Electronic Construction Collaboration System – Phase III

Final Report
December 2011

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16. Abstract

This phase of the electronic collaboration project involved two major efforts: 1) implementation of AEC Sync (formerly known as Attolist), a web-based project management system (WPMS), on the Broadway Viaduct Bridge Project and the Iowa Falls Arch Bridge Project and 2) development of a web-based project management system for bridge and highway construction projects with less than \$10 million in contract value.

During the previous phase of this project (fiscal year 2010), the research team helped with the implementation process for AEC Sync and collected feedback from the Broadway Viaduct project team members before the start of the project. During the 2011 fiscal year, the research team collected the post-project surveys from the Broadway Viaduct project members and compared them to the pre-project survey results.

The results of the AEC Sync implementation on the Broadway project were positive. The project members were satisfied with the performance of the AEC Sync software and how it facilitated document management and its transparency. In addition, the research team distributed, collected, and analyzed the pre-project surveys for the Iowa Falls Arch Bridge Project. The implementation of AEC Sync for the Iowa Falls Arch Bridge Project appears to also be positive, based on the pre-project surveys.

The fourth phase of this electronic collaboration project involves the identification and implementation of a WPMS solution for smaller bridge and highway projects. The workflow for the shop drawing approval process for sign truss projects was documented and used to identify possible WPMS solutions. After testing and evaluating several WPMS solutions, Microsoft SharePoint Foundation's site pages were selected to be pilot-tested on sign truss projects. Due to the limitation on the SharePoint license that the Iowa Department of Transportation (DOT) has, a file transfer protocol (FTP) site will be developed alongside this site to allow contractors to upload shop drawings to the Iowa DOT. The SharePoint site pages are expected to be ready for implementation during the 2012 calendar year.

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Final Report December 2011

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EXECUTIVE SUMMARY

Due to complexities in bridge projects, the Iowa Department of Transportation (DOT) identified and decided to implement a web-based project management system (WPMS) as part of their construction administration system. Throughout the previous phases of this project, the research team, alongside DOT staff, identified and tested solutions for various bridge projects.

For the first project phase, the solution selected was an in-house website developed for document sharing. From this implementation, a solution that had email notification capabilities was identified as more desirable. For this reason, the second phase of the research consisted of the implementation of a solution that had this feature. This solution included Google Groups along with a file transfer protocol (FTP) site. At the end of this research phase, the conclusion was that a more automated solution could be more beneficial.

This phase of the project involved two major efforts: 1) complete the implementation of AEC Sync (formerly known as Attolist) on the Broadway Viaduct Bridge Project and the Iowa Falls Arch Bridge Project and 2) development of a WPMS solution for projects under \$10 million.

AEC Sync was provided for the Iowa DOT in a Software as a Service agreement, allowing the Iowa DOT to rapidly implement the solution with modest efforts. During the 2010 fiscal year, the research team was able to help with the implementation process for the solution. The research team also collected feedback from the Broadway Viaduct project team members before the start of the project and implementation of the solution.

This past 2011 fiscal year, the research team collected the post-project surveys from the Broadway Viaduct project members and compared them to the pre-project survey results. The results of the AEC Sync implementation in the Broadway project were positive. The project members were satisfied with the performance of AEC Sync and how it facilitated document management and transparency. In addition, the research team distributed, collected, and analyzed the pre-project surveys for the Iowa Falls Arch Bridge Project. The implementation of AEC Sync for the Iowa Falls Arch Bridge Project also appears to be positive, based on the pre-project surveys.

The second major effort for this project involves the identification and implementation of a WPMS solution for smaller bridge and highway projects. Sign truss projects were the type selected for pilot-testing and implementation. The workflow for the shop drawing approval process for this type of project was documented and used to identify possible WPMS solutions. After testing and evaluating several WPMS solutions, Microsoft Foundation's SharePoint site pages were selected to be pilot-tested on sign truss projects.

Due to the limitations on the SharePoint license that did not allow external users, a file transfer protocol (FTP) site was recommended to be developed alongside the SharePoint site to allow contractors to upload shop drawings to the Iowa DOT. Since that recommendation was made, the licensing agreement has been expanded to allow external users and the decision was made not to implement the FTP site. The SharePoint site pages are expected to be ready for implementation during calendar year 2012.

INTRODUCTION

Problem Statement

Bridge construction projects are becoming more complex in terms of the project team composition, design aspects, and construction processes. Project teams are becoming more diverse in terms of their location (not centrally located) and team member compositions. Design aspects are becoming more complex due to code requirements and emphasis on the aesthetics of the bridge. Finally, new construction methods, such as lean and rapid accelerated bridge construction, are becoming more common within the industry.

In 2008 the Iowa Department of Transportation (DOT) was entering a phase of complex bridge construction, beginning with the I-80 and US 34 bridges over the Missouri River and the I-74 bridge over the Mississippi River. Because of this, the Iowa DOT contracted with the researchers to identify a web-based project management system (WPMS) that could ease the document management of shop drawings and requests for information (RFIs) for these projects.

For the previous two phases of this research project, the team sought to find a WPMS solution that met the needs and requirements for large and complex bridge projects. The results of the implementation of WPMS solutions for these types of projects have proven to be positive.

Researchers recommended to the Iowa DOT that a similar solution could also benefit smaller bridge projects (less than \$10 million). It is expected that WPMS solutions will increase efficiency, specifically for the shop drawing approval process and the RFI transmittals for smaller highway projects. For this reason, the Iowa DOT considered and allowed the research team to find a WPMS solution that eased the shop drawing approval process for projects under \$10 million.

Research Objectives

For the third year of the project, the research team continued monitoring and evaluating the AEC Sync projects and began the evaluation, identification, and testing of WPMS solutions for small highway/bridge projects.

Researchers continued on the implementation of AEC Sync (formerly known as Attolist), the WPMS selected for the third project phase, on the Broadway Bridge Project in Council Bluffs and the Iowa Falls Arch Bridge Project. The researchers also evaluated the performance of AEC Sync for both projects. The post-project surveys were distributed to the Broadway Bridge project members, while the pre-project surveys were distributed to the Iowa Falls Arch Bridge project members.

For the smaller highway and bridge projects, the researchers, with the help of Iowa DOT staff, selected sign truss projects as test project types for WPMS implementation. The workflow for sign truss projects was documented and used to identify and select tools to develop a WPMS

solution that met the needs of the Iowa DOT. Mock-up versions of web-based collaboration solutions were created using existing web applications accessible to the Iowa DOT.

AEC SYNC IMPLEMENTATION

Overview

Work on the AEC Sync implementation continued during the 2011 fiscal year. The post-project surveys were distributed to the Broadway Bridge Project team members. These results were compared to the pre-project surveys to provide how the WPMS implementation affected the project team's performance and opinions of the system. In addition, the pre-project surveys for the Iowa Falls Arch Bridge were distributed among project team members, collected, and analyzed.

Broadway Viaduct Bridge Post-Project Survey Analysis

Survey Population

The survey was sent to 39 project team members and 14 project members responded, representing a 36 percent response rate. From those 14 responses, three mentioned that their involvement with AEC Sync (Attolist) was not significant. These three members did not complete the survey questionnaire. The survey responses, then, corresponds to 11 team members, or 28 percent.

From the survey respondents, 64 percent correspond to Iowa DOT staff and employees, nine percent were consultants to the project, and 27 percent identified themselves as contractors. (Some subcontractors classified themselves as contractors.) There were no responses from suppliers.

Survey Responses and Analysis

The post-project survey feedback turned out to be positive when it comes to making the project member's job easier, the overall cost of document management, transparency of document management, and project information. The results also portrayed that the WPMS made the RFI process much easier than anticipated, as well as the submittal process. The project members also thought the computer and internet requirements were reasonable. The survey results compared to the pre-project survey results can be found in Appendix A.

An interesting aspect found when comparing the post-project surveys to the pre-project surveys was that the actual usage of AEC Sync per month was lower than anticipated. As seen in Figure 1, the anticipated use for AEC Sync was from 10 to 20 times a month, when the actual usage of AEC Sync was of less than 10 times a month.

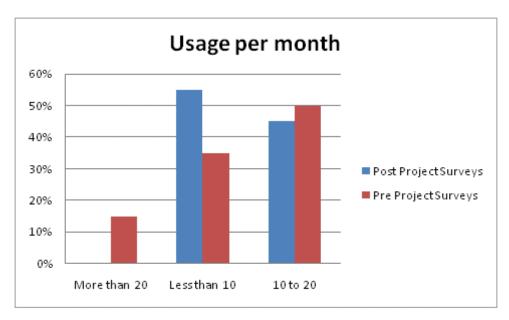


Figure 1. Survey results – usage per month

None of the project members used the project's WPMS more than 20 times a month, compared to an anticipated member usage of 15 percent in the pre-project surveys.

As shown in Figure 2, the distribution of size for recommended future WPMS project implementation changed compared to the pre-project surveys. The reason for this change can be due to the fact that having some knowledge about the system, additional implementation opportunities are easier to identify.

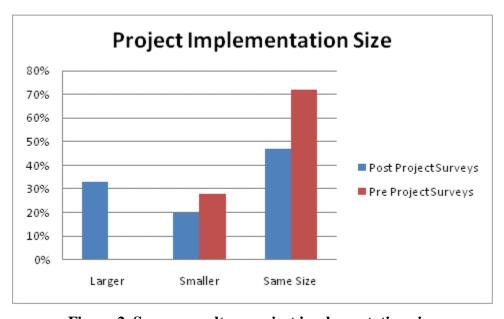


Figure 2. Survey results – project implementation size

One last observation found by the researchers is that only around 10 percent of the respondents considered that learning how to operate and work with the system was *not* worth the benefits (see Figure 3). Around 20 percent felt neutral about learning the system. However, if combined, one third of the population did not feel it was completely worth the benefits of learning the system.

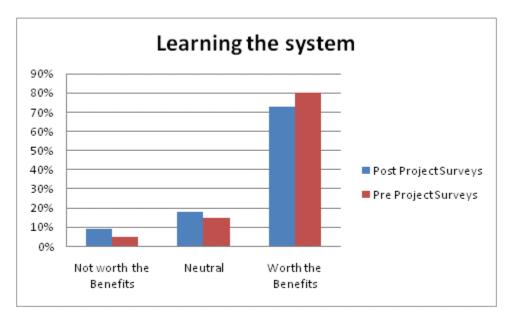


Figure 3. Survey results – learning the WPMS

A similar result was found when the project team members were asked about the effect of AEC Sync to the bridge project management (see Figure 4).

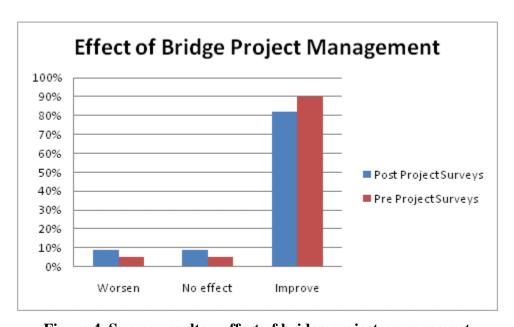


Figure 4. Survey results – effect of bridge project management

Given these results, the researchers recommend that the Iowa DOT inform other project members about the benefits of the WPMS solution on bridge projects during the early stages/the preconstruction phase.

Iowa Falls Arch Bridge Pre-Project Surveys

Survey Population

The surveys were sent to 35 project team members and 18 project members responded, representing a 51.4 percent response rate. From those 18 responses, two mentioned that their involvement with AEC Sync (Attolist) was not significant. These two members did not complete the survey questionnaire. The survey responses, then, correspond to 16 respondents, representing 45.7 percent of the initial population of people who were sent the surveys.

From the survey respondents, 50 percent correspond to Iowa DOT staff and employees, 35 percent to subcontractors or suppliers, and 19 percent to project consultants. There were no responses from the prime contractor.

Survey Responses and Analysis

The responses concerning the implementation of a WPMS for the Iowa Falls Arch Bridge project were positive. The respondents stated that the computer and internet requirements are reasonable (71 percent) or they were neutral about it (29 percent). And, 81 percent agreed that the use of a WPMS will make the submittal process much easier compared to the traditional methods. 75 percent of the respondents stated that the RFI process will become easier by implementing a WPMS. 88 percent stated that relevant project information will become more available to project team members. And, 94 percent of responders agreed that, based on their knowledge and past experiences with a WPMS, a system like this can improve the project management on other Iowa DOT projects. For the detailed graphs see Appendix B.

Concerning the use of the WPMS on the project, 75 percent of the respondents said they would most likely use it less than 10 times per month, while 25 percent were expecting to access the WPMS from 10 to 20 times per month.

The graphs in Figures 5 and 6 correspond to the results concerning the user benefits of using a WPMS, such as AEC Sync, specifically on the Iowa Falls Arch Bridge Project.

As shown, around half of the respondents agreed that a WPMS will indeed have a positive impact on their work. While, 38 percent stated that the implementation of a WPMS will not have an effect in their jobs. Also, 38 percent responded that it was neutral for them to learn the use of the WPMS.

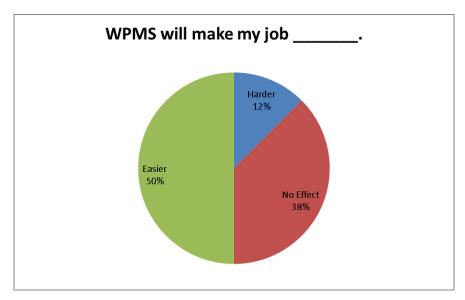


Figure 5. Survey results – project role

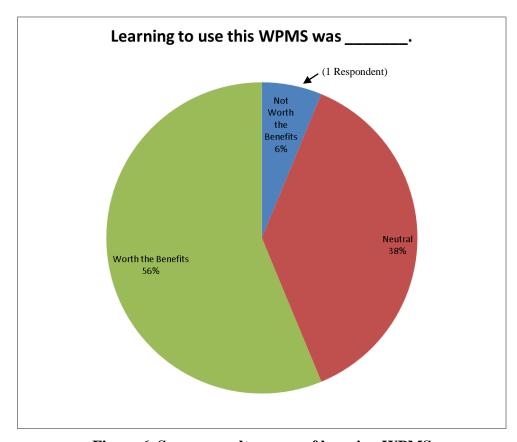


Figure 6. Survey results – ease of learning WPMS

The Iowa DOT decided to continue the implementation of AEC Sync, even though many respondents expected no change in their effort and/or were neutral with regard to ease of learning. This was because half or more of the users were positive and because improve arching and tracking of documents was expected.

The project participants were also asked about expected outcomes for project document management. As shown in Figure 7, 69 percent agreed there will be an increase in document management transparency, while 31 percent responded there would not be any effect.

The results are positive and promising given the implementation and use of AEC Sync is expected to increase the trust of team members when it comes to document management.

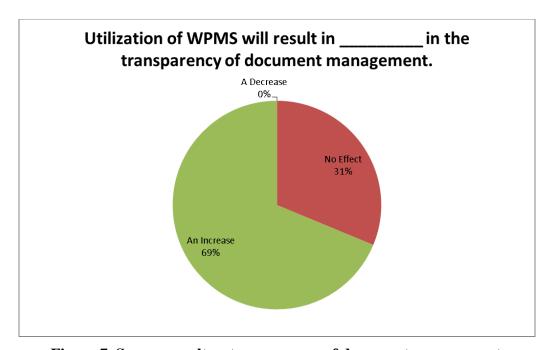


Figure 7. Survey results – transparency of document management

A similar result was found when the survey participants were asked about how the implementation of AEC Sync could affect the accountability of the project participants: 63 percent responded there would be an increase in the accountability of the project participants, while 37 percent said there was not going to be any effect (see Figure 8).

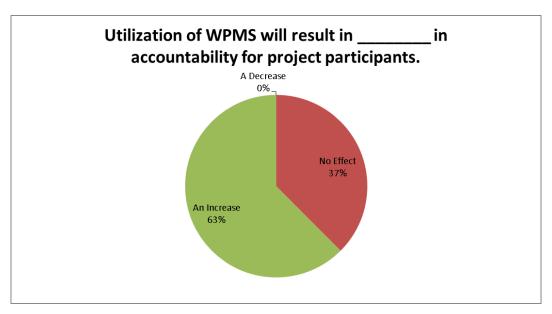


Figure 8. Survey results – accountability of project participants

When asked about the implementation of a similar WPMS on other Iowa DOT projects, and specifically the size of the project, the responses were distributed equally by the three options given, as can be seen in Figure 9. This response might encourage the Iowa DOT to also consider implementing WPMS solutions for different-sized projects.

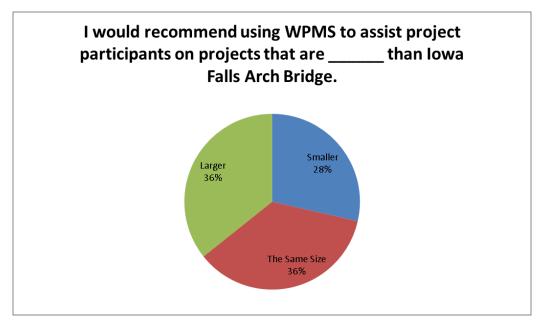


Figure 9. Survey results – future implementation

Surveys

The completed surveys for both the Broadway Viaduct Bridge Project and the Iowa Falls Arch Bridge Project can be found in Appendix F and G, respectively. These surveys include the responses to the questions previously analyzed, as well as additional comments from the users and survey respondents.

One comment from the respondents that the researchers would like to identify and quote regarding the implementation of AEC Sync on the Broadway Bridge Project is: "It is too easy to send the documents, so many times there were more people notified of an issue, RFI, or a submittal than the document may have concerned. Because of this, some people would not respond because it did not need their approval or concern them, but the RFI would not be completed and answered until everyone that was notified had given a response."

Given this thoughtful response, the researchers recommended that care should be taken to only send documents for review to those who are actually required to review the document. If the document is brought to a stakeholder's attention for information only and not approval, it should be submitted to that stakeholder in a way that does not require response before the document can be returned to the submitter.

WPMS FOR HIGHWAY PROJECTS UNDER \$10 MILLION

Overview

The project team recommended that the Iowa DOT consider the implementation of WPMS solutions for smaller bridge projects. The technical advisory committee (TAC) chair person recommended that the research team and TAC identify a WPMS solution for sign truss projects.

The reason for selecting this type of project was primarily because they are typically projects under \$10 million with short durations and a complex shop drawing approval process. The shop drawing approval process involves five offices and departments from the Iowa DOT and may include a large number of suppliers. Therefore, the research team sought to identify a WPMS solution for these types of projects.

Sign Truss Workflow

Researchers met with representatives from the Traffic and Safety Division and Bridges and Structures Division to establish the workflow for sign truss projects. There are two critical aspects considered to document the workflow. These are the abilities to understand the multi-step approval process and the typical interactions that involve some collaborative efforts, which come into play, for this type of project.

After meeting with the Iowa DOT engineers involved in sign truss projects, the desired workflow was established, as presented in Figure 10.

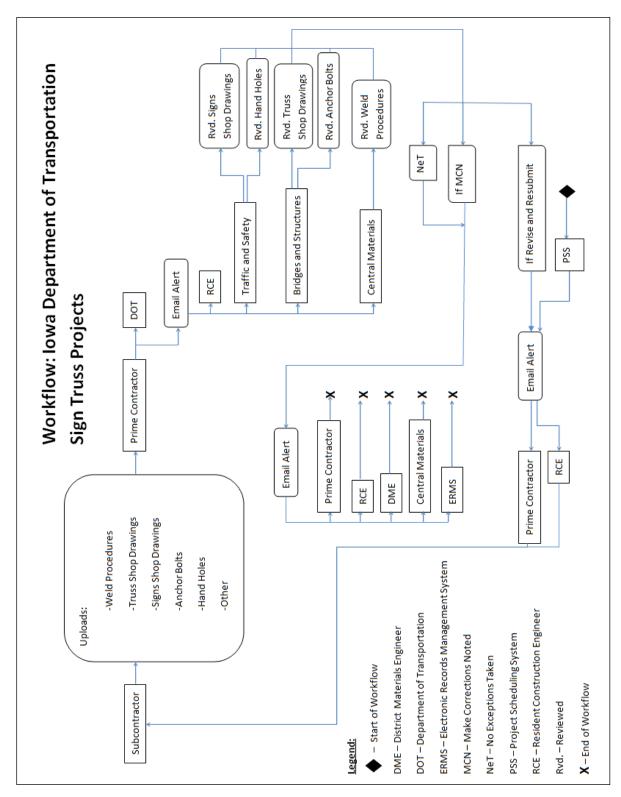


Figure 10. Workflow for sign truss projects

The workflow begins when the subcontractor sends the shop drawings to the prime contractor. The prime contractor then sends the documents for approval to the Iowa DOT. The divisions within the DOT that are responsible for the document review and approval receive an email notification announcing that a document is waiting for their approval.

The documents, if the review results are approved as No Exceptions Taken or Make Corrections Noted, do not need to be resubmitted by the contractor to the Iowa DOT. The reviewed and possibly marked up documents are sent to the Prime Contractor, Resident Construction Engineer, District Materials Engineer, Central Materials, and the Electronic Records Management System. On the other hand, if the document is classified as Revise and Resubmit, a notification is sent to the Prime Contractor and the workflow repeats from the beginning.

WPMS Solutions

Using the established workflow, several WPMS solutions were identified and studied. A list of these solutions, along with their corresponding internet addresses, are included in Table 1.

Table 1. Solutions considered (and internet addresses)

Solution	Web Address
AEC Sync	http://http://www.aecsync.com/
Google	http://www.google.com/
Huddle	http://www.huddle.com/
Microsoft SharePoint Server 2007	Depends on internal server
Sosius	http://sosius.com/
TeamWork Live	http://www.teamworklive.com/
TeamWork Project Management	http://www.teamworkpm.net/

The evaluation criteria used to measure each of the solutions consisted of the following:

- Project capacity
- Storage capacity
- Document tracking history
- Accessibility
- Notification
- Approval option
- Price
- Capacity to replicate the workflow and requirements provided by the Iowa DOT

Table 2 was developed to compare the various alternatives and to select the ones for further research and study.

Table 2. WPMS solutions considered for small highway projects

	Huddle	Google Applications	TeamWork Live	TeamWork Project Management	Sosius	Microsoft SharePoint
Project Capacity	25 Projects	Unlimited	Unlimited	35 Projects	Unlimited	Depends on server space
Member Capacity	Unlimited	Unlimited	25	Unlimited	Unlimited	Unlimited- Approved by Adm.
Managers	1	Unlimited	1	1	1	1
Storage Capacity (Group)	25 Gb	100 Mb	50 GB	10 Gb	25 Gb	Depends on server space
Storage Capacity (Personal)	NA	NA	NA	NA	250 Mb	NA
Document Tracking History	Yes	No	Yes	Yes	Yes	Yes
Ease of Accessability to the Site	Yes	No	Yes	Yes	No	Yes
Document Approval Option	Yes	No	Yes	No	No	Yes
Email Notification	Yes	Only for folder created	Yes	Yes	Yes	Yes
Calendar Option	Yes	Yes	Yes	Yes	No	Yes
Price	\$200/month	Free	\$149/month	\$49/month	\$100/month	Depends on License
Capacity to Reproduce DOT Workflow	Yes	No	Yes	Yes	No	Yes

From these, Huddle and Microsoft SharePoint Foundation were selected for additional research. Huddle proved to be a useful solution because it could reproduce the Iowa DOT workflow and had the capacity to send email notifications (a feature that was important for the Iowa DOT).

A workflow was developed to compare the performance of Huddle with the Sign Truss Workflow. This can be seen in Appendix C. Because this solution did not allow personalized customization for individual projects, the decision was made to continue this current project phase with SharePoint pages. SharePoint operates by creating customized project pages specific to the project needs and workflows, which is useful when it comes to implementing this solution on other projects.

Selected Solution

The original WPMS solution selected by the TAC for small projects (under \$10 million) combined two different components: a file transfer protocol (FTP) site and Microsoft SharePoint pages. The reason for planning to implement two different components was because the SharePoint license that the Iowa DOT acquired did not allow external users (such as contractors) to log-in or access the system.

Because of this, the FTP site was selected as the portal for contractors to upload the documents, while SharePoint would have been an Iowa DOT internal WPMS. The FTP site would have allowed document storage with log-in constraints and control.

The Microsoft SharePoint server is a web content management system that allows the creation of various workflows for document management. It also facilitates the transmittal process by keeping track of the different versions, sending out email notifications, and providing the option to check out documents for revisions.

Even though the first pilot projects using this solution won't have all of the features expected, the expected final workflow, which combines the application and use of the FTP site and SharePoint, is shown in Appendix D.

When a project is started, the engineer in charge of document management will access a web page were the basic project information is put in. The required information includes the project number, bid items, expected shop drawings, and other information. After all of the information is entered, a SharePoint site and FTP site, based on the project, will be created automatically.

The workflow in Appendix D can be established after these actions. The workflow starts when the contractor uploads the document for review to the FTP site. The document will be sorted in the corresponding FTP folder and forwarded to the SharePoint project page. When the documents are placed in SharePoint, the engineers at the Iowa DOT receive an email notification telling them that a document has been received for review. After the document is reviewed, it will be sent to the FTP site, where it can be accessed by the contractor.

A snapshot was developed by Iowa DOT staff to show how a SharePoint project page is organized compared to a user-front Iowa DOT webpage (used also for project document management on the Jackson 108 Bridge Project). These screenshots are reprinted in Appendix E.

Before the FTP site could be developed, the Iowa DOT acquired an external license for SharePoint and made the decision to design the system so that contractors would directly upload to SharePoint, eliminating the need for the FTP site. Details of this development will be described in the forthcoming Phase IV report for this project.

SUMMARY

For this third year of the Electronic Collaboration Research Project, the research team continued working with the Phase II projects: the Broadway Viaduct and Iowa Falls Arch Bridge Projects AEC Sync implementation.

The post-project surveys for the Broadway Viaduct project were distributed. They were analyzed and compared to the pre-project surveys distributed the past fiscal year. The results of the surveys were positive. The implementation of AEC Sync was able to make the document collaboration and management easier for all parties involved in the project.

To achieve even better results, the researchers recommend that the Iowa DOT explain during the pre-construction phase how all parties involved in the project can benefit from using a WPMS. This recommendation is based on the fact that the survey topics with the lower marks were the ones regarding the benefits and effects of these systems relating to project management.

The pre-project surveys for the Iowa Falls Arch Bridge were also distributed to the project team members. They were analyzed and will be used for comparison with the post-project survey results.

In addition, the research team began to identify a WPMS solution for small (less than \$10 million) highway projects. The workflow for sign truss projects was established and used as a baseline to identify possible solutions for these types of projects.

After considering and testing several possible solutions, Microsoft SharePoint pages was selected as the WPMS for implementation. As of this writing, a SharePoint page for the sign truss projects is under development by Iowa DOT staff and is expected to be implemented in 2012.

FUTURE RESEARCH

For the next fiscal year, the research team will finish analyzing the evaluation of the AEC Sync solution for the Iowa Falls Arch Bridge Project. The post-projects surveys for this project will be distributed, collected, analyzed, and compared to the pre-project surveys.

The research team will also continue with the Small Highway Projects WPMS implementation. The SharePoint page is expected to be ready for implementation in calendar year 2012. The research team, with the help from the TAC, will evaluate the implementation of the SharePoint solution on sign truss projects.

APPENDIX A. BROADWAY VIADUCT BRIDGE PRE-PROJECT AND POST-PROJECT SURVEY ANALYSIS

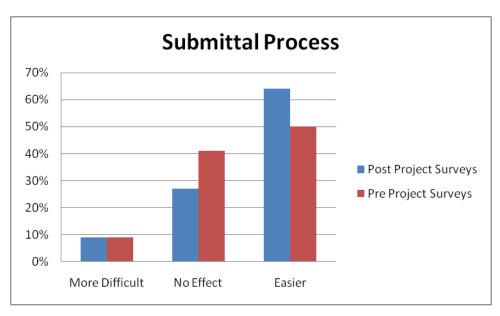


Figure A.1. Survey results comparison – submittal process

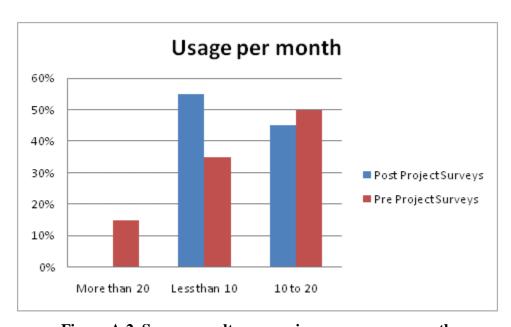


Figure A.2. Survey results comparison – usage per month

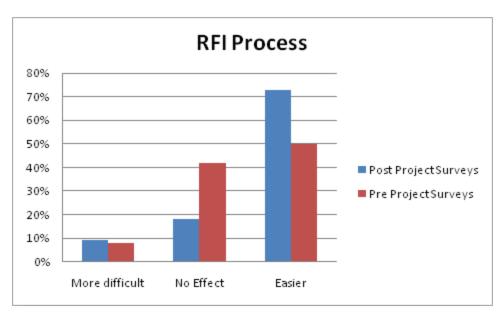


Figure A.3. Survey results comparison – RFI process

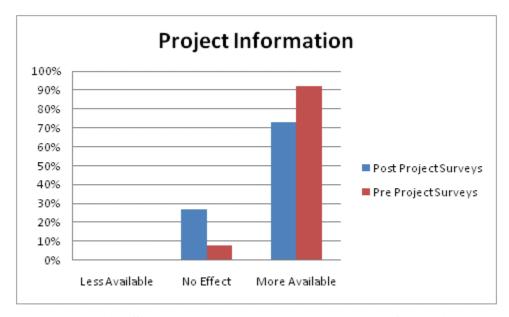


Figure A.4. Survey results comparison – project information

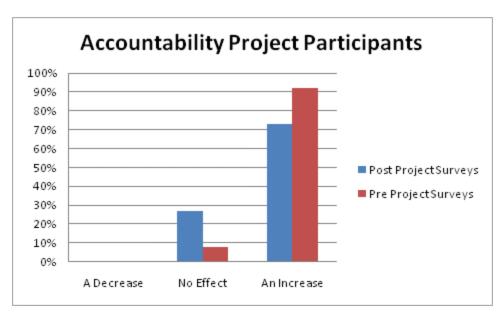


Figure A.5. Survey results comparison – accountability of project participants

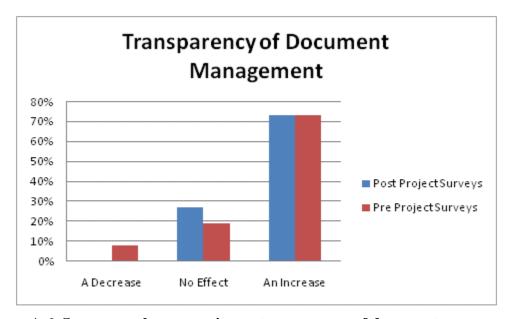


Figure A.6. Survey results comparison – transparency of document management

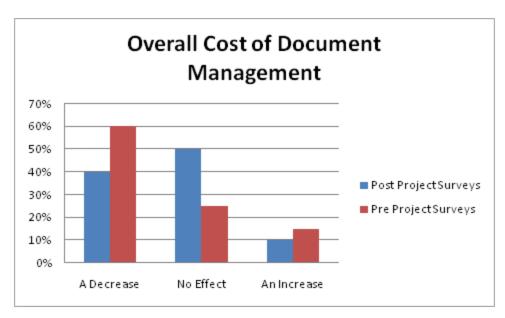


Figure A.7. Survey results comparison – overall cost of document management

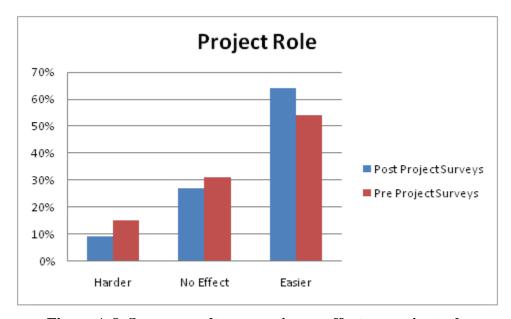


Figure A.8. Survey results comparison – effect on project role

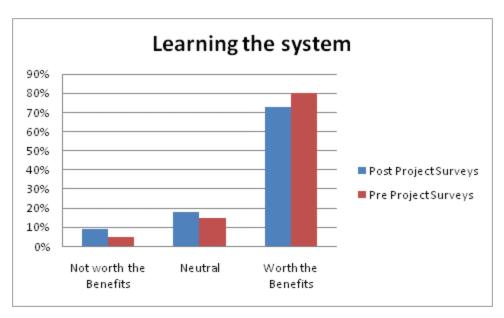


Figure A.9. Survey results comparison – learning the system

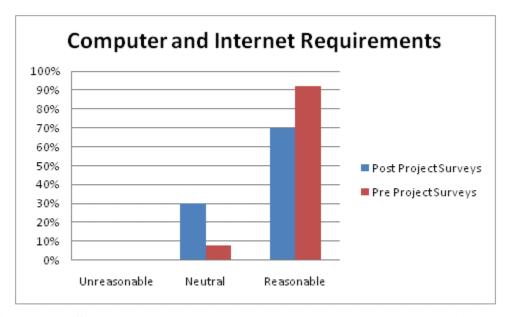


Figure A.10 Survey results comparison – computer and internet requirements

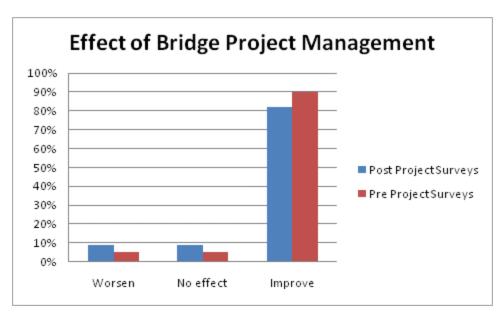


Figure A.11. Survey results comparison – effect of bridge project management

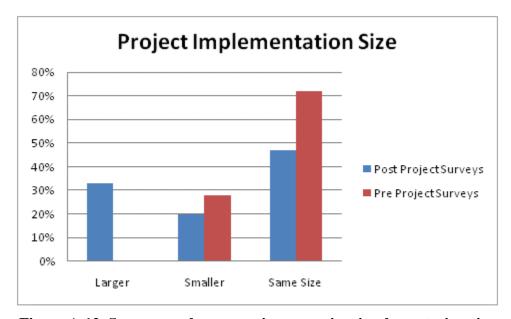


Figure A.12. Survey results comparison – project implementation size

APPENDIX B. IOWA FALLS ARCH BRIDGE PRE-PROJECT SURVEY ANALYSIS

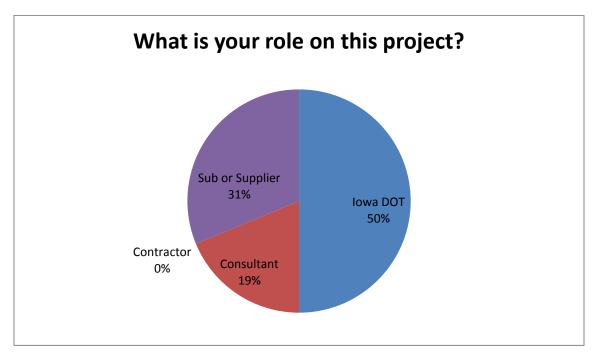


Figure B.1. Survey results – project role

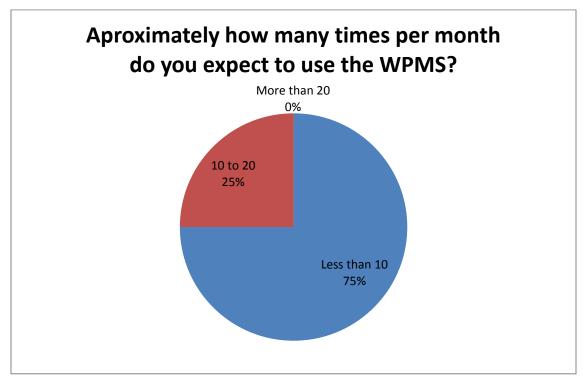


Figure B.2. Survey results – expected WPMS usage

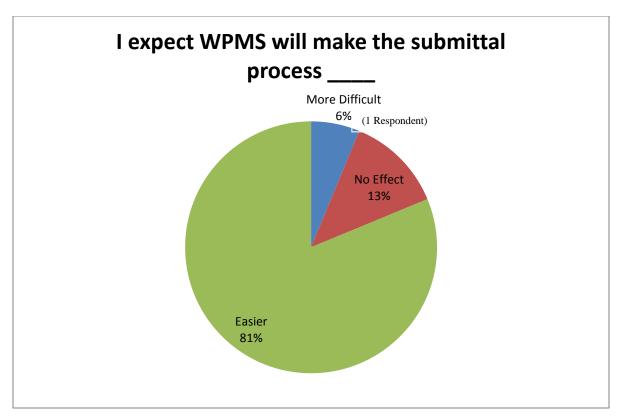


Figure B.3. Survey results – submittal process

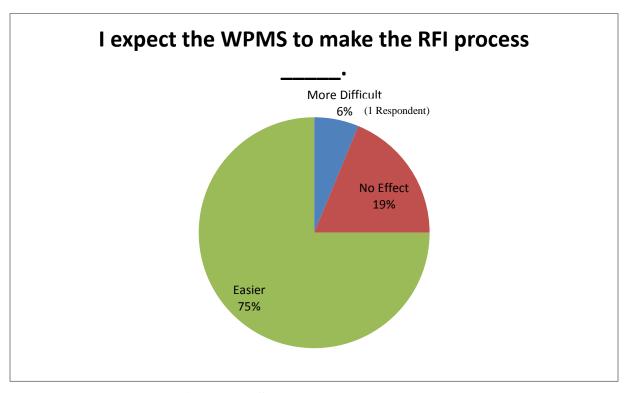


Figure B.4. Survey results – RFI process

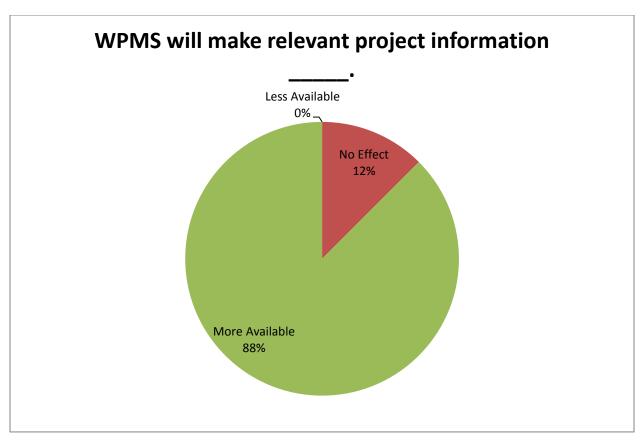


Figure B.5. Survey results – project information

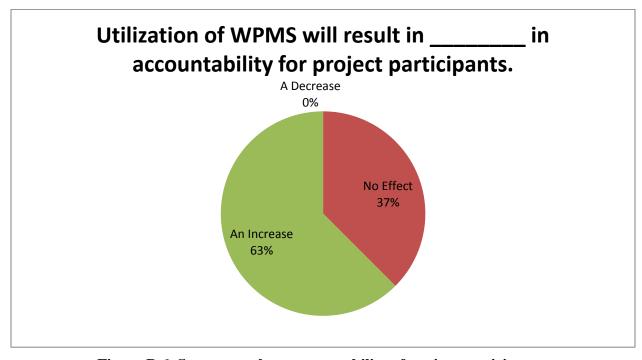


Figure B.6. Survey results – accountability of project participants

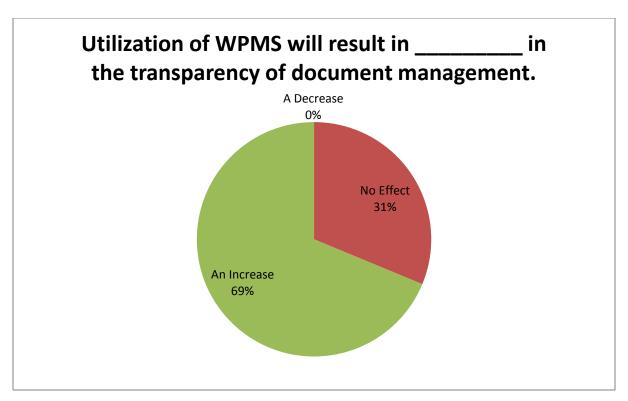


Figure B.7. Survey results – transparency of document management

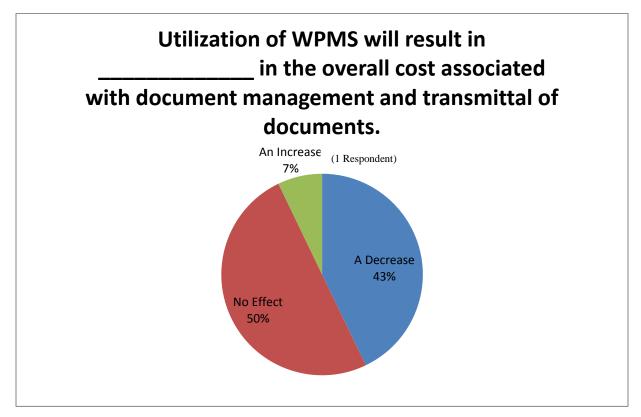


Figure B.8. Survey results – effect in document management cost

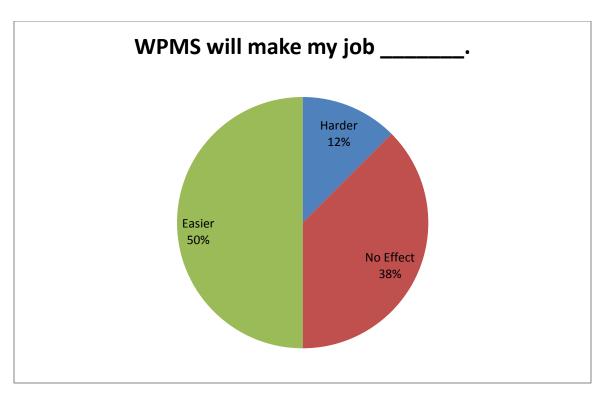


Figure B.9. Survey results – effect on project role

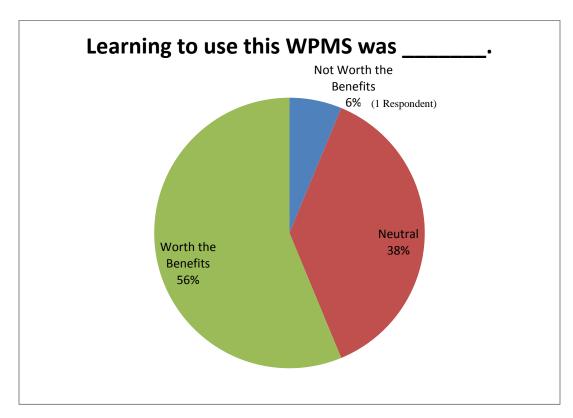


Figure B.10. Survey results – ease of learning the system

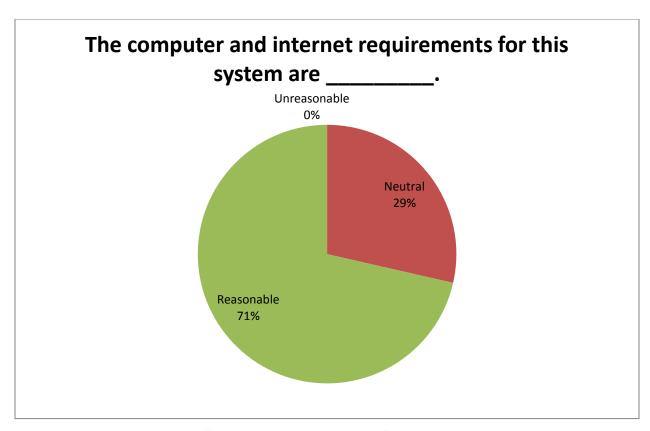


Figure B.11. Survey results – computer/internet requirements

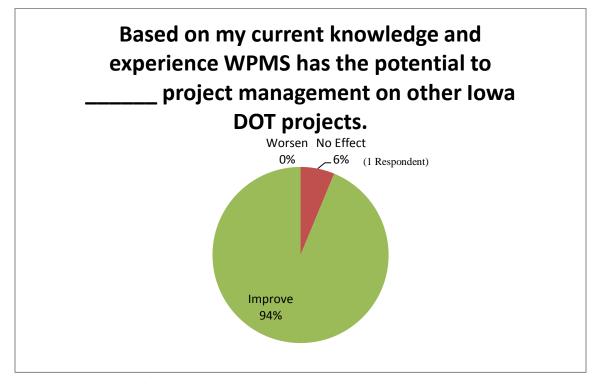


Figure B.12. Survey results – potential effect on other Iowa DOT projects

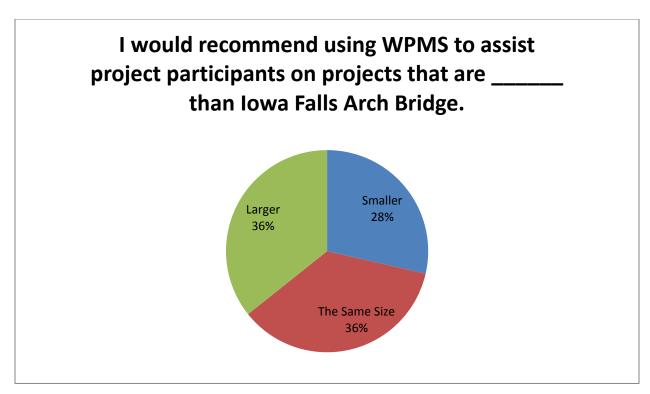


Figure B.13. Survey results – project implementation size for other projects

APPENDIX C. HUDDLE WORKFLOW COMPARED TO ORIGINAL WORKFLOW

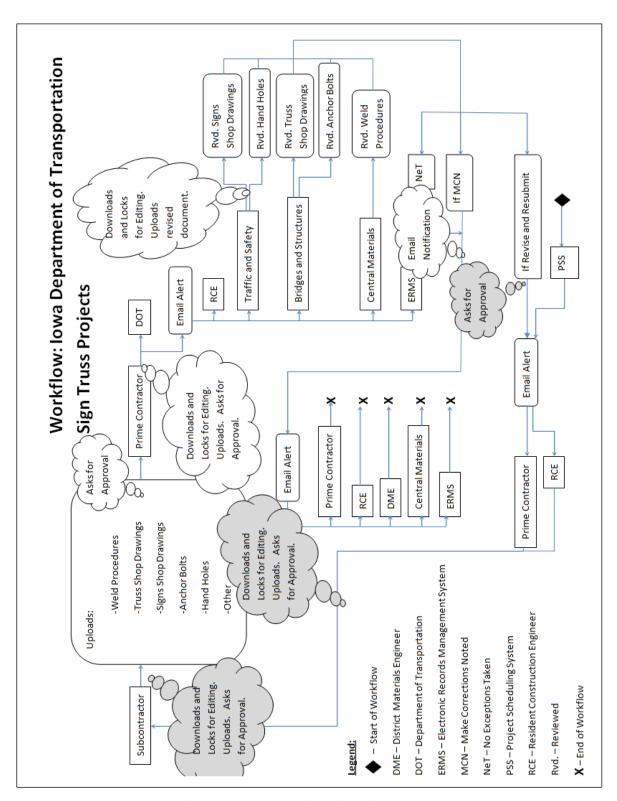


Figure C.1. Huddle workflow for sign truss projects

APPENDIX D. WORKFLOW FOR SHAREPOINT AND FTP IMPLEMENTATION ON SIGN TRUSS PROJECTS

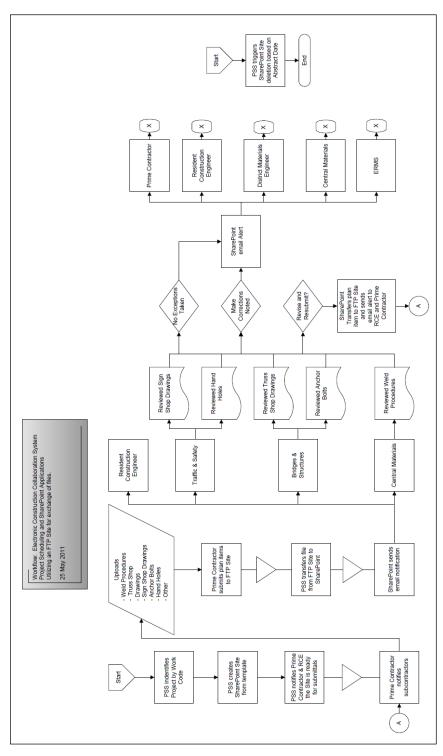


Figure D.1. Workflow for SharePoint and FTP site implementation on sign truss projects (Karla Hocker, Iowa DOT)

APPENDIX E. COMPARISON SCREENSHOTS OF TRADITIONAL WEBSITE USED FOR DOCUMENT SHARING AND MICROSOFT SHAREPOINT PAGE

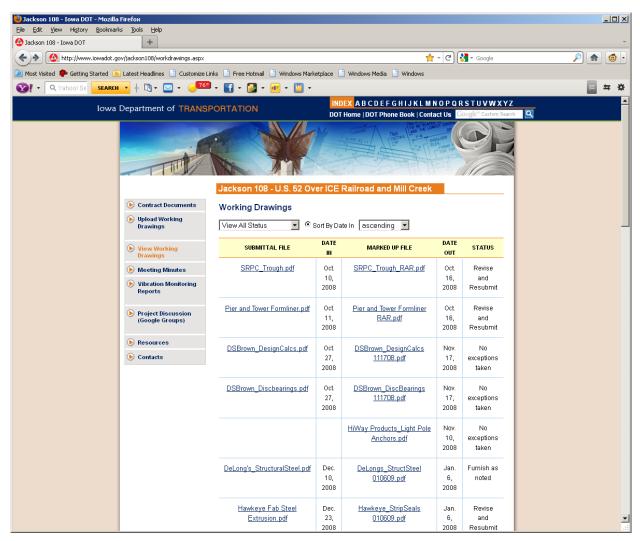


Figure E.1. Screenshot of Jackson 108 Bridge Project document management website (Karla Hocker, Iowa DOT)

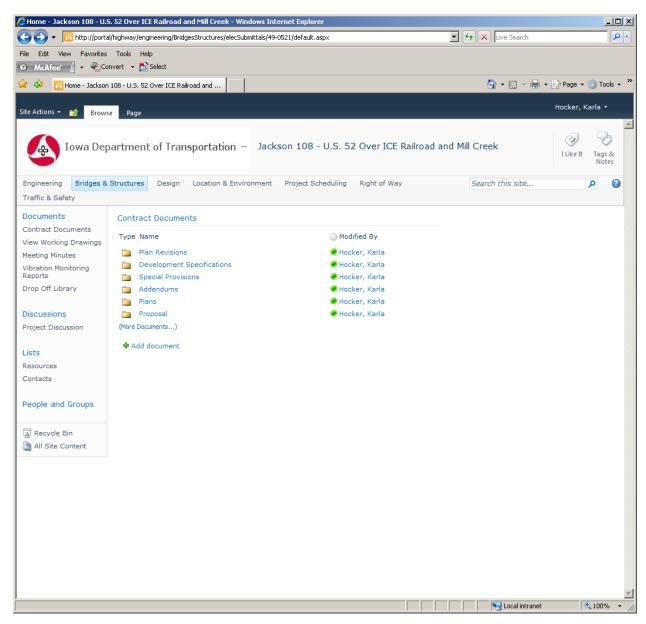


Figure E.2. SharePoint page screenshot for the Jackson 108 Bridge Project (Karla Hocker, Iowa DOT)

APPENDIX F. ANSWERED SURVEYS – BROADWAY BRIDGE

Attolist Pre Project Survey **Broadway Viaduct**

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the lowa DOT. Your answers are important in helping the lowa DOT n

p. 0,00	t management and its ase s	, the lower both roan answer	are important in	melping the lowa 20
	re the benefits of using web		_	
compl	etion please return this surv	ey to Jose Perez, <u>japerez@i</u>	astate.edu. Thank y	ou.
	_			
	pant Information:			
1.	What is/was your role on t			
	<u>Iowa DOT Employee</u>	Consultant	Contractor	Supplier
2.	Approximately how many	times per month did you int	terface with the we	b-based project
	management site?			
	Less than 10	10 to 20	Mo	ore than 20
<u>Projec</u>	t Website Experience:			
Based	on your knowledge of web-l	based project management	and prior experien	ce with Iowa DOT
bridge	projects, please respond to	the following statements by	y circling the most a	appropriate response
1.	For my work, web-based p	roject management made t	he submittal proce	SS
	More Difficult	No Effect		<u>Easier</u>
2.	For my work, web-based p	roject management made t	he RFI process	•
	More Difficult	No Effect	·	<u>Easier</u>
3.	For my work, Web-based p	oroject management made i	relevant project inf	ormation
	Less Available	No Effect		More Available
4.	Utilization of Web-based p	project management resulte	d in i	n accountability for
	project participants.			
	A Decrease	No Effect		An Increase
5.	Utilization of Web-based p	oroject management website	e resulted in	in the
	transparency of document	: management.		
	A Decrease	No Effect		An Increase
6.	Utilization of Web-based p	project management resulte	d inin t	he overall cost
	associated with document	management and transmit	tal of documents.	
	A Decrease	No Effect		An Increase
	No information			
7.	Web-based project manag	ement made my job	•	
	Harder	No Effect		<u>Easier</u>
8.	Learning to use this web-b	ased project management s	system was	·
	Not Worth the Benefits	Neutral		Worth the Benefits

9.	The computer and in	ternet requirements for this system were	·
	Unreasonable	Neutral	Reasonable
	No information		
10.	. Based on my current	knowledge and experience, web-based p	roject management has the
	potential to	project management on other Iowa [OOT bridge projects.
	Worsen	No Effect	Improve (On Large Projects)
11.	. I would recommend เ	using web-based project management to	assist project participants on
	projects that are	than Broadway Viaduct.	
	Smaller	The Same Size	<u>Larger</u>
Please	write in answers to the	e following questions:	
What v	vere the primary bene	fits from using web-based project manag	ement?
Quicke	r after I learned how t	o use it.	
What v	vere your biggest conc	erns with web-based project manageme	nt and its use on this project?
No rea	l concerns, but not ne	eded on small projects.	
Was th	ere anything you want	the system to do that it could not do?	
<u>No</u>			
What p	parts of the system did	you find to be hard to learn and use?	
I only h	nad to use one small p	art of the overall system, so I cannot pro	ovide too much information on
this.			

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the Iowa DOT. Your answers are important in helping the Iowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon C

Participa	nt Info	ormation	:
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comple	etion please return this surv	vey to Jose Perez, <u>japerez@ia</u>	<u>istate.edu</u> . Thank you.
Partici	pant Information:		
	What is/was your role on	this project (please circle):	
	Iowa DOT Employee	Consultant	Contractor Supplier
2.	Approximately how many	times per month did you int	erface with the web-based project
	management site?	·	
	Less than 10	<u>10 to 20</u>	More than 20
<u>Project</u>	: Website Experience:		
Based	on your knowledge of web-	based project management a	and prior experience with Iowa DOT
bridge	projects, please respond to	the following statements by	circling the most appropriate respons
1.	For my work, web-based p	project management made th	ne submittal process
	More Difficult	No Effect	<u>Easier</u>
2.	For my work, web-based p	project management made th	ne RFI process
	More Difficult	No Effect	<u>Easier</u>
3.	For my work, Web-based	project management made r	elevant project information
	Less Available	No Effect	More Available
4.	Utilization of Web-based p	project management resulted	d in in accountability for
	project participants.		
	A Decrease	No Effect	An Increase
5.	Utilization of Web-based p	project management website	e resulted inin the
	transparency of document	t management.	
	A Decrease	No Effect	<u>An Increase</u>
6.	•	•	d inin the overall cost
	associated with document	t management and transmitt	al of documents.
	A Decrease	No Effect	An Increase
7.	Web-based project manag	gement made my job	·
	Harder	No Effect	<u>Easier</u>
8.	Learning to use this web-b	pased project management s	ystem was
	Not Worth the Benefits	Neutral	Worth the Benefits
9.	The computer and interne	et requirements for this syste	em were
	Unreasonable	Neutral	<u>Reasonable</u>
10.	. Based on my current knov	vledge and experience, web-	based project management has the
	potential top	project management on othe	r Iowa DOT bridge projects.
	Worsen	No Effect	<u>Improve</u>

11. I would recommend u	sing web-based project management to assis	t project participants on
projects that are	than Broadway Viaduct.	
Smaller	The Same Size	Larger

What were the primary benefits from using web-based project management?

Speed of document distribution.

Speed of response on reviews of project documents.

Reduced need for paper copies.

What were your biggest concerns with web-based project management and its use on this project?

<u>Learning to use/navigate within the program.</u>

Was there anything you want the system to do that it could not do?

Not at this time.

What parts of the system did you find to be hard to learn and use?

Navigation within project "directories". It seems like a maze at times.

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the Iowa DOT. Your answers are important in helping the Iowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon

comple	etion please return this surv	ey to Jose Perez, <u>japerez@iastat</u>	<u>e.edu</u> . Thank you.
Particip	pant Information:		
	What is/was your role on t	this project (please circle):	
	Iowa DOT Employee		ontractor Supplier
2.	Approximately how many	times per month did you interfa	ce with the web-based project
	management site?	,	, ,
	Less than 10	10 to 20	More than 20
Project	: Website Experience:		
	· · · · · · · · · · · · · · · · · · ·	based project management and	prior experience with Iowa DOT
	· -		cling the most appropriate response
_		project management made the su	• ,, ,
	More Difficult	No Effect	<u>Easier</u>
2.	For my work, web-based p	project management made the R	FI process
	More Difficult	No Effect	<u>Easier</u>
3.	For my work, Web-based p	oroject management made relev	ant project information
	Less Available	No Effect	More Available
4.	Utilization of Web-based p	project management resulted in	in accountability for
	project participants.		
	A Decrease	No Effect	An Increase
5.	Utilization of Web-based p	project management website res	ulted inin the
	transparency of document	t management.	
	A Decrease	No Effect	<u>An Increase</u>
6.	Utilization of Web-based p	project management resulted in	in the overall cost
	associated with document	management and transmittal of	f documents.
	A Decrease	No Effect	An Increase
7.	Web-based project manag	gement made my job	
	Harder	No Effect	<u>Easier</u>
8.	Learning to use this web-b	ased project management syste	m was
	Not Worth the Benefits	Neutral	Worth the Benefits
9.	The computer and interne	t requirements for this system w	/ere
	Unreasonable	Neutral	<u>Reasonable</u>
10.	. Based on my current know	vledge and experience, web-base	ed project management has the
	potential to p	roject management on other lov	wa DOT bridge projects.
	Worsen	No Effect	Improve

11.	I would recommend using	web-based project management to assist project part	cicipants on
	projects that are	than Broadway Viaduct.	
	<u>Smaller</u>	The Same Size	<u>Larger</u>

What were the primary benefits from using web-based project management?

Easy and fast way to track submittals from contractors and having a one central location for all documents.

What were your biggest concerns with web-based project management and its use on this project? Getting everyone to use it for submittals and communication all the time and not selectively.

Was there anything you want the system to do that it could not do?

Be able to designate a lead person for each submittal and copy others.

What parts of the system did you find to be hard to learn and use?

With some effort it was not that hard.

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the Iowa DOT. Your answers are important in helping the Iowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon completion please return this survey to Jose Perez, japerez@jastate.edu. Thank you.

Participant Information:

	,	, , , , , , , , , , , , , , , , , , ,		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
<u>Particip</u>	oant Information:			
1.	What is/was your role on this	s project (please circle):		
	Iowa DOT Employee	<u>Consultant</u>	Contractor	Supplier
2.	Approximately how many tin	nes per month did you in	nterface with the w	eb-based project
	management site?			
	Less than 10	<u>10 to 20</u>	N	1ore than 20
Project	: Website Experience:			
Based o	on your knowledge of web-bas	sed project management	t and prior experie	nce with Iowa DOT
bridge	projects, please respond to th	e following statements b	y circling the mos	t appropriate response
1.	For my work, web-based pro	ject management made	the submittal prod	ess
	More Difficult	No Effect		Easier
2.	For my work, web-based pro	ject management made	the RFI process	
	More Difficult	No Effect		<u>Easier</u>
3.	For my work, Web-based pro	ject management made	relevant project ir	nformation
	Less Available	No Effect		More Available
4.	Utilization of Web-based pro	ject management result	ed in	in accountability for
	project participants.			
	A Decrease	No Effect		An Increase
5.	Utilization of Web-based pro	ject management websi	te resulted in	in the
	transparency of document m	anagement.		
	A Decrease	No Effect		An Increase
6.	Utilization of Web-based pro	ject management result	ed inin	the overall cost
	associated with document m	anagement and transmi	ttal of documents.	
	A Decrease	No Effect		An Increase
7.	Web-based project managen	nent made my job	•	
	Harder	No Effect		<u>Easier</u>
8.	Learning to use this web-bas	ed project management	system was	•
	Not Worth the Benefits	Neutral		Worth the Benefits
9.	The computer and internet re	equirements for this syst	tem were	·
	Unreasonable	Neutral		<u>Reasonable</u>
10.	Based on my current knowle	dge and experience, web	o-based project ma	anagement has the
	potential to pro	ject management on oth	er Iowa DOT bridg	e projects.
	Worsen	No Effect		Improve

11. I would recommend	using web-based project management to assis	t project participants on
projects that are	than Broadway Viaduct.	
<u>Smaller</u>	The Same Size	<u>Larger</u>

What were the primary benefits from using web-based project management?

All documents in one location. Simple system for returning review comments.

What were your biggest concerns with web-based project management and its use on this project? Sometimes too many reviewers—providing conflicting comments.

Was there anything you want the system to do that it could not do?

System for sorting/searching documents.

What parts of the system did you find to be hard to learn and use? None

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the Iowa DOT. Your answers are important in helping the Iowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon

Participant Information:

comple	etion please return this surv	vey to Jose Perez, <u>japerez@ia</u> :	state.edu. Thank you.
Particip	pant Information:		
		this project (please circle):	
	<u>Iowa DOT Employee</u>	Consultant	Contractor Supplier
2.	Approximately how many	times per month did you inte	erface with the web-based project
	management site?		
	Less than 10	10 to 20	More than 20
<u>Project</u>	: Website Experience:		
Based	on your knowledge of web-	-based project management a	nd prior experience with Iowa DOT
_		= -	circling the most appropriate response
1.		project management made th	e submittal process
	More Difficult	<u>No Effect</u>	Easier
2.		project management made th	·
	More Difficult	No Effect	<u>Easier</u>
3.			elevant project information
	Less Available	No Effect	<u>More Available</u>
4.	Utilization of Web-based	project management resulted	in in accountability for
	project participants.		
	A Decrease	No Effect	<u>An Increase</u>
5.		-	resulted inin the
	transparency of documen	<u>-</u>	
	A Decrease	No Effect	<u>An Increase</u>
6.		•	inin the overall cost
		t management and transmitta	
_	A Decrease	No Effect	An Increase
7.		gement made my job	
_	Harder	No Effect	Easier
8.	_	based project management sy	
_	Not Worth the Benefits	<u>Neutral</u>	Worth the Benefits
9.	·	et requirements for this system	
	Unreasonable	<u>Neutral</u>	Reasonable
10.	•		pased project management has the
		oroject management on other	
	worsen	No Effect	Improve

11.	I would recommend using	web-based project management to assist project part	ticipants on
	projects that are	_ than Broadway Viaduct.	
	Smaller	The Same Size	Larger

What were the primary benefits from using web-based project management? Simultaneous communication and feedback. Also reduced response time.

What were your biggest concerns with web-based project management and its use on this project? Wide variation in users equipment and capabilities in the use.

Was there anything you want the system to do that it could not do?

What parts of the system did you find to be hard to learn and use?

	: Pre Project Survey			
Broadv	vay Viaduct			
project measu	management and its use by re the benefits of using web-l	the lowa DOT. Your answers	erience and knowledge of web-based are important in helping the lowa DC n bridge construction projects. Upon ate.edu. Thank you.	T
Particip	pant Information:			
1.	What is/was your role on th	is project (please circle):		
	Iowa DOT Employee	Consultant (<mark>Contractor</mark> Supplier	
2.	Approximately how many ti management site?	mes per month did you interf	ace with the web-based project	
	Less than 10	10 to 20	More than 20	
Based	· -		d prior experience with lowa DOT rcling the most appropriate response	
1.	For my work, web-based pro	oject management made the	submittal process	
	More Difficult	No Effect	Easier	
2.	For my work, web-based pro	oject management made the	RFI process	
	More Difficult	No Effect	Easier	
3.	For my work, Web-based pr	oject management made rele	evant project information	
	Less Available	No Effect	More Available	
4.	Utilization of Web-based project participants.	oject management resulted ir	n in accountability for	
	A Decrease	No Effect	An Increase	

5.	Utilization of Web-based project mana transparency of document manageme		in the
	A Decrease	No Effect	An Increase
6.	Utilization of Web-based project mana associated with document manageme		
	A Decrease	No Effect	An Increase
7.	Web-based project management mad	e my job	
	Harder	No Effect	Easier
8.	Learning to use this web-based projec	t management system was	
	Not Worth the Benefits	Neutral	Worth the Benefits
9.	The computer and internet requireme	ents for this system were	
	Unreasonable	Neutral	Reasonable
10.	Based on my current knowledge and e		_
	Worsen	No Effect	Improve
11.	I would recommend using web-based projects that are than Broad		oject participants on
	Smaller	The Same Size	Larger
Please	write in answers to the following quest	ions:	
What v	vere the primary benefits from using w	eb-based project management?	
	ent transparency and accountability. I as lagging in a response and then conta		

What were your biggest concerns with web-based project management and its use on this project?
It is too easy to send the documents, so many times there were more people notified of an issue, RFI, or a submittal than the document may have concerned. Because of this, some people would not respond because it did not need their approval or concern them, but the RFI would not be completed and answered until everyone that was notified had given a response.
It also delayed decisions. Instead of making a decision, the engineer could send an issue out to several others to weigh in, rather than making a phone call and speeding up the decision making process.
Was there anything you want the system to do that it could not do?
No
What parts of the system did you find to be hard to learn and use?
None

	at Pre Project Survey way Viaduct	w.		
projec measu	answer the following questions t management and its use by the are the benefits of using web-bas etion please return this survey to	e lowa DOT. Your answe sed project management	rs are important in hel on bridge constructio	ping the lowa DOT
<u>Partici</u>	pant Information:			
1.	What is/was your role on this	project (please circle):		
(lowa DOT Employee	Consultant	Contractor	Supplier
2.	Approximately how many time management site?	es per month did you inte	erface with the web-ba	sed project
	Less than 10	10 to 20	More th	nan 20
		Lotely	Fewer during	winter
Projec	t Website Experience:			
	on your knowledge of web-base projects, please respond to the			
1.	For my work, web-based proje	ct management made th	e submittal process	
	More Difficult	No Effect	Easie	er
2.	For my work, web-based proje	ct management made th	e RFI process	
	More Difficult	No Effect	Easie	er
3.	For my work, Web-based proje	ect management made re	elevant project informa	ation
	Less Available	No Effect	Mor	e Available
4.	Utilization of Web-based proje project participants.	ct management resulted	in in ac	countability for
	A Decrease	No Effect	An Ir	ncrease

5.	Utilization of Web-based project mana transparency of document manageme		in the
	A Decrease	No Effect	An Increase
6.	Utilization of Web-based project mana associated with document management	-	
,	A Decrease	No Effect	An Increase
7.	Web-based project management mad	e my job	
	Harder	No Effect	Easier
8.	Learning to use this web-based project	t management system was _	·
	Not Worth the Benefits	Neutral	Worth the Benefits
9.	The computer and internet requireme	ents for this system were	·
	Unreasonable	Neutral	Reasonable
10	Based on my current knowledge and e		
	Worsen	No Effect	Improve
11.	I would recommend using web-based projects that are than Broad		t project participants on
	Smaller	The Same Size	Larger
Please	write in answers to the following quest	ions:	
What v	vere the primary benefits from using w	eb-based project managemei	nt?
	All the project	T documents a	re in one place
	and readily ac	cessible.	

What were your biggest concerns with web-based project management and its use on this project?

- none

Was there anything you want the system to do that it could not do?

- none

What parts of the system did you find to be hard to learn and use?

Initially the system takes time to figure out the navigation.

projec measu	answer the following questions t management and its use by the are the benefits of using web-bas etion please return this survey to	e lowa DOT. Your answe sed project managemen	ers are important in t on bridge construc	helping the lowa DOT tion projects Upon
<u>Partici</u>	pant Information:			
1.	What is/was your role on this p	project (please circle):		
Ć	lowa DOT Employee	Consultant	Contractor	Supplier
2	Approximately how many time management site?	s per month did you int	erface with the web	-based project
	Less than 10	10 to 20	Mor	e than 20
Based	website Experience: on your knowledge of web-base projects, please respond to the			
1.,	For my work, web-based project	ct management made ti	ne submittal process	
	More Difficult	No Effect	Ea	asier
2	For my work, web-based project	ct management made th	ne RFI process	
	More Difficult	No Effect	Ea	sier
3	For my work, Web-based proje	ct management made r	elevant project infor	mation
	Less Available	No Effect	М	ore Available
4.	Utilization of Web-based project participants.	ct management resulted	l in in	accountability for
	A Decrease	No Effect	(Ar	Increase

Not Worth the Benefits Neutral Worth the Benefits			
A Decrease No Effect An Increase Utilization of Web-based project management resulted in in the overall cost associated with document management and transmittal of documents A Decrease No Effect An Increase Web-based project management made my job Harder No Effect Easier Learning to use this web-based project management system was Not Worth the Benefits Neutral Worth the Benefits The computer and internet requirements for this system were Unreasonable Neutral Reasonable Description management has the potential to project management on other lowa DOT bridge projects. Worsen No Effect Improve I would recommend using web-based project management to assist project participants on projects that are than Broadway Viaduct			d inin the
associated with document management and transmittal of documents A Decrease No Effect An Increase Web-based project management made my job Harder No Effect No Effect Easier Learning to use this web-based project management system was Not Worth the Benefits Neutral Worth the Benefits The computer and internet requirements for this system were Unreasonable Neutral Reasonable O Based on my current knowledge and experience, web-based project management has the potential to project management on other lowa DOT bridge projects. Worsen No Effect Improve	transparency of docume	ent management	
associated with document management and transmittal of documents A Decrease No Effect An Increase Web-based project management made my job Harder No Effect Easier Learning to use this web-based project management system was Not Worth the Benefits Neutral Worth the Benefits The computer and internet requirements for this system were Unreasonable Neutral Reasonable Description Neutral Reasonable Neutral Neutral Reasonable Neutral Neutral Reasonable Neutral Neutral Neutral Neutral Reasonable No Effect Improve	A Decrease	No Effect	An Increase
A Decrease No Effect An Increase Web-based project management made my job Harder No Effect Easier Learning to use this web-based project management system was Not Worth the Benefits Neutral Worth the Benefits The computer and internet requirements for this system were Unreasonable Neutral Reasonable O Based on my current knowledge and experience, web-based project management has the potential to project management on other lowa DOT bridge projects. Worsen No Effect Improve 1 I would recommend using web-based project management to assist project participants on projects that are than Broadway Viaduct	6. Utilization of Web-based	d project management resulted in	in the overall cost
Harder No Effect Easier Learning to use this web-based project management system was Not Worth the Benefits Neutral Worth the Benefits The computer and internet requirements for this system were Unreasonable Neutral Reasonable O. Based on my current knowledge and experience, web-based project management has the potential to project management on other lowa DOT bridge projects. Worsen No Effect Improve 1. I would recommend using web-based project management to assist project participants on projects that are than Broadway Viaduct	associated with docume	nt management and transmittal of doc	uments.
Harder No Effect Easier Learning to use this web-based project management system was Not Worth the Benefits Neutral Worth the Benefits The computer and internet requirements for this system were Unreasonable Neutral Reasonable O Based on my current knowledge and experience, web-based project management has the potential to project management on other lowa DOT bridge projects Worsen No Effect Improve 1 I would recommend using web-based project management to assist project participants on projects that are than Broadway Viaduct	A Decrease	No Effect	An Increase
Learning to use this web-based project management system was Not Worth the Benefits	7. Web-based project mana	agement made my job	
Not Worth the Benefits Neutral Worth the Benefits The computer and internet requirements for this system were Unreasonable Neutral Reasonable Description of the system were Neutral Neutral Neutral Reasonable Neutral Neutral Neutral Neutral Neutral Neutral Neutral Reasonable No Based on my current knowledge and experience, web-based project management has the potential to project management on other lowa DOT bridge projects. Worsen No Effect Improve 1. I would recommend using web-based project management to assist project participants on projects that are than Broadway Viaduct	Harder	No Effect	Easier
The computer and internet requirements for this system were	8 Learning to use this web	-based project management system wa	ns
Unreasonable Neutral Reasonable Description Reasonable Neutral Reasonable Neutral Reasonable Neutral Reasonable No Based on my current knowledge and experience, web-based project management has the potential to project management on other lowa DOT bridge projects. Worsen No Effect Improve I would recommend using web-based project management to assist project participants on projects that are than Broadway Viaduct	Not Worth the Benefits	\ Neutral	Worth the Benefits
Unreasonable Neutral Reasonable Description Reasonable Neutral Reasonable Neutral Reasonable Neutral Reasonable No Based on my current knowledge and experience, web-based project management has the potential to project management on other lowa DOT bridge projects. Worsen No Effect Improve I would recommend using web-based project management to assist project participants on projects that are than Broadway Viaduct	The computer and intern	net requirements for this system were	
worsen No Effect Improve I would recommend using web-based project management to assist project participants on projects that are than Broadway Viaduct	•		
worsen No Effect Improve I would recommend using web-based project management to assist project participants on projects that are than Broadway Viaduct			
Worsen No Effect Improve 1. I would recommend using web-based project management to assist project participants on projects that are than Broadway Viaduct	O Resed on my current kno	wood and everience web based or	ningt management has the
1. I would recommend using web-based project management to assist project participants on projects that are than Broadway Viaduct		-	-
projects that are than Broadway Viaduct		-	-
projects that are than Broadway Viaduct	potential to	project management on other lowa DO	OT bridge projects.
Smaller The Same Size Larger	potential to	project management on other lowa DO	OT bridge projects. Improve
	Worsen 1. I would recommend using	project management on other lowa DO No Effect g web-based project management to a	OT bridge projects. Improve
	worsen 1 I would recommend using projects that are	No Effect g web-based project management to a than Broadway Viaduct	OT bridge projects. Improve ssist project participants on
	worsen 1 I would recommend using projects that are	No Effect g web-based project management to a than Broadway Viaduct	OT bridge projects. Improve ssist project participants on
e write in answers to the following questions:	worsen 1. I would recommend using projects that are Smaller	No Effect g web-based project management to as than Broadway Viaduct The Same Size	OT bridge projects. Improve ssist project participants on
	potential to	No Effect g web-based project management to as than Broadway Viaduct The Same Size	OT bridge projects. Improve ssist project participants on Larger
e write in answers to the following questions: were the primary benefits from using web-based project management?	potential to	No Effect g web-based project management to as than Broadway Viaduct The Same Size	OT bridge projects. Improve ssist project participants on Larger
	potential to	No Effect g web-based project management to as than Broadway Viaduct The Same Size	OT bridge projects. Improve ssist project participants on Larger
	potential to	No Effect g web-based project management to as than Broadway Viaduct The Same Size	OT bridge projects. Improve ssist project participants on Larger
	potential to	No Effect g web-based project management to as than Broadway Viaduct The Same Size	OT bridge projects. Improve ssist project participants on Larger
	potential to	No Effect g web-based project management to as than Broadway Viaduct The Same Size	OT bridge projects. Improve ssist project participants on Larger

What were your biggest concerns with web-based project management and its use on this proje	ect?
Was there anything you want the system to do that it could not do?	
What parts of the system did you find to be hard to learn and use?	

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the lowa DOT. Your answers are important in helping the lowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon

<u>P</u>

comple	etion please return this survey	to Jose Perez, japerez@	iastate.edu Thank yo	ou.
<u>Partici</u>	pant Information:			
. 1.	What is/was your role on thi	s project (please circle):		
	lowa DOT Employee	Consultant	Contractor	Supplier
2	Approximately how many tir management site?	nes per month did you ir	nterface with the web	-based project
	Less than 10	10 to 20	Mor	e than 20
<u>Project</u>	: Website Experience:			
	on your knowledge of web-ba projects, please respond to th			
1	For my work, web-based pro	ject management made	the submittal process	S
	More Difficult	No Effect	E	asier
2.	For my work, web-based pro	ject management made	the RFI process	· · · · · · · · · · · · · · · · · · ·
	More Difficult	No Effect	E	asier
3.,	For my work, Web-based pro	oject management made	relevant project info	rmation
	Less Available	No Effect	N	ore Available
4	Utilization of Web-based pro project participants	ject management resulte	ed in in	accountability for
	A Decrease	No Effect	A	n Increase

	No Effect	An Increase
	based project management resulted in cument management and transmittal of doc	
A Decrease	No Effect	An Increase
7. Web-based project	management made my job	
Harder	No Effect	Easier
8. Learning to use this	s web-based project management system w	as
Not Worth the Ben	efits Neutral	Worth the Benefits
The computer and	internet requirements for this system were	
Unreasonable	Neutral	Reasonable
•	nt knowledge and experience, web-based pr project management on other lowa D	-
Worsen	No Effect	Improve
1. I would recommend	No Effect d using web-based project management to a than Broadway Viaduct	The second second
1. I would recommend	d using web-based project management to a	The state of the s
I.1 I would recommend projects that are Smaller	d using web-based project management to a than Broadway Viaduct The Same Size	assist project participants on
11. I would recommend projects that are Smaller Se write in answers to t	d using web-based project management to a	assist project participants on Larger

What were your biggest concerns with web-based project management and its use on this project?

SOME QUESTIONS THAT COULD BE ANSWERED QUICKLY WITH A PHONE CALL CAN NOW TAKE DAYS TO GET A RESPONSE

Was there anything you want the system to do that it could not do?

NO

What parts of the system did you find to be hard to learn and use?

TITLES OF SUBMITTALS NEED TO BE CLEAR AND ORIGINAL OR IT CAN BE DIFFICULT TO FIND THE INFORMATION YOU ARE LOOKING FOR.

Attolist Pre Project Survey **Broadway Viaduct** Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the lowa DOT. Your answers are important in helping the lowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon completion please return this survey to Jose Perez, japerez@iastate.edu. Thank you. Participant Information: 1. What is/was your role on this project (please circle): Iowa DOT Employee Consultant Contractor Supplier 2. Approximately how many times per month did you interface with the web-based project management site? Less than 10 10 to 20 More than 20 Project Website Experience: Based on your knowledge of web-based project management and prior experience with Iowa DOT bridge projects, please respond to the following statements by circling the most appropriate response 1. For my work, web-based project management made the submittal process____ More Difficult No Effect Easier 2. For my work, web-based project management made the RFI process_ More Difficult No Effect Easie 3. For my work, Web-based project management made relevant project information_ Less Available No Effect More Available 4. Utilization of Web-based project management resulted in _____ in accountability for project participants.

No Effect

An Increase

A Decrease

A Decrease	No Effect	An Increase
	oject management resulted in nanagement and transmittal of doc	in the overall cost
A Decrease	No Effect	An Increase
Web-based project manager	ment made my job	
Harder	No Effect	Easier
Learning to use this web-bas	sed project management system wa	as
Not Worth the Benefits	Neutral	Worth the Benefits
The computer and internet i	requirements for this system were	·
Unreasonable	Neutral	Reasonable
•	edge and experience, web-based pr oject management on other Iowa D	
Worsen	No Effect	Improve
L. I would recommend using w projects that aret	reb-based project management to a han Broadway Viaduct.	assist project participants on
Smaller	The Same Size	Larger
the in the second of the fellow	do a succession of	
e write in answers to the follow	ving questions: m using web-based project manage	·mant?
were the primary benefits from	n using web-based project manage	mentr

Wh	nat were your biggest concerns with web-based project management and its use on this project?
Eas	se of use
Wa	s there anything you want the system to do that it could not do?
Res	spond to RFI after they have been answered and returned
Wh	nat parts of the system did you find to be hard to learn and use?
No	ne

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the lowa DOT. Your answers are important in helping the lowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon completion please return this survey to Jose Perez, japerez@iastate.edu. Thank you.

<u>Partici</u>	pant Information:						
1.	What is/was your role on this project (please circle):						
	Iowa DOT Employee	Consultant	Contractor	Supplier			
2.	Approximately how many time management site? Less than 10	es per month did you 10 to 20		pased project than 20			
Project Website Experience:							
Based on your knowledge of web-based project management and prior experience with lowa DOT bridge projects, please respond to the following statements by circling the most appropriate response							
1.	For my work, web-based project management made the submittal process						
<	More Difficult	No Effect	Easi	ier			
2.	For my work, web-based project management made the RFI process						
(More Difficult	No Effect	Easi	ier			
3.	. For my work, Web-based project management made relevant project information						
	Less Available	No Effect	Moi	re Available			
4.	Utilization of Web-based project management resulted in in accountability for project participants.						
	A Decrease	No Effect	An I	Increase			

5.	Utilization of Web-based project management website resulted inin the transparency of document management.						
	A Decrease	No Effect	An Increase				
6.	6. Utilization of Web-based project management resulted inin the overall cost associated with document management and transmittal of documents.						
	A Decrease	No Effect	An Increase				
7.	Web-based project management	made my job					
1	Harder	No Effect	Easier				
8.	8. Learning to use this web-based project management system was						
	Not Worth the Benefits	Neutral	Worth the Benefits				
9.	9. The computer and internet requirements for this system were						
	Unreasonable	Neutral	Reasonable				
10. Based on my current knowledge and experience, web-based project management has the potential to project management on other lowa DOT bridge projects.							
	Worsen	No Effect	Improve				
11. I would recommend using web-based project management to assist project participants on projects that are than Broadway Viaduct.							
	Smaller	The Same Size	Larger				
Please write in answers to the following questions: What were the primary benefits from using web-based project management?							
	Nove						

What were your biggest concerns with web-based project management and its use Missing Some Information in a MANNEY	on this project? Timely
Was there anything you want the system to do that it could not do?	
What parts of the system did you find to be hard to learn and use?	

APPENDIX G. ANSWERED SURVEYS – IOWA FALLS ARCH BRIDGE

Attolist Pre Project Survey Iowa Falls Arch Bridge

Unreasonable

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the lowa DOT. Your answers are important in helping the lowa DOT

measure the benefits of using web-based project management on bridge construction projects. Upon completion please return this survey to Jose Perez, japerez@iastate.edu. Thank you.				
·	·			•
<u>Partici</u>	oant Information:			
1.	What is your role on this pr	oject (please circle):		
<u>lov</u>	wa DOT Employee	Consultant	Contractor	Sub or Supplier
2.	Approximately how many t	imes per month do you e	expect you will no	eed to interface with the
	web-based project manage	ment site?		
	Less than 10	10 to 20		More than 20
Proiect	Website Experience:			
	on your knowledge of web-b	ased project manageme	nt and prior expe	erience with Iowa DOT
	projects, please respond to t	, ,		
_	For my work, I expect web-	_	-	
	More Difficult	No Effect		Easier
2.	For my work, I expect web-	based project managem	ent to make the	RFI process
	More Difficult	No Effect		Easier
3.	For my work, Web-based pi	roject management will	make relevant pr	oject information
	Less Available	No Effect		More Available
4.	Utilization of Web-based pr	oject management will r	esult in	in accountability for
	project participants.			
	A Decrease	No Effect		An Increase
5.	Utilization of Web-based pr	oject management web	site will result in	in the
	transparency of document	management.		
	A Decrease	No Effect		An Increase
6.	Utilization of Web-based pr	oject management will r	esult in	in the overall cost
	associated with document i	management and transm	nittal of documer	nts.
	A Decrease	No Effect		An Increase
7.	Web-based project manage	ement will make my job _	·	
	Harder	No Effect		<u>Easier</u>
8.	Learning to use this web-ba	ised project managemen	t system was	·
	Not Worth the Benefits	Neutral		Worth the Benefits
9.	The computer and internet	requirements for this sy	stem are	·

Neutral

Reasonable

10. Based on my current knowledge and experience web-based project management has the				
potential to	potential to project management on other lowa DOT bridge projects.			
Worsen	No Effect	<u>Improve</u>		
11. I would recommend usin	g web-based project management to a	ssist project participants on		
projects that are	than Iowa Falls Arch Bridge.			
Smaller	The Same Size	Larger		
Please write in answers to the following questions:				
	imary benefits from using web-based p	project management?		
What are your biggest concerns v	with web-based project management a	and its use on this project?		
Was there anything you want the system to do that it could not do?				

I'm not sure how to answer the questions yet. I will be the materials auditor on the project and have not had an opportunity to fully utilize the program to date, however, from what I have seen, I feel this will be very user friendly and make my job easier.

What parts of the system did you find or expect to be hard to learn and use?

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the Iowa DOT. Your answers are important in helping the Iowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon со

Participant	Informa	ation:
raiticipant	1111011116	นเบเเ

comple	etion please return this survey to Jose Perez, <u>japerez@iastate.edu</u> . Thank you.			
<u>Particip</u>	pant Information:			
1.	What is your role on this project (please circle):			
	<u>Supplier</u>			
2.				
	web-based project management site?			
	Less than 10			
	Website Experience:			
	on your knowledge of web-based project management and prior experience with Iowa DOT			
_	projects, please respond to the following statements by circling the most appropriate response			
1.	For my work, I expect web-based project management will make the submittal process			
	<u>Easier</u>			
2.	For my work, I expect web-based project management to make the RFI process			
	<u>Easier</u>			
3.	For my work, Web-based project management will make relevant project information			
	More Available			
4.	Utilization of Web-based project management will result in in accountability for			
	project participants.			
	<u>An Increase</u>			
5.	Utilization of Web-based project management website will result inin the			
	transparency of document management.			
	<u>An Increase</u>			
6.	Utilization of Web-based project management will result inin the overall cost			
	associated with document management and transmittal of documents.			
	<u>A Decrease</u>			
7.	Web-based project management will make my job			
	<u>Easier</u>			
8.	Learning to use this web-based project management system was			
	Worth the Benefits			
9.	The computer and internet requirements for this system are			
	<u>Didn't notice</u>			
10.	Based on my current knowledge and experience web-based project management has the			
	potential to project management on other Iowa DOT bridge projects.			
	<u>Improve</u>			

11.	I would recommend using v	web-based project management to assist project part	icipants on
	projects that are	than Iowa Falls Arch Bridge.	
	Smaller	The Same Size	Larger

Please write in answers to the following questions:

What do you expect to be the primary benefits from using web-based project management? Time management

What are your biggest concerns with web-based project management and its use on this project? No verbal communication when there is difficulties?????

Was there anything you want the system to do that it could not do?

More clear description of transmittal

What parts of the system did you find or expect to be hard to learn and use?

Viewing where information was regarding returned submittals, it turned out that the only place was on the face of the page. This made it easier however it was not clear that this was the transmittal and document information that we needed. We searched for more information and did not find any.

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the Iowa DOT. Your answers are important in helping the Iowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon completion please return this survey to Jose Perez, japerez@iastate.edu. Thank you.

<u>Participant</u>		Information:		

•	·	,		•		
Participant Information:						
1.	What is your role on this project (please circle):					
lov	wa DOT Employee	<u>Consultant</u>	Contractor	Sub or Supplier		
2.	Approximately how many t	imes per month do yo	ou expect you will ne	eed to interface with the		
	web-based project manage	ement site?				
	Less than 10	10 to 20		More than 20		
D	Markette Brook Service					
	: Website Experience:			wianaa with Jawa DOT		
	on your knowledge of web-b		·			
_	projects, please respond to	_				
1.	For my work, I expect web-	No Effec				
า	More Difficult For my work, I expect web-			Easier		
۷.	More Difficult			Easier		
2		No Effect				
3.	For my work, Web-based p Less Available	No Effec	•	-		
4				More Available		
4.	Utilization of Web-based p	roject management w	iii resuit iii	iii accountability for		
	project participants.	No Effec	.+	An Increase		
_	A Decrease			An Increase		
5.	Utilization of Web-based p transparency of document		ebsite will result in .	in the		
	A Decrease	No Effec	+	An Increase		
6.	Utilization of Web-based p			An Increase		
0.	associated with document					
	A Decrease	No Effec		An Increase		
7.	Web-based project manage			All lilcrease		
7.	Harder	No Effec		Easier		
8.	Learning to use this web-ba					
O.	Not Worth the Benefits	Neutral	ient system was	 Worth the Benefits		
9.	The computer and internet		s system are			
Э.	Unreasonable	Neutral		 Reasonable		
10	Based on my current know		weh-hased project i			
10.	potential to pi	•				
	Worsen	No Effec		Improve		

11. I would recommend	using web-based project management to assist	t project participants or
projects that are	than Iowa Falls Arch Bridge.	
<u>Smaller</u>	The Same Size	Larger

Please write in answers to the following questions:

What do you expect to be the primary benefits from using web-based project management? Communication and availability of documentation

What are your biggest concerns with web-based project management and its use on this project? Inexperience on my part with web-based project management

Was there anything you want the system to do that it could not do?

This is my first experience; I do not know what I would be missing.

What parts of the system did you find or expect to be hard to learn and use?

As a consultant, we have established our own in-house documentation procedures which do not integrate into the web-based system.

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the Iowa DOT. Your answers are important in helping the Iowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon

Particinant	Information:
raiticipalit	IIIIOIIIIauoii.

comple	tion please return this surve	ey to Jose Perez, <u>japere</u>	<u>z@iastate.edu</u> . Tha	ank you.
Particin	eant Information:			
-	What is your role on this p	roject (please circle):		
	va DOT Employee	Consultant	Contractor	Sub or Supplier
	Approximately how many t			• •
	web-based project manage		a copect year time.	
	Less than 10	10 to 20		More than 20
<u>Project</u>	Website Experience:			
Based o	on your knowledge of web-b	pased project managem	ent and prior expe	erience with Iowa DOT
ا bridge	projects, please respond to	the following statemen	ts by circling the m	nost appropriate response
1.	For my work, I expect web	-based project manage	ment will make the	submittal process
	More Difficult	No Effect		<u>Easier</u>
2.	For my work, I expect web	-based project manage	ment to make the	RFI process
	More Difficult	No Effect		<u>Easier</u>
3.	For my work, Web-based p	project management wi	II make relevant pr	oject information
	Less Available	No Effect		More Available
4.	Utilization of Web-based p	roject management wi	l result in	in accountability for
	project participants.			
	A Decrease	No Effect		An Increase
5.	Utilization of Web-based p	roject management we	bsite will result in	in the
	transparency of document	-		
	A Decrease	No Effect		An Increase
6.	Utilization of Web-based p	•		
	associated with document	=		nts.
	<u>A Decrease</u>	No Effect		An Increase
7.	Web-based project manage	• •		
	Harder	No Effect		<u>Easier</u>
8.	Learning to use this web-ba	ased project managem	ent system was	·
	Not Worth the Benefits	Neutral		Worth the Benefits
9.	The computer and internet	t requirements for this	system are	·
	Unreasonable	Neutral		<u>Reasonable</u>
10.	Based on my current know	•		
	potential to p	•		ridge projects.
	Worsen	No Effect		Improve

11. I would recommend usin	g web-based project management to assist	t project participants on
projects that are	than Iowa Falls Arch Bridge.	
Smaller	The Same Size	<u>Larger</u>
Please write in answers to the fo	llowing questions:	
What do you expect to be the pri	imary benefits from using web-based proje	ct management?
Simultaneous review and commu	unications of appropriate people.	
What are your biggest concerns v	with web-based project management and i	ts use on this project?
No concerns		
Was there anything you want the	e system to do that it could not do?	
<u>No</u>		
What parts of the system did you	I find or expect to be hard to learn and use	?

None from my use perspective

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the Iowa DOT. Your answers are important in helping the Iowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon

Partici	pant	Inform	nation:
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comple	tion please return this surve	ey to Jose Perez, <u>japere</u>	<u>z@iastate.edu</u> . Tha	ank you.
Particin	eant Information:			
-	What is your role on this pr	oiect (please circle):		
	va DOT Employee	Consultant	Contractor	Sub or Supplier
	Approximately how many t			• • •
	web-based project manage		a copect year time.	
	Less than 10	10 to 20		More than 20
<u>Project</u>	Website Experience:			
Based o	on your knowledge of web-b	ased project managem	ent and prior expe	erience with Iowa DOT
ا bridge	projects, please respond to t	the following statemen	ts by circling the m	nost appropriate response
1.	For my work, I expect web-	based project manage	ment will make the	submittal process
	More Difficult	No Effect		Easier
2.	For my work, I expect web-	based project manage	ment to make the	RFI process
	More Difficult	No Effect		Easier
3.	For my work, Web-based p	roject management wi	II make relevant pr	oject information
	Less Available	No Effect		More Available
4.	Utilization of Web-based pr	oject management wil	l result in	in accountability for
	project participants.			
	A Decrease	No Effect		An Increase
5.	Utilization of Web-based pr	roject management we	bsite will result in	in the
	transparency of document	-		
	A Decrease	No Effect		An Increase
6.	Utilization of Web-based pr	•		
	associated with document	_		
	A Decrease	No Effect		An Increase
7.	Web-based project manage	• •		
	Harder	No Effect		Easier
8.	Learning to use this web-ba	ised project managem	ent system was	•
	Not Worth the Benefits	<u>Neutral</u>		Worth the Benefits
9.	The computer and internet	·	system are	·
	Unreasonable	Neutral		<u>Reasonable</u>
10.	Based on my current knowl	•		
	potential to pr	-		
	Worsen	No Effect		Improve

11. I would recommend us	sing web-based project management to assist	t project participants on
projects that are	than Iowa Falls Arch Bridge.	
Smaller	The Same Size	<u>Larger</u>
Please write in answers to the	following questions:	
What do you expect to be the	primary benefits from using web-based proje	ect management?
What are your biggest concerr	ns with web-based project management and i	its use on this project?
Was there anything you want	the system to do that it could not do?	
What parts of the system did y	you find or expect to be hard to learn and use	?

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the Iowa DOT. Your answers are important in helping the Iowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon

<u>Partici</u>	pant	Inforr	<u>nation:</u>
	_		

comple	tion please return this surve	ey to Jose Perez, <u>japerez@iastate.edu</u> . T	hank you.
Particip	eant Information:		
-	What is your role on this p	roject (please circle):	
	va DOT Employee	Consultant Contractor	Sub or Supplier
		times per month do you expect you will	• •
	web-based project manage		
	Less than 10	10 to 20	More than 20
-	Website Experience:		
	•	pased project management and prior exp	
		the following statements by circling the	
1.	For my work, I expect web	-based project management will make tl	he submittal process
	More Difficult	No Effect	<u>Easier</u>
2.	For my work, I expect web	-based project management to make the	e RFI process
	More Difficult	No Effect	<u>Easier</u>
3.	For my work, Web-based p	roject management will make relevant _l	project information
	Less Available	No Effect	More Available
4.	Utilization of Web-based p	roject management will result in	in accountability for
	project participants.		
	A Decrease	No Effect	An Increase
5.	Utilization of Web-based p	roject management website will result in	nin the
	transparency of document	management.	
	A Decrease	No Effect	An Increase
6.	Utilization of Web-based p	roject management will result in	in the overall cost
	associated with document	management and transmittal of docume	ents.
	A Decrease	No Effect	An Increase
7.	Web-based project manage	ement will make my job	
	Harder	No Effect	Easier
8.	Learning to use this web-b	ased project management system was _	·
	Not Worth the Benefits	Neutral	Worth the Benefits
9.	The computer and internet	t requirements for this system are	
	Unreasonable	Neutral	<u>Reasonable</u>
10.	Based on my current know	rledge and experience web-based projec	
	potential top	roject management on other Iowa DOT	bridge projects.
	Worsen	No Effect	Improve

11.	I would recommend ι	using web-based	project management to	assist project part	icipants on
	projects that are	than lowa	Falls Arch Bridge.		
	<u>Smaller</u>		The Same Size		Larger

Please write in answers to the following questions:

What do you expect to be the primary benefits from using web-based project management? <u>Faster and more traceable submittal process.</u>

What are your biggest concerns with web-based project management and its use on this project? No concerns

Was there anything you want the system to do that it could not do?

It lacks some features commonly found in other tools such as ProjectWise. An example is copying other users on submittals without requiring action.

What parts of the system did you find or expect to be hard to learn and use? None

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the Iowa DOT. Your answers are important in helping the Iowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon

Participant	Information:
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comple	tion please return this surve	ey to Jose Perez, <u>japerez@iastate.edu</u> . Tha	ınk you.
Particip	pant Information:		
-	What is your role on this pr	roject (please circle):	
	va DOT Employee	Consultant Contractor	Sub or Supplier
		imes per month do you expect you will ne	• •
	web-based project manage		
	Less than 10	10 to 20	More than 20
-	Website Experience:		
		pased project management and prior expe	
	• •	the following statements by circling the m	, , , , , , , , , , , , , , , , , , , ,
1.		-based project management will make the	
	More Difficult	No Effect	<u>Easier</u>
2.		-based project management to make the F	•
	More Difficult	No Effect	<u>Easier</u>
3.		roject management will make relevant pro	
	Less Available	No Effect	More Available
4.		roject management will result in	in accountability for
	project participants.		
	A Decrease	No Effect	An Increase
5.		roject management website will result in _	in the
	transparency of document		
	A Decrease	No Effect	An Increase
6.		roject management will result in	
		management and transmittal of documen	
_	A Decrease	No Effect	An Increase
7.	, ,	ement will make my job	
_	Harder	No Effect	<u>Easier</u>
8.		ased project management system was	
_	Not Worth the Benefits	<u>Neutral</u>	Worth the Benefits
9.		requirements for this system are	
	Unreasonable	Neutral	Reasonable
10.	•	ledge and experience web-based project r	
		roject management on other lowa DOT br	
	Worsen	No Effect	Improve

11.	I would recommend using	web-based project management to assist project part	cicipants on
	projects that are	than Iowa Falls Arch Bridge.	
	Smaller	The Same Size	Larger

Please write in answers to the following questions:

What do you expect to be the primary benefits from using web-based project management? Everything in one place

What are your biggest concerns with web-based project management and its use on this project? <u>Difficult and cumbersome to work with in some instances.</u>

Was there anything you want the system to do that it could not do? Be easier to work with.

What parts of the system did you find or expect to be hard to learn and use? Multiple items.

Worsen

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the lowa DOT. Your answers are important in helping the lowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon completion please return this survey to Jose Perez, japerez@iastate.edu. Thank you.

comple	etion please return this surv	ey to Jose Perez, <u>japer</u>	<u>ez@iastate.edu</u> . Th	ank you.
<u>Partici</u>	pant Information:			
1.	What is your role on this p	roject (please circle):		
lov	wa DOT Employee	Consultant	Contractor	Sub or Supplier
2.	Approximately how many	times per month do yo	ou expect you will n	eed to interface with the
	web-based project manag	ement site?		
	Less than 10	10 to 20		More than 20
<u>Project</u>	: Website Experience:			
Based	on your knowledge of web-	based project managei	ment and prior expe	erience with Iowa DOT
bridge	projects, please respond to	the following stateme	nts by circling the n	nost appropriate response
1.	For my work, I expect web	-based project manage	ement will make the	e submittal process
	More Difficult	No Effec	t	<u>Easier</u>
2.	For my work, I expect web	-based project manage	ement to make the	RFI process
	More Difficult	No Effec	t	<u>Easier</u>
3.	For my work, Web-based	oroject management w	vill make relevant p	roject information
	Less Available	No Effec	t	More Available
4.	Utilization of Web-based p	project management w	ill result in	in accountability for
	project participants.			
	A Decrease	No Effec	t	An Increase
5.	Utilization of Web-based p	project management w	ebsite will result in	in the
	transparency of document	management.		
	A Decrease	No Effec		An Increase
6.	Utilization of Web-based p	project management w	ill result in	in the overall cost
	associated with document	management and trar	nsmittal of docume	nts.
	A Decrease	No Effec	<u>t</u>	An Increase
7.	Web-based project manag	ement will make my jo	ob	
	Harder	No Effec	t	<u>Easier</u>
8.	Learning to use this web-b	ased project managen	nent system was	·
	Not Worth the Benefits	Neutral		Worth the Benefits
9.	The computer and interne	t requirements for this	system are	·
	Unreasonable	Neutral		<u>Reasonable</u>
10	. Based on my current know	ledge and experience	web-based project	management has the

No Effect

potential to ______ project management on other lowa DOT bridge projects.

11. I would recommend using	g web-based project management to assis	t project participants on
projects that are	_ than Iowa Falls Arch Bridge.	
<u>Smaller</u>	The Same Size	Larger

Please write in answers to the following questions:

What do you expect to be the primary benefits from using web-based project management? Less time spent getting submittals to the correct people.

What are your biggest concerns with web-based project management and its use on this project? No concerns at this time.

Was there anything you want the system to do that it could not do?

<u>No</u>

What parts of the system did you find or expect to be hard to learn and use? The system seems very easy to understand.

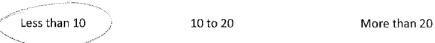
Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the Iowa DOT. Your answers are important in helping the Iowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon completion please return this survey to Jose Perez, <u>japerez@iastate.edu</u>. Thank you.

Participant Information:

1. What is your role on this project (please circle):

Iowa DOT Employee Consultant Contractor Sub or Supplier

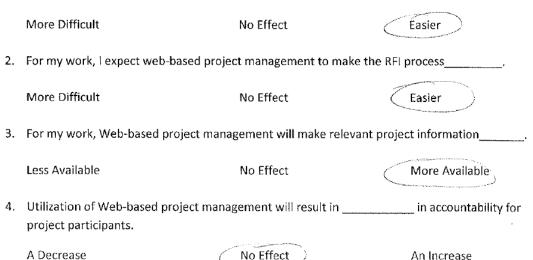
2. Approximately how many times per month do you expect you will need to interface with the web-based project management site?



Project Website Experience:

Based on your knowledge of web-based project management and prior experience with lowa DOT bridge projects, please respond to the following statements by circling the most appropriate response

For my work, I expect web-based project management will make the submittal process



	ilization of Web-based project m		t inin the
tra	ansparency of document manage	ement.	
А	Decrease	No Effect	An Increase
	ilization of Web-based project n sociated with document manage		
А	Decrease	No Effect	An Increase
7. W	eb-based project management v	will make my job	
Ha	arder	No Effect	Easier
8. Le	arning to use this web-based pr	oject management system wa	s
No	ot Worth the Benefits	Neutral	Worth the Benefits
9. Th	ne computer and internet requir	ements for this system are	
Uı	nreasonable	Neutral	Reasonable
	ased on my current knowledge a	All Marketines	
po	otential to project n	nanagement on other lowa Do	of bridge projects.
W	orsen /	No Effect	Improve
	would recommend using web-ba		ssist project participants on
pr	rojects that are than lo	owa Falls Arch Bridge.	
Sr	maller	The Same Size	Larger
ease wr	ite in answers to the following q	uestions:	
hat do y	you expect to be the primary be	nefits from using web-based p	project management?

What are your biggest concerns with web-based project management and its use on this project?	
Was there anything you want the system to do that it could not do?	
• · · · · · · · · · · · · · · · · · · ·	
What parts of the system did you find or expect to be hard to learn and use?	

Attolist Pre Project Survey Iowa Falls Arch Bridge Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the lowa DOT. Your answers are important in helping the lowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon completion please return this survey to Jose Perez, japerez@iastate.edu. Thank you. Participant Information: 1. What is your role on this project (please circle): Towa DOT Employee Consultant Contractor Sub or Supplier 2. Approximately how many times per month do you expect you will need to interface with the web-based project management site? Less than 10 10 to 20 More than 20 Project Website Experience: Based on your knowledge of web-based project management and prior experience with Iowa DOT bridge projects, please respond to the following statements by circling the most appropriate response 1. For my work, I expect web-based project management will make the submittal process_____ No Effect

2. For my work, I expect web-based project management to make the RFI process__

No Effect

No Effect

4. Utilization of Web-based project management will result in ______ in accountability for

No Effect

3. For my work, Web-based project management will make relevant project information____

Easier

Easier

More Available

An Increase

More Difficult

More Difficult

Less Available

A Decrease

project participants.

5.	Utilization of Web-based project mar transparency of document managem	_	in the
	A Decrease	No Effect	An Increase
6.	Utilization of Web-based project mar associated with document managem	_	
	A Decrease	No Effect	An Increase
7.	Web-based project management will	make my job	
	Harder	No Effect	Easier
8.	Learning to use this web-based proje	ct management system was	
	Not Worth the Benefits	Neutra	Worth the Benefits
9.	The computer and internet requirem	ents for this system are	<u></u> .
	Unreasonable	Neutral	Reasonable
10.	Based on my current knowledge and potential to project man		_
	Worsen	No Effect	Improve
11.	I would recommend using web-based projects that are than lower		roject participants on
	Smaller	The Same Size	Larger
What d	write in answers to the following questle you expect to be the primary benefit ost correspondence and submitted accessed by all involved.	ts from using web-based project	

What are your biggest concerns with web-based project management and its use on this project?
Was there anything you want the system to do that it could not do?
What parts of the system did you find or expect to be hard to learn and use?

project management and its use by the lowa DOT. Your answers are important in helping the lowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon completion please return this survey to Jose Perez, japerez@iastate.edu . Thank you.				
Particip	ant Information:			
1.	What is your role on this	project (please circle):		
lov	va DOT Employee	Consultant	Contractor	SUBCONTEACTOR Sub or Supplier
2.	Approximately how man web-based project mana	ny times per month do you ex agement site?	pect you will need to int	erface with the
	Less than 10	(10 to 20)	More th	an 20
Project	Website Experience:			
	A STATE OF STREET STREET, STRE	b-based project management to the following statements b	zerzen ereta ere≝ ha krei-eratzen bez ind e n beren at zuzen itzen ereta zuen.	
1.	For my work, I expect w	eb-based project managemer	nt will make the submitta	al process
	More Difficult	No Effect	Easie	
2.	For my work, I expect w	eb-based project managemen	nt to make the RFI proces	
	More Difficult	No Effect	Easie	r
3.	For my work, Web-base	d project management will m	ake relevant project info	rmation
	Less Available	No Effect	More	e Available
4.	Utilization of Web-based project participants.	d project management will re	sult in in a	ccountability for
	A Decrease	No Effect) An Ir	crease
	A Comment of the Comm			

5.	Utilization of Web-based project transparency of document management		It inin the
	transparency of document mana	gement.	
	A Decrease	No Effect	(An Increase)
6.	Utilization of Web-based project	management will result in	in the overall cost
	associated with document manage	gement and transmittal of docu	uments.
	A Decrease	No Effect	An Increase
7.	Web-based project management	will make my job	
	. West of the		-
	Harder	No Effect	Easier
8.	Learning to use this web-based p	roject management system wa	·
	Not Worth the Benefits	Neutral	Worth the Benefits
9.	The computer and internet requi	rements for this system are	·
	Unreasonable	Neutral	Reasonable
10	. Based on my current knowledge	and experience web-based pro	ject management has the
	potential to project	management on other lowa DO	OT bridge projects.
	Worsen	No Effect	Improve
11	. I would recommend using web-b	ased project management to a	ssist project participants on
	projects that are than		ssist project participants on
			1
	Smaller	The Same Size	Larger
Please	write in answers to the following	questions:	
What	do you expect to be the primary be	enefits from using web-based p	roject management?
IFU	1500 CONSISTANTLY	I WOULD EXPERT	YOU WILL
GET A MORE ROAL TIME AWARENESS OF WHAT IS			
GOI	NG ON IN THE PER	KESS AND AS A	SUBCORTEAUTOR
Y00	WILL KNOW WHAT	10 GOING ON FO	R THE FULL
500	DRE OF THE WORK \$	NOT JUST WHAT	15 ROLDIANT
10	YOUR LOOKE.		

What are your biggest concerns with web-based project management and its use on this project?

THAT IF WE ARE NOT CHECKING THE SITE CORSTANTLY

WE WON'T BE NOTIFIED PROMPTLY THAT A SUBMITTAL OR

RFI HAS BEEN ADDRESSED OR SOME OTHER CORRESPONDENCES

HAS BEEN ISSUED THAT WE NEED TO KNOW ABOUT

THAT MAY AFFECT OUR WORK.

Was there anything you want the system to do that it could not do?

NONE THAT I CAN THINK OF RIGHT NOW.

What parts of the system did you find or expect to be hard to learn and use?

I DON'T REALLY KNOW RIGHT NOW AS SYSTEM IS NEW TO ME ALSO.

Please answer the following questions based on your current experience and knowledge of web-based

1. What is your role on this project (please circle): Iowa DOT Employee	project management and its us measure the benefits of using a completion please return this s	web-based project manage	ment on bridge cor	nstruction projects. Upon
2. Approximately how many times per month do you expect you will need to interface with the web-based project management site? Less than 10 10 to 20 More than 20 Project Website Experience: Based on your knowledge of web-based project management and prior experience with lowa DOT bridge projects, please respond to the following statements by circling the most appropriate response 1. For my work, I expect web-based project management will make the submittal process More Difficult No Effect Easier 3. For my work, Web-based project management will make relevant project information Less Available No Effect More Available 4. Utilization of Web-based project management will result in in accountability for	Participant Information:			
2. Approximately how many times per month do you expect you will need to interface with the web-based project management site? Less than 10 10 to 20 More than 20 Project Website Experience: Based on your knowledge of web-based project management and prior experience with lowa DOT bridge projects, please respond to the following statements by circling the most appropriate response 1. For my work, I expect web-based project management will make the submittal process More Difficult No Effect Easier 3. For my work, I expect web-based project management to make the RFI process More Difficult No Effect Easier 4. Utilization of Web-based project management will result in in accountability for	1. What is your role on th	nis project (please circle):		
Web-based project management site? Less than 10 10 to 20 More than 20 Project Website Experience: Based on your knowledge of web-based project management and prior experience with lowa DOT bridge projects, please respond to the following statements by circling the most appropriate response 1. For my work, I expect web-based project management will make the submittal process More Difficult No Effect Easier 3. For my work, I expect web-based project management to make the RFI process More Difficult No Effect Easier 4. Utilization of Web-based project management will result in in accountability for	Iowa DOT Employee	Consultant	Contractor	Sub or Supplier
Project Website Experience: Based on your knowledge of web-based project management and prior experience with lowa DOT bridge projects, please respond to the following statements by circling the most appropriate response 1. For my work, I expect web-based project management will make the submittal process More Difficult No Effect Easier 2. For my work, I expect web-based project management to make the RFI process More Difficult No Effect Easier 3. For my work, Web-based project management will make relevant project information Less Available No Effect More Available 4. Utilization of Web-based project management will result in in accountability for			u expect you will n	eed to interface with the
Based on your knowledge of web-based project management and prior experience with lowa DOT bridge projects, please respond to the following statements by circling the most appropriate response 1. For my work, I expect web-based project management will make the submittal process More Difficult No Effect Easier 2. For my work, I expect web-based project management to make the RFI process More Difficult No Effect Easier 3. For my work, Web-based project management will make relevant project information Less Available No Effect More Available 4. Utilization of Web-based project management will result in in accountability for	Less than 10	10 to 20		More than 20
1. For my work, I expect web-based project management will make the submittal process More Difficult No Effect Easier 2. For my work, I expect web-based project management to make the RFI process More Difficult No Effect Easier 3. For my work, Web-based project management will make relevant project information Less Available No Effect More Available 4. Utilization of Web-based project management will result in in accountability for	Project Website Experience:			
More Difficult No Effect Easier Tor my work, I expect web-based project management to make the RFI process More Difficult No Effect Easier Tor my work, Web-based project management will make relevant project information Less Available No Effect More Available Utilization of Web-based project management will result in in accountability for	oridge projects, please respon	d to the following statemen	nts by circling the n	nost appropriate response
More Difficult No Effect Easier 3. For my work, Web-based project management will make relevant project information Less Available No Effect More Available 4. Utilization of Web-based project management will result in in accountability for				
3. For my work, Web-based project management will make relevant project information Less Available No Effect More Available 4. Utilization of Web-based project management will result in in accountability for	2. For my work, I expect	web-based project manage	ment to make the	RFI process
Less Available No Effect More Available 4. Utilization of Web-based project management will result in in accountability for	More Difficult	No Effec	t .	Easier
Utilization of Web-based project management will result in in accountability for	3. For my work, Web-ba	sed project management w	ill make relevant p	roject information
	Less Available	No Effec	t	More Available
	 Utilization of Web-base project participants. 	sed project management w	ill result in	in accountability for
A Decrease No Effect An Increase	A Decrease	No Effec	t .	An Increase

A Decrease		No Effect	An Increase
		anagement will result in ment and transmittal of do	
A Decrease		No Effect	An Increase
7. Web-based	project management w	ill make my job	,
Harder		No Effect	Easier
8. Learning to	use this web-based proj	ject management system w	vas
Not Worth	the Benefits	Neutral	Worth the Benefits
9. The comput	er and internet require	ments for this system are _	
Unreasonal	ble	Neutral	Reasonable
10. Based on m	y current knowledge an		roject management has the
10. Based on m	y current knowledge an	d experience web-based p	roject management has the
10. Based on m potential to Worsen11. I would recommend	y current knowledge an	d experience web-based properties of the control of	roject management has the DOT bridge projects.
10. Based on m potential to Worsen11. I would recommend	y current knowledge an project ma	d experience web-based properties of the control of	roject management has the DOT bridge projects.
10. Based on m potential to Worsen11. I would recoprojects the	y current knowledge an project ma	d experience web-based properties on other loward No Effect ed project management to wa Falls Arch Bridge.	roject management has the DOT bridge projects. Improve assist project participants on
10. Based on monotonial to worsen11. I would recomprojects the Smaller	y current knowledge an project ma	d experience web-based pranagement on other loward No Effect ed project management towa Falls Arch Bridge. The Same Size	roject management has the DOT bridge projects. Improve assist project participants on
10. Based on m potential to Worsen 11. I would rece projects the Smaller	y current knowledge an project man project man project man project man project man low than low than low to be the following quest to be the primary benefit are	d experience web-based pranagement on other loward No Effect ed project management toward Falls Arch Bridge. The Same Size estions:	roject management has the DOT bridge projects. Improve assist project participants on Larger
10. Based on m potential to Worsen 11. I would rece projects the Smaller	y current knowledge an project man project man project man project man project man low than low than low than low the following quarters to the foll	d experience web-based pranagement on other loward No Effect ed project management toward Falls Arch Bridge. The Same Size estions:	roject management has the DOT bridge projects. Improve assist project participants on Larger

What are your biggest co	incerns with web-based project	t management and its use on the	nis project?
documen	1.		
Was there anything you Keep Ynac (history)	want the system to do that it cless of document	ould not do? Ys that Ih	eve viewed
What parts of the syster	n did you find or expect to be h	nard to learn and use?	
Locating	porticular d	ocuments.	*

Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the lowa DOT. Your answers are important in helping the lowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon

completion please return this survey to Jose Perez, japerez@iastate.edu. Thank you. Participant Information: What is your role on this project (please circle): Iowa DOT Employee Consultant Contractor Sub or Supplier 2. Approximately how many times per month do you expect you will need to interface with the web-based project management site? Less than 10 10 to 20 More than 20 Project Website Experience: Based on your knowledge of web-based project management and prior experience with lowa DOT bridge projects, please respond to the following statements by circling the most appropriate response 1. For my work, I expect web-based project management will make the submittal process_ More Difficult No Effect Easier 2. For my work, I expect web-based project management to make the RFI process____ More Difficult No Effect Easier 3. For my work, Web-based project management will make relevant project information_ Less Available No Effect More Available 4. Utilization of Web-based project management will result in __ ___ in accountability for project participants. No Effect A Decrease An Increase

A Decrease	No Effect	An Increase
· · · · · · · · · · · · · · · · · · ·	roject management will result in management and transmittal of	
A Decrease	No Effect	An Increase
Web-based project manage	ment will make my job	·
Harder	No Effect	Easter
Learning to use this web-ba	sed project management syster	m was
Not Worth the Benefits	Neutral	Worth the Benefits
The computer and internet	requirements for this system ar	re
Unreasonable	Neutral	Reasonable
<u>-</u>	edge and experience web-based oject management on other low	
Worsen	No Effect	Improve
_	veb-based project management than lowa Falls Arch Bridge.	to assist project participants on
Smaller	The Same Size	Larger
write in answers to the follow	ving questions:	
do you expect to be the prima	ary benefits from using web-bas	ed project management?
ASY ACCESS TO	ALL CONTRACT D	OCUMENTS

What are your biggest concerns with web-based project management and its use on this project?

PERTAIN TO MY JOB DUTIES AREA OF INTEREST

Was there anything you want the system to do that it could not do?

INFORMATION CAN BE HARD TO TRACK. MARK-UPS, COMMENTS
AND ATTACHMENTS INSIDE OF RESPONSES CAN MAKE IT HARD
TO FIND DATA.

What parts of the system did you find or expect to be hard to learn and use?

NOVE

Please answer the following questions based on your current experience and knowledge of web-based

measu	re the benefits of using web etion please return this surve	-based project managen	nent on bridge constru	ction projects. Upon
<u>Partici</u>	pant Information:			
1.	What is your role on this p	roject (please circle):		
(lo	wa DOT Employee	Consultant	Contractor	Sub or Supplier
2.	Approximately how many to web-based project manage		expect you will need to	o interface with the
	Less than 10	10 to 20	Mo	re than 20
Based	: Website Experience: on your knowledge of web-b projects, please respond to For my work, I expect web-	the following statement	s by circling the most a	ppropriate response
	More Difficult	No Effect	Œ	asier
2.	For my work, I expect web-	-based project managen	nent to make the RFI pr	ocess
	More Difficult	No Effect	E	asier
3.	For my work, Web-based p	roject management will	make relevant project	information
	Less Available	No Effect	$\langle N \rangle$	Aore Available
4.	Utilization of Web-based project participants.	roject management will	result in	in accountability for
	A Decrease	No Effect) A	n Increase

5.	Utilization of Web-based project transparency of document mana		sult inin the
	A Decrease	No Effect	An Increase
6.	Utilization of Web-based project associated with document mana	-	
(A Decrease	No Effect	An Increase
7	Web-based project managemen	t will make my job	
	Harder	No Effect	Easier
8.	Learning to use this web-based p	project management system v	vas
	Not Worth the Benefits	Neutral	Worth the Benefits
9.	The computer and internet requ	irements for this system are _	
	Unreasonable	Neutral	Reasonable
10	Based on my current knowledge potential to project	·	-
	Worsen	No Effect	Improve
11	I would recommend using web-k		assist project participants on
	Smaller	The Same Size	Larger
	write in answers to the following do you expect to be the primary be		project management?
			cipants see review tially the same time.
	Reviews move thro		4.

What are your biggest concerns with web-based project management and its use on this project?

Not enough experience with this yet to respond

Was there anything you want the system to do that it could not do?

Be Simpler (?). Typically there are Several Categories is offen not intuitively obvious. This can make navigating the System frustrating.
What parts of the system did you find or expect to be hard to learn and use?

Navigating the categories / subcategories of documents can be like a maze,

/	0/1	/10
		/

lowa	wa Falls Arch Bridge						
proje meas	lease answer the following questions based on your current experience and knowledge of web-based roject management and its use by the lowa DOT. Your answers are important in helping the lowa DOT leasure the benefits of using web-based project management on bridge construction projects. Upon ompletion please return this survey to Jose Perez, japerez@iastate.edu . Thank you.						
<u>Parti</u>	rticipant Information:						
1	1. What is your role on this project (please circle):						
ı	owa DOT Employee	Consultant	Contractor	Sub or Supplier			
2	Approximately how many times per month do you expect you will need to interface with the web-based project management site?						
	Less than 10	10 to 20		More than 20			
bridge	sed on your knowledge of web-based project management and prior experience with lowa DOT dge projects, please respond to the following statements by circling the most appropriate response 1. For my work, I expect web-based project management will make the submittal process						
	More Difficult	No Effect	(Easier			
2.	For my work, I expect web-based project management to make the RFI process						
	More Difficult	No Effect		Easier			
3.	For my work, Web-based project management will make relevant project information						
	Less Available	No Effect		More Available			
4.	Utilization of Web-based project management will result in in accountability for project participants.						
	A Decrease	No Effect		An Increase			

A Decrease	No Effect	An Increase		
. Utilization of Web-based associated with docume	d project management will result in nt management and transmittal of doc	in the overall cost		
A Decrease	No Effect	An Increase		
Web-based project management will make my job				
Harder	No Effect	Easier		
Learning to use this web-based project management system was				
Not Worth the Benefits	Neutral	Worth the Benefits		
The computer and internet requirements for this system are				
Unreasonable	Neutral	Reasonable		
D. Based on my current kno- potential to	wledge and experience web-based pro project management on other lowa DO	ject management has the OT bridge projects.		
Worsen	No Effect	Improve		
. I would recommend using projects that are	g web-based project management to as than lowa Falls Arch Bridge.	ssist project participants on		
Smaller	The Same Size	Larger		
write in answers to the follo	owing questions:			
write in answers to the follo	owing questions: nary benefits from using web-based pr	oject management?		

What are your biggest concerns with web-based project management and its use on this project?

Participants will expect immediate response to issues that still require time to carefully evaluate.

Was there anything you want the system to do that it could not do?

What parts of the system did you find or expect to be hard to learn and use?

Attolist Pre Project Survey Iowa Falls Arch Bridge Please answer the following questions based on your current experience and knowledge of web-based project management and its use by the lowa DOT. Your answers are important in helping the lowa DOT measure the benefits of using web-based project management on bridge construction projects. Upon completion please return this survey to Jose Perez, japerez@iastate.edu. Thank you. Participant Information: 1. What is your role on this project (please circle): Iowa DOT Employee Consultant Contractor Sub or Supplier 2. Approximately how many times per month do you expect you will need to interface with the web-based project management site? Less than 10 10 to 20 More than 20 Project Website Experience: Based on your knowledge of web-based project management and prior experience with Iowa DOT bridge projects, please respond to the following statements by circling the most appropriate response 1. For my work, I expect web-based project management will make the submittal process_ More Difficult No Effect Easier 2. For my work, I expect web-based project management to make the RFI process More Difficult No Effect Easier 3. For my work, Web-based project management will make relevant project information_ Less Available No Effect More Available 4. Utilization of Web-based project management will result in _____ in accountability for project participants. A Decrease No Effect An Increase

5.	Utilization of Web-based project management website will result inin the transparency of document management.				
	A Decrease	No Effect	An Increase		
6.	-	ilization of Web-based project management will result inin the overall cost sociated with document management and transmittal of documents.			
	A Decrease	No Effect	An Increase		
7.	Web-based project management will make my job				
	Harder	No Effect	Easier		
8.	8. Learning to use this web-based project management system was				
	Not Worth the Benefits	Neutral	Worth the Benefits		
9.	The computer and internet re	equirements for this system are	·		
	Unreasonable	Neutral	Reasonable		
10.	 Based on my current knowledge and experience web-based project management has the potential to project management on other lowa DOT bridge projects. 				
	Worsen	No Effect	Improve		
11. I would recommend using web-based project management to assist project participants on projects that are than lowa Falls Arch Bridge.					
(Smaller	The Same Size	Larger		
<u>Please</u> v	write in answers to the follow	ing questions:			
What do you expect to be the primary benefits from using web-based project management? ACENTRAL LOCATIONS RELATED TO ALL CONSTRUCTIONS POLUMENTS (TELIS POLUMENTALIONS OF RESPONSES SUBMITTED BY ALL PARTIES. OEGANIZATIONS OF POCUMENTS.					

What are your biggest concerns with web-based project management and its use on this project?
Was there anything you want the system to do that it could not do?
What parts of the system did you find or expect to be hard to learn and use?