A Qualitative Study on Web Product Development:

Based on Experiences of Professionals

A Master's Thesis

Presented to

Department of Information Design and Technology

State University of New York
Institute of Technology

Utica, NY

In Partial Fulfillment
of the Requirements for the

Master of Science Degree

by

Krista A. Plano

August 2011
Table of Contents

Abstract 4
Research Questions 5
Literature Review 7
Methodology 15
Sampling Method & Interview Protocol 17
Data Collection, Instrumentation, and Analysis 18
Results 19
Discussion 32
Implications and Future Research 34
Conclusion 37
References 39
Tables and Figures

Table 1 An Established Web Development Team by Department and Role 8

Figure 1. DeLone & McLean’s Success Model 12

Table 2 A list of the codes used in the analysis phase of the data from interview transcripts 18

Table 3 Compilation of Definitions for Terms used in this Thesis in Reference to the Digital Industry 19

Table 4 A list of the themes discovered through conversations with web professionals 20

Figure 2. Flow of Management Structure Developed and Explained by Participant 6 31
Abstract

The purpose of this thesis is to discuss the different experiences of web professionals and how these professionals interact with one another and with clients to create web products. I used relevant literature and qualitative research to present the themes that exist in the production of web products. When I began my thesis I was an aspiring Web Project Manager with minimal experience in the digital field and decided to research the experiences of web professionals to learn about the process of creating web-based products from beginning to end. Research and interviews provided information on the steps involved in web product development: I learned that the steps are dependent on the scope of a project and the requirements of stakeholders, clients, and users. I conducted semi-structured, in-depth interviews with seven professionals and extracted themes that include making a functional team, professional roles, the merging roles of web developer and web designer, problem solving, marketing strategies, the process, team interaction, client relations, and products versus projects. Professionals discussed experiences related to team and client interaction that help define the overall development process and answer the research question, how do web professionals create web products? I learned that these steps vary and overlap depending on experiences and professional roles.
Research Questions

I set out to answer the following questions in my thesis to better understand the variety of circumstances, roles, and steps involved in building a successful web product.

Who makes up the web team?

The literature review outlined the roles of web professionals which include the project manager or business analyst, web developer, web designer, and, when necessary, an information architect and user experience specialist. My goal was to find out how these professionals interact with one another and with clients to create web products. As an average Internet user, I browsed through websites without questioning how these products were developed. I was given a job opportunity to work on a website and began to learn about the steps involved in the process that I never considered as the average user. That experience inspired me to learn more about the interactions between professionals and their clients that are necessary to create web products.

How do web professionals define the work they do and the products of their work?

Web professionals refer to their experiences and the end products they develop in different ways. Some refer to web tools as websites and others define them as products. I wanted to interview professionals to learn about their experiences and the steps that they take to develop a product from beginning to end and discover who is involved, how the product is defined and conceptualized, and the steps taken to reach the end goal.

What steps are necessary to conceptualize, design, and develop a web product?

One goal of the study was to understand and compare the different approaches professionals take to build a web product for targeted users. As the literature review revealed, some professionals prefer a strategically organized process (Miranda, 2006, p. 80), others prefer to allow the process to unfold organically (Braun, 2001, p. 58), and some take the process into
their own hands to facilitate the work flow (personal communication, Participant 5, March 23, 2011). In the middle of these approaches is the preference for agility which results in a combination of a well-structured and thought out process that changes hands from conception to development without extraneous debate (Braun, 2001, p. 59). According to current research, the extent to which these can all be adopted depends upon the scope of a project, the requirements of the stakeholder, and the needs of the user. I wanted to ask current professionals about their experiences in order to discover the themes involved in the process of creating web products.

**What are the requirements of a web project dependent upon?**

I designed open-ended questions to extract information regarding the necessary requirements to complete projects, the circumstances that define each project, and the responsibilities of each role in the process of development. I had a general understanding that it is the responsibility of the web team to meet the needs of the client and the users in order to translate those needs into a functional, user-friendly product. I was interested in gaining knowledge about the experiences and steps a web team takes to meet these requirements.
A QUALITATIVE STUDY ON WEB PRODUCT DEVELOPMENT: BASED ON EXPERIENCES OF PROFESSIONALS

**Literature Review**

The Internet has rapidly expanded to become an undeniable aspect of our lives and is used as a means to perform tasks from scholarly research to paying bills (Schaupp, 2010, p. 43). The purpose of this thesis is to learn about and discuss the roles involved and the steps taken to create the web products that we use. Relevant literature discusses the processes of web product development from agile methods to ad-hoc approaches (Braun, 2001, p. 58). The approaches are dependent on the scope of the project, requirements of the stakeholder, goals of the client, and needs of the user (Schaupp, 2010, p. 42). Miranda (2006) states that the requirements to create relevant and usable tools that survive the constantly changing nature of the Internet include innovative ideas, thoughtful planning, and user-friendly design (p. 80). My research interest is grounded in the prominence of the Internet and the development of the web products we use. Schaupp (2010).

**Roles of the Web Team**

In her article, “Where have all the webmasters gone?”, Guenther (2005) discusses the nearly extinct role of the single webmaster, who is responsible for ensuring that a website runs efficiently and is up-to-date. The role has transformed into various roles which include content managers, server administrators, writers, and editors (p.45). Guenther (2005) discusses additional positions and the responsibilities involved in maintaining a functional website. My summary of these positions is included in Table 1 (p. 45-47):

<table>
<thead>
<tr>
<th>Table 1 An Established Web Development Team by Department and Role</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Web Management
Responsible for developing and implementing web strategy to align with the business strategy (p. 45).

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Operations Manager</td>
<td>Oversees web strategy, staff, and budget, working with customers, colleagues and stakeholders to ensure all business, strategic, and information processes move forward accordingly.</td>
</tr>
<tr>
<td>E-Business Manager</td>
<td>Develops approach to identifying related markets and strategizing aspects of e-commerce, marketing, and communications.</td>
</tr>
<tr>
<td>Web Project Manager</td>
<td>Coordinate team members and define necessary goals and tasks for developers, designers, and administrators to deliver an optimal product to the end user.</td>
</tr>
<tr>
<td>Web Product Manager</td>
<td>Coordinates staffing and development of a single item within a larger project scope.</td>
</tr>
</tbody>
</table>

### Web Design & Development
Responsible for the aesthetic appeal of the site and developers for functionality of the site (p. 46).

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Designer</td>
<td>Creates the aesthetic of the site or product including colors, typography, and graphics.</td>
</tr>
<tr>
<td>Web Developer</td>
<td>Implements programming languages to add functionality to a website; translates system requirements into code.</td>
</tr>
<tr>
<td>Quality Assurance Developer</td>
<td>Focuses on workflow design and production and adheres to standards to promote use of documentation, quality assurance testing, and debugging.</td>
</tr>
<tr>
<td>Integration Engineer or Architect</td>
<td>Integrates web systems and services for a consolidated, strategic platform.</td>
</tr>
<tr>
<td>Role</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Usability Analyst</strong></td>
<td>Responsible for creating a testing environment and translating data into usable information.</td>
</tr>
<tr>
<td><strong>Information Architect</strong></td>
<td>Defines organization of categories, language, labeling, and navigational structure of a product or website.</td>
</tr>
<tr>
<td><strong>Website Product Marketing</strong></td>
<td>Responsible for promoting web-based services through search engine optimization (p. 47).</td>
</tr>
<tr>
<td><strong>Web Marketing Manager</strong></td>
<td>Develops a marketing strategy and promotes products on the web through user analysis.</td>
</tr>
<tr>
<td><strong>SEO Engineer</strong></td>
<td>Facilitates internal and external search indexing to increase website traffic.</td>
</tr>
<tr>
<td><strong>Technical</strong></td>
<td>Responsible for upgrading and maintaining technical performance for optimal functionality (p. 47).</td>
</tr>
<tr>
<td><strong>Web Technical Administrator</strong></td>
<td>Responsible for maintaining the technical integrity of the site.</td>
</tr>
<tr>
<td><strong>Content Organizers</strong></td>
<td>Responsible for writing and maintaining quality content and managing data (p. 47).</td>
</tr>
<tr>
<td><strong>Web content writer</strong></td>
<td>Responsible for creating and maintaining website copy.</td>
</tr>
<tr>
<td><strong>Web content manager</strong></td>
<td>Manages content to be presented on the website including multimedia and supplemental materials.</td>
</tr>
</tbody>
</table>

The summary of Guenther’s (2005) explanations highlights the departments, individual roles, and responsibilities of each position. She discusses the roles necessary to build a web product
and explains certain roles in comparison to one another providing a foundation for my qualitative research. For example, sometimes the roles of web designer and web developer are unclear because the skill sets overlap but there is distinction between these roles (Guenther, 2005, p. 46). The designer creates the overall aesthetic of a product with graphic elements and color schemes and the developer translates templates or wireframes into code that become functional web products. The combined efforts of each role are necessary to produce a usable, well-designed web product with quality content (Guenther, 2005, 47). She explains other roles like writer and project manager as jobs that have always been in place in the professional world and function now within online-based professions (p. 47).

**Web Development Approaches and Processes**

In order to understand and extract themes from the experiences of current professionals, it is useful to explore the research that discusses web development approaches and processes. Miranda (2006) identifies three fundamental and high level stages of web production as planning, design, and implementation (p. 80). Within these high level stages are the steps that must be taken to ensure quality and functionality. It is essential to identify the target audience and elements for presentation, define the content, conceptualize the structure and information architecture, stage the product for testing, and then retrieve user feedback when the site is published (p. 80). According to Miranda (2006), content structure and navigation are the most important site elements that fulfill the purpose of the project and guarantee user satisfaction (p. 80). In contrast to strategic planning methods are ad-hoc development methods discussed by Braun (2001) who defines ad-hoc as the absence of a formal method (p. 58). Ad-hoc development is comprised of the immediate translation of user needs into an end product that may or may not fulfill quality standards (p. 58). Research by both Braun (2001) and
Bauer (2005) suggests that a comprehensive and attainable medium between rigorous planning and a rapid turnover is a lean and agile method. Braun’s (2001) agile method identifies and extracts the extraneous resulting in more time to market the product, better quality with greater flexibility, lower costs, and positive team morale (p. 59). The method consists of small teams made up of five to fifteen members with defined roles and responsibilities (p. 60). The idea is to compile a team that works in harmony and takes the steps necessary to create a usable end product (Braun, 2001, p. 60). The emerging product is defined by the decision maker and the team works in three to eight week phases known as sprints. Sprints keep team members on task and each sprint has a narrow focus to ensure task completion (p. 60).

Bauer (2005) discusses the need for change in an approach when projects fail to meet deadlines, go over budget due to lack of communication with the client, or underestimation of the project scope (para. 6). He (2005) set out to find a comprehensive and sufficient information methodology and then decided to apply methodologies of the agile movement to streamline the web development process (para. 16). Aligned with an agile method is the theory of simplified design: iterative design methods can create streamlined websites that attract users and encourage them to return to a website (Fichter, 2007, p. 52). Like agile methodology, iterative design efficiently influences new and creative ideas in place of a debate process that can slow a product down from being developed and tested immediately (p. 53). Fichter explains that when employing rapid prototyping the design can be tweaked after live testing, but it is important to maintain continuity between designs for users to acclimate from one design iteration to the next (p. 53).

Lee and Lee (2008) reinforce the importance of user response; their strategy focuses on customers, competitors, and the company itself (p. 309). Defining customer values and
creating a system that supports the customer in completing his goals should be superior to the competition (p. 312). Benchmarking is a technique that can be used to comprehend the vertical market; analyzing features and elements that can be used, improved, or avoided (p. 312). A team can identify key factors, current user behaviors, and use the competition to create a better end product for the user (p. 313, 318). Schapp (2010) agrees that the success of a website is goal and context specific (p. 42). The theme of these approaches points out that each end product should be treated uniquely depending on the preferred workflow of the web team, scope of the project, and client and user needs.

**Quality Assurance**

The success of an end product is dependent on a positive user experience (Schapp, 2010, p. 46). The better the system quality, the higher the rate of user satisfaction which results in positive user experience and organizational productivity (DeLone & McLean, 2003, p. 11). The three components of the process model illustrated in DeLone and McLean’s figure below (Figure 1, p. 16) include the creation of a system, the use of the system, and the consequences of this system use (DeLone & McLean, 2003, p. 16).
Figure 1. DeLone & McLean’s Success Model illustrates the three components necessary to achieve user satisfaction, which include the creation of a system, the use of the system, and the consequences of this system use.

System quality can be tested through the process referred to in the digital industry as QA (quality assurance). Before an end product is deployed to production or "goes live" for public use, a member of the web team, in most cases the project manager, is responsible for conducting a QA phase that occurs when the product is put on a private server for functionality and interface testing. The purpose of this phase is to reveal the bugs or errors that affect the stability of the product and to resolve them before the production phase. While the project manager is usually responsible for performing QA and reporting any bugs, the web developers are responsible for resolving them.

User Response

Research on user response to web products discusses information quality, user satisfaction, and the goals of a product. Schaupp (2010) defines quality information as accurate, relevant, complete, and easy-to-navigate (p. 49). System quality is dependent on how easily a user can complete a task (p. 49). Study findings prove that information quality is an influential factor in providing satisfaction to the end user which means that it should be considered as a step in the process of developing a web product (p. 57).

A study on user experience carried out by Tucha, Bargas-Avilaa, Opwisa, and Wilhelm (2009) explains the importance of usability as well as aesthetic appeal to achieve user satisfaction (p. 703). The authors identify the introduction to a website also known as the homepage as significant because it is the first impression of a site. It immediately sets user expectations and influences their decision on whether or not to browse (p. 703). It is the
A QUALITATIVE STUDY ON WEB PRODUCT DEVELOPMENT: BASED ON EXPERIENCES OF PROFESSIONALS

responsibility of a web team to realize how to attract users, keep them on the site, and deliver
a memorable experience that will bring a user back to the site (p. 703). Tucha et al. (2009)
believe that visual complexity plays a significant role in developing a successful first impression,
and their study investigates its impact through physiological response to and ratings on live
homepages (p. 706). Results proved that users performed more efficiently on search and
recognition tasks on homepages with low visual complexity, which points out another element to
be considered by web professionals when developing a product (p. 712).

**Design & Navigation**

It is useful to review literature on aspects of web products such as design and navigation
because they are often a part of the product development process and professional experience.
Regarding the aesthetic design of a website, Schaupp (2010) notes that it is important that the
design coincides with the objectives of the organization (p. 42). Engholm (2002) elaborates on
various theories regarding design and its relationship to usability and purpose. Usability expert,
Jakob Nielsen (2000) supports a concentration on content and function along with decreased
prioritization afforded to graphic elements. In contrast, Siegel supports an increased focus
on design aesthetics to promote the entertaining aspects of a website (as cited in Engholm,
advances in technology have afforded website producers the flexibility to concentrate on
incorporating design elements and features that promote smart, user-friendly designs with
optimal communication of content (p. 198).

Combined with the ideal graphic elements and design decisions, successful information
architecture creates a positive user experience (Maloney & Bracke, 2004, p. 146). An initial
approach to defining the structure of a website begins with grouping content logically for clear
delivery to the user. Site structures ideally include search tools and link-management tools
that guide users in locating necessary content and services (p. 147). Maloney and Bracke
(2004) suggest these elements be conceptualized in advance for a systematic approach to avoid
an ad-hoc approach to website design and to ensure affordable design, implementation, and
maintenance (p. 150).

Methodology

As the researcher, I was the primary instrument of data collection and analysis for this study (Merriam, 2009, p. 29). I used qualitative methods to learn about and describe the steps
that web professionals including project managers, web designers, web developers, and
marketing and business team members take to develop web products. The variation of
possibilities and circumstances aligned with web product development inspired the question:
How do web professionals create web products? I conducted seven interviews with professionals
in the digital field. One of the seven interviews was conducted over the phone for logistical
reasons and the remaining six were conducted in person. One of the six face-to-face interviews
was conducted as a joint interview with colleagues who requested they meet with me at the same
time. Participants included product or project managers, a marketing director, designers, and
developers in order to analyze and compare their experiences and reflections on those
experiences. I used a digital recorder, took notes during interviews, and transcribed each
interview as soon after it was conducted as possible. The data from each interview built upon
new material from the previous interviews and informed my questions in the next interview
illustrating a "recursive and dynamic" process (Merriam, 2009, p.169). After transcribing each
interview, I summarized the main concepts and noted participant roles and the time and location
of the interview. When I realized consistencies in codes and themes across interviews, I noted each and created a reference list for the coding and data collection process.

**The Role of Researcher and Product Manager**

The formulation of my research question was based on the minimal professional experience I had from working as part of a web team. I had experience as a part-time business analyst for a year during which I was introduced to the various roles and steps required to build a web product. Exposure to the industry and the process of product development led me to ask questions regarding the practices of companies and professionals. I was introduced to project requirements like managing content, creating wireframes, communicating functionality to the web developers who program the product, and communicating with clients. The part-time experience left me with a vague understanding regarding the intricacies of the product development process and its components.

I used my thesis as an opportunity to communicate with experienced professionals and answer the questions that are unknown to the average user and to discover themes related to my research question: How do web professionals create web products? While I began research for my literature review, I was applying for a full-time role in the digital industry and was hired as a Product Manager for a consulting company that builds web products focused on behavioral change. For example, one of the products is meant to help people with jobs get raises through a series of questions and data analysis that is customized to the professional experience of each user. My role as a novice Product Manager has exposed me to the process of building web products while writing this thesis, and my research has facilitated my knowledge regarding the process.
IRB and Confidentiality

This study was exempt from an IRB because the focus of the interview questions was on web product development and not on the personal lives of the participants. Additionally, the research was not dangerous to the participants. In the absence of an IRB, I took precautions to ensure the participants that their responses were confidential. Prior to the start of each interview I explained the purpose of my research, provided background information about myself, and explained that participation was voluntary and the interviewee could refuse participation. I notified each participant when I would begin recording and asked for permission to proceed, and in the cases when I recognized a noteworthy statement, I asked permission to quote the participant. The identity of each participant remains anonymous in the discussion of my results and findings. I maintained confidentiality within my documentation, transcriptions, and findings by referring to each participant by number rather than by name.

Sampling Method & Interview Protocol

My experience working with web professionals has pointed to the fact that people who work with creating, editing, developing, and producing content for the web understand it differently than the average user. I interviewed a purposeful sample of professionals whom I know or have worked with in the past. The interviews were between twenty-five and forty minutes long with the exception of the joint interview which was an hour long. My goal was to discover overlapping themes from the different experiences of web professionals and how these professionals interact with one another and with clients to create web products. I allowed the interviews to unfold organically, asking follow up questions when appropriate, questioning generalizations, and inquiring about possible themes. Below is a set of questions I used to guide the interview process.
1. What do you do in a typical day at work?

2. What kind of web based products do you develop and what does the process of developing these products entail?

3. Who are the members of your team and can you discuss your interaction with them?

4. Can you discuss the goals you set at the start of a project?

5. What is your background and how did it pave the way for the role you fulfill today?

Data Collection, Instrumentation, and Analysis

I used the qualitative analysis software HyperRESEARCH to code the interview transcripts and followed the tutorials provided with the software to become acquainted with its capabilities. I used the coding function to label the similarities across participant responses. I began to write while I coded the data in order to compare notes across interviews and to discover the themes that contribute to my findings. Below in Table 2 is the list of codes that were used. In the results and discussion sections I elaborate on the codes in bold text which appeared most frequently in the interview transcripts.

Table 2 A list of the codes used in the analysis phase of the data from interview transcripts

<table>
<thead>
<tr>
<th>Code</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Web design and development merge</td>
</tr>
<tr>
<td>2.</td>
<td>Participant background</td>
</tr>
<tr>
<td>3.</td>
<td>Client Interaction</td>
</tr>
<tr>
<td>4.</td>
<td>CMS</td>
</tr>
<tr>
<td>5.</td>
<td>Corporate</td>
</tr>
<tr>
<td>6.</td>
<td>End Product</td>
</tr>
<tr>
<td>7.</td>
<td>Evolving Industry</td>
</tr>
<tr>
<td>8.</td>
<td>Examples of products</td>
</tr>
<tr>
<td>9.</td>
<td>Expertise</td>
</tr>
<tr>
<td>10.</td>
<td>Typical day (email)</td>
</tr>
<tr>
<td>11.</td>
<td>Marketing</td>
</tr>
<tr>
<td>12.</td>
<td>Outcome measure</td>
</tr>
<tr>
<td>13.</td>
<td>Problem solving</td>
</tr>
<tr>
<td>14.</td>
<td>Process</td>
</tr>
</tbody>
</table>
After I accumulated several paragraphs of information, I began to use bold text to highlight themes in different data units and used related concepts from transcripts to build upon the theories and reoccurring patterns like the approach discussed in Rubin and Rubin (2005): The authors (2005) explain that "once you have seen the connection between these ideas, you can look elsewhere in your transcript where any of the individual themes are mentioned to see if what is said is consistent with your emerging theory about how they relate" (p. 232).

Results

Compilation of Definitions

Table 3 below provides a compilation of terms with definitions that are used in the digital industry that will act as a reference for the results and conclusion sections to follow. These definitions are based on data extracted from participants, the literature review, and my recent professional experience in the industry.

<table>
<thead>
<tr>
<th>Table 3 Compilation of Definitions for Terms used in this Thesis in Reference to the Digital Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web and Product Development</td>
</tr>
<tr>
<td>Implementation</td>
</tr>
</tbody>
</table>
This is a general reference to the programming languages written by web developers or engineers that add functionality to web products.

Digital Industry
The industry encompasses the companies and roles within those companies that collaborate to conceptualize and build functional products for web use.

Project
Project refers to the process followed to create a product. It can also refer to the end product itself, usually when it is a website.

Product
The product is the end result of a project. It most often refers to the deliverable that is presented to the client at the end of a project.

CMS (Content Management System)
This is a database that is used to manage and edit the content of large websites that require frequent updates and gather and output a significant amount of information.

Wireframes
Wireframes are most often created by project managers and are used to communicate the concept and functionality of a product to developers. They are essentially the skeleton of a website or product and include technical specifications that define functionality.

QA (Quality Assurance)
QA involves the testing of a product on a private server before it is put on production for public use. Developers and project managers work together to test the product, reveal outstanding bugs or errors, and resolve them.

Back End Developer
A back end developer is responsible for programming the data required to make elements function for the user on the front end.

Front End Developer
A front end developer is responsible for the user interface, which is visible to the user when interacting with a product. They make the data coming from the back end appear as it should in the browser (i.e. Internet Explorer, Firefox, Chrome).

Scope
This includes the specifications and requirements of a project defined by the needs of the client.

Design brief
This is a document provided by the client that outlines the design requirements of a project with information that defines the audience and clarifies the purpose of the project.

Themes
In the results section I will discuss the common themes discovered across the seven interviews with experienced web professionals which provided insight into the industry. Themes include the following:

Table 4 A list of the themes discovered through conversations with web professionals

<table>
<thead>
<tr>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Team Interaction</td>
</tr>
<tr>
<td>2. Professional Roles and Environments</td>
</tr>
<tr>
<td>3. Role of Intermediaries</td>
</tr>
<tr>
<td>4. Making a Functional Team</td>
</tr>
</tbody>
</table>
5. Two Sides of Client Relations
6. Merging Roles of Web Developer and Web Designer
7. Self-taught Developers
8. Integration of Skills
9. Products versus Projects
10. Problem Solving
11. Marketing Strategies
12. The Process

These themes are related to team and client interactions, role responsibilities, self-taught professionals, the merging roles of web designer and web developer, marketing strategies of the business team, and products versus projects. Participants provided commentary and suggestions on the practiced approaches and processes required to develop a web product. Many of the perspectives are related to and dependent on participant experience and whether the participant works in a start-up, corporate, or freelance environment, the scope of each project, and the dynamic of the web team and their commonly adopted approaches. Discussions on the process provide insights into the daily happenings in the industry and explain steps like creating wireframes, writing technical specifications, managing content, and performing QA.

Team Interaction

Team interaction and distribution of tasks varies from company-to-company and from project-to-project. A common reference to team interaction in interviews regarded the ability to communicate with different types of people on different levels. Communicating with a
designer is much different than communicating with a developer: “..it's a skill to be able to
speak to a designer and programmer at their level because they speak totally different languages”
(Participant 2, personal communication, March 18, 2011). It is the job of the project manager to
be able to communicate effectively with each member of the team because they are responsible
for the entire project and making sure everyone gets their tasks done on time. Participant
7 provided a summary of her responsibilities as Business Analyst/Project Manager: she
communicates with clients, developers, and designers and does “all sorts of things in between
to manage project and product development”. Participant 1 also explains that he interacts with
clients and different members of his team in unique ways depending on their roles and work
habits (personal communication, March 17, 2011).

For active projects Participant 7 works with the developer to set up the requirements
and talks to the clients to find out what they need then makes wireframes, writes technical
specifications, speaks with clients who have questions, sends reports based on data collection,
and coordinates projects within the company by asking questions like “Has this been done?,
Where are we at with this project?” . She makes sure the developers have built all of the pieces
then does “quality assurance (QA)” for each piece to verify that the sites work like they are
meant to work. Then there is a back and forth process called “request for clarification (RFC)”
with the developers to clarify the coordination between functionality and design based on the
original wireframes (personal communication, March 25, 2011).

Professional Roles and Environments

The common roles addressed in interviews included project manager, web designer, web
developer, and sales and marketing. Roles that were referenced and explained as sometimes
in place for each project include information architect and user experience specialist; these are
roles that can be absorbed by other team members but are sometimes necessary depending on the scope and focus of the project. The experiences between professionals in these roles vary based on the work environment of the participant. Freelancers who have their own clients and complete projects from start to finish without the support of a team respond differently than professionals who work for a medium sized company in a team environment. Participant 6, an experienced Web Designer and Developer, has freelance project experience and experience working for a large digital agency. His most valued experience was based on the knowledge he gathered from working side-by-side with other developers who do the same work (personal communication, March 24, 2011). Participant 2, a Partner and Project Manager at a web development boutique, discussed the value of working side-by-side to communicate project requirements to his developers and designers (personal communication, March 18, 2011).

Role of Intermediaries

Participants commonly referenced roles of intermediaries who are often not helpful to the development of a project. Participant 6 explained, "You can have five colors or two-hundred fifty-six colors of job titles and things like that depend on the project, the bigger the company the bigger the client and the more steps between the client and the end product". He thinks the intermediaries are most helpful so that the developers do not have to deal with the clients, but sometimes those people in the middle just bloat the cost of the project and are not helpful. In relation to this Participant 7 said, “when there is a need for a user experience specialist then bring one on, if not then do not use the extra resources because unnecessary resources can inflate the cost of completing a project and extend the launch date” (personal communication, March 25, 2011). In order to develop a successful web product in a team environment, it is essential to have quality, experienced professionals on your team. For example, Participant 4, a Marketing
Director, explained that "It's all about surrounding yourself with the right team and with people who are do-ers and not complainers". He wants to work with the people who will "take your idea and run with it rather than taking it and tearing it apart" (personal communication, March 24, 2011).

**Two Sides of Client Relations**

Participants including the project managers and other professionals commonly agree that the project manager should protect the team from clients. As projects develop clients have questions and expectations that require attention, and it is the job of the project manager to regulate client expectations. For example, if a project manager starts responding to emails after business hours, the client will adopt this as the norm. Participant 2 who is a Project Manager explained that part of his role is to “shield the team because clients are always bombarding them with stuff”. He uses preventative maintenance by asking the client to sign off on a set of requirements so his team can go and do the work. He said, "So, ideally I would not talk to my client for three weeks and then come back and show them something, and if we did our job it will be exactly as spec'ed. You need to build a buffer between you and the client because they will request changes and some changes are beyond the original scope of the project" (personal communication, March 18, 2011).

Participant 5 manipulates turnaround times to regulate client interaction. I asked, “Aren’t you supposed to speed up the work flow?”, Participant 5 responded, "I can do that when I need to but I don't need to. I try to control the client so I can protect my team" (personal communication, March 23, 2011). His team is more important than the client, but he explains that it was the opposite when he worked for a start-up: the client was most important and he would not hesitate to push the production team to do something in a rush. His resources no
longer have the “desire to go the extra mile”. Similar to the sentiment toward client interaction by Participant 5, Participant 2 explains that he avoids constant communication with clients by collecting emails from them and grouping their questions, then he compiles a punch list and sends it out at the end of the week (personal communication, March 18, 2011). Participant 5 also avoids talking to clients everyday and he has become accustomed to writing detailed emails so the communication is limited.

While client relations can be viewed negatively, there is also the positive and necessary side. For example, Participant 7 offers a positive explanation of client relations when she explained that it is all about what the client wants because the client has the users and "the game is to get users to do what the client wants them to do"; therefore, if you do not listen to the client then you have no idea who the users are or how successful the end product is. While it is "hard to satisfy a client..if you do it right then it is worth it" (personal communication, March 25, 2011).

**Merging Roles of Web Developer and Web Designer**

Two roles that are necessary for web projects and are becoming more similar include the web designer and the web developer. Participant 3, a retired Web Designer, explained his recent experiences with browsing job posts. He noticed that the skill set is similar for web designer and web developer positions. In his opinion, both roles will remain in place but with overlapping skill sets. Web design is becoming increasingly programmatic and he believes that web designers need programming knowledge in order to fulfill their job roles (personal communication, March 18, 2011). Participant 7 supports this theme by explaining that it is necessary for a designer to know programming in order to build a successful web page (personal communication, March 25, 2011).
Web designers experience a feeling of creative loss when they spend more time writing code than designing the aesthetic elements of a product. Participant 3 knows designers who have left their jobs because they became too focused on programming. Participant 6 started his career as a web developer and learned programming language out of necessity. Since programmers are in high demand, the majority of his time is spent programming and he expressed his frustration, "if I cannot get a little bit of art in there then I am going to lose my soul entirely..." (personal communication, March 24, 2011).

_Self-taught Developers_

The web designers interviewed or referenced in participant interviews learned how to program out of necessity to fulfill their job roles or to grow within the industry. When Participant 6, Web Designer and Developer, began to freelance as a web designer he discovered the immediate need for programming knowledge and when he went from freelance to working for a large digital agency he learned from doing and from fixing other peoples projects because he was able to see how they did it. In the year and a half he was working in a team environment, he learned more than he ever had about programming and the process of developing a product than while working on his own (personal communication, March 24, 2011). When I asked Participant 7 if the designer she works with also writes code she explained that “You basically have to because when you are designing you have to know how pages are built in order to design a successful page. They have to know some amount of development” (personal communication, March 25, 2011).

_Integration of Skills_
Similar to the way that designers learn to program, other web professionals adopt additional skill sets to increase workflow. I asked Participant 5, a Project Manager, “Do you ever produce an end product or is your job primarily to get other people to produce the end product?” He responded, “I do, I shouldn’t but I do”. He learned Hyper Text Markup Language (HTML), a front end based language that creates static web pages, in order to do work himself rather than delegating. He elaborates on the fact that sometimes it is more time consuming but less frustrating to do things yourself. Participant 4, Marketing Director, explained that he produces video emails with embedded HTML to send out as marketing pieces. He is supposed to assign this task to a colleague but he usually does it himself because it is “easier” to put his original skills as graphic and web designer to use (personal communication, March 24, 2011). Participant 5 chimed in and added, “It is the lesser of the evils, you're going to spend more time” and while delegating saves time if you want something done a certain way you should do it yourself (personal communication, March 24, 2011).

Products versus Projects

Products and project are referred to interchangeably, but the terms can have distinct meanings. Participant 7 said that she suddenly realized the difference between the product and project: "A project is a website and a product is something that can be marketed as its own thing." A project is more customized but it is not a product that can be sold to multiple clients: a project is usually not "re-marketable", it is for one client (personal communication, March 25, 2011). Participant 2’s differentiation between a project and a product is dependent on the complexity of the end goal: “complicated projects” require a content management system (CMS) and products are “simple, fancy brochures” which are static web pages with no CMS, it is “beautiful, but just an interactive brochure, we realize peoples visions on the web” (personal
communication, March 18, 2011).

Some professionals refer to all deliverables and the elements that combine to create them as products. Participant 1’s explanation of product is unique in comparison to other participants because he does not differentiate between project and product and stated that, “Everything is a product” (personal communication, March 17, 2011). Product is what you are building, so even your business model is a product because everything affects product: “Every detail changes the product, there’s a business model, there’s design, there is tech, and the product glues all of the pieces together.” He went on to explain that if all of the products in the world were perfect and humans created all of the possible products then all of our wants and needs are substantiated and there would be no more inefficiencies left to be solved: “Product is guiding you to the truest form of yourself, to the expression of the truest form of yourself with as few barriers in between as possible” (personal communication, March 17, 2011).

Problem Solving

Web professionals consider themselves to be problem solvers. Participant 1 explained that “the process depends on the type of product, either a client brings to our attention a problem they want solved or they (his team) come up with a problem or inefficiencies in the world and try to solve them. Participant 2 explained the presence of problem solving in product development: “...basically it’s like, solve a problem that you know intimately well” and then sell it as a product (personal communication, March 18, 2011). Participant 4 stated that he either helps clients come up with solutions or proposes solutions to clients (personal communication, March 23, 2011). When I asked Participant 7 about the process of building e-learning and video-based websites, she responded, "the client says I have an idea or 'have a problem that needs to be solved"" (personal communication, March 25, 2011).
Marketing Strategies

Sales and marketing is ingrained in the process of product development because marketing strategies determine the sale of the product. Participants shared both positive and negative experiences with marketing strategies. For example, Participant 2 discussed his failed launch of a product because he and his team tried to perfect the prototype and sell the “go-to-market product” instead of testing the prototype on the people who would use it (personal communication, March 18, 2011). Participant 4, a Marketing Director at a digital agency that produces webcasts, uses the company’s webcasting software as a platform to market the product: “It's all about coming up with a solution based around streaming media.....Interacting with clients on this platform has produced more work than any other marketing ever has” (personal communication, March 18, 2011). In contrast, Participant 7 explained that her company pushes the product itself rather than integrating it into presentations to the client. She explained that “they (meaning the sales and marketing team) just call people and bother them until we can do a demo and show them the sites we have built to show them our competency in building technology. It is more of a résumé instead of we do this so this is how we can help you. There is a lack of sales strategy” (personal communication, March 25, 2011).

There is a common frustration related to marketing and sales team members who are responsible for selling the product but do not understand its functionality. Participant 6 alluded to experiences when the sales team sold ideas that were not possible to make because they had no knowledge of technology (personal communication, March 25, 2011). Ideally, the sales team should know how to sell reusable products, understand how they function and what they can offer a particular client, and how the product can work for the company in the future.

The Process
The process of product development is dependent on work environment, team interaction, and project requirements. The basic steps in the process are usually in place according to discussions with the seven participants. The steps include client interaction related to their needs, defining project scope and requirements, wireframes, design, development, QA, and production. For example, Participant 7 explained a new project management structure that she developed with a colleague based on improvements to the past management structure of their company. Figure 2 below (a flow chart provided by the participant) provides a summary of her explanation of the process. The process of development begins after the sale and determination of the problem that has to be solved. Participant 5 explained “turnkey execution” which occurs after a sale is made and the client explains the concept. After the initial steps, the project manager steps in to define the project requirements (personal communication, March 23, 2011). When the scope of a project is in place the business and product development teams meet to decide the most efficient and cost effective way to fulfill project requirements.
Figure 2. Flowchart of Management Structure Developed and Explained by Participant 6
Participant 6 explained his experience of the process after working for a large advertising agency in comparison to his freelance work experience (personal communication, March 24, 2011). He explained that when you work for a large company there is the information architect and user experience specialist but when you work by yourself that gets "lumped into the design phase" because you are thinking about how everything will function. Then, you present the whole thing to your client to show, this is how the site will work, this is how it will look and then the client provides feedback. After approval, then programming begins. After programming, the client can then test or QA the end product and make tweaks. When it is done you determine if you will have an ongoing relationship based on if the client will need content updates.

Discussion

Analysis across interviews pointed to the professional roles, teams interactions, client relations, and the steps involved in product development. The client introduces a problem that a team of web professionals sets out to fix based on project requirements. The data shows that preferred and unique approaches exist that impact the development process: the adopted approach affects how the process unfolds in terms of communication with the client, the efficiency at which deadline is reached, and the interaction between web professionals who are a part of a team. Miranda (2006) identifies three fundamental and high level stages of web production as planning, design, and implementation (p. 80). Within these high level stages are the steps that must be taken to ensure quality and functionality like those discussed by Participant 7. She explained the point at which her and a developer come into the project when it is a "gray area, somewhere in between where it is an idea and an actual project" and they ask the client, "What do you need done, what are your KPI’s (key performance indicators), what will determine the success of your project?" (personal communication, March 25, 2011). Interviews
verified Miranda’s (2006) explanation that it is essential to identify the user and elements for
presentation, define the content, conceptualize the structure and information architecture, stage
the product for testing (QA), and then retrieve client and user feedback when the site is
published (p. 80).

Below is the suggested step-by-step process that from my data collection, analysis, and
professional experience, I found is necessary to define, develop, and implement a product:

1. Identify the problem
2. Define client needs
3. Write out project requirements and scope
4. Create wireframes that define the structure and navigation of the site or product
5. Write technical specifications that define the functionality of the product
6. Gather necessary content
7. Get client approval on direction and specifications
8. Provide designers and developers with all of the necessary details for design and implementation
9. Tweak and approve design
10. Quality assurance to test functionality

Relating Personal Experience

My recent experience as a Product Manager informed my understanding of the data from
interviews. After analysis of the interview transcripts I was able to relate my own professional
experiences to participant experiences. I did not realize the implications and steps involved in
building web products at the onset of this thesis, and my research shed light on how the web
products many of us use on a daily basis are developed. The process of product development is
dependent on the requirements of the project. In my experience I have witnessed the roles of the
each professional that has a hand in bringing a project to life. A project or product manager has
a team of one or more developers and a designer. The project manager works with the client to
define the problem and the client needs and then scopes out the project and conceptualizes the product by creating wireframes. The wireframes are discussed with and eventually approved by the client. Next, they are handed to the designer who adds aesthetic appeal and to the developers who add functionality. Throughout the process there is a consistent back and forth between the client and the project manager and the project manager and the team to solve any problems that arise and define any elements that need further specification. The last phase of the process consists of QA when the project manager has the opportunity to test the product on a private server and make necessary changes before it is passed to the client. After it is approved by the client it goes to production for public use.

**Implications and Future Research**

The data collected in my interviews and my first-hand experience uncovered the steps that affect the processes used to build web products. The processes cannot be clearly defined but the common steps and professionals involved within the process can be defined. Some steps are dependent on circumstances including the interaction between the web team, client needs and relations, the end goal, and the scope of project. Interview discussions and professional experience related to the process have discovered the themes that are common across the experiences of web professionals. The recognition and presence of these themes has created an understanding of the implications involved in developing a web product from start to finish.

I began the research process with the purpose to educate myself on the process of building websites and products and meanwhile was hired as a full-time Product Manager. The environment that I am working in, the professionals I am surrounded by, the products I am creating and projects I am managing have constantly informed this data.

Through the interview process, I discovered areas of interest that are worth researching
further including start-up versus corporate and the future of the digital industry. The majority of participants have had experience in both start-up and corporate environments, which prove to yield contrasting work environments with different team interactions. According to participants, the culture of a company is dependent on its stage of development. For example, regarding work ethic, Participant 4, the Marketing and Creative Director at a corporate company that began as a start-up, explained that he accomplished what is expected of him and no longer goes beyond that, but when the company was a start-up everything that went out the door was “perfect” from a quality standard: "We stuck to a high level of quality. We needed to be trusted as the expert in what we were doing. There was more QA because it was important to the employees and it was more important to keep clients” (personal communication, March 23, 2011). The dynamic of the joint interview between this participant and Participant 5 was heavily dependent on conversation about the “way things are (corporate) and the way things were (start-up)”. They continually alluded to the fun-loving nature and ambition of employees at a start-up compared to the disgruntled attitude of corporate employees. Regarding the approaches used by each, Participant 7 suggests that start-ups lack expertise, “When you work in a start-up, you work so much with the client because they are the only other person there. You don't realize that there are different areas that you can pull from to gain expertise. When you take an organized approach it is worth it to think through it then do what needs to be done” (personal communication, March 25, 2011).

In addition to further research based on two environments that exist within the digital industry, it was also suggested during interviews that the industry is evolving and “The margins in the business are going to shrink” (Participant 2, personal communication, March 18, 2011). Participant 2 explained that there are the large networks of digital agencies who dominate the industry, then the one to five person shops who have networks and loyalty. He thinks that
in the middle, the ten to fifty person shops will have trouble surviving because they are run independently and not backed by anyone. When I questioned him about this he elaborated:

"Back in the 1990's there was still an ‘I know how to do this and you don't’ and that barrier to entry. Merging the two themes together, Participant 2 recognizes that the start-ups are developing new technologies like the large agencies were ten years ago, which he thinks is a positive reality for the industry and its evolving nature. Further research on the nature of a start-up versus a corporate environment would be insightful and can potentially inform even further research on the evolution of the industry as a whole. I have learned in my research, analysis, and experience about the different approaches professionals take to build a web product for targeted users. We, the users, engage with the web products addressed in this thesis on a day-to-day basis. I think we would all agree that these products generally enhance our experiences in some way or another and sometimes we do not realize the thought, planning, interaction, and digital knowledge that goes in to creating them. It is not the users job to realize this, like Participant 1 explains, a good product is the one that the user does not notice because it has no faults (personal experience, March 17, 2011). It is interesting to acknowledge at all levels of use but necessary to understand for anyone who aspires to be a part of the professional team who make these products functional. Prior to my recent experience, I saw and interacted with web pages and sites as they are meant to be interacted with, never questioning what is behind the scenes or under the hood. The moment I began to think about it I entered a world of digital knowledge to which it feels like there is no end and due to its evolving and ever changing nature new research is continually necessary.

**Conclusion**

A combination of open-ended interviews and recent professional experience resulted in the discovery of overlapping themes in the field of web development and insight to how
these themes contribute to the process of creating web products. Through discussions related
to work environment, team interaction, and project and product development a common work
flow or process emerged through responses, suggestions, and shared experiences. Discussions
with participants provided a foundation for my understanding of the process, and my recent
professional experience has given me the chance to become a part of the real life process of
developing a product for the web. First, a business or individual either has a client in need of
solving a problem or strategizes a way to solve a common problem in the real world with a
digital solution. In a team environment, a group of professionals including a project manager,
web developer, and web designer work together to deliver a functional web product. For larger,
more specialized projects an information architect and/or user experience specialist are needed.
The project manager is in charge of maintaining client relations and providing the designers
and developers with all of the necessary information related to project scope, requirements, and
content.

My goal was to find out how these professionals interact with one another and with
clients to create web products. Like the literature review revealed, some professionals prefer
a strategically organized process (Miranda, 2006, p. 80), others prefer to allow the process
to unfold organically (Braun, 2001, p. 58), and some take the process into their own hands
to facilitate the work flow (personal communication, Participant 5, March 23, 2011). In the
middle of these approaches is the preference for agility which results in a combination of a well-
structured and thought out process that changes hands from conception to development without
extraneous debate (Braun, 2001, p. 59 and Participant 6). According to current research, the
extent to which these can all be adopted depends upon the scope of a project, the requirements of
the stakeholder, and the needs of the user which has proved to be true in my experience as well
as the experiences of the seven participants.
References


