ThyssenKrupp Steel Case Study

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ThyssenKrupp Steel USA (TKS) is a global steel producer that invested approximately $5 billion to build the world's newest and most efficient steel mill in Mobile County, Alabama. It is also the largest steel mill built in the US in decades. The mill began production in July, 2010 and is the largest non-governmental capital project in the US in decades. The investment is in keeping with a Steel Industry move from being labor intensive to capital intensive with technology being the primary driver for this shift.

Steel is used primarily in construction, automobile and infrastructure industries and its use is rapidly increasing across the world and in the United States. A primary target customer of this new plant is the automotive industry, which has high quality standards and low tolerance for supply chain disruption. These requirements are key to the choices ThyssenKrupp made.

The Problem

TKS knew that building state-of-the-art business process systems to support supplying rolled steel to US customers was the only way to compete with older mills investing in new technology and newer mills being built in emerging markets. We also felt there would be a great benefit from having a single, vertically integrated supply chain that would manage our products and quality from iron ore to the customer's loading dock.

Our supply chain vision had three major components: Iron ore processed into slabs in Sepetiba, Brazil, the hot and cold rolling completed near Mobile, Alabama, and the centralized slab purchasing and planning managed from Rotterdam, the Netherlands. This system needed to be seamless across three continents and many thousands of miles.

With thousands of work instructions, reports and procedures to be captured, managed and deployed, we knew we had a very short time frame for a successful launch. On top of these substantial process needs, we knew we needed to build this BPM system with links into SAP, ISO and other certification standards, and eventual support for our Lean/Six Sigma continuous improvement efforts. Once launched, this system would need to enforce safety, provide training, and carefully track operational metrics all while maintaining ownership and the flexibility for change to occur out of the gate.

The Approach

Having the benefit of starting literally from the ground up with no legacy systems or methods, TKS made the decision to create a process-centric organization in early 2009. We realized that aligning a business around transactional systems and applications would not be flexible enough to adapt to the fast changing business requirements. Conversely, aligning every part of the enterprise in a way that puts business strategy first and human behavior and transactions as an outcome would serve our competitive needs.

Establishing BPM Policy

One of the earliest decisions was to firmly establish an executive policy for business process management. By making process the cornerstone for all manual and automated activities, we hoped to provide strong process accountability, control and oversight, and to facilitate training. [5]

Choosing a Process Framework

Based on the APQC Process Classification Framework (PCF), the application came to be known as the Integrated Business management System (iBMS). It was developed as a model with the five goals of, 1) driving best practices, 2) process accountability, control and oversight, 3) aligning business and IT needs, 4) facilitating training, and, 5) driving international standards certifications.

Figure 1. iBMS Model

Each one of these key areas would be linked by a central repository of process data that would be maintained within the process management group.

Choosing a BPM Software Application

TKS chose the Nimbus Control process management software. We knew that the short timeline combined with the complexity of our requirements would require a product that would allow for very quick capture of process, assignment of ownership, establishment of change management practices and deployment of processes out to the entire organization. Nimbus provides a Model Company 'accelerator' process map based on the APQC PCF that had the additional value of enterprise end-to-end process flows, activity inputs and outputs and activity and diagram-level ownership. Constructing this additional data on our own would have delayed our efforts by several months.

Methodology for capture

Starting with the APQC model, we were able to quickly decide which activities to keep, which to change, and where to add our proprietary activities. Having a template allowed for a 'default' answer that would only be altered when required by the TKS business model. This approach was much faster than starting with a blank whiteboard and having to find process stakeholders piecemeal.

The Model Company is based on a hierarchy of process that made it straightforward for TKS to move from the highest and strategic level of the organization down to the most tactical. Our

document policy likewise needed to follow a structured hierarchy, which was decided to be a four-level hierarchy. Level 1 policies were the first established, including the first non-HR policy which established a business process focus, establishing the question, "why?". At Level 2, the higher level's policies are broken down into process maps, answering the questions, "who?, "what?" and when?" Level 3 contains specific work instructions for all roles within the facility and at the lowest level is the documentation that includes forms, tags or labels. These items can become part of the quality record once used to capture data.
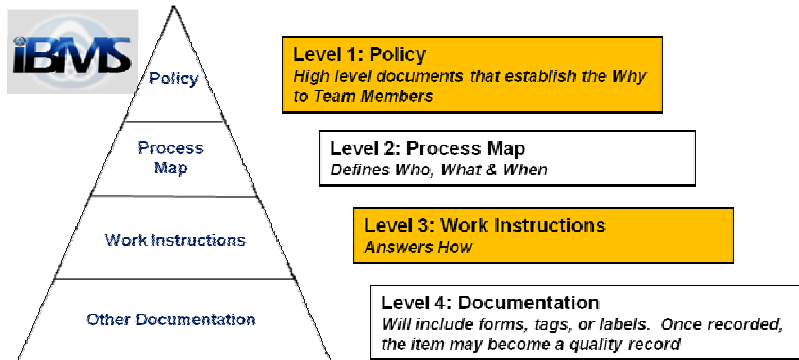

Figure 2. Documentation Hierarchy

In a similar fashion, the method for process mapping involved creation of multiple levels, with the top three covering executive strategy down to the individual lines of business. Detailed operational processes were located below these first levels and could be built out in digestible chunks of work with the prior knowledge of where it would 'hang' in the overall model. By completing the process map in this fashion, executive strategy can be linked to execution activities at every step of the effort. This organizational structure also allows for key metrics at the fourth level and below to be monitored and aggregated at each level so that Level 1 scorecards can reflect a continuous chain-of-data-custody for how the operation is performing.
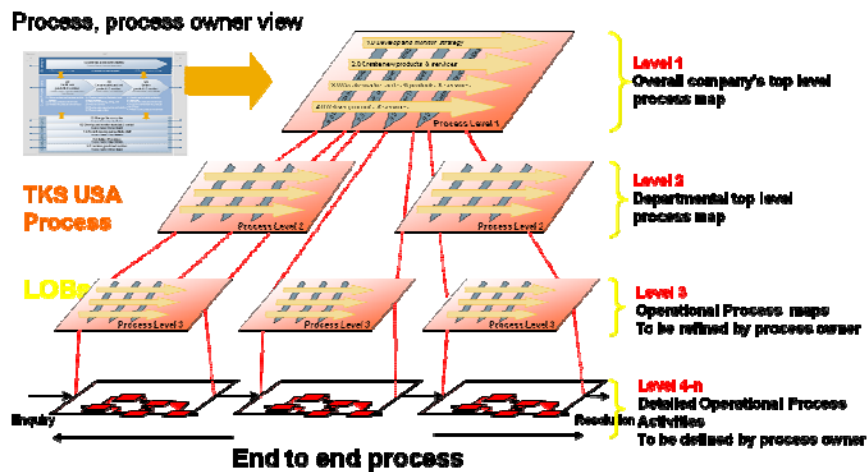

Figure 3. Process Map Hierarchy

Without a method for governance, anything captured would be difficult to maintain as the business goes through inevitable cycles of change. It is a common BPM problem to have a system out of line with reality the moment real capture begins. To avoid that problem, TKS

established a change workflow that provided an executive owner as well as a process/document owner assigned for all processes and documents and includes a defined set of stakeholders and controls as part of the cycle of approval. In addition, process advisors and internal auditors were given visibility into processes and documents. TKS has a system that is in continually in sync with all process stakeholders and the realities of an ever-changing business. This change process workflow is represented in the diagram below and is a built-in component of our technology:
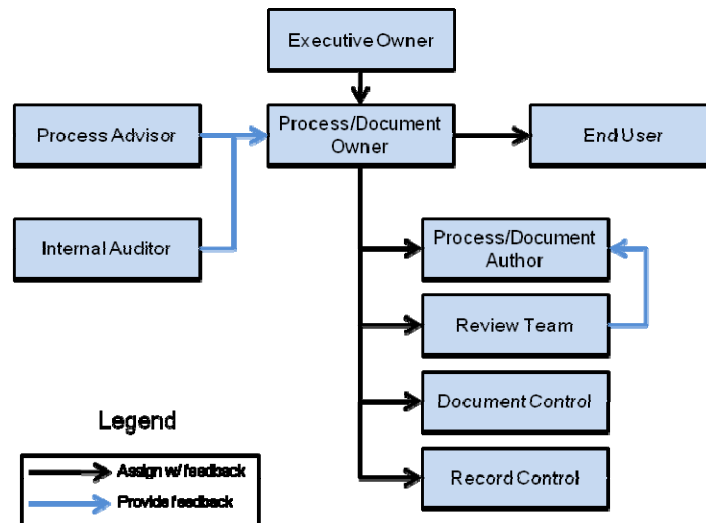
Figure 4. TKS Hierarchy of Process Governance

To make this system work well, the decision was made to store all documents in the Control Document Registry, which allowed TKS to maintain links between documents, transactions and websites and any relevant activities. TKS was able to version those links and assign ownership separately from the underlying activities, allowing the naturally different lifecycles and ownership challenges to be simplified.

The Results

iBMS is the established system for managing all aspects of business process accountability and oversight, training, certification, alignment of business and IT, and continuous improvement at TKS.
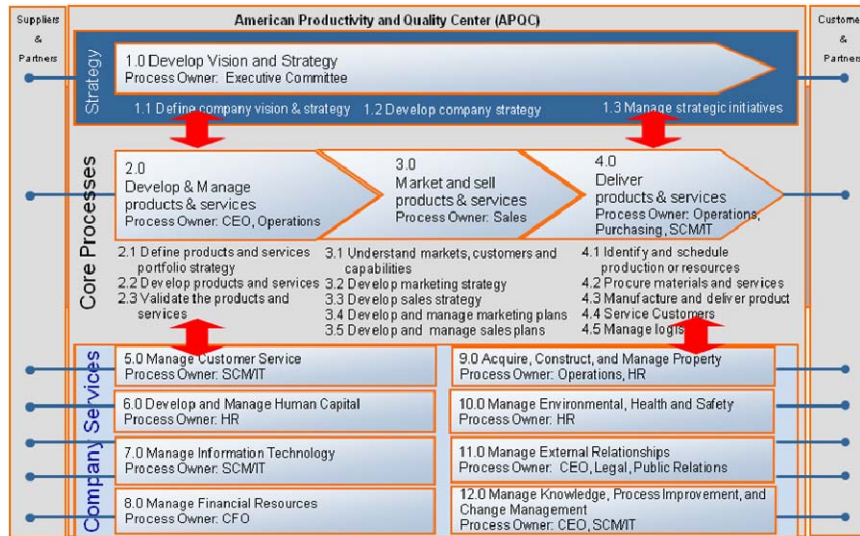
Figure 5. TKS APQC PCF-based business process model

Competing on Compliance

The end customer of TKS makes their purchase based on quality, price and the expectation of an uninterrupted supply chain. The clear sales message is an uninterrupted supply chain backed by quality, environmental, health, safety, IT and BPM standards. The challenge of so many standards and certifications is the ability to manage all of the data found within standards simultaneously with the human and system behaviors in the daily flow of work. Control's Statement Set feature was heavily exploited to allow mapping of hierarchical standards (which define certifications) directly into activities within process diagrams. A particular activity may have an impact on multiple standards and TKS is able to clearly visualize those linkages. Through defined reports in the system, we are able to look at each standard, see what activities support it and where, and to see any gaps that might exist that would be problematic for certification. We also attach audit records to compliance data sets and have a single system that overlays iBMS and is the organizational touchstone for compliance.
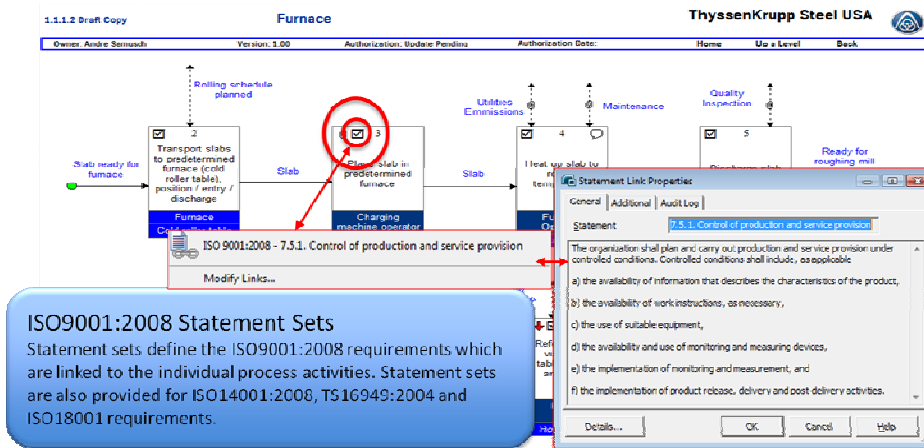

Figure 6. TKS compliance linkages
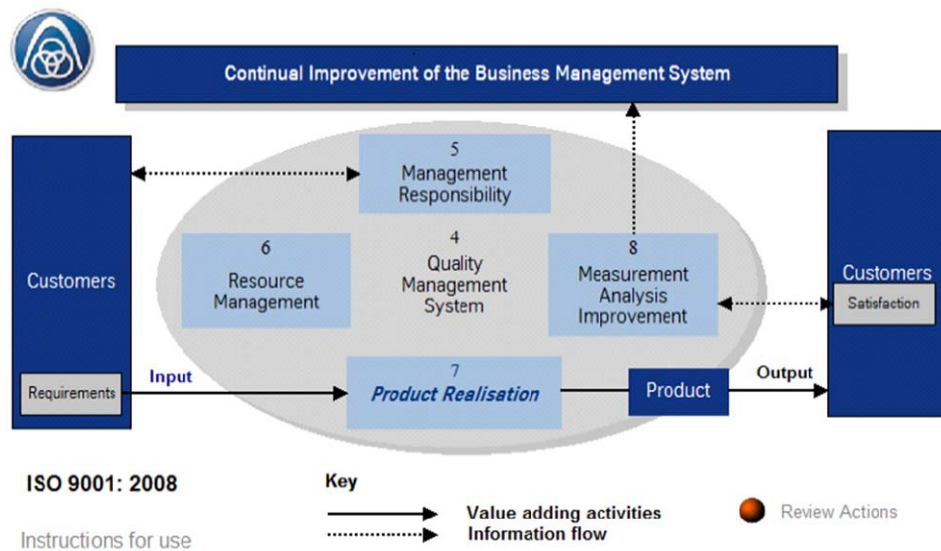
IBMS: ISO 9001:2008 Interaction

Figure 7. TKS compliance overlay

Process metrics and benchmarking

Because iBMS is closely associated with the APQC PCF, specific activities can be measured in a way that allows for comparison against APQC's benchmarking data. The usual task of translating proprietary processes in a dissimilar hierarchy is made significantly easier by aligning from the start with a widely-used framework. TKS is currently collecting metric data to allow for future benchmarking against industry standards.

Transparent Accountability

Two key outputs of the iBMS system are training instructions and process change instructions, both with the capability of requesting user acknowledgement as a fully audited request/reply-or-escalate model that manages all data within one system. This contributes as an enforcement for compliance-associated activities and enforces change and passing of knowledge.

Supporting Lean/Six Sigma

With a single, centralized database of process supported by a change process and full end-user deployment, TKS is planning to support Lean/Six Sigma initiatives through the same interfaces. This will create an environment of real-time continuous improvement as candidate processes are identified, analyzed, changed and redeployed using the same methods used for daily process management. TKS is planning to use data tables to capture DMAIC, Failure Mode and Effect Analysis and other data elements within specific process activities and handoffs.
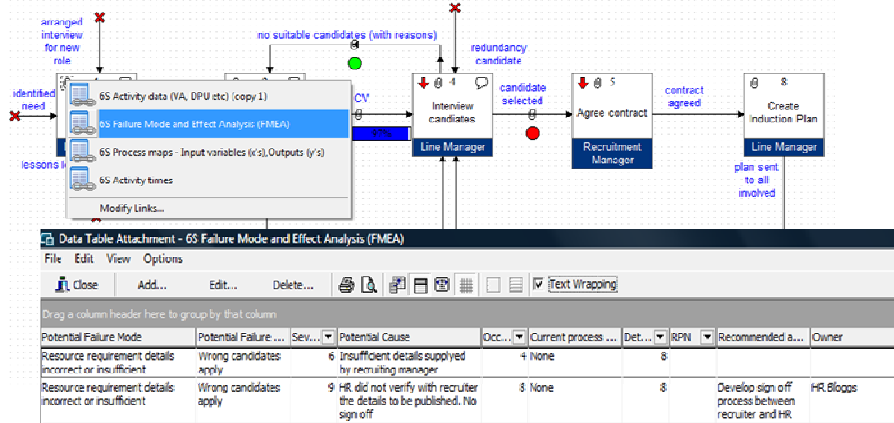
Lean/Six Sigma Activity-level Capture

APQC's John Tesmer, who led the APQC Frameworks Study, said, "It is gratifying to see how thoroughly TKS has leveraged the PCF and other frameworks to develop an integrated, end-to-end solution for process, compliance, training, and ultimately, sales.

Publications

Wall Street Journal

The Wall Street Journal published a story on TKS as the plan opened in December 2010 [5].

APQC Frameworks Study

The author presented to the APQC Using Process Frameworks and Reference Models to Get Real Work Done (APQC Frameworks Study) on January 12, 2011 as a virtual site visit (via Webex conference). The results are summarized in APQC's Findings [4]

References

[1] Nimbus USA User Conference Presentation, "ThyssenKrupp Steel USA – Building a Process Focused Company for the 21st Century," Richard Davis, Business Process Manager, ThyssenKrupp Steel USA, October 2010 in Houston, TX.

[2] Gartner Rearch G00208768, "Tracking Innovation: On the Edge of Business Process Models for Workforce Visualization of Business Operations," by Bill Rosser, published November 17, 2010.

[3] "Business Process Management," delivered to the APQC Frameworks Study on January 12, 2011

[4] Wall Street Journal, "Thyssen's High-Tech Relay," by Robert Guy Matthews, published December 14, 2010

[5] APQC Research "Using Process Frameworks and Reference Models to Get Real Work Done" by John Tesmer, Manager APQC Open Standards Research, published April 27, 2011

Author

Richard Davis is the Manager of Business Process and Quality Systems at ThyssenKrupp Steel USA (TKS USA). He joined the operation as it first launched in the US with an ambitious plan to build a vertically integrated rolled steel supply chain to primarily support the US automotive industry. He was selected by TKS USA for his extensive customer-side experience at Hyundai Motor Manufacturing where he helped streamline their value chain, which included managing Hyundai's vendor relationships with companies similar to TKS USA. At VF Corporation he lead the development of corporate wide best practices and the systems to support them.

Richard is a multi-disciplined professional with more than 20 years experience in Process Development, Information Technology, and Supply Chain management. He is a graduate of Auburn University's MBA program in Information Systems and has his undergraduate degree from Auburn as well. He is an avid sailor and sportsman and spends much of his off time exploring the pristine beaches and waters of the Gulf Coast.

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