Implementation of Construction Industry Best Practices into Workflow Management Systems

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Outline

- Introduction & Motivation
- Process vs. Practice
- Process vs. Workflow
- Conceptual Framework
- Practical Framework
- Summary
Introduction

- Best practices are guidelines
- They enable the reuse of experience

<table>
<thead>
<tr>
<th>Organization</th>
<th>Guidelines referred as</th>
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<tbody>
<tr>
<td>Construction Industry Institute (CII)</td>
<td>Best Practices</td>
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<tr>
<td>Construction Owners Association of Alberta (COAA)</td>
<td>Best Practices</td>
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<tr>
<td>Independent Project Analysis (IPA)</td>
<td>Value Improving Practices (VIPs)</td>
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<tr>
<td>Project Management Institute (PMI)</td>
<td>Foundational and Practice Standards</td>
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<td>Construction Management Association of America (CMAA)</td>
<td>Standards of Practice</td>
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<td>The Association for the Advancement of Cost Engineering (AACE) International</td>
<td>Professional Practice Guides (PPGs)</td>
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<tr>
<td>Process Industry Practices</td>
<td>Practices</td>
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Introduction

- Typical adoption approaches
  - Socializations and face-to-face interactions
  - Meetings / Workshops
  - Training / Mentoring

- Challenges
  - Offered at an abstract level
  - Adoption approaches are not scalable
  - Adoption is not consistent from project to project
Introduction

- Electronic Product and Process Management (EPPM) Systems

http://www.cda-it-systems.com/referenzen.html
Motivation

- Systematic adoption of best practices is one of the most important contributing factors to mega projects’ success (Chanmeka, Thomas, Caldas, & Mulva, 2012)

- Most construction best practices are process oriented (CII)

- The popularity of EPPM systems in mega capital projects is growing – The infrastructure
Process vs. Practice

- Process is a series of well-defined steps.
- Practice is a series of steps, but loosely defined.

Diagram:
- Explicit
- Tacit
- Data
- Information
- Knowledge
- Wisdom

Process

Practice
Conceptual Framework

Practice Components
- Explicit
- Tacit
- Implicit

Association
- What is done...
- Who accomplish...
- How is defined...

Process Elements
- Structure
- Human-tasks
- Behavior
Practical Framework

Best Practice

Organizational Level Process

Operational Level Process

Implementation Level Process

Construction Industry Best Practices

Organizational Level Processes

Not directly implementable in WfMS

Informal and Semiformal Techniques

Business Analysts

Business Process Models

Software Developers

Programming Languages
Organizational Level Process

Promote a Balanced Change Culture

- Encourage beneficial change
- Discourage detrimental change

Recognize Change

- Communication
- Documentation
- Trending

Evaluate Change

- Classify Change
- Conduct Impact Analysis
- Determine Funding Source

Implement Change

- Authorization
- Documentation
- Tracking

Continuously Improve

- Share lessons learned
- Be prepared to improve

Mostly Tacit Knowledge

RFI & Other Processes

Change Request (CR) Process

EPPM System Processes

Lessons Learned Process
Organizational Level Process

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<tbody>
<tr>
<td>3.1</td>
<td><strong>Determine the time frame for change decision.</strong></td>
</tr>
<tr>
<td>3.2</td>
<td><strong>Collect data needed.</strong></td>
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<tr>
<td>3.3</td>
<td><strong>Identify impacts.</strong></td>
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<tr>
<td>3.4</td>
<td><strong>Determine final funding source or “who pays”</strong> (cost reimbursable, design development, lump sum, and others). If applicable, confirm the interim funding source decision.</td>
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<tr>
<td>3.5</td>
<td><strong>Re-evaluate project feasibility with proposed change included.</strong></td>
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<tr>
<td>3.6</td>
<td><strong>Authorize change and send out notice to all affected organizations/disciplines.</strong></td>
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## Process vs. Workflow

<table>
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<tr>
<th>Process</th>
<th>Workflow</th>
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<tbody>
<tr>
<td>A process is a series of well-defined inter-related steps</td>
<td>A workflow is considered as an outline of a process</td>
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<tr>
<td>The focus is on steps of work</td>
<td>The focus is on the flow of work</td>
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<tr>
<td>A process can be modeled with different abstraction levels:</td>
<td>The focus is on organizational details, but can include operational and implementation-level details</td>
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<tr>
<td>organizational, operational, and implementation levels</td>
<td>A analyst can modify the steps, and update the flow of a workflow without changing the underlying code</td>
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<tr>
<td>A software developer typically implements a process by coding the steps</td>
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Operational Level Workflow

Initiator
1. Initiate RFI
2. Select Coordinator

Coordinator
3. Verify Details
4. Sufficient Detail?

Responder
5. Clarify
6. Select Participants
7. Verify and Update Participants
8. Check the Request
9. Clarification Required?
10. Respond
11. Respond Warning

Consolidator
12. Verify for Clarification
13. Verify for Clarification Warning
14. Clarification Required?
15. Consolidate & Endorse
16. Consolidate & Endorse Warning
17. Approve?
18. Response Close Out
19. Response Notification to Stakeholders
Implementation Level Workflow
• Best practices typically include several components.
• Related components can be defined as high-level organizational processes.

Organizational Process
• High level processes include explicit, tacit, and implicit knowledge.
• Explicit knowledge can more easily be transformed into structured processes.

Practice

Structured Process
• The roles and responsibilities play an important role.
• Structured processes can be implemented into workflow management systems.
Thank You!