

**National Construction Forum: Best Practice Workstream
Feasibility Report**

The Development of an Open Repository for Industry Best Practices

**National Academy of Construction
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Letter to National Academy of Construction

Dear National Academy of Construction Board Members,

On behalf of the National Construction Forum (NCF) Best Practice Workstream, we would like to submit this report on our findings from a feasibility study conducted with the support of the Construction Industry Institute and Arizona State University.

Warm Regards,

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Executive Summary

In the architecture-engineering-construction (AEC)¹ industry the term “best practice” generally refers to a method or task that is implemented for an increased chance of success when managing construction/capital projects. At the 2011 National Construction Forum, the Best Practice workstream identified that the inconsistent implementation and use of best practices in the AEC industry impacts project performance. Reasons for the inconsistent implementation and use are 1) not all best practices are applicable to every project, project type, or organization, and 2) they are not universally applied within individual organizations. In August 2012, the workstream, with funding from the Construction Industry Institute (CII) and Arizona State University, sought to assess the feasibility of an online open repository (clearinghouse) for industry practices. With an open repository, the hope is to help improve industry implementation and use of best practices.

The main objectives of the feasibility study included developing a framework and set of rules to start the repository, assessing industry terminology around best practices and developing a collection of starting practices. With the guidance of a steering committee, interviews, focus group and Delphi study methods were used to accomplish the study objectives. In total, over 50 participants from various industry organizations participated in the study.

Key findings from the feasibility study include consensus that there is industry interest for the open repository for best practices. Another finding is that the repository should be tied to an industry organization, the National Academy of Construction. The open repository should focus on practices related to the management of capital projects. Finally the target users for the open repository include project engineers, senior project managers and owners.

Feasibility study participants repeatedly mentioned the importance of funding for the repository. It is estimated that \$15 to \$135 thousand is needed for business costs for the repository. Development costs (i.e., software programming) for the repository are estimated at a range from \$255 to \$475 thousand.

Study participants did indicate industry interest potential; however, they also identified potential challenges to the start-up and continued success of the open repository. Challenges include lack of industry buy-in, possible restrictions on disseminating proprietary information, content management and the identification of subject matter experts.

The feasibility study concluded with a path forward. The first step is the identification of individuals to form a steering board. This board would be responsible for start-up of the open repository. After the board is formed, subsequent steps in the path forward include the procurement of start-up funds, engagement of industry associations, recruitment of industry subject matter experts and the decision of development due date for the open repository.

¹ The AEC industry encompasses not only building projects but also industrial, infrastructure and manufacturing projects as well. It also refers to all project participants (owners, designers, engineers and contractors).

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1: INTRODUCTION

At the 2011 National Construction Forum, the Best Practice workstream identified an impact on project performance due to the inconsistent implementation and use of best practices in the AEC industry. Reasons for the inconsistent implementation and use are that 1) not all best practices are applicable to every project, project type, or organization, and 2) they are not universally applied within individual organizations.

To address the inconsistent implementation and use of best practices, the workstream explored the possibility of developing an online repository for best practices that is open for industry contribution and learning. The idea of developing, using, and sharing best practices (i.e., front end planning, schedule development, supply chain management, etc.) was thought to be an excellent response to fragmentation and lack of understanding and education in the industry. With an open repository, the hope is to help improve industry implementation and use of best practices. The open repository for best practices would provide a consistent resource for the industry, addressing the reasons behind inconsistent implementation and use of best practices as an outlet for those seeking instruction on implementation and use of best practices.

Open Repository Description

The term “open repository” refers to a free online resource for users (i.e., website) that houses practices for project success. The repository would include global input from industry subject matter experts on practices related to the management of capital projects and would serve as a reference for those looking to learn about industry best practices. A well-known open repository example is Wikipedia. Appendix C gives an overview of the wiki model and Wikimedia (Wikipedia’s parent company). A simple mock-up of a possible design for the open repository is given in Appendix D.

Benefits of the Open Repository

The task of developing an open repository for best practices will be demanding but the benefits are great. The industry benefits from open repository by having a resource that standardizes practices and facilitates rapid dissemination. Standardization of successful practices creates an opportunity to systematically incorporate these practices within industry organizations. If critical practices are standardized and readily accessible in the industry, organizations can capitalize on opportunities for performance improvement. Further, the open repository supports knowledge transfer despite the labor turnover, in turn allowing organizations to maintain or even improve their performance.

In August 2012, The National Academy of Construction (NAC), with funding from the Construction Industry Institute (CII) and Arizona State University, sought to assess the feasibility of an open online repository for best practices. This report details the feasibility objectives, methods, findings and recommendations for developing the repository.

Feasibility Study Objectives

To explore the feasibility of the open repository for best practices, we developed the following objectives. Starting in the fall of 2012, the specific action items are as follows:

1. Assess best practice terminology.
2. Assess potential interest in the open repository.
3. Develop a comprehensive collection of starting best practices.
4. Assess funding costs for the open repository.
5. Develop framework and rules to start open repository.

To achieve the feasibility study objectives, we assessed industry resources for best practices. We also sought the guidance of a steering committee (see Appendix A), and with this guidance, recruited participants for structured interviews, focus groups and a Delphi study. The remaining report details the feasibility study methods, findings, estimated costs for the repository and recommendations to start the open repository for best practices.

2: ASSESSMENT OF INDUSTRY RESOURCES FOR BEST PRACTICES

To address the first objective of the study (best practice terminology assessment), a review of industry resources for best practices (and similar terms) was needed. This definition of the terms used were also reviewed. With this information, feasibility study participants were asked to clarify the definition of a “best practice” and the purpose of the open repository.

Industry Resources for Best Practices

To understand the niche of the open repository, it is important to assess resources that are currently used in the industry. The table below lists some industry associations and their respected best practice (or equivalent) resources. This short list demonstrates the fragmentation of practices in the industry. These resources (excluding the Guidelines for a Successful Construction Project) must be purchased and in some cases, a membership or consulting fee is required.

Table 1: Available Industry Resources and Terminology

Organizations	Industry Resources	Terminology
The Associated General Contractors of America (AGC), Associated Specialty Contractors (ASC) and American Subcontractors Associations (ASA)	Guidelines for a Successful Construction Project (AGC et al., 2008)	“Guidelines”
The American Institute of Architects (AIA)	Best Practices (AIA, 2013)	“Best Practice”
Construction Industry Institute (CII)	Best Practices (CII, 2013)	“Best Practice”
Construction Management Association of American (CMAA)	Standards of Practice (CMAA, 2010)	“Standards”
Independent Project Analysis (IPA)	Value Improving Practices (IPA, 2013)	“Value Improving Practices”
Project Management Institute (PMI)	PMBOK and Library of PMI Global Standards (PMI, 2013)	“Global Standards”

Non-Industry Resources for Best Practices

In addition to industry resources, there are non-industry resources that are used when seeking information on best practices. According to feedback from study participants, other resources for best practices used are:

- Internal Knowledge
- Consultants
- Google
- Wikipedia
- Google Scholar
- Knowledgeable Industry Colleagues

Definition of a Best Practice

The task of defining what constitutes a “best practice” was a challenge due to the various terms used in the industry (i.e., “best practices”, “standards”, “value improvement practices”, etc.). In an attempt to create a common terminology of the various terms, we developed a new phrase to encompass “best practice” and similar terms. With input from the steering committee, the

phrase “Practices for Excellence”² (PFE) was created. According to feedback from feasibility study participants, the definition of the new phrase, PFE, does encompass and adequately describe “best practices” and similar terms. However, participants indicated the use of the phrase should be not forced upon the industry; it could lead to confusion. The identification of practices is more important than the given name.

According to feedback from participants of this feasibility study practices in the open repository should meet the following criteria:

- Increases the likelihood for project success.
- Resides in one or more project life cycle.
- Has demonstrable benefits for project improvement.
- Includes documented steps of implementation.
- Applies to one or more industry sector (e.g. commercial, industrial, manufacturing, etc.).

In assessing best practice industry resources, it can be seen that there is no standard terminology regarding best practices. When the new term “Practices for Excellence” was introduced, feasibility study participants indicated that the new term was not needed. Therefore the open repository should focus on organize industry best practices. The mission of the repository is to be a “one-stop” resource for industry members who seek information on best practices and the implementation steps to use them.

² Practices for Excellence (PFEs) are specific processes and actions, with proven benefits (from research or past performance), that when repeated and documented, result in an increased probability of management or operational improvement throughout the construction/capital project lifecycle.

3: FEASIBILITY STUDY TIMELINE, METHODS AND FINDINGS

Timeline

The feasibility study on the development of an online repository for industry best practices started August 2012. Initial months were spent exploring industry resources, “best practice” definitions, the Wiki information model and informally interviewing organizations on their best practice management processes. At the end of 2012, the formation of the steering committee and structured interviews began. Structured interviews continued until May 2013. During the second half of 2013, the main focus the creation and deployment of the Delphi study. At the end of 2013, focus group sessions were used to share findings and garner additional industry input. In the early months of 2014, the Delphi study continued and synthesis reporting of data collected from the study was finalized.

Feasibility Study Methods	2012					2013												2014		
	Q3		Q4			Q1			Q2			Q3			Q4			Q1		
	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Initial Research & Informal Interviews	■	■	■																	
Steering Committee Formation					■	■	■													
Structured Interviews				■	■	■	■	■	■	■										
Delphi Study: Round 1											■	■	■	■	■	■	■	■	■	■
Delphi Study: Round 2																		■	■	■
Focus Group Sessions																			■	■
Data Synthesis & Final Report																				■

Figure 1: Feasibility Study Methods and Timeline

Study Participants

Individuals from industry companies, associations and academic institutions participated in the feasibility study. Over 50 individuals participated in the feasibility study through various methods of interaction (steering committee, interviews, Delphi study and focus group sessions). The participants were from organizations representing various industry sectors (e.g. chemical, commercial building, pharmaceutical, manufacturing and oil industry). The information garnered in the feasibility study is relevant due to the participants’ high level of industry experience; the large and complex organizations represented by the participants; and the high number of process improvements related to the management of participants’ best practices. Participating organizations are listed in Appendix B.

Study Methods

1) Steering Committee

The steering committee for the feasibility study consisted of key industry executives and representatives from industry associations. The committee was convened to provide guidance on both the content and form of the repository, the structured interviews, the Delphi study, as well as a mockup attempt of the repository. The steering committee members (10 individuals) were critical in identifying potential participants for the structured interviews and the Delphi study.

2) Structured Interviews

Interviews with industry participants were important to the feasibility study because they were the first step to understanding internal best practice processes within organizations. During 60-minute interviews, we were able to assess interest in an open repository for best practices, explore best practice systems and the required resources needed for to successful management.

3) *Delphi Study*

The origin of the Delphi method dates back to research studies by the RAND Corporation in the 1950s (Dalkey et al. 1969; Rowe and Wright 1999). The method is used to structure communication that allows a group of individuals, as a whole, to deal with complex concepts (Linstone and Turoff 1975). For the feasibility study, there were Delphi study rounds. The objective of the Delphi study was to develop a strategy to create an open online repository, identify starting best practices, and identify potential barriers for success.

4) *Industry Focus Groups Sessions*

Two focus group sessions were used to communicate with industry professionals on the repository structure and garner additional input on the development process. The sessions were held at the National Academy of Construction (NAC) meeting, held October 2013, and the National Construction Forum (NCF) meeting, held December 2013.

Covered Topics and Important Findings

The topics covered when interacting with the feasibility study participants are listed below. The responses to the topics were important to understanding how to develop the open repository, the level of industry interest, and challenges to development.

- Repository Purpose
- Repository Business Management Model
- Repository Funding
- Definition and Granularity of Best Practices - Breadth and Depth of Practices
- Potential Barriers to Industry Use of Open Repository

Important Findings

Below are findings critical to the study objectives. The findings are grouped around the aforementioned topics.

Repository Purpose

1. Industry has interest for an open repository for best practices
2. Project engineers, senior project managers and owners are the target users of the open repository.

Repository Business Management Model

3. The repository should be tied to the National Academy of Construction.
4. A steering board is needed to oversee the startup and operations of the repository.
5. A review panel, made up of industry and academic experts, must be in place to review contributed content in the repository.
6. The use of the phrase “Practices for Excellence” would add little value to the industry. The term should not be forced upon the industry. The term “best practices” is sufficient for the open repository.

Repository Funding

7. Revenue stream options for the repository include advertising, promoted articles (“pay to play”) and industry association sponsorship.
8. A “working” model/example of a best practice for the open repository must be created to help attract funding.

Definition and Granularity of Best Practices - Breadth And Depth of Practices

9. Focus on large global complex construction projects (e.g., commercial, industrial, manufacturing, transportation) in the industry (residential construction is excluded).
10. Include practices related to the management of capital projects for all project life stages at start-up (i.e., front end planning, risk management, constructability, project team alignment and change management).
11. Upon start-up, pilot the practice “Safety”. It is easier to find subject matter experts to write articles on the topic.

Potential Barriers to Industry Use of Open Repository

12. The lack of industry commitment and involvement, lack of resources (time and money) and inconsistent use of the repository are challenges to success. Potential barriers to initial and continued success

The aforementioned findings serve as the building blocks to the framework that can be followed to start the development on the repository. An extremely important aspect from study findings is the cost of repository. Estimated business and development costs for the repository are highlighted in the following session.

4: OPEN REPOSITORY START-UP AND DEVELOPMENT COSTS

Identified early and reiterated by feasibility participants, a cost estimate for the repository is a critical aspect for successful start-up and development. The costs associated with the start-up and development of the repository are detailed in this section.

Start-Up Costs

The start-up costs for the open repository are small compared to the development of the online repository. The line items listed should be decided upon and completed before significant funds are committed for software development of the repository.

Scenario A: Repository with Heavily Involved Steering Board

In this scenario, members of the open repository steering board are heavily involved in the start-up phase. The board will be responsible for the legal formation of the repository business entity, securing naming and online rights. Most importantly, a detailed pilot project must be completed as well as a detailed website layout plan for end users.

Scenario B: Repository with Full-Time Repository Operations Manager

Scenario B includes the costs of hiring a full-time manager to lead (inside of the steering board) out the start-up phase of the open repository.

Table 2: Start-Up Costs for Open Repository

Costs Items	Scenario A	Scenario B
Open Repository Entity Formation		
Legal and Tax Entity Formation (i.e., formal naming, etc.)	\$ 2,000	\$ 2,000
Digital Online Property (i.e., domain name, social media, etc.)	1,000	1,000
Detailed Mock-Up (Pilot Practice)		
Web Design Mock-Up and Web Hosting	5,500	5,500
Software Development Consultation		
Website Planning and Wire framing	6,500	6,500
Full-Time Repository Manager		120,000
Total	\$ 15,000	\$ 135,000

Software Development Costs

In the cost table below, the estimated time to start and complete the repository development is 10 months. Before the development process begins, the start-up activities in Table 2 must be completed.

Scenario A: Outsourced Software Development

Outsourcing software development can lead a significant monetary savings; however, the steering board must have developing experience to successfully communicate with the outsourced team. Usually outsourced development takes place in an international country (typically India). Here, the cost of outsourcing is estimate at 55 percent of Scenario B.

Scenario B: Dedicated Project Manager, Software Programmer and User Experience Developer
Having a dedicated project manager, programmer and user experience developer is ideal for the repository development process. With a dedicated team working exclusively on the repository and in sync with the steering board, the development and testing of the repository can be more efficient. However, it must be noted that development teams are in high demand; therefore the cost to procure services are slightly great.

Table 3: Development Costs for Open Repository

Costs Items	Scenario A	Scenario B
Developer Project Manager	\$ -	\$ 235,000
User Experience Developer	-	130,000
Software Programming	-	110,000
Outsourced Development	255,000	-
Total	\$ 255,000	\$ 475,000

In total between the start-up and development of the repository costs ranges from \$15 thousand, if the repository is not developed, to \$610 thousand, if a repository manager is hired and if the development costs are not outsourced.

5: FRAMEWORK TO START THE OPEN REPOSITORY

Benefits of the open repository to the industry its openness and the organizations of successful practices and its central “one-stop” location. Any organization and individual in the industry will have access to the information, and be able to contribute to the repository. The purpose of the repository is to help improve the implementation of best practices in the industry. The repository must be designed and developed with this ultimate purpose in mind. A framework to start the creation process is provided in this section.

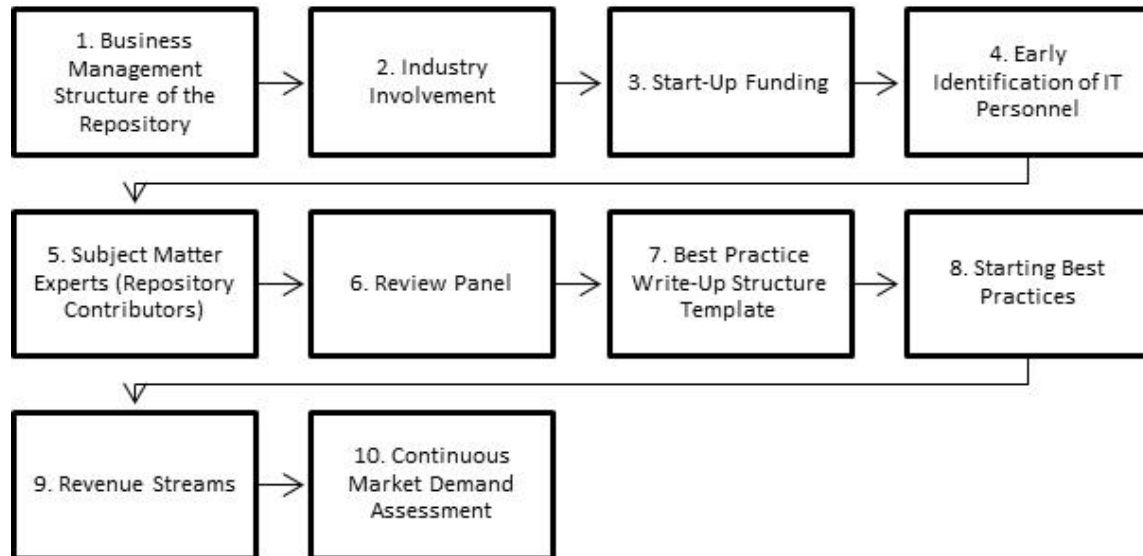


Figure 2: Ten Steps in Open Repository Start-Up Framework

Framework to Repository Creation

Based upon the findings from the feasibility study, the following 10 steps make up the framework to move towards the conception and creation process for the repository.

1. Business Management Structure of the Repository

The creation and management of the open repository should be connected to the National Academy of Construction. A steering board/committee is needed to carry out the start-up stage of the repository. Specifically, the board/committee must focus on industry buy-in, start-up funding, intellectual property rights (repository branding, etc.) and IT developer recruitment.

2. Industry Involvement

Involvement from industry associations, academic institutions, government entities and others is critical to the initial and continue success of the repository. The process of involving the industry should begin shortly around the assembly of the repository board/committee. Communication (presentations, letters, etc.) is key to industry “buy-in” and the identification of subject matter experts.

3. Start-Up Funding

Funding needed to develop and launch the open repository is estimated at (see cost report). The funding for start-up will need to be procured before the development of the repository can begin. Funds must be procured for a populated detailed mockup of the repository.

4. Early Identification of IT Personnel

The development of the repository heavily depends on the skills of IT individuals. The software programmer and user experience developer teams are critical to a functional and usable repository. The early identification of these individuals will improve the development process. Also, the relationship between the steering board and IT individual must be open to encourage continuous communication.

5. Subject Matter Experts (Repository Contributors)

Critical to the success of the open repository is the identification and contribution of subject matter experts. To date, some participants from the feasibility study have expressed interest in contributing to the open repository. Project engineers, senior construction/project managers and owners should be targeted initially as contributors. These individuals can be recruited by sharing the opportunity with industry associations. The leaders of these associations can help spread the message on behalf of the National Academy of Construction.

6. Review Panel

To ensure the integrity of the contributor information, a review panel is necessary. The panel should be in place during the development of the online repository, prior to its final launch. The panel can include subject matter experts industry (contractors, owners, consultants, etc.) and academic members.

7. Best Practice Write-Up Structure Template

An input template for practices submitted should be created to guide the input process. Based on input from participants, the elements for submittals should include the following:

- Definition and description of best practice.
- Reason(s) why the process is a best practice.
- Case studies or examples of the practice in use.
- Explanation of the practice applied in different project situations (i.e., fixed price compared to reimbursable contract).
- Benefits and value added explanation related to the practice.
- List of references (including online website links).

8. Starting Best Practices

Practices at the start of the repository should initially include only those practices specific to the management of capital projects. The repository should initially include the listed practices. These practices can be universally applied to various sectors in the industry. Also, if the initial practices are widely applicable, identifying and recruiting subject matter experts (contributors) is less challenging.

- Safety
- Front End Planning
- Constructability
- Risk Management
- Project Team Alignment/Team Building
- Change Management

9. Revenue Streams

For continued operations, potential revenue streams for the repository include:

- Advertising on website
- Promoted articles (“pay to play”)
- Industry association sponsorship

10. Continuous Market Demand Assessment

Continual market assessment is important to an endeavor such as the open repository. Demand and interest for the open repository must be continually monitored for duplication of efforts. In this feasibility study, we reviewed various resources from best practices but none were open and robust. However there should be caution. It is important to monitor the demand for the open repository to avoid the "build it and they will come" fallacy. At times there is a tendency for the creators of a resource to believe that a built project will be used. The board must be aware of this pitfall.

Specific Challenges to Developing the Open Repository

The participants from this study identified several potential challenges against the development of the open repository. Those challenges are as follows:

- Identification of best practices
- Finding industry experts.
- Making resource applicable to various project types.
- Restrictions on disseminating proprietary information.
- Content management and up keep.
- Continuous funding.
- “Not invented here” syndrome.
- Objective and un-biased information.

The 10 steps, based on the feedback of the study participants, given are ways to start the development process for the repository. Steps that the National Academy of Construction can take in the near future are detailed in the next (and final) section of this report.

6: PATH FORWARD

As this study comes to a close, it is important to remember the initial driving force of this study, the inconsistent implementation and use of industry best practices. Late 2012 with the support of the Construction Industry Institute (CII) and Arizona State University, the feasibility of an open online repository of best practices was explored.

In this feasibility study, through interviews, a Delphi study panel, focus groups and the guidance of a steering committee, a framework for the development of an open repository is provided (section 4). The framework serves as a starting point for the National Academy of Construction to begin the development stage.

To continue the momentum garnered in the feasibility stage, we have five recommendations for the immediate future. Our recommendations for moving forward to the National Academy of Construction are:

1. **Identify Repository Development Board** – NAC must identify individuals interesting in serving on the board to oversee the development of the repository.
2. **Procure Funding for Start-Up Costs** – start-up funding is estimated at \$15 thousand (Scenario A) and \$135 thousand (Scenario B). These funds must be procured for a detailed mock up for the repository.
3. **Decide the Development End Date** – the end date for public release should be determined. With this date, development activities can be scheduled accordingly.
4. **Engage Industry Associations** – engagement of industry associations and other associations is critical to “buy in” for the repository. The purpose behind the repository, industry benefits of the repository and target audience are topics to communicate to the associations
5. **Begin Recruitment of Subject Matter Experts** – the identification of individuals who are experts in the suggested starting practices are critical to the development process; they should be sought out early.

Identification of the development board is the first step in the process. This group of individuals will be responsible for spearheading the remaining recommended steps. In closing, a quote from a Delphi study panelist summarizes the intent of the repository; “it should not drive new content but organize existing content”. The finding and final recommendations here in this report sets the ground work for this intent.

Acknowledgement

Special thanks are given to the sponsors of this study, National Academy of Construction, Construction Industry Institute and Arizona State University. As well, participants of the steering committee, interviews and Delphi study are acknowledged for their time and expertise.

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APPENDIX A: BEST PRACTICE WORKSTREAM STEERING COMMITTEE

1. Jan Tuchman ENR
2. John Dalton Wood Group Mustang
3. Wayne Crew The Construction Industry Institute
4. Jim Vicknair Eichleay Engineers Inc
5. Stuart Anderson Texas A&M University
6. Michael Loulakis Capital Project Strategies, LLC
7. Ray Topping Fiatech
8. J.D. Slaughter S & B Engineers and Constructors, Ltd.
9. Don Cooley CH2M HILL
10. G. Edward Gibson Arizona State University

APPENDIX B: PARTICIPATING ORGANIZATIONS

- Air Products
- Architect of the Capitol
- Arizona State University
- Burns and McDonald
- Capital Project Strategies LLC
- CH2M HILL
- Eastman Chemical
- Eichleay Engineers Inc.
- Eli Lilly and Company
- ENR
- Fiotech
- Ford, Bacon, & Davis LLC
- Granite Construction
- S & B Engineers and Constructors, Ltd.
- Saudi Aramco
- Sundt Construction
- Texas A&M University
- The Construction Industry Institute
- University of Colorado at Boulder
- University of Texas at Austin
- Valency Inc.
- Virginia Tech University
- Wood Group Mustang
- WorleyParsons

APPENDIX C: WIKI MODEL AND WIKIMEDIA OVERVIEW

Wiki Model

The term wiki comes from the Hawaiian term wiki, which means fast (Wagner 2004). Today's use of the word, wiki, is almost synonymous with the free encyclopedia, Wikipedia. Be it Wikipedia or another website, a wiki is a set of linked webpages, incrementally developed and used through a collaborative effort by a group of users (Leuf and Cunningham 2001). Over time with the suitable amount of knowledge creation and user interaction the wiki can be successful.

Typically to start a wiki, a wiki management software tool is needed. Depending on the scope and intent of the project, this can be open source or proprietary. With open source software, there is an initial low cost (financial) to implementation. A popular wiki management software tool is MediaWiki. The software is released under the General Public License (GPL). Under GPL works derived from open licenses software must be openly distributed as well (Tsai 2008). Hosting of a wiki site is also important. Some sites are hosted locally on the organization's servers (intranets for example) and other times the hosting is outsourced.

Open Source Model –Wikipedia/Wikimedia Foundation

A well-known use of the wiki format is the online resource Wikipedia. Wikipedia is a "project to build free encyclopedias in all language of the world" (Wikipedia 2012). As of May 2011, there were over ten million articles in 273 languages. Since its inception, in 2001 by Jimmy Wales and Larry Sander, there have been over 650,000 users that have made 10 or more edits (Wikipedia 2012). Wikipedia is just one of 10 wiki based learning tools provided by Wikimedia and it uses the wiki management software, MediaWiki. In the financial year 2011-2012, the Wikimedia Foundation (WMF) had revenues of \$34.8 million; expenses of \$27.2 million and reserves of \$27.7 million. At the end of the 2012-13 fiscal year, WMF had almost 120 staff members (WMF 2012).

APPENDIX D: REPOSITORY DESIGN MOCK-UP

Using the free wiki online resource, Wikispaces.com, we were able to create a simple mock-up. The mock-up has four webpages that includes an overview of the phrase “Practices for Excellence”, target audience, and a brief write-up on an industry practice. The wiki website was created to quickly illustrate a best practice example (risk management).

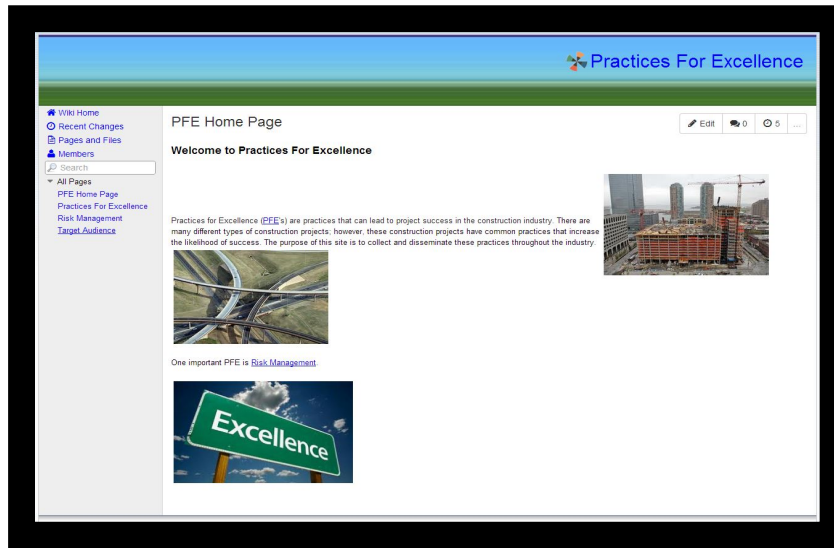


Figure 3: Home Page <<http://practicesforexcellence.wikispaces.com/PFE+Home+Page>>

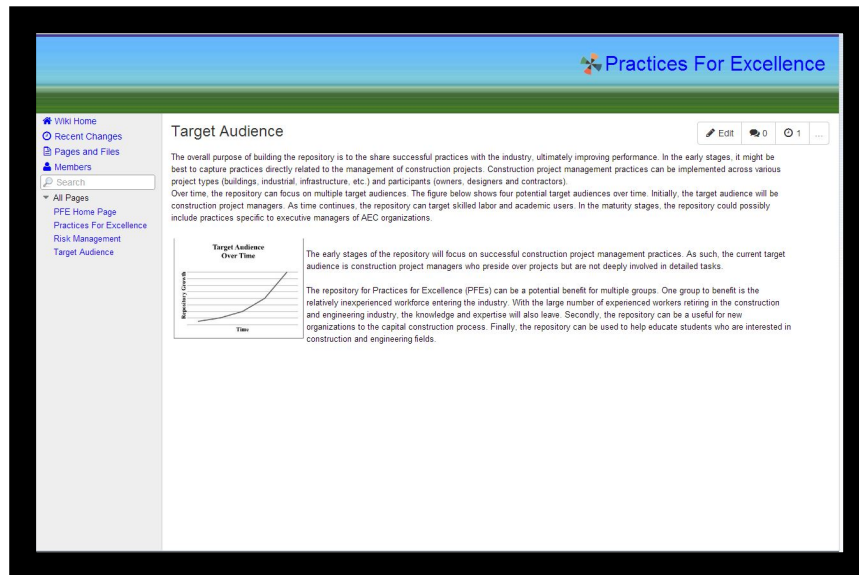


Figure 4: Target Audience
<<http://practicesforexcellence.wikispaces.com/Target+Audience>>

APPENDIX E: CONTACTS FOR GAINING ADDITIONAL INFORMATION

Questions and additional information requests can be obtained by contacting any of the following individuals:

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