

# Replace or Revise? A Case Study Investigating the Replacement of an Organizational Website

*Full Paper*

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## Abstract

When should an organization's web page be replaced rather than updated? As Internet technologies evolve, organizations are often urged to keep pace. Yet replacing a web page, or creating an entirely new web page can be both a risky and expensive proposition. Not only are there financial costs of starting a new project, there are also pitfalls of working through the challenges of a new technology that may result in gaps in service, lost sales opportunities, or even lost customers. This paper examines one organization's choice to replace an existing website rather than revise the website. The original website is compared to the replacing website through both an organizational and a technical model. The differences between the two websites provide both managers and academics with a heuristic or bedeker for evaluating the replacement or revision of an organization's website.

## Keywords (Required)

Technology Replacement, Technology Disposal, Systems Development Life Cycle, Case study.

## Introduction

When should an organization's web page be replaced rather than updated? As Internet technologies evolve, organizations are often urged to keep pace with technology. Yet replacing a web page, or creating an entirely new website, can be both a risky and expensive proposition. Not only are there financial costs associated with a new project, there are also established pitfalls of new technologies that, in the past, have resulted in service gaps, lost sales, and lost customers; essentially a failed website can result in a loss of trust in an organization (Siau and Shen 2003). Consequently, replacing a web page is not an action to be taken lightly. Conversely updating a webpage carries significantly less risk, the technology works and revisions can be 'rolled back', or the web site can be restored to a prior working state. Despite the safety of updating a website, new technologies push technical requirements and social expectations eventually result in the replacement of web pages.

Theoretically, the systems development lifecycle (SDLC) asserts that this decision, to replace or update, is driven by contextual factors (Takata, Kirnura, Van Houten, Westkamper, Shpitalni, Ceglarek, and Lee 2004, French 2015). This indicates that the only variables influencing a replace or revise decision are unique to the organization. Even research that has focused on the SDLC specifically for websites has a limited commentary on the disposal of websites; simply stating that safety precautions should be taken

(John & Swapna 2017). However organizational and technical models have been used to understand both organizational and technological phenomenon, and a replace or update decision can benefit from a similar approach.

This paper moves the replace or revise question forward by examining why one organization replaced a website. Rather than relying on contextual factors to that organization a hybrid theoretical model was created that integrates both organizational and technical constructs. In accordance with Design Theory, a case study was conducted by comparing the organization's original web page with the replacement web page and identifying the organizational and technical differences (Von, March, Park, & Ram 2004). Findings from this case highlight that the organization replaced its website when both organizational and technical aspects of the web page were to be radically altered as opposed to incrementally changed (Dewar and Dutton 1986; Carlo, Gaskin, Lyytinen, & Rose(2014)). These findings provide preliminary support to an organizational-technical model when examining organizational replace or revise decisions. This model benefits both practitioners and academics. Practitioners can use this model as a starting point when deciding to replace or update an organization's web page. Academically, this model also serves as a starting point in examining organizational decisions to replace technologies. The rest of this paper is outlined as follows: the next section provides a literature review, which is followed by the methods, the fourth section identifies the theoretical model, the fifth section provides the case findings, which is followed by a discussion, and closes with a conclusion.

## Literature Review

Theoretically, the foundation for the replace or revise decision for technologies rests in the systems development life cycle, or SDLC. This theoretical framework proposes that technologies move through stages similar to living beings. Consequently technologies are born, mature, and ultimately are either disposed of or replaced. The implementation, or application, of SDLC concepts is traditionally done through a project management methodology. Project management methodologies, or PMM, have focused on the creation, design, and implementation of new technologies. Indeed there is a bounty of research identifying and examining the beginning stages of the SDLC - creation, design, and implementation of all types of technologies - including websites. This literature addressing websites focuses on logical design tools (Taylor, McWilliam, Forsyth, and Wade 2002; Cebi 2013; Hasan 2016), programming practices (Taylor, McWilliam, Forsyth, and Wade 2002; Chen 2007; Xuexiang 2009), and website experiences (Stevens, Funk, Brantley, Erlinger, Myers, Champagne, & Hollis2008; Pallud and Straub 2014; Hasan 2016).

What is absent in the literature is research addressing the end of a technology's life cycle. As this project focused on a website, literature searches for website replacement, website disposal, and website revision yielded no results. A wider search for information systems replacement, information systems disposal, information systems revision also resulted in no literature.

Website maintenance was a more fruitful research topic resulting in both research and patents. Research on website maintenance has traditionally focused on individual case studies or surveys. Two case studies have focused on how library websites conduct maintenance, integrate workflow, and present content. (Yu 2008, Mach 2004). Selim, Yunusoglu, and Balaman, examined a website maintenance technique using fuzzy TOPSIS and FMEA in a manufacturing setting ( Selim, Yunusoglu, & Balaman 2016). Jing, Yang, and Pei have contributed to the understanding of website maintenance by conducting a survey examining maintenance and security concerns (Jing, Yang, and Pei 2009).

In addition to the literature found addressing website maintenance, several patents were identified related to this topic (U.S. Patent No. 09/805,417, 2001; U.S. Patent No. 09/727,975, 2000; U.S. Patent No. 09/727,127, 2000; U.S. Patent No. 10/10/270,350, 2002). These patents outline different proprietary techniques developed for maintaining websites.

However maintenance is not the end of life for a website. Disposal or replacement of a technology is accepted as the end of life for a technology. Without proper guidance in the literature, we were left to

examine the replacing artifact. Following guidelines for Design Theory, a model was designed integrating both organizational and technical constructs.

## **Methodology**

This study examined the replacement of an organization's website. Theoretically, this is the final stage of the SDLC. Because literature review associated with this phenomenon produced limited results, and because the researchers did not have access to the organizational decision makers, a case study highlighting the differences of the two websites was conducted. This focus on the information technology artifact is in accordance with design theory which promotes the comparison of different technologies (Von, March, Park, & Ram 2004).

The participants in this study were the development team who created the replacing website. While the development team was given permission by the case site to compare the functionality and general technical aspects of the website, this study was not given permission to reveal technical standards, languages, or other details as determined by the case site. Additionally no members of the case site management team were interviewed or provided insight into this study. Rather the research focuses only on the information technology artifact, the website, in the pre and post implementations.

The website is for a small insurance company in North Texas. Because this company has more than forty (40) employees, more than seven thousand customers, and a company valuation of more than \$5 million dollars with operations in one geographic area, this company meets the United States Small Business Administration's definition for being a small business in the insurance industry (Table of Small Business Size Standards, 2017).

Because the research participants were awarded the contract to replace the website with four months notice, a research model to identify organizational and technical differences was developed that met with the case site approval. The research model was then tested as careful notes were taken during the development process, and one of the authors was responsible for the website implementation providing valuable insight into the pre and post systems.

## **Theoretical Model**

The theoretical model proposed to compare the pre and post versions of the website was developed by analyzing the requirements for the new website. Website requirements identified organizational functions and technical specifications. Consequently an organizational and a technical model were identified. The organizational model used to analyze the websites is Porter's Value Chain. The Value Chain is an organizational model that highlights the reception of raw materials and the transformation of these raw materials into products and services. Traditionally the value chain has been used for organizations that build tangible products. The model highlights the transformation of products from raw inputs to the sales and services of finished materials as primary activities. The model also identifies four major support areas that are needed to complete each primary activity as a support activity. Although the model has been criticised as not fitting service industries and pull-based markets, the underlying primary and secondary activities of the value chain have been found in all organizations, whether for profit or not for profit, in service industries or pull-based markets (Norman and Ramirez 1993, Rayport and Sviokla 1995). Because the Value Chain will be used only for the identification of the presence of primary or secondary activities, not the timing or sequencing of these activities, the model allows the websites to be analyzed along functional and support areas as opposed to organizational timing.

While there are several website models available, Tarafdar and Zhang use six characteristics to model websites: information content, navigation, usability, customization, download speed, and security (Tarafdar and Zhang 2005, Lafuente and Rossi 2001). These characteristics were approved for publication by the case site.

## Case Findings

The first version of the company's website was primarily informative, as this website provided general information about the insurance company and the company's offerings. This information was static, programmed into the web page's source code, and provided a single, consistent message. In addition to providing information about the company, the website also created a channel, via email, through which visitors could contact the insurance company. However, the standard business practice of the company was to respond to an email with a telephone call. This allowed for insurance agents to directly interact with customers, actions that the company thought would facilitate insurance sales.

The second version of the company's website differs from first version along three major dimensions. First, while the website still informs visitors about the company and the products it offers, the information displayed on the website is dynamic. The content of the web pages draw real-time information from a database and displays this information. This means that the content changes, the web page is dynamic, not static. Second, website visitors have the ability to create a personal account, and using this account, price and purchase an insurance policy. This is a major departure from an insurance agent directly interacting with a customer. Finally, customers who have a website account and who have purchased insurance, can use the website to use and manage their insurance policy. Customers can resolve insurance claims, make changes to coverage, add or remove individuals covered, and modify other policy details.

### **Organizational Analysis**

The organizational model used to analyze the websites is the Value Chain. The Value Chain is an organizational model that highlights the reception of raw materials and the transformation of these raw materials into products and services. Traditionally the value chain has been used for organizations that build tangible products. The model highlights the transformation of products from raw inputs to the sales and services of finished materials as primary activities. The model also identifies four major support areas that are needed to complete each primary activity as a support activity. Although the model has been criticised as not fitting service industries and pull-based markets, the underlying primary and secondary activities of the value chain have been found in all organizations, whether for profit or not for profit, in service industries or pull-based markets (Norman and Ramirez 1993, Rayport and Sviokla 1995). Because the Value Chain will be used only for the identification of the presence of primary or secondary activities, not the timing or sequencing of these activities, the model allows the websites to be analyzed along functional and support areas as opposed to organizational timing.

Comparison of the two websites highlights how the new website transformed the value chain primary activities of marketing, operations, sales, and services. Table 1 highlights these differences. First, the marketing activities changed with new version of the website. Marketing information changed from static information to dynamic, real-time information. The original website could not perform sales transactions, which the new website can. Third, the original website could not underwrite insurance or perform claims resolution. The new website has this functionality. Finally the original website had limited communication through email and business practices. With the addition of customer web accounts, customers can directly buy and manage their insurance without having to interact with an insurance agent. This fundamentally changed how the organization interacted with customers and visitors.

Value Chain Factor	Original Website	Replacement Website
Marketing	Static display of organizational information	Dynamic display of organizational information
Operations	No activities	Customer can apply for an insurance policy. Customers can also use the policy through claims resolution

		function.
Sales	No activities	Insurance company can approve transactions that customers apply for.
Service - customer communication	Email address with business policy of communication through telephone	Customers can choose interaction with the insurance provider, either through email or by telephone
Service - policy modification	No activities	Customers can manage insurance policy (i.e. coverages, limits, other insurance details)

**Table 1. Value Chain Segment Comparison**

### ***Technical Analysis***

The technical analysis used Tarafdar and Zhang’s website model as these characteristics were approved by the case site. These six characteristics include: information content, navigation, usability, customization, download speed, and security (Tarafdar and Zhang 2005, Lafuente and Rossi 2001). Table 2 compares the two websites along these six characteristics. As Table 2 highlights, five of the six characteristics were altered with the replacement of the website. The only characteristic not altered was navigation, which remained the same. Of the five areas of change, three can be perceived as being ‘beneficial’ changes while the other two areas could be perceived as being ‘negative’ areas of changes.

Beneficial changes between the two versions of the website would include information content, usability and customization. Information content changed substantially for the better as the website shifted from providing static information to dynamic content. This new content gives end users real-time data to make decisions with, cutting down decision making time for end users. Usability also improved with the new version. The original web page was only used for informative purposes while the new improved as this new version could be used for both information and transactions. This increased the scope of activities end users could conduct on the website, increasing overall utility of the web page. The third characteristic that changed for the better is customization. Customization changed with the websites as the original website was an informative site with a consistent message. The new version changed customization as individuals could create accounts with dynamic, information tailored to the individual.

Two potentially ‘negative’ areas of change in the new web page are downloads and security. The downloads changed as the new web page had a larger overall download, requiring a file and Internet cookie, whereas the old webpage had no such downloads. Second, the security risks between the websites substantially changed. Because the old website was a purely informative page that could not conduct transactions, there was a minimal risk associated with this website. Other than changing the content of the web page, there were not organizational functions that could be compromised through the web page. However the new website, with the ability for customers to purchase and manage insurance accounts, has a much larger security risk as the interactivity adds new dimensions of security risks to the organization and to the customers (Cavusoglu, Mishra, & Raghunathan (2004)).

Factor	Original Website	Replacement Website
Information Content	Static	Dynamic
Navigation	Standard web page navigation	Standard web page navigation
Usability	Information purposes only	Information and transaction purposes

Customization	None	Tailored to the individual
Download Speed	Smaller file to download*	Larger file to download*
Security	Fewer Risks**	Greater Risks**

**Table 2. Website Comparison**

\*It is difficult to quantify the download speed as different end users will experience different speeds depending upon the system downloading the website. However, the original website is much smaller than the new website in terms of content to be downloaded.

\*\*While the researchers were privileged to view the replacement process, the researchers did not have access to the security practices and procedures of the firm. However, there were significantly more security risks with the new website as the new website interacts with multiple organizational systems while the original website was a static website on a single server.

## Discussion

When should organizations replace a website rather than update one? The Systems Development Life Cycle theorizes that contextual factors determine this decision during the maintenance phase. However, despite this accepted theory, there is scant literature examining the disposal or replacement of technologies. This study has contributed to the literature by in several ways. First, this study examines one organization's replacement technology. Second, this study has confirmed that both organizational and technical factors were changed in the information technology artifact. Third, in this case study, all organizational changes to the web page were radical. The changes were designed to increase either the number or the type of value chain activities that could be performed through the website. These changes radically change the function of the website, and from an organizational perspective, can be perceived as increasing the overall value chain utility in the website. Fourth, organizational changes were accompanied by technical changes. While the organizational changes appear to all be positive to the organization, these technical changes were mixed. There were several positive technical changes, the information content was much richer, usability was increased, and customization was increased. But there were also negative technical changes: the new website had decreased download speeds and increased security risks. Because all of these changes are not positive it is difficult to determine if the overall technical utility of the website is increased.

Practically this research provides organizational managers with a starting point with which to evaluate technologies for replacement. Organizational business functions and technology characteristics should be compared. And if this study is consistent with technology replacement decisions, then management should consider replacement if a substantial number of these changes are radical in nature. This study cannot provide insight into maintenance as the website itself was not maintained. However, if this study is indicative of management decisions, then perhaps if changes are incremental in nature, management should consider revising, or updating the technology.

Academically this research also provides a starting point. While the SDLC is a widely accepted systems theory, there is little research examining systems end of life replacement. This study confirms that both organizational and technical factors were altered in the information technology artifact. Further research may consider to examine organizational adoption constructs. The technology, organization, and environment, or TOE model, proposes that three groups of factors influence an organization's adoption of a technology (Chau and Tam 1997; Zhu, Kraemer, and Xu 2006). While this study did not examine environmental factors, organizational and technology factors were found to be radically different in the replacement artifact.

## Conclusion

This paper contributes to the understanding of the disposal or replacement of one website. By examining the differences between the original website and the replacing website practice and theory can both be contributed to. Practically, this is important as new technologies continue to be deployed at a rapid pace. Organizations need to understand how to integrate these new technologies, like social media, and the new contexts that these technologies create. Theoretically, this study provides insight into a replacing technology. By observing this replacement website, insight into what an organization expected from an information technology artifact can be observed. However this is only one website at one organization. It is possible that the case site is substantially different from other businesses. Indeed, the case site is a small business in Texas. Perhaps larger organizations do not face these challenges that this organization faced. Larger organizations may have permanent information technology staff that can maintain and integrate new technologies as these technologies appear. This is one of many questions that will surely be raised as businesses adapt to new technologies.

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