Semantic action

Model-based Architectural Framework for Rapid Business Transformation of Global Operations

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Rising complexity of value chains and fast global competition

Rapid expansion of global manufacturing could completely rearrange competitive landscape. Global companies not only face increasing number of new competitors in their established markets, but also they are entering new market segments for which they need to expand current offerings with new products and services. Innovations from one market segment spread quickly into other markets effectively leveling the playing field and providing opportunity to competitors. This "see-saw" competitive outsmarting on a global scale plays out in a range of manufacturing industry verticals (automotive with Toyota and GM, commercial aerospace with Boeing and Airbus for example). New competition drives complexity through new products and offerings, while complexity opens the door for new competition, making global markets very unpredictable.

To play a high risk and reward game such as global manufacturing, companies pursue a variety of strategies (mergers and acquisitions, outsourcing, reuse) with mixed results. Companies that focus on global reuse of brands and product platforms (Coca Cola, Microsoft, Volkswagen and Intel for example) have been able to outperform competitors in the global arena. Companies that pursue "arithmetic" acquisition and merger strategy usually do not fare as well. What has been crucial for success is emphasizing scalable business processes to synchronize dispersed marketing, development, sales and manufacturing operations. In other words, to compete globally, companies need to think and act as a single, although global corporation, and not as many local corporations with a shared ownership structure.

Business architecture for global operations

Transforming business process on a global scale is not trivial endeavor. To understand the complexity involved, one has to examine the scope of global manufacturing operations. Value Reference Model (VRM, formerly known as VCOR) is well suited for this task[1], because it normalizes definitions of all basic value chain processes and their relationships.

[1] See www.value-chain.org

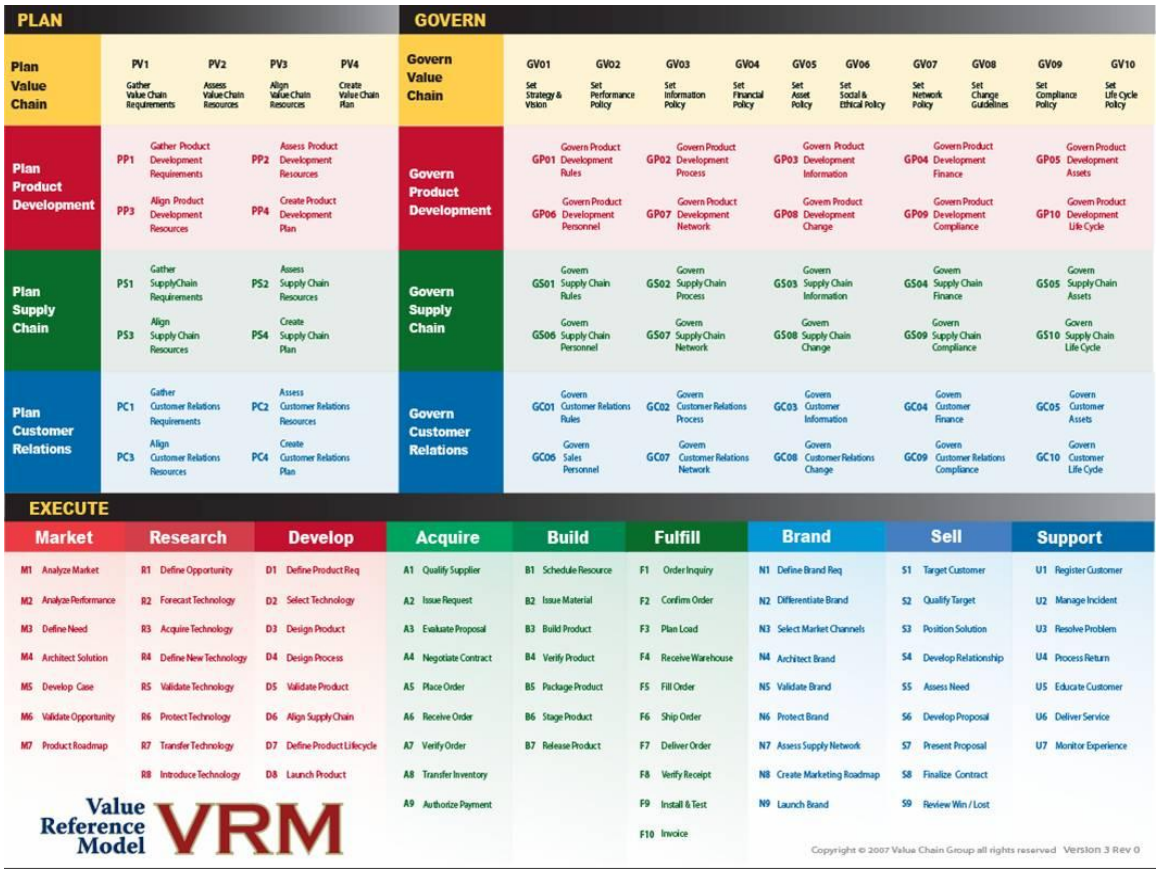

Figure 1. An example of business reference model - VRM (former VCOR) reference model for global enterprise business operations

Obviously, governance and planning processes have to be fully integrated in order to reuse assets such as brands, knowledge, intellectual property, and production resources. There are region specific regulatory and fiscal reporting rules, however they can be organized and consistently mapped to each of the governance and planning processes in VRM, without altering basic flow of information.

Difficulties usually arise with execution of processes. Organizational inconsistencies arise at the task level of process decomposition, primarily due to various terminologies and local preferences of divisional managers. Organizational charts in many companies add layers of complexity due to duplication of positions and multiple reporting. Streamlining communications becomes very challenging in these organizations.

First step in a global transformation should be to achieve full and consistent reconciliation of three top-down operational management structures: process breakdown, organizational chart and business metrics. With clarity of global business architecture in regards to who does what, why, how and when, mapping of process flows across all global value chain constituents is possible. Once the process models are defined using consistent language and structure, full comparisons of different process flows should point to reasons for reuse of global processes, tools, practices and methods.

Speed of transformation with continual change

Second equally important enabler of global operations is enterprise wide information framework that enables fast re-configuration and adjustment of process flows on a continual basis. All processes that span global operations require rich information sharing from multiple sources in a fast and efficient manner. Some of currently used information management systems happen to enable required process flows, while other may slow them down. However, processes continually evolve to better address changing business needs. Quickly outgrowing their information infrastructure, global companies have no time or other resources to continually fix and adjust proprietary legacy systems. Their only chance is to adopt new paradigm of business computing – reconfigurable system architecture based on service orientation and standard protocols of information exchange.

In the paradigm enabled by service orientation, business process is dynamic, constantly morphing according to business rules. However, standard reusable building blocks of processes – value added services are stable at a very fine grain level. Just like in model based business architecture, the enterprise architecture defines the process as a model consisting of services that embody fine grain value added activities. Thus, both business architecture and information management infrastructure follow a common ontology tying them together in an integrated process design and execution framework. This provides for much needed speed of transformation, since processes built from granular components do not require re-coding of the business logic, and are ready to deploy directly from the process models representing targeted flows.

Integrated framework

Tying together business architecture with the service-oriented architecture for rapid transformation provides best possible environment for global manufacturers to re-engineer and re-deploy their processes. The benefits come not only from speed and agility, but also from ability to tap into information that has been otherwise impossible to reuse globally.

Standardizing processes on common business semantics and performance metrics enables reduction of variability and high fidelity insights into proactive performance indicators. Re-configurable system architecture provides for speed of change and reuse of global practices and computing assets. The two combined are best chance for global manufacturers to maximize on the opportunity of expanding world economy, while minimizing transformation challenges and unpredictable competitive threats that inevitably come with them.

To address business needs fast and cost effectively, business and enterprise architects require an integrated framework. This framework consists of a closed-loop continuous improvement methodology and model based environment (see Figure 2).

Continual transformation of business processes requires a model based environment, since writing and re-writing requirements documents just to compromise them later with packaged applications, or to custom code them in proprietary formats, will not suffice for the speed and precision of transformation required today.

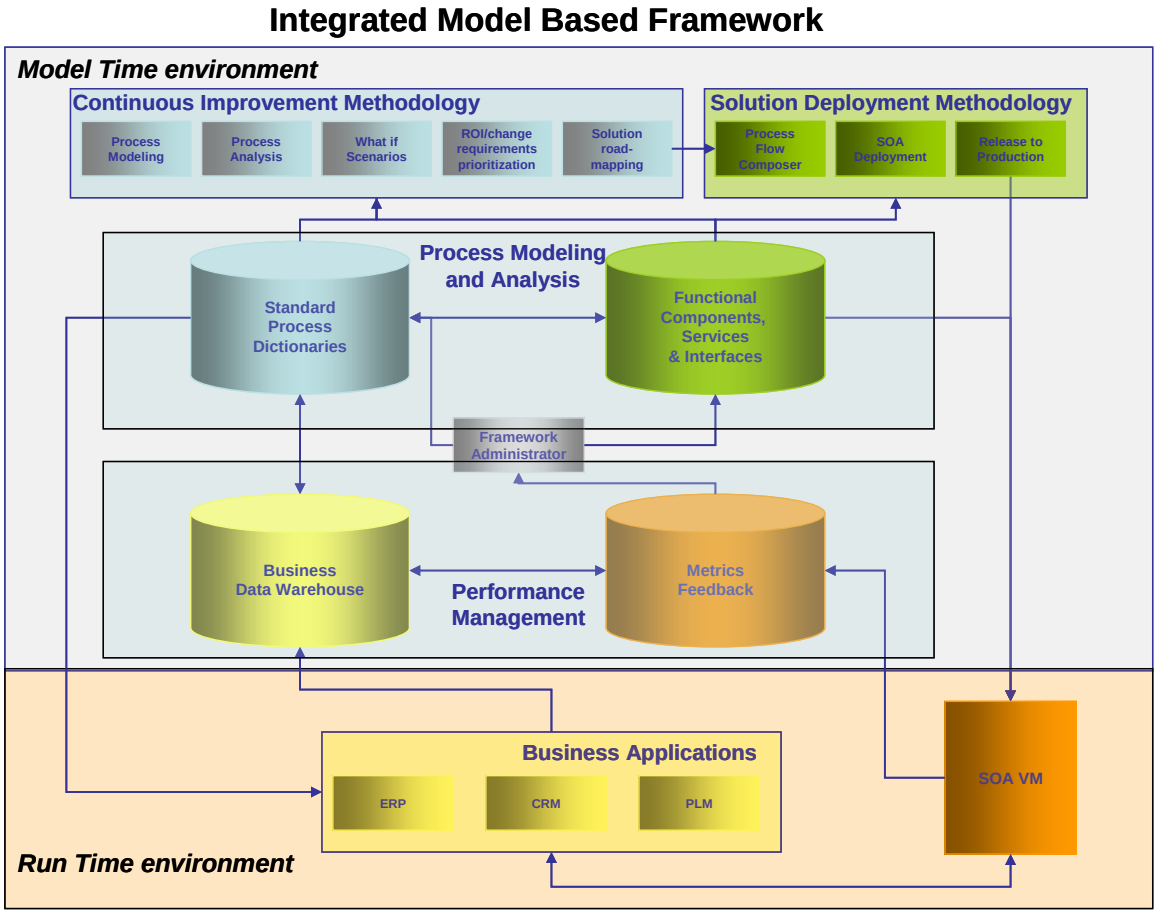

Figure 2. Integrated Model based Architectural Framework - Basic Elements

In a model-based environment, a closed-loop continuous improvement methodology is followed. Business process is first represented using a high level description to perform analysis of the root causes, gaps and performance issues. Then, by adding specificity several candidate process flow models evolve through series of architectural analyses steps to evaluate possible improvement solutions and their return on investment. Eventually, selected models that represent best solutions evolve to comprise specific implementation details tying services, infrastructure and functional capabilities to the original business process vision.

Once the process is deployed in the run-time environment it is supported by both business applications providing essential services and by SOA VM (Virtual Machine) providing

orchestrated execution of collaborative processes spanning multiple systems and organizations. The metrics from a run-time environment continuously feeds back to the model time environment where business and enterprise architects analyze performance to design improved processes where the continuous improvement loop closes. Two repositories serve the model time environment: standard process dictionaries and architecture dictionaries (standard process and components/services/interfaces) containing available functional components, their capabilities, exposed services and interfaces and their deployment parameters. Standard process dictionaries can be at the same time used as sources of meta-data for various business applications.

Conclusion

An integrated framework serves the needs of fast and precise continual transformation of business processes by:

- Building consensus on business needs using the language of business professionals and preserving business objectives throughout solution design and implementation;
- Enabling fast and accurate analysis of root causes of business performance problems;
- Providing a common communication platform for business and IT architects to determine the best course of action for feasible transformation;
- Allowing for fast and accurate assessment of many ideas for improvement;
- Eliminating needs for documentation and coding that result in misinterpretation of the original requirements;
- Normalizing business semantics between model and run time environments;
- Preserving and reusing already developed assets that best serve the business needs and gradually eliminating less economic solutions.

Companies that adopt a model based architectural framework report much better alignment between strategic goals, transformation initiatives and IT implementation projects. They also obtain faster and more precise architectural planning of the solutions with much more intelligent selection of the required capabilities. Leading adopters of integrated architectural framework report dramatic decrease in the initiative design and implementation time, cost savings in software acquisition and maintenance costs. Above all, they value model based approach, because it enables much tighter alignment between business needs and implemented solutions.