

Harvesting Process Knowledge to Reduce the Risk of Changing Workforce

Background / Situation

Preparing for a large retirement wave, a major Electric Utility company saw that several critical processes were going to experience a complete transition. Their mining division's low-turnover and long tenure had allowed complete dependence on on-the-job training and minimal process documentation. Senior managers within mining operations and human resources prepared a strategy to:

1. Identify and prioritize the processes of greatest operational and regulatory risk
2. Capture location-specific process knowledge, skills required, and identify Quick-win improvements
3. Create standard work procedures for the updated process with **task-specific** multi-media guidance
4. Schedule and manage **skills training**, using the new interactive procedures
5. Collect process data for **compliance**, process **scorecarding**, and **decision support**
6. Identify Best Demonstrated Practices, for **transfer** to other mining locations.
7. Sustain & Evolve processes with **continuous improvements** of the tacit knowledge and measurements

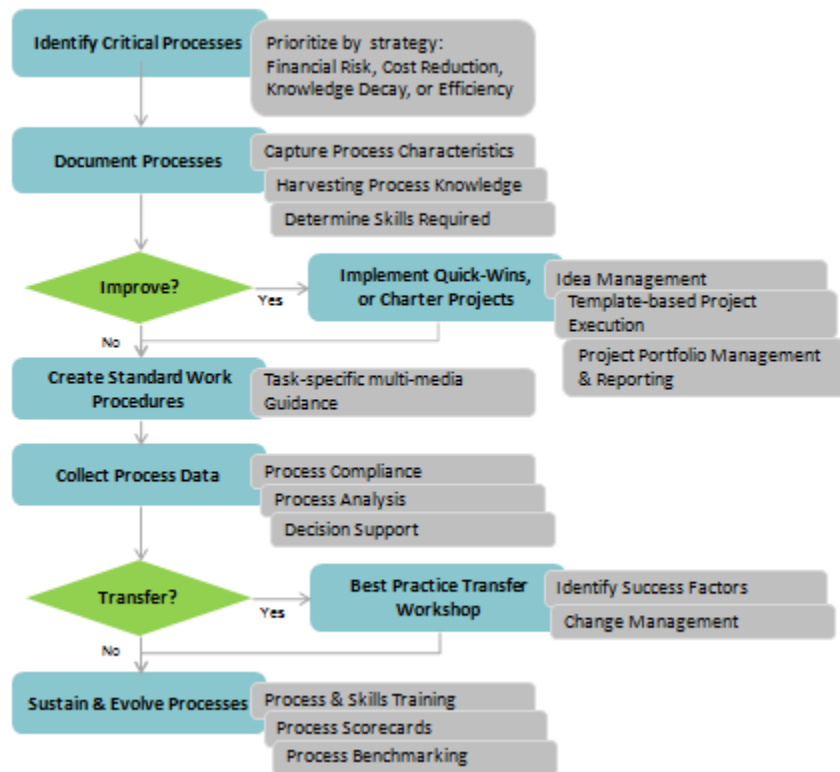


Figure 1: Strategy for Harvesting Process Knowledge and enabling Decision Support

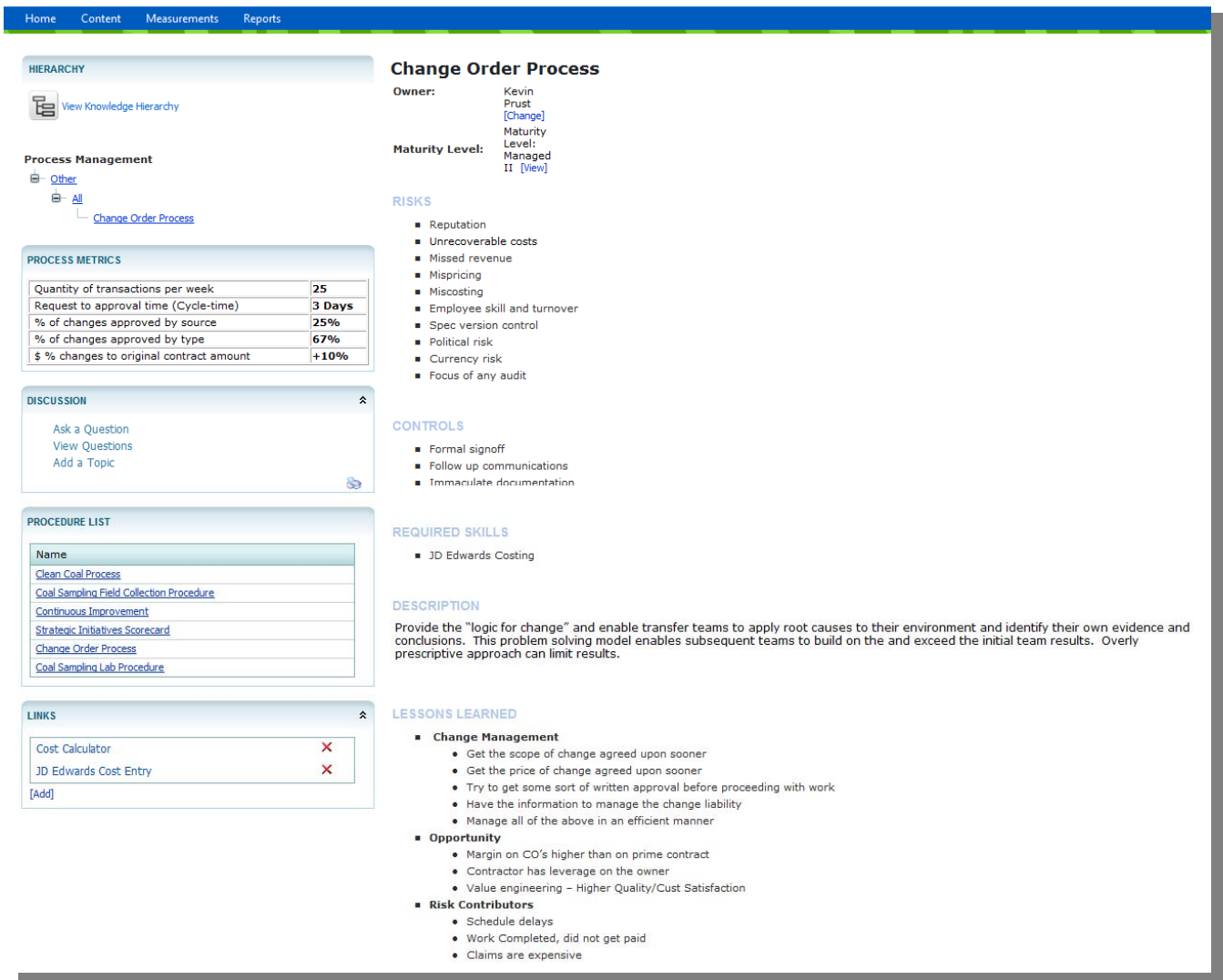
The team recognized that success depended on the employees valuing and utilizing the new process capabilities and that standards could only be accomplished via a **collaborative process-centric solution**. They evaluated process mapping, process management, document management, and Wiki type collaboration applications; however these all required central management for sustainability. The critical needs were: to enable

employees to add their own process knowledge, provide guidance to help employees execute processes, and collect measurements for continuous improvement and decision support.

Solution / Approach

To identify and prioritize the processes at greatest risk from a changing workforce, the Human Resources department created a matrix with process skills on one axis, and ‘people and their retirement dates’ on the other axis. This matrix enabled them to create a **heat map** of the processes and skills that were going to be most impacted by the retirements. It is also common for companies to prioritize processes that represent the greatest Financial Risk, Cost Reduction, or Efficiency Improvement opportunity.

To engender buy-in, and share process knowledge from each location, the process workers followed a standard process for documenting their own process characteristics and procedures. Each location entered: process owner, process maturity level, process risks, process controls, process metrics, and needed skills (see Figure 2).



Home Content Measurements Reports

HIERARCHY
View Knowledge Hierarchy

Process Management
Other
All
Change Order Process

PROCESS METRICS

Quantity of transactions per week	25
Request to approval time (Cycle-time)	3 Days
% of changes approved by source	25%
% of changes approved by type	67%
\$ % changes to original contract amount	+10%

DISCUSSION
Ask a Question
View Questions
Add a Topic

PROCEDURE LIST

Name
Clean Coal Process
Coal Sampling Field Collection Procedure
Continuous Improvement
Strategic Initiatives Scorecard
Change Order Process
Coal Sampling Lab Procedure

LINKS
Cost Calculator ✖
JD Edwards Cost Entry ✖
[Add]

Change Order Process

Owner: Kevin Prust [Change]
Maturity Level: Managed II [View]

RISKS

- Reputation
- Unrecoverable costs
- Missed revenue
- Mispricing
- Miscosting
- Employee skill and turnover
- Spec version control
- Political risk
- Currency risk
- Focus of any audit

CONTROLS

- Formal signoff
- Follow up communications
- Immaculate documentation

REQUIRED SKILLS

- JD Edwards Costing

DESCRIPTION
Provide the "logic for change" and enable transfer teams to apply root causes to their environment and identify their own evidence and conclusions. This problem solving model enables subsequent teams to build on the and exceed the initial team results. Overly prescriptive approach can limit results.

LESSONS LEARNED

- Change Management**
 - Get the scope of change agreed upon sooner
 - Get the price of change agreed upon sooner
 - Try to get some sort of written approval before proceeding with work
 - Have the information to manage the change liability
 - Manage all of the above in an efficient manner
- Opportunity**
 - Margin on CO's higher than on prime contract
 - Contractor has leverage on the owner
 - Value engineering – Higher Quality/Cust Satisfaction
- Risk Contributors**
 - Schedule delays
 - Work Completed, did not get paid
 - Claims are expensive

Figure 2: Sample Process Knowledge Management web-page

Process owners were encouraged to facilitate a workshop to create a current-state process diagram (process map and/or a SIPOC). The act of documenting a process gave visibility to non-value added efforts, rework loops, safety improvement opportunities, and redundant controls. A *Quick-Wins* punch list was created for immediate improvements to the process efficiency and effectiveness.

During the session the group captured the workforce’s Tacit and Tribal knowledge, by documenting lessons-learned and uploading pertinent process documents. If the opportunities uncovered didn’t have an obvious and quick solution, the ideas were added to the hopper for the continuous improvement project team to evaluate ‘Benefit vs. Effort’, prioritize, and convert into projects (see Figure 3). Selected ideas were matched with a project execution template for Kaizen Workshop, Workout, DMAIC, DFSS, or appropriate continuous improvement methodology.

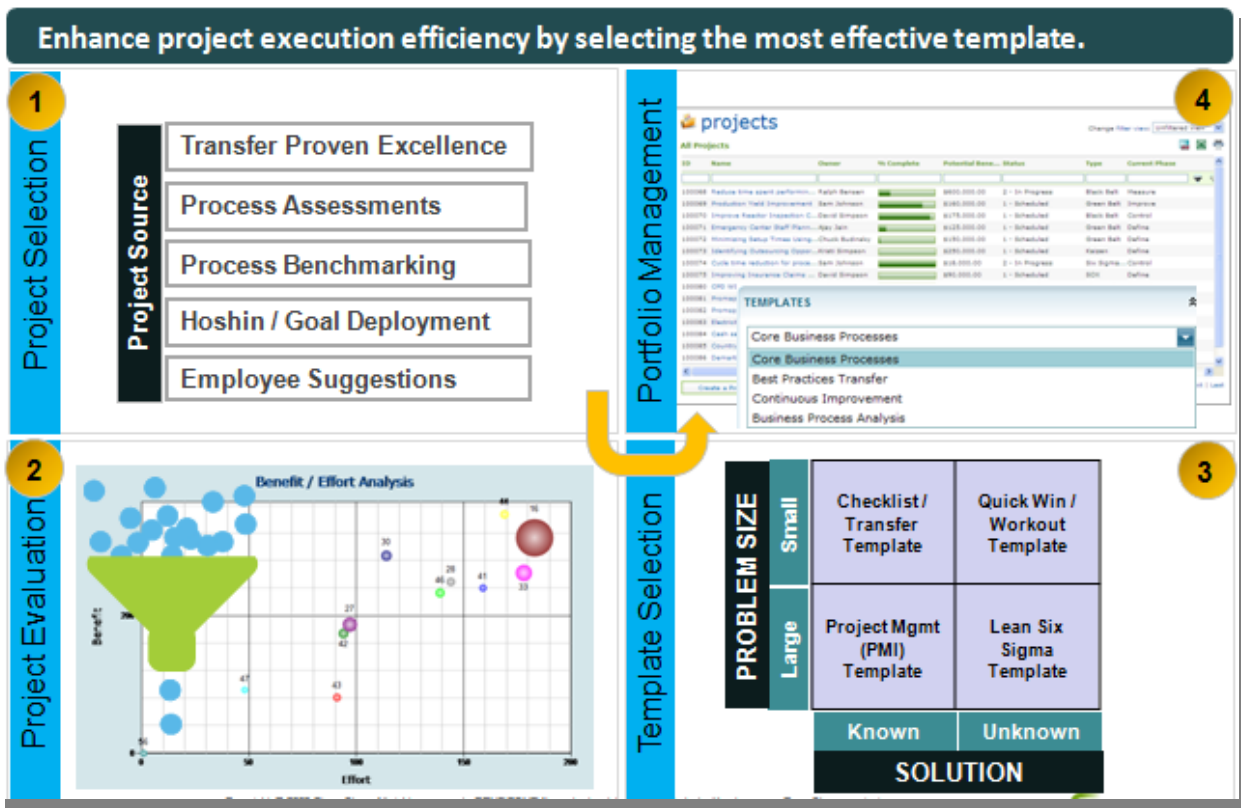


Figure 3: Project Selection and Execution

Once the *Quick-Wins* process improvements were incorporated, for each procedure task, the process owner videotaped and uploaded a short movie snippet, (an extremely pragmatic method to capture and transfer an **expert’s** tacit process knowledge (see Figure 4).

The process knowledge and procedure pages greatly diminished the need for on-the-job training. New and existing employees desiring a refresher were able to access the needed process knowledge via process hierarchy navigation, or key-word search. Employees immediately recognized the value, because it enabled them to quickly review the process procedure movies, see questions asked by others, add their own questions, and, if necessary, quickly contact the process owner.

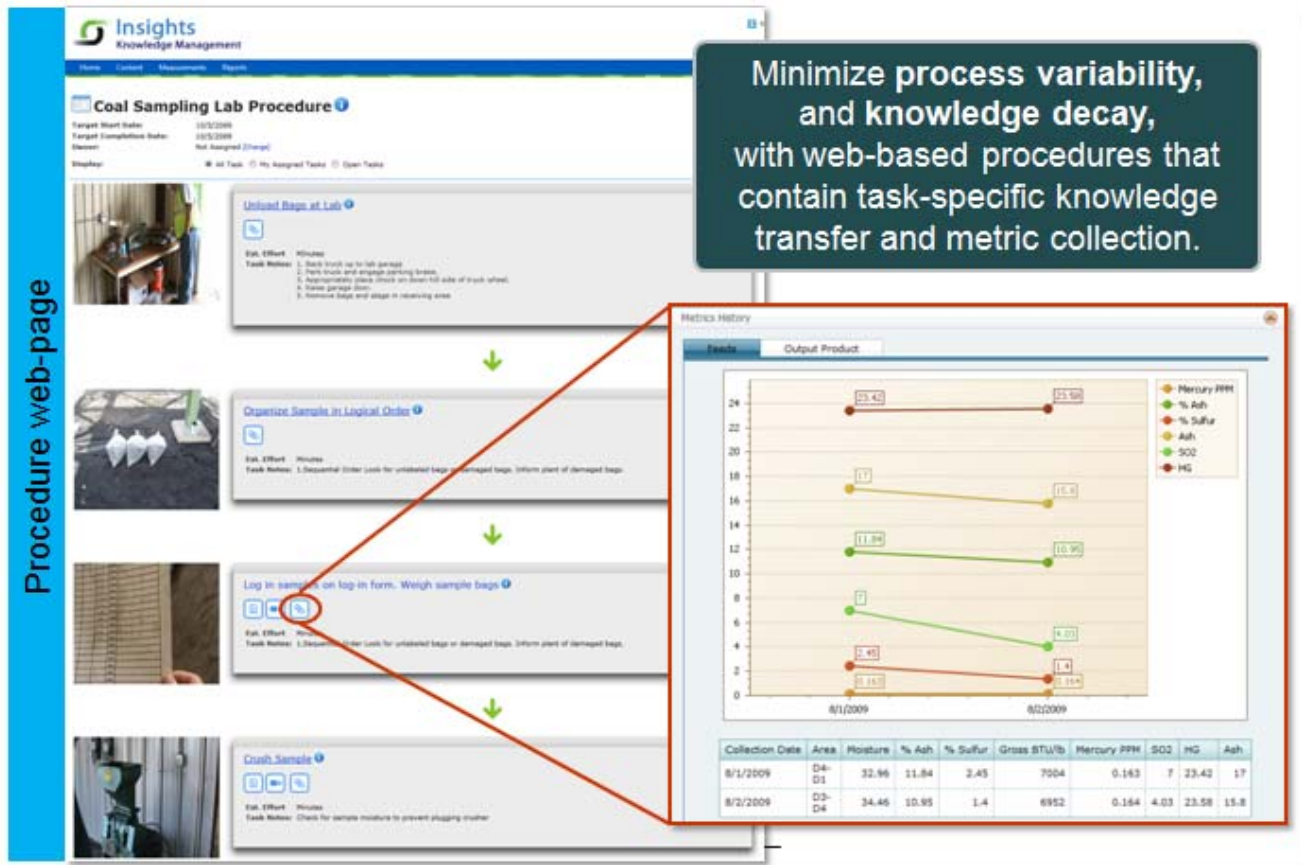


Figure 4: Sample Procedure web-page

Recognizing the operational and regulatory risk associated with a transition to new employees, management wanted to ensure the procedures were being followed by incorporating compliance steps within the procedure. A symbiotic relationship was created: The procedures simplified tedious tasks and *reduced process variability* by providing employees with **task-specific guidance**. Embedding data collection within the procedures validated the procedures were being followed and increased management confidence in the accuracy of the collected Key Performance Indicators (KPIs) and their measurements (KPMs).

Previously, the clean coal processing KPIs and KPMs were not being captured and correlated to the post-processing coal lab results. The Engineering group was now able to leverage the new closed-loop system for improving the clean coal manufacturing process. A clean coal process dashboard was created with time-based control charts (illustrating trends and shifts) for the output variables of BTU, and percentages for sulfur, ash, and mercury. For each control chart measurement, the engineer can drill-down to view the corresponding KPI and KPM equipment settings (crusher, filtering screens, air tables, and air jig settings).

“The procedures provided guidance to enhance the metric collection consistency. The collection of the metrics became a compliance validation that provided valuable information for process scoring, continuous improvement and decision support.”

Process scorecarding highlighted performance variation between the locations. A workshop was held at the best performing location to identify and prioritize the success factors of the best demonstrated practice. The highest ranking success factors were then transferred to the other mining locations.

Instead of limiting results with an overly prescriptive approach, **Transfers** provide the “logic for change” and enable transfer teams to apply root causes of success to their environment and identify their **own** evidence and conclusions. This enables subsequent teams to build on, and exceed, the initial team results. (see Figure 5)

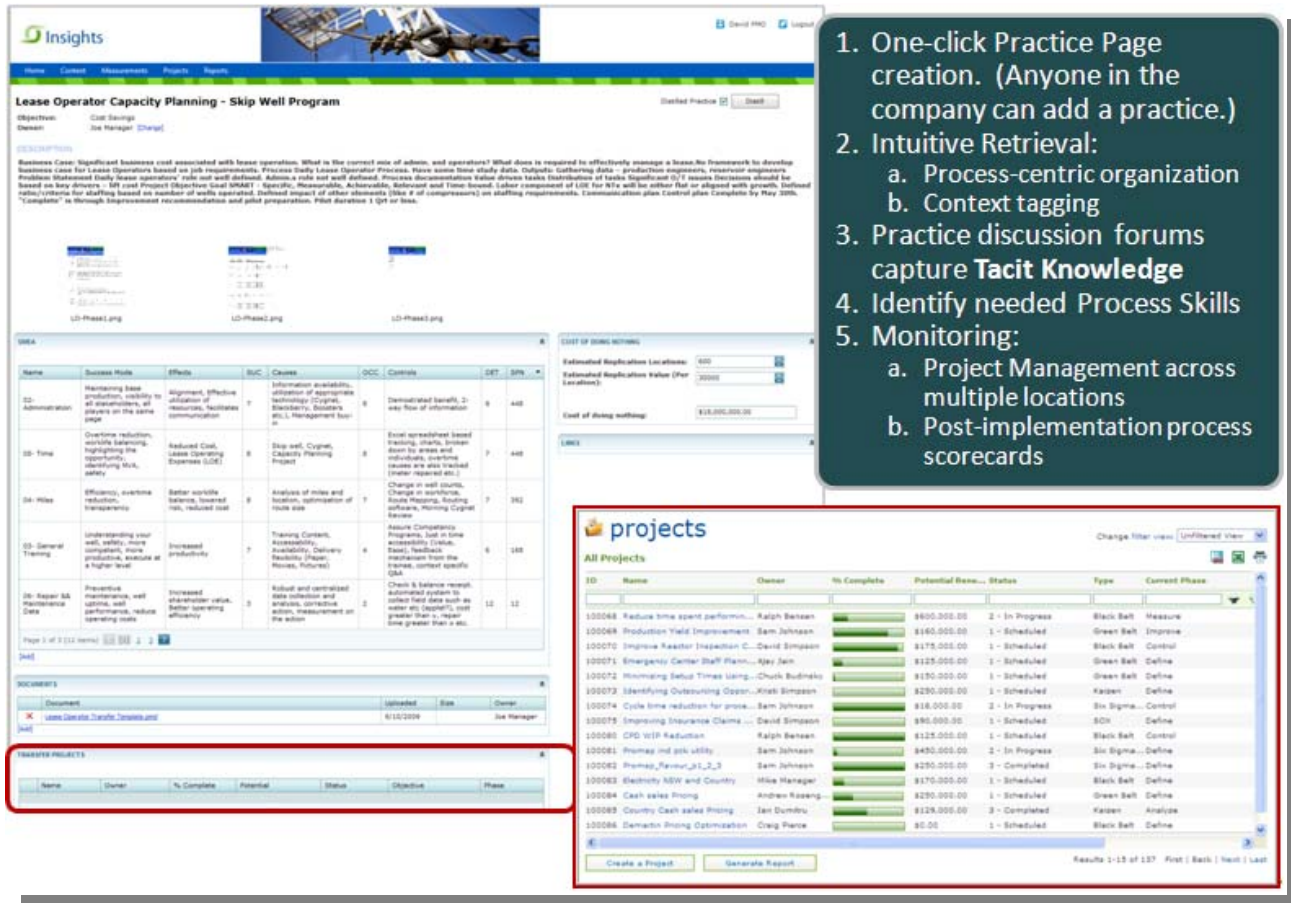


Figure 5: Sample Best Practice Transfer Management

Results Derived

In addition to finding themselves much better positioned to accommodate a changing workforce, the electric utility company realized significant benefits from the efficient platform in place to **Transfer their best practices** from their most successful locations to the rest of their locations.

The **Human Resource** department found particular value in the improved and easier method to Manage **Skills**, now that they were associated to specific processes and people.

Added by-products of these process improvements included: a substantially improved safety record, expedited training, with better employee buy-in, easier paths to compliance, and immeasurable benefits from improved access to vital company **knowledge** and **decision support**.