

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 task¹, because it normalizes definitions of all basic value chain processes and their relationships.

¹ See www.value-chain.org

PLAN					GOVERN										
Plan Value Chain	PV1 Gather Value Chain Requirements	PV2 Assess Value Chain Resources	PV3 Align Value Chain Resources	PV4 Create Value Chain Plan	Govern Value Chain	GV01 Set Strategy & Vision	GV02 Set Performance Policy	GV03 Set Information Policy	GV04 Set Financial Policy	GV05 Set Asset Policy	GV06 Set Social & Ethical Policy	GV07 Set Network Policy	GV08 Set Change Guidelines	GV09 Set Compliance Policy	GV10 Set Life Cycle Policy
Plan Product Development	PP1 Gather Product Development Requirements		PP2 Assess Product Development Resources		Govern Product Development	GP01 Govern Product Development Rules		GP02 Govern Product Development Process		GP03 Govern Product Development Information		GP04 Govern Product Development Finance		GP05 Govern Product Development Assets	
	PP3 Align Product Development Resources		PP4 Create Product Development Plan			GP06 Govern Product Development Personnel		GP07 Govern Product Development Network		GP08 Govern Product Development Change		GP09 Govern Product Development Compliance		GP10 Govern Product Development Life Cycle	
Plan Supply Chain	PS1 Gather Supply Chain Requirements		PS2 Assess Supply Chain Resources		Govern Supply Chain	GS01 Govern Supply Chain Rules		GS02 Govern Supply Chain Process		GS03 Govern Supply Chain Information		GS04 Govern Supply Chain Finance		GS05 Govern Supply Chain Assets	
	PS3 Align Supply Chain Resources		PS4 Create Supply Chain Plan			GS06 Govern Supply Chain Personnel		GS07 Govern Supply Chain Network		GS08 Govern Supply Chain Change		GS09 Govern Supply Chain Compliance		GS10 Govern Supply Chain Life Cycle	
Plan Customer Relations	PC1 Gather Customer Relations Requirements		PC2 Assess Customer Relations Resources		Govern Customer Relations	GC01 Govern Customer Relations Rules		GC02 Govern Customer Relations Process		GC03 Govern Customer Information		GC04 Govern Customer Finance		GC05 Govern Customer Assets	
	PC3 Align Customer Relations Resources		PC4 Create Customer Relations Plan			GC06 Govern Customer Relations Personnel		GC07 Govern Customer Relations Network		GC08 Govern Customer Relations Change		GC09 Govern Customer Relations Compliance		GC10 Govern Customer Relations Life Cycle	
EXECUTE															
Market	Research	Develop	Acquire	Build	Fulfill	Brand	Sell	Support							
M1 Analyze Market	R1 Define Opportunity	D1 Define Product Req	A1 Qualify Supplier	B1 Schedule Resource	F1 Order Inquiry	N1 Define Brand Req	S1 Target Customer	U1 Register Customer							
M2 Analyze Performance	R2 Forecast Technology	D2 Select Technology	A2 Issue Request	B2 Issue Material	F2 Confirm Order	N2 Differentiate Brand	S2 Quality Target	U2 Manage Incident							
M3 Define Need	R3 Acquire Technology	D3 Design Product	A3 Evaluate Proposal	B3 Build Product	F3 Plan Load	N3 Select Market Channels	S3 Position Solution	U3 Resolve Problem							
M4 Architect Solution	R4 Define New Technology	D4 Design Process	A4 Negotiate Contract	B4 Verify Product	F4 Receive Warehouse	N4 Architect Brand	S4 Develop Relationship	U4 Process Return							
M5 Develop Case	R5 Validate Technology	D5 Validate Product	A5 Place Order	B5 Package Product	F5 Fill Order	N5 Validate Brand	S5 Assess Need	U5 Educate Customer							
M6 Validate Opportunity	R6 Protect Technology	D6 Align Supply Chain	A6 Receive Order	B6 Stage Product	F6 Ship Order	N6 Protect Brand	S6 Develop Proposal	U6 Deliver Service							
M7 Product Roadmap	R7 Transfer Technology	D7 Define Product Lifecycle	A7 Verify Order	B7 Release Product	F7 Deliver Order	N7 Assess Supply Network	S7 Present Proposal	U7 Monitor Experience							
	R8 Introduce Technology	D8 Launch Product	A8 Transfer Inventory	B8 Release Product	F8 Verify Receipt	N8 Create Marketing Roadmap	S8 Finalize Contract								
			A9 Authorize Payment		F9 Install & Test	N9 Launch Brand	S9 Review Win / Lost								
					F10 Invoice										

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.

Integrated Model Based Framework

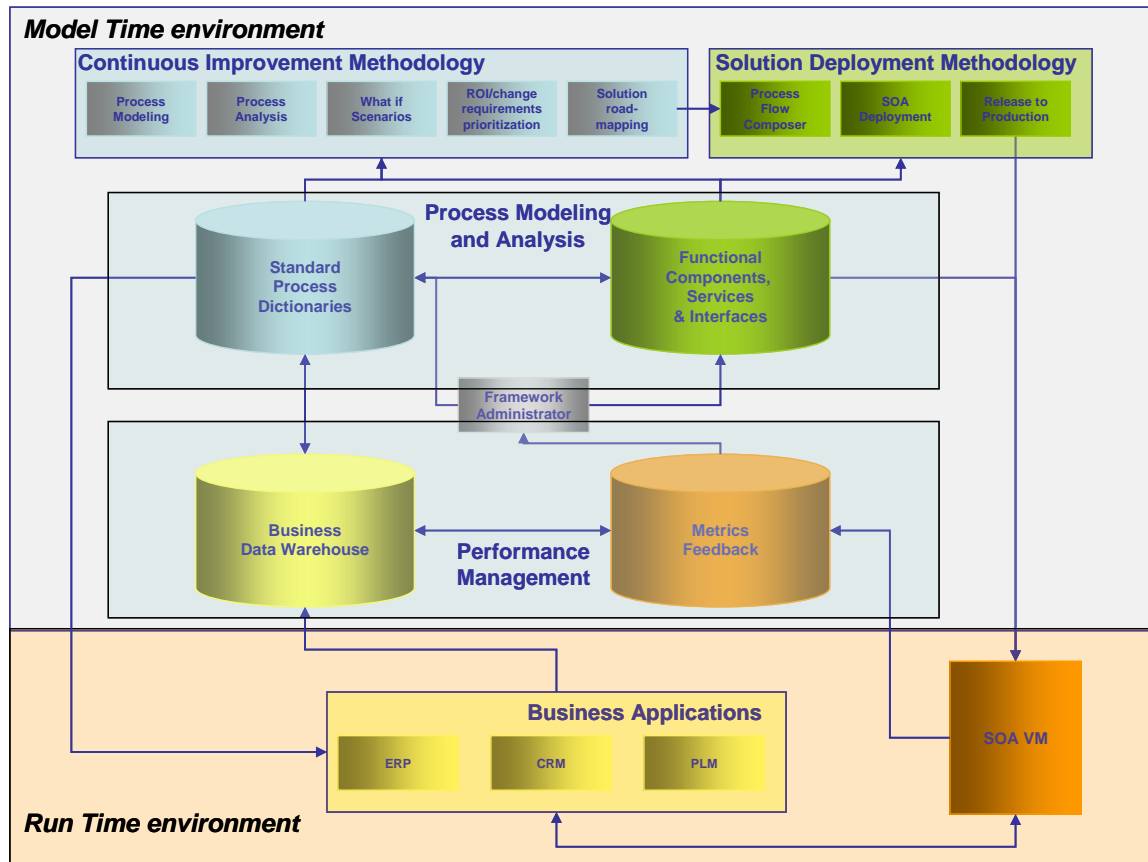


Figure 2. Integrated Model based Architectural Framework - Basic Elements

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.