Information Request Form
Welcome Form - Each new Loveland resident is eligible to receive a standard gift bag. This form indicates to the Chamber that a new resident wants to pick up their gift bag.

Figure 12: Welcome to Loveland Form

5.4 Analysis of the Web site

The Web site was designed from the beginning with ease of use in mind. The Chamber’s old Web site had become outdated and information was often more than six mouse clicks away. The project team prioritized all information that the Chamber provides to its users through a series of meetings and discussions. The idea of interactivity is incorporated into the design of the Web site by ensuring that whatever page the user is looking at, there are always ways to interact with the information that is being presented. Through the simple, yet intuitive, inclusion of “Next Steps” and “Tools and Resources” sections as seen in Figure 13, the team was able to provide the user with an easy way to interact with the Web site.
5.4.1 Home Page

The project team constructed the Home Page by assigning three levels of priority to each item that the Chamber wanted to feature on the page. There is one large item on the page, this section will always feature the next big event in Loveland as shown in Figure 14. There is also one slightly smaller item on the right which always features the next big Chamber event. Clicking either of these items will open a new browser window. The new window guides users to the area of the site where people can register for the featured event. The Home Page also features two smaller items. The Business Directory is a very important part of the Web site, and can be access by clicking on its image. The other smaller item to the left of the Business Directory section guides users to a Web form. This is a form that the Chamber staff uses to send out relocation and guest packets. The project team has preloaded all annual events into the system to ensure easy
maintainability. The Chamber staff simply logs into the administration interface and chooses which preloaded event to display.

5.4.2 About Loveland

The About Loveland page (Figure 15) was created to showcase all of the things that may make someone want to relocate to, or open a business in Loveland. The Next Steps section of the page lists several calls to action that a user may want to take. Here a user can, request a relocation packet, get a welcome gift, and contact the Chamber for more information. Each item listed in the Next Steps section was carefully selected and prioritized based on the Chamber’s business practices and interests. The About Loveland section also displays a Tools and Resources section as seen in Figure 15. This section empowers the users by listing several tools they may want to use while they are reading about Loveland. Here a user can view the Business Directory to search for a local
business, view an interactive map of Loveland, check the Event Calendar for the latest event, and much more. This section was included on all sub-pages to facilitate interactivity on the Web site, while empowering the users with the most relevant tools.

Figure 15: About Loveland Page

5.4.3 About the Chamber

The About the Chamber page (Figure 16) was developed in effort to get information to the user about the Chamber of Commerce itself. There are several different sub-pages under the About the Chamber page. These include Purpose, Member Benefits, Volunteer Opportunities, Chamber Committees, Trustees and Staff, and Join the Chamber. These represent the effort to convey information about the different functions of the Chamber.
5.4.4 Chamber Programs

6. Conclusion

The project team created a customized Web solution to modify and enhance the Web site for the Loveland Chamber of Commerce. The project involves the use and modification of the Joomla Content Management System as well as the implementation and customization of the ChamberMaster software application. The functionality lets the non-technical staff of the Loveland Chamber of Commerce change content in all areas of
the Web site and add new pages. Essentially, the project is Web design for non-Web designers. They are able to upload files and pictures as well. This application is module-based using Joomla as the content management system framework as well as ChamberMaster software for the backend data manipulation and storage. Joomla is an open source framework that is licensed under the GNU/GPL license. The member management software ChamberMaster was implemented which took the responsibility of Chamber employees updating member information annually, and placed that responsibility in the Chamber member hands. This project involved extensive use of technical knowledge, but more than anything it involved intensive project management skills. Managing the Chamber employees to get the information we needed to finish the Web site. The Web site provides a way for the non-technical Chamber employees to edit, update, and maintain the Chamber of Commerce’s Web site.

7. Recommendations

While working on this project, the team encountered a few small challenges along with one major challenge. This biggest challenge to the project completion was the inability of the Chamber staff to decide on one color scheme. The project team developed six different color schemes for the Web site before the project was finalized. One recommendation from the project team is to get the client to agree to one final design and color scheme before moving forward with the project. This will help by limiting the amount of pre-existing elements of the Web site that will need to be changed.

Another challenge that the team was faced with was feature creep. The Chamber came up with several “great ideas” throughout the project’s timeline. This needs to be
avoided by stating every deliverable at the beginning of the project. The list of deliverables can be referenced throughout the project's duration when the client wants to add more features.
References


