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Responsive website design for First Unitarian Church and Louis Kahn

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Rochester Institute of Technology

A Thesis submitted to the Faculty of
the Department of Computer Graphics Design,
School of Design,
College of Imaging Arts and Sciences
in candidacy for the degree of
Master of Fine Arts

Responsive Website Design for First Unitarian Church and Louis Kahn
by Chen Zhang

August 13, 2013

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Responsive Website Design
for First Unitarian Church and Louis Kahn
Chen Zhang
Rochester Institute of Technology
Computer Graphics Design MFA Program

Abstract

Responsive Website Design for First Unitarian Church and Louis Kahn is a thesis project for Master Degree of Fine Arts in Computer Graphics Design program at the Rochester Institute of Technology. This thesis project is to design a responsive website for the First Unitarian Church, a website which has three user experiences: a desktop site, tablet site and a mobile site. The website audience is architecture or design students, professors, and enthusiasts. There are three objectives in this thesis project: first, to design a responsive website for cross-platform experience for users; second, to provide users a real digital visiting experience which is immersive and vibrant to First Unitarian Church; third, to keep the design direction for this whole project the same as Louis Kahn's architectural design style – disciplined and clean.

Thesis project website URL: http://www.rochesterunitarian.org/virtual_tour/ and <http://chenzhangdesign.com/kahn/>.

Keywords: responsive design, digital visiting experience, First Unitarian Church

Background Review

The First Unitarian Church, located in Rochester, New York, was designed by the architect Louis Kahn in 1959 to replace the previous church designed by architect Richard Upjohn.



(Figure 1: exterior look of First Unitarian Church)

Louis Isadore Kahn is an American architect, based in Philadelphia, Pennsylvania. Influenced by ancient ruins, Kahn's style tends to the monumental and monolithic. (Robert McCarter, 2009 & Klaus-Peter Gast, 2001) Some of his famous works include Yale University Art Gallery, Salk Institute, Indian Institute of Management, Philips Exeter Academy Library. His heavy buildings do not hide their weight or their

materials. His works are considered to be monumental beyond modernism. (Sonit Bafna, 2005) The First Unitarian Church was named as one of the greatest religious



(Figure 2: A view from the loft inside First Unitarian Church)

structures of the 20th century according to Paul Goldberger, Pulitzer Prize-winning architectural critic. (Paul Goldberger, 1982)

Responsive web design is the approach that suggests that design and development should respond to the user's behavior and environment based on screen size, platform and orientation. (Ethan Marcotte, 2011) The practice consists of a mix of flexible grids and layouts, images and an intelligent use of CSS media queries. As the

user switches from their laptop to tablet to mobile devices, the website should automatically switch to accommodate for resolution, image size and scripting abilities.

Problem Statement

This is the first website which is available to provide users a real digital visiting experience for the First Unitarian Church. A large number of books, papers and other research resources on Kahn's design for the church exist, but none of them gives a detailed digital online visiting experience to the church.

Mobile devices and tablets are more and more popular these days. Digital media and online consumption is rapidly changing. It's no longer the era of PC desktop Internet, and it's going to be dominated by mobile and tablet devices. In the Post-PC Era, devices change, users change, context changes and this means everything will change. (Ethan Marcotte, 2011) However, few successful websites are successfully delivered across different platforms. (Luke Wroblewski, 2011) Most sites still provide only one version and it is design makes it impossible for the mobile users to view the site on the small screens with the slow connection speed. The good thing is that more and more designers and developers are aware of this trend and these problems. Designing a responsive website across different platforms is a must for future web design projects, so this thesis is not only about the desktop website, it is also about designing a website experience for tablets and mobile devices. Using HTML5 and CSS3 for front-end programming is critical for this project.

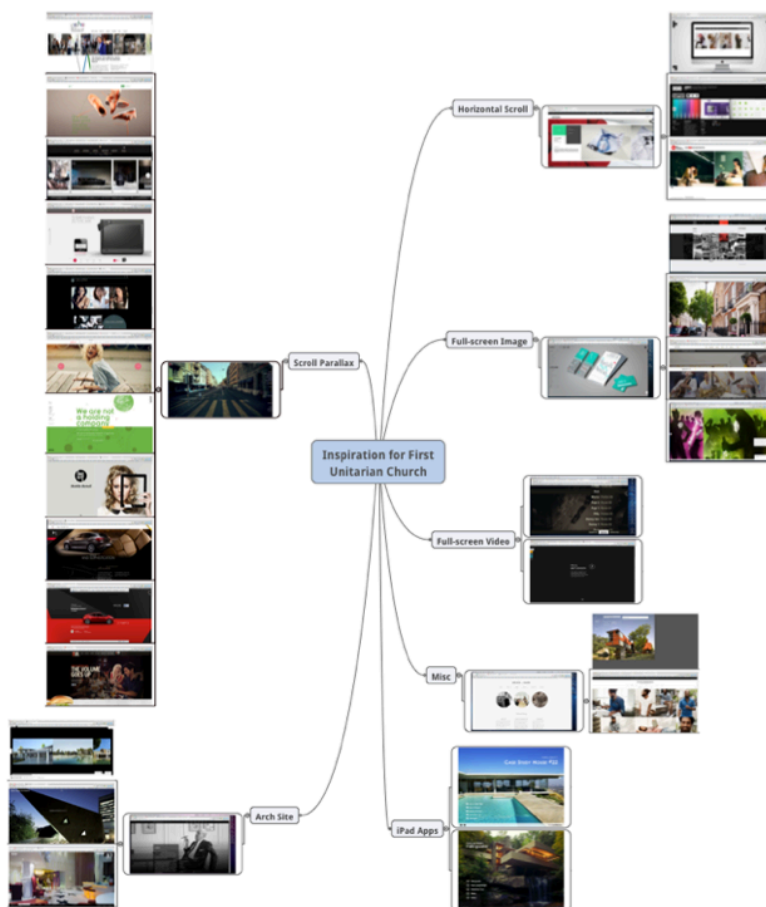
Keeping consistency and a good user experience throughout the three platforms is another design challenge, so the visual design for this site needs to be consistent

with the design of the architecture itself: that is, to express “only what matters”.

(Katrine Lotz, 2001)

Design Process

The first step was to build a mood board for the whole project. The mood board was important as its function was to set up the abstract visual mood and look and feel for this thesis. After researching on most of Louis Kahn’s architecture works and critics’ comments, the mood board for this thesis was consistent with Louis Kahn’s design architectural style.



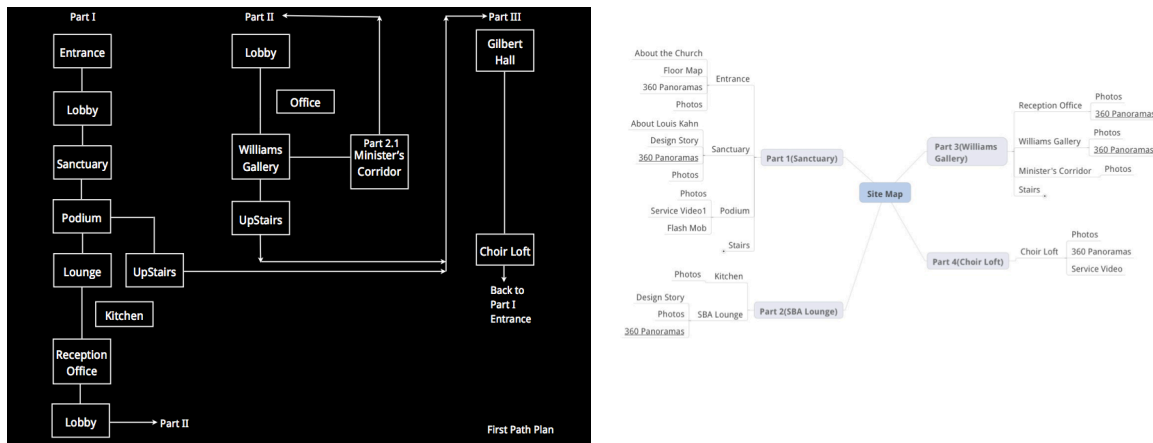
(Figure 3: inspiration list)

The second step was to investigate an inspiration example analysis research on other similar websites. Most of the examples were architectural websites, design studio websites and fashion websites. Some iPad apps were also included in the research because part of this thesis project was also about tablet website design. After researching about 30 websites and 3 apps, a few inspirations were achieved as the following: parallax scroll, horizontal scroll, full-screen image and full-screen video.

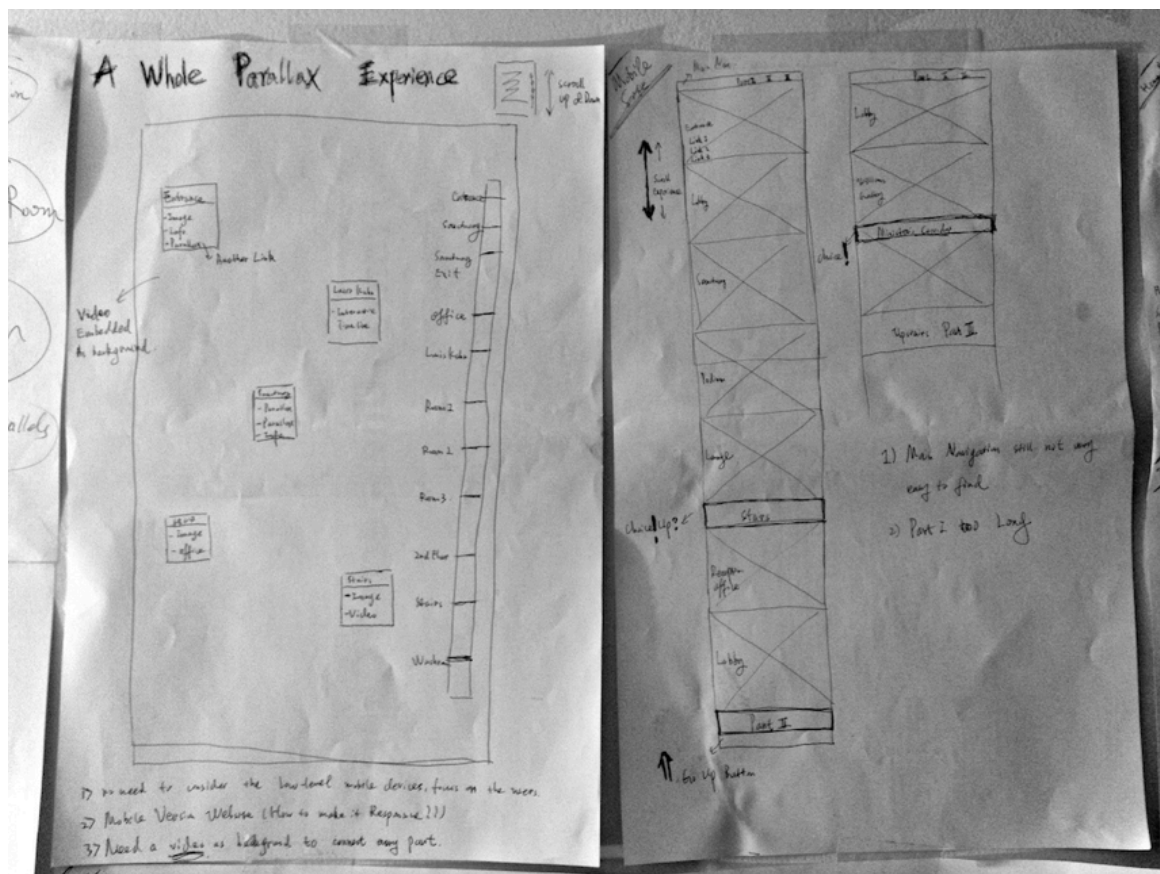
The next step was to define the functional specification for this thesis project. Responsive design was definitely one of the specifications. Since another objective of the thesis was to provide users with an immersive digital visiting experience, so 360 panoramas was a must add-on in this project. Besides that, video and photo gallery, text information was also included. With functional specification defined, the foundation of design and development for this whole website was clearly set up. Video, images and panoramas were shot on site at the church at the same time. The photo and video tools used were Canon 350D and Canon 5D Mark II, a spider dolly and a tripod. For 360 panoramas, an iPhone app called 360 was used to capture and create the panoramas.

The next step was to define and build the site map. For this thesis, the site map was based on the floor plan of the First Unitarian Church. After reviewing the floor plan and a video shooting test at the church, the first path plan and site map was designed. Then the second path plan was created after meeting with committee members. Part I in the first path plan was revised and divided into two separate parts because part I was too lengthy and jumbled. After a second round of site testing and meeting with

committee members, the third path plan was created and the final site map was done.



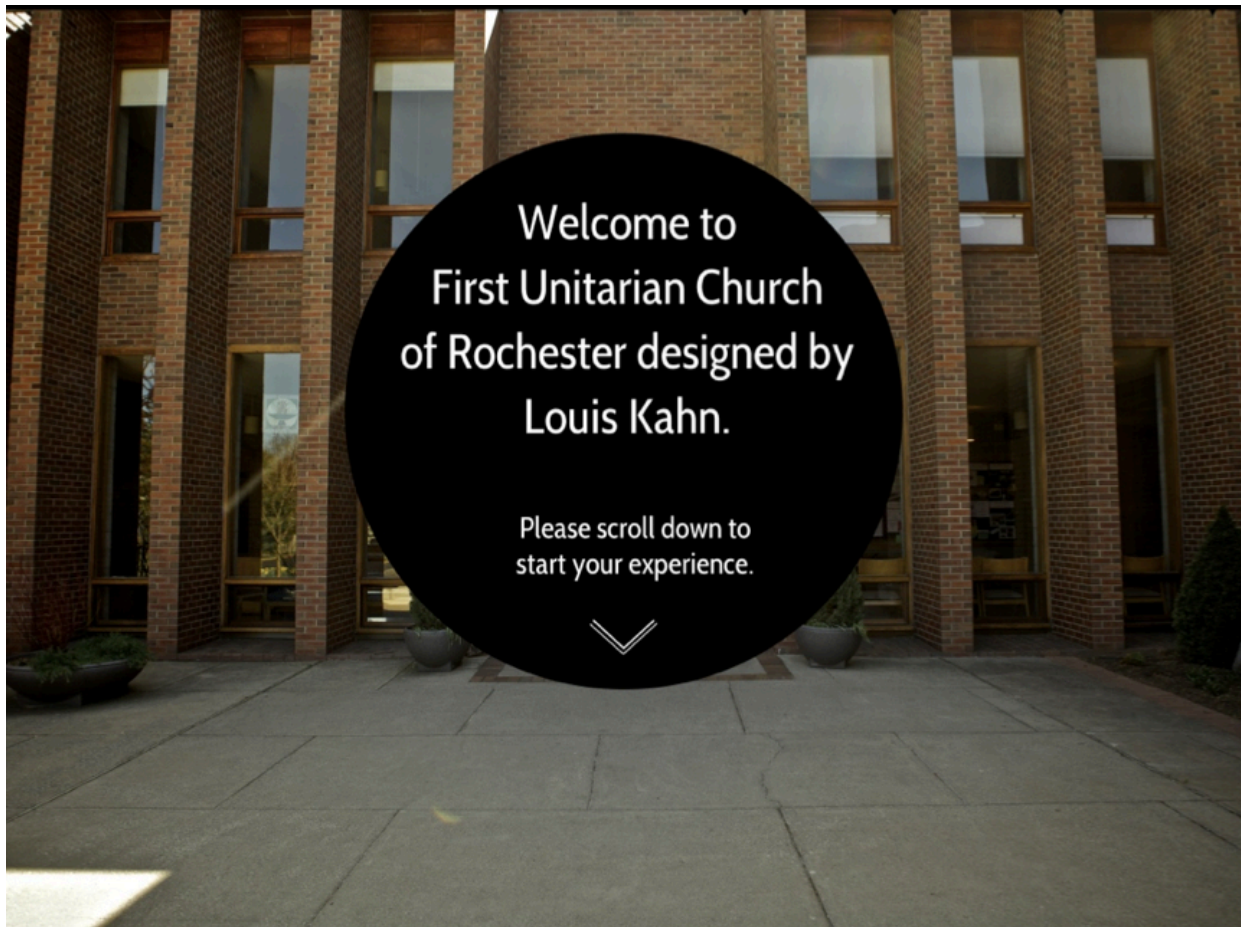
(Figure 4: path plan and site map)



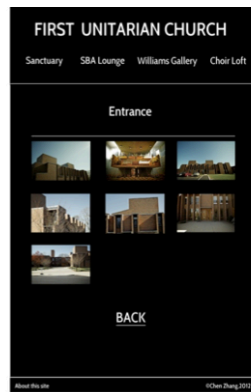
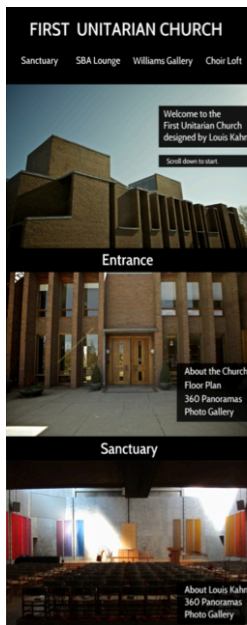
(Figure 5: wireframe on the paper)

With the functional specifications and site map prepared, wireframes and prototypes were ready to go. For the desktop website, a paper prototype was used to create wireframes. An interactive prototype was also created to show the interactive idea with parallax scroll and background video. The prototype can be visited here: <http://chenzhangdesign.com/thesis/test5.html> For the tablet and mobile website, Axure Pro was used to create the interactive wireframe prototypes. The mobile website cannot be background-video-based because of the browser limit, so high quality images were used to keep consistent with the desktop experience. A quick user test was done on the mobile devices with this interactive prototype. The mobile prototype can be visited here: <http://share.axure.com/3OMAJ3/>

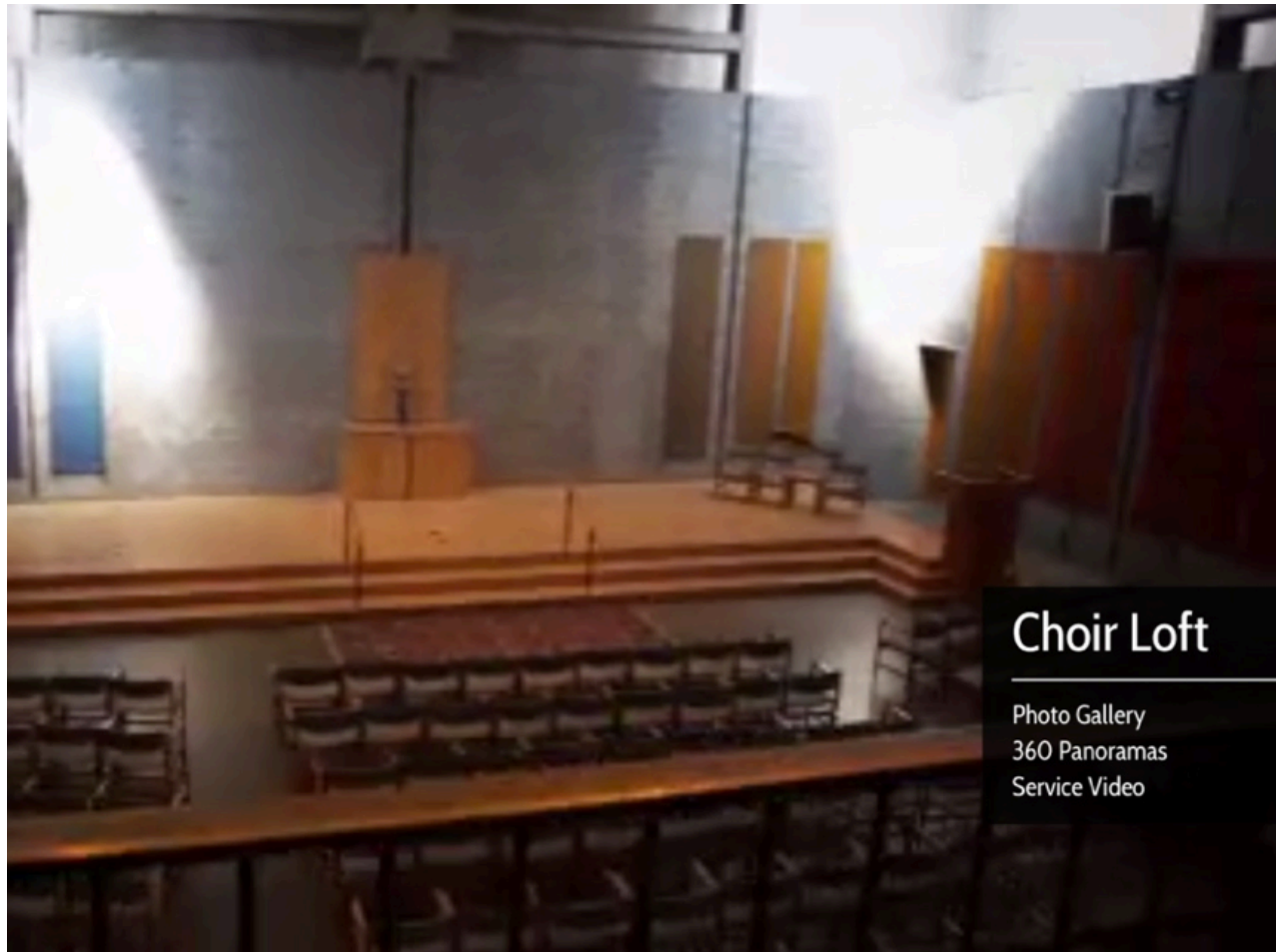
The next step was visual design. The first round visual design for the desktop website was not successful because the navigation was right in the middle of the interface and it blocked most of the background video. There were some other minor issues with the visual design in the first round such as the centered text, copy for the navigation and instructions for the interaction. After revising all those issues, a second round of visual design was created for desktop, tablet and mobile. The committee members and users tested the visual design and provided some useful feedbacks such as the navigation bar, type size and copy. After some small revisions, the final visual design was done.



(Figure 6: first round of visual design mockup)



(Figure 7: visual design mockup for mobile experience)



(Figure 8: final visual design mockup for desktop experience)

Last but not least, development for this project was critical to the whole thesis project. HTML5 and CSS3 was the core technology for the responsive design. Some jQuery and Javascript were used to make the parallax scroll function work well. For the tablet and mobile devices, the responsive image technique (a smaller image for these small screen to save data and loading time to ensure better user experience) was used with coding samples from the Boston Globe redesign project by the Filament Group. (Responsive Images Technique, Filament Group)

Testing and Optimization

After the development, usability testing was followed. Around 20 people took part in the usability testing. Most participants in the testing were design professors, design students. The testing location were at the Computer Graphics Design Lab at the Rochester Institute of Technology. The devices were iMac, iPad, iPhone and Motorola Droid.

I designed some typical user tasks for testing. Users were required to read the tasks and understand it well before they started to use the website. The testing process is as following:

- a. On desktop, please enter the church and explore. Find the Podium and view the photos and videos.
- b. On desktop, continue exploring and go to the Choir Loft on the second floor.
- c. On the iPad, please repeat the same task a and task b.
- d. On iPhone 4S and Droid, please repeat the same task a and task b.

After each user finished the user tasks, I had a short interview with each user to collect their feedback. The overall feedback after the usability testing was quite positive. Most users said they liked the overall design and feel of the website. They also were quite surprised at the parallax scrolling background video interaction model and they really enjoyed this unique digital visiting experience. Users also liked the tablet and mobile website. Some users also provided negative feedback for some of the design in the thesis project. Some issues included the need for back buttons in

panoramas page, sound off button, mobile layout, video quality, path navigation for the background video. After the testing, those issues were all solved.

Conclusion

In the process of this thesis project, I realized that a responsive design project should follow a right design process. Mobile first and content first should be the core principal for responsive design, and usability testing is another indispensable process. With two usability testing sessions for this thesis project, I learnt that different small factors all have a big influence on the design decisions for responsive design, such as browser capabilities, mobile device connected to Wifi or not, mobile device display angle and ambient illumination. Because responsive design needs to deal with different user scenarios and devices capabilities, the best way to solve the problem and make a consistency user experience is to get real user feedback from the usability testings.

This thesis project still has some areas for improvement in the future. I think two features should be added. One is an interactive map, the other is an interactive timeline for Louis Kahn. An Interactive map would be a good guide for users to explore the church, so it will make the digital visiting experience much more easy and immersive. An Interactive timeline for Louis Kahn will add another content layer for this project. Users who want to know more about the architect would benefit from this feature.

This thesis project is the first website which is available to provide users an online digital visiting experience for First Unitarian Church and it's also a cross-platform experience – available on desktop, tablet and mobile devices. The thesis project is now hosted by the First Unitarian Church of Rochester, NY and it can be visited at:

http://www.rochesterunitarian.org/virtual_tour/. The website can also be visited at: <http://chenzhangdesign.com/kahn/>. A documentary video for the tablet and mobile experience can be viewed at: <https://vimeo.com/42186905>.

I first want to give credits to my three thesis committee members — Marla K Schweppe, Chris Jackson and Jeff Sonstein.

I also want to give credits to my other friends who gave me support and feedback for this thesis project and took part in the usability testing sessions.

Special thanks to my friends — Yinan Cheng for helping me take the photos and videos for my thesis project. Yinan Cheng is a student at Photography major at Rochester Institute of Technology.

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Appendix

Thesis proposal for Master of Fine Arts: Responsive Website Design for First Unitarian Church and Louis Kahn

Thesis Proposal for Master of Fine Arts Degree

Rochester Institute of Technology
College of Imaging Arts and Sciences
School of Design
Computer Graphics Design

Title: Responsive Website Design for First Unitarian Church and Louis Kahn

Submitted by: Chen Zhang

Date: November 9th, 2011

Thesis Committee Approval Marla Schweppe, Professor, Computer Graphics Design

Signature of Committee Chair

Date

Chris Jackson, Associate Professor, Computer Graphic Design

Signature of Committee Member

Date

Jeffery Sonstein, Associate Professor, Department of Information Technology

Signature of Committee Member

Date

Your signature on this page indicates your commitment to working with this student in their effort to complete this thesis project for the time period indicated on the timeline.

Responsive Website Design
for First Unitarian Church and Louis Kahn
Chen Zhang
Rochester Institute of Technology
Computer Graphic Design MFA Program

Abstract

The First Unitarian Church, located in Rochester, New York, was designed by architect Louis Kahn in 1959 to replace the previous church designed by architect Richard Upjohn.

Louis Isadore Kahn is an American architect, based in Philadelphia, Pennsylvania. Influenced by ancient ruins, Kahn's style tends to the monumental and monolithic. Some of his famous works include Yale University Art Gallery, Salk Institute, Indian Institute of Management, Philips Exeter Academy Library. His heavy buildings do not hide their weight or their materials. His works are considered to be monumental beyond modernism.

Responsive Web design is the approach that suggests that design and development should respond to the user's behavior and environment based on screen size, platform and orientation. The practice consists of a mix of flexible grids and layouts, images and an intelligent use of CSS media queries. As the user switches from their laptop to iPad, the website should automatically switch to accommodate for resolution, image size and scripting abilities.

This thesis project is to design a responsive website about the First Unitarian Church, a website which has three user experiences: a desktop site, tablet site and a mobile site. The website audience is architecture or design students, professors, and enthusiasts. The goal of this website is to tell the story of the design of this

church, including the design concept and ideas, design process, methods and materials of construction, and a detail analysis.

This is the first website which is available to describe Louis Kahn's design for the church. A large amount of books, paper and other research resources on Kahn's design for the church exists, but none of them both give an overview and a detail analysis on the church. Also, this thesis is not only about the desktop website, it's also the website experience for tablets and mobile devices. Using HTML5 and CSS3 for the front-end programming is critical for this project. Keeping consistency and a good user experience throughout the three platforms is another design challenge. The users will also be able to get background information when they visit the site.

Problem Statement

Mobile devices and tablets are more and more popular these days. Digital media and online consumption is rapidly changing. It's no longer the era of PC desktop Internet, and it's going to be dominated by mobile and tablet devices. According to IDC, mobile Internet users will outnumber wireline connections like DSL and cable by 2015. The annual growth rate of mobile Internet devices is 16.6% between 2010 and 2015. Soon, users will use their mobile and tablets devices more than the desktop to access the Internet. This is what we call the Post-PC Era.

In the Post-PC Era, devices change, users change, context changes and this means everything will change. However, few successful websites are successfully delivered across different platforms. Most sites still provide only one version and it's design makes it impossible for the mobile users to view the site on the small screens with their slow connection speeds. The good thing is that more and more designers and developers are aware of this trend and it's problems. Designing a responsive website across different platforms is a must for future website design.

Another challenge of this thesis is to design a reasonable information architecture. There are numerous research books and papers about his works and philosophy. Based on existing resources, the contents of the website need to be carefully selected and filled into the website structure. For the mobile website, the content needs to be optimized for a better mobile user experience. Also the church itself is minimal. The design concern is with the integrity of materials, a feeling for the

expression of structure and a desire to return to essentials, so the visual design for this site needs to be consistent with the design of the architecture itself: that is, to express “only what matters”.

Survey of Literature

Louis Kahn

Author: Robert McCarter

Press: PHAIDON

ISBN-10: 0714840459

ISBN-13: 9780714840451

This book is an in-depth and scholarly monograph providing the definitive account of the life and works of Louis I Kahn. It includes major buildings such as the Kimbell Art Museum, the Yale Art Gallery and the Salk Institute, as well as the National Assembly Building, Dhaka, Bangladesh. It is also fully illustrated with photographs that convey the spirit and spatial qualities of Kahn's buildings, as well as concept development portfolios with drawings and plans that reveal the inspiration and development behind each project.

Louis I. Kahn : das Gesamtwerk / complete works

Author: Klaus-Peter Gast

Press: Munchen: Deutsche Verlags-Anstalt, c2001

ISBN-10: 3421032947

ISBN-13: 9783421032942

This volume provides an overview of the life and complete works of the 20th-century architect Louis I. Kahn (1901 - 1974). Kahn designed such buildings as: the Yale University Art Gallery 1951 - 53); the Richards Medical Research Building, University of Pennsylvania, Philadelphia (1957 - 61); the First Unitarian Church, Rochester, New York (1959 - 67); the Salk Institute for Biological Studies, La Jolla, California (1959 - 65); and the new capital in Dhaka, Bangladesh (1962 - 74). The book also includes a complete chronology of events in Kahn's life and work.

Mobile First

Author: Luke Wroblewski

Press: A Book Apart

ISBN: 978-1-937557-02-7

Former Yahoo! design architect and co-creator of Bahcheck, Luke talks about mobile experience design for modern website design. Its data-driven strategies and "battle tested" techniques provide very valuable guidance and resources for mobile design projects.

Responsive Web Design

Author: Luke Wroblewski

Press: A Book Apart

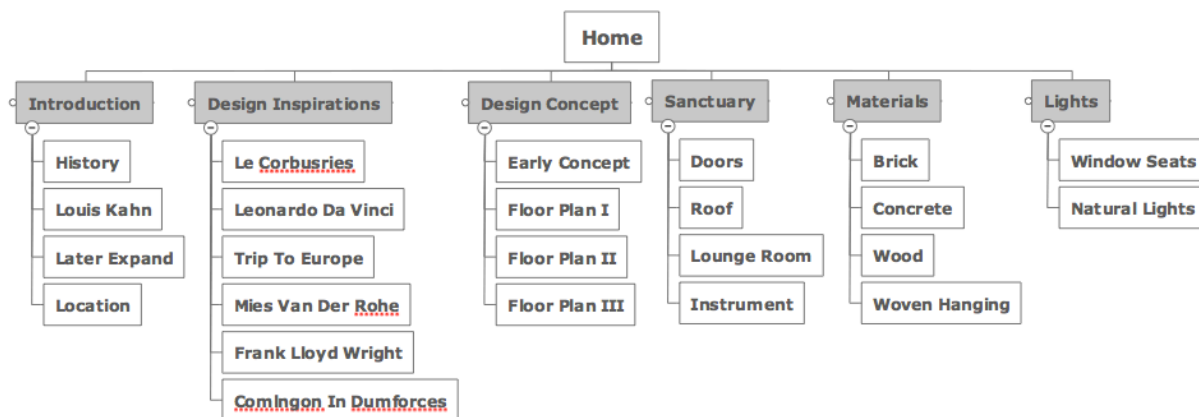
ISBN: 978-0-9844425-7-7

This book talks about how a designer can think beyond the desktop and craft beautiful designs that anticipate and respond to the user's need. The book talks about some CSS techniques and design principles, including fluid grids, flexible images and media queries. The objective of this book is to teach the designer to

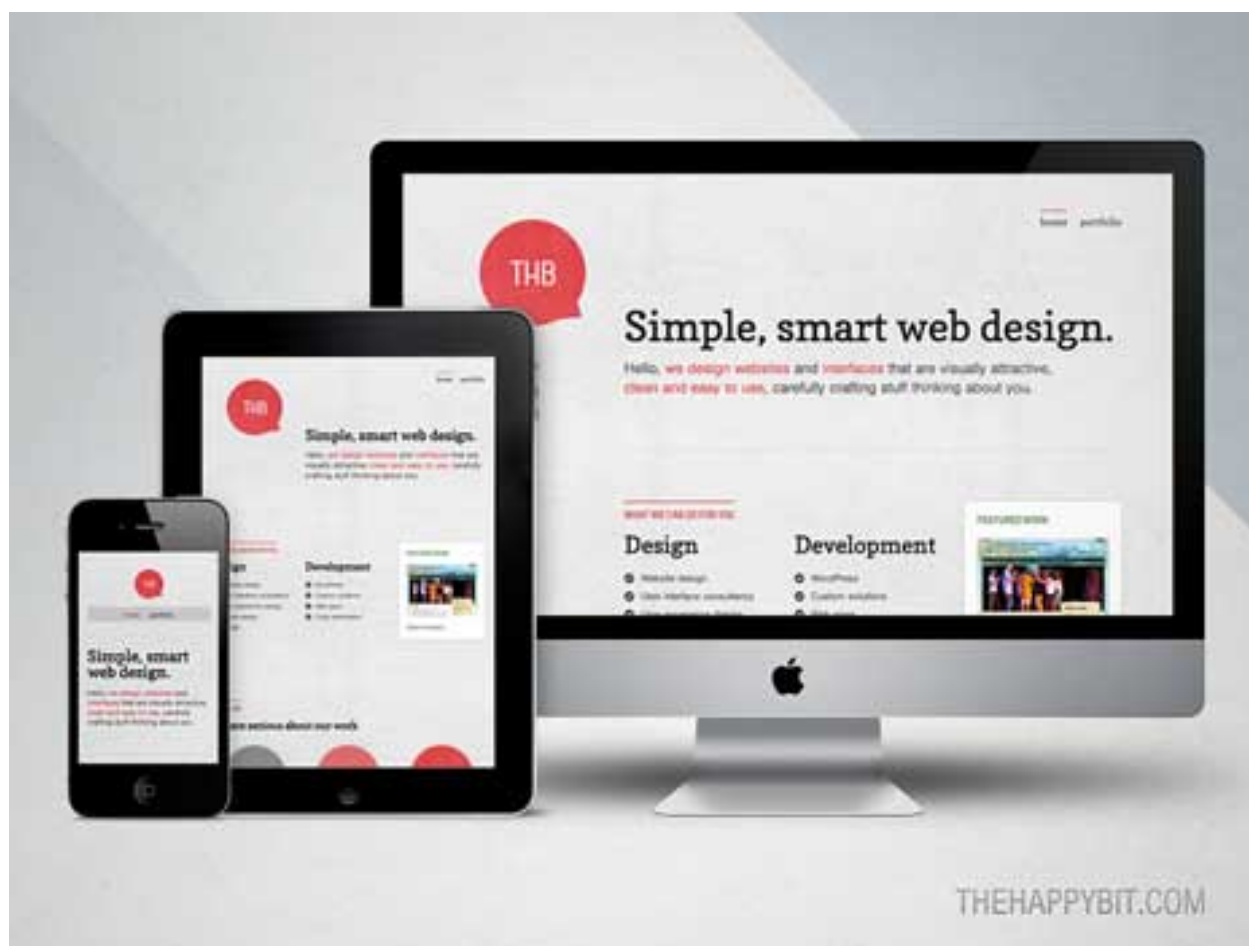
deliver a quality experience to the user no matter how large or small the display will be.

Design Ideation

This is the initial site map structure for this project. The site structure has six parts and it goes in chronological order to describe the design process of the architecture, starting from the introduction of the church and its religion, and proceeding to the design inspirations and concept. The main part of this site and the main part of the church is the sanctuary, so the sanctuary is an important section to describe and analysis Louis Kahn's design. Materials and lights will also be overviewed and analyzed in more details.



As for the cross platform user experience design for this site, the website should be responsive and effective at different screen sizes. It's the same content and same structure, but the presentation layout will be changed according to the context. A good example can be found here: <http://colly.com/>.



For the visual design of the project, the whole site needs to be minimal and reflect the design style of Louis Kahn's "back to the essentials". The look and feel of it should be the same as the First Unitarian Church.



Methodological Design

Graphical User Interface Design

The website audience is the design professionals, students and enthusiasts. The First Unitarian Church is very minimal. Louis Kahn is also an architect with a very strong personal, unique design style and philosophy. Therefore, the look and feel of this site must be consistent with the subject.

An central principle of the GUI design for this project is responsive design. This will be a cross-platform experience design for desktop, tablets and mobile. Different platforms have different screen sizes, interactive input hardware, connecting speed, user context. With all these considerations, the design for this site needs to be consistent across with the different screens.

User Experience Design

The contents of this site are a fundamental part of this whole project. All of the contents will not be from others, but from the designer himself. All photos for this site will be taken by the designer and all the texts will be written by the same person from the research paper and books. A sketch or other design diagrams will also be used with authorization from the church.

With all contents, a reasonable and solid information architecture can be designed. In order to tell the story of the design for the First Unitarian Church, contents can be divided into different parts: history, design concept and inspirations, Sanctuary, Materials and Lights.

Front-end Programming Design

Using HTML5 and CSS3 will make the website responsive to different platforms and devices. The design considerations for the development part will require that the coding standard match the current mainstream, and most browsers have no

problems rendering it. Another issue is to make the files as small as possible to avoid excessive downloading time for mobile users.

Implementation Strategies

Prior to selecting the contents and designing information architecture, preparation for the design of the site includes the design competitive analysis, design inspiration, user research and design direction.

The second part of the project is to select the content and design the site structure. All the photos require to be taken on site. The texts for this site will also be added and edited at the same time. At the same time the wireframes for this site will be developed. A series of versions will be revisited and revised.

After the user experience for this site is decided, the visual mock-up for this site is the next step. Then comes the HTML/CSS coding part, and the final step is the testing and revision.

User testing will be conducted during the whole project. Four big user testings will be conducted: one for the site map, a second for the wireframe, a third for the visual mock-up and the last for the final website.

Throughout the project, mobile first is the design strategy I will use. I will first think about mobile and choose the most important parts to display for the small screen, and then think about the tablet and the desktop experience.

Dissemination Plan

The main promotion for this project is to make the site live and to make it available to the public. Some basic SEO methods will be used to make it friendly to the Google search engine and make sure it can be found.

One way for the site promotion is through the church website and church publications. It's also possible to get help from the church to let more members and visitors know about this projects.

Another way is to submit this site to the mainstream web awards website, like FWA, AWWWARDS, Site Inspire and etc.

Social networks are another important tool to market this project, like Facebook, Twitter and Google+.

Evaluation Plan

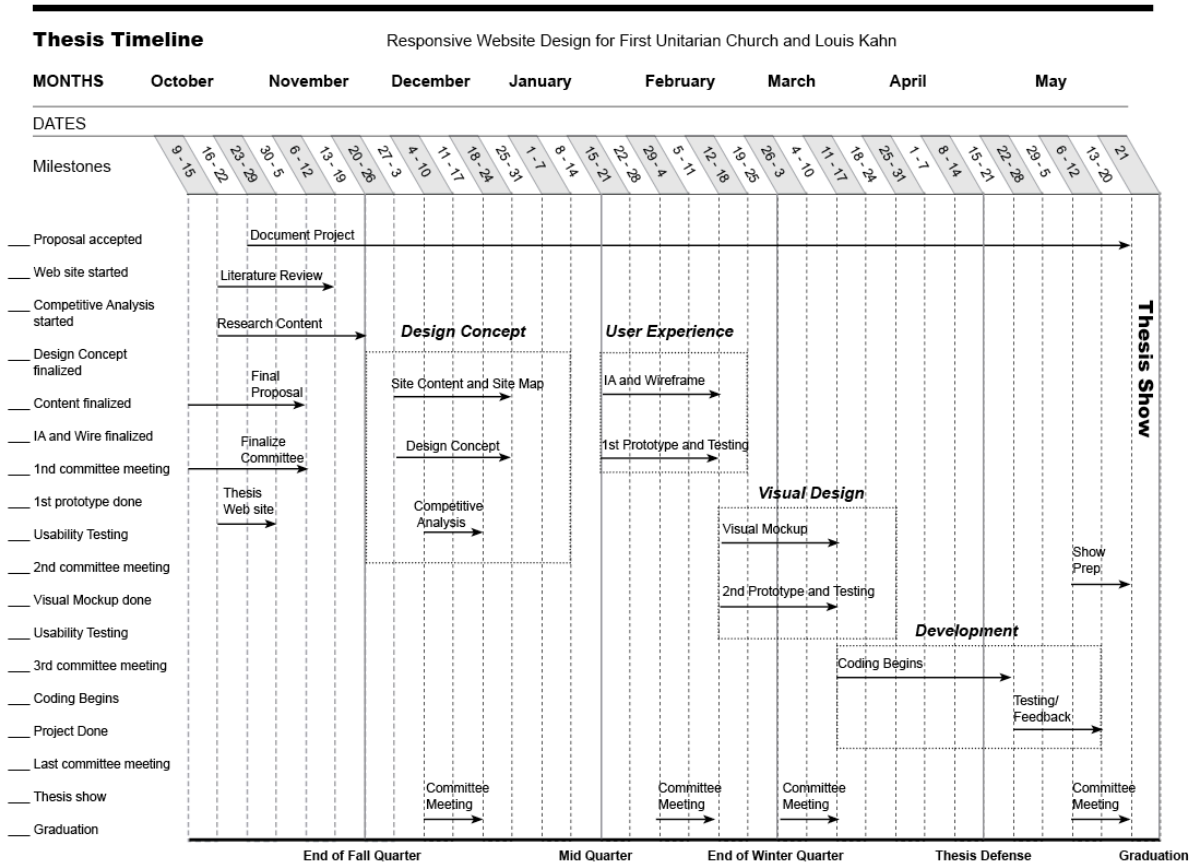
Various usability tests will be used to evaluate this project continuously. For the site structure, an online questionnaire will be used. Google Form is a powerful tool to get and analyze data from the users. For the wireframe and mockups, some users will be invited to do the user testing on the prototypes. Follow-up user interviews will also be used to get their feedback.

After the site is live, Google Analytics will be used to detect and monitor site usage.

Pragmatic Considerations

The budget for this budget is minimal. The main two budget items are the reference books and usability testing materials. Because some books can be borrowed from the RIT library, only one or two books will be purchased online. I estimate a \$200 budget for this project.

Timeline



Reference

Sonit Bafna, *Symbolic construction in non-discursive media: The design development of Kahn's Unitarian Church in Rochester*, Georgia Institute of Technology, USA