

## Change Happens!

**Mahesh H. Dodani**, IBM Software, U.S.A.

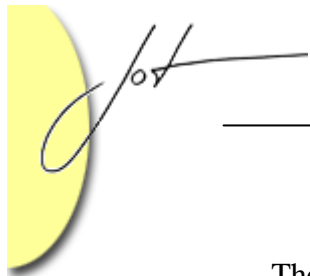
### 1 BEHAVIORS, NOT STRATEGY, CREATES VALUE

*“Businesses are under increasing pressure to change more rapidly, and IT (in particular, software) now ranks for many CEOs as a major impediment in achieving such change. SOA and associated changes in products and market structures will improve the ability of software to adapt to business change. The extent of this improvement will vary from company to company based on skills, the legacy of previous software investment, and the centrality of software to the company’s business operations, but overall the value will be such that, over five to seven years, SOA will replace previous software architectures to the same degree that client/server replaced mainframe screen-based transaction systems and word processing replaced typewriters. So, for anyone involved in IT, the issue is not if SOA will have an impact, but when, and how aggressively you should go out to meet the future rather than waiting for it to come to you.”* – Simon Hayward, Gartner Research  
[http://www.gartner.com/DisplayDocument?doc\\_cd=125868](http://www.gartner.com/DisplayDocument?doc_cd=125868)

As we start the new year, it is evident that change is here to stay and the rate of change is accelerating, impacting almost every aspect of our lives. For business leaders, the impact of this change is profound. They must contend with an increasingly diverse set of competitors, an unpredictable economic environment, and a demanding and fickle customer set. In addition to all these challenges, business leaders must meet the stringent expectations of financial markets and ensure that their organizations will deliver consistent growth in revenue and profitability, despite the uncertain and dynamic environments in which they operate.

As a result, companies are being forced to continuously rethink and redefine their business models, operations and organizational structures in order to succeed. We call the business model that will help companies excel in this market environment “on demand business”, which I have introduced in several prior columns (e.g. [http://www.jot.fm/issues/issue\\_2003\\_05/column3](http://www.jot.fm/issues/issue_2003_05/column3).)

Obviously, information technology plays a crucial role in the shift to on demand business. Organizations can start by better aligning their IT capabilities with their business strategy and design, creating more flexible technology infrastructures that will make IT an enabler of change rather than an obstacle to it.



The best practice for aligning IT implementation with business strategy is through the establishment of an Enterprise Architecture. The Enterprise Architecture embraces both business and IT architectures and provides a plan - in the form of technologies, standards, methods, etc. - for building solutions that span business and IT. Enterprise Architecture provides the enterprise-wide focus that is needed to make the vision of on demand business a reality.

The implementation of an the Enterprise Architecture typically requires three major elements. The Reference Architecture defines a technical framework for modeling, assembling, deploying, and managing business focused solutions. The Implementation Roadmap provides a detailed analysis of the current environment, analyzes the gap between the current environment and the intended reference architecture, and provides a step-by-step plan to implement the Reference Architecture. The Governance model defines the processes, roles and organization required to ensure that all projects conform to the Enterprise Architecture, allowing and the Architecture itself to be managed effectively and to evolves to meet the ever-changing needs of the Enterprise.

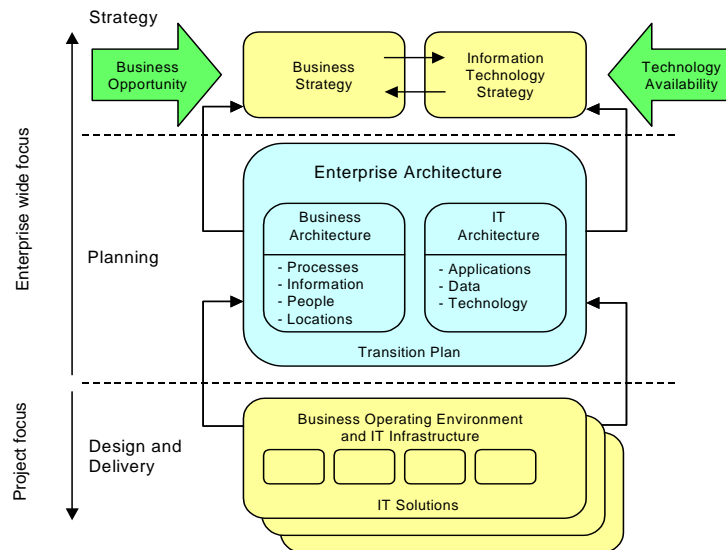


Figure 1: Enterprise Architecture: Aligning Business and IT Concerns

How does Service Oriented Architecture (SOA) relate to Enterprise Architecture? SOA is, in fact, an approach for designing and implementing distributed systems that allows a tight correlation between the business model and the IT implementation. Consequently, it is a paradigm that can be applied as companies consider the three elements of an overall Enterprise Architecture. By applying SOA concepts and principles, companies can align business and IT goals and objectives, can drive increased flexibility into their IT systems, and can be more responsive to rapidly changing business requirements.

CIOs are increasingly involved in finding solutions to the broad requirements and concerns of CEOs. In fact, CIOs are in a unique position to drive the activities that will



more tightly align business and IT goals and objectives. Yet, many CIOs find that their current operating systems and environments are very complex and difficult to change, their budgets are increasingly under scrutiny, and their organizations are focused more on the technical concerns of the IT systems than on solving specific business problems. These are precisely the issues that SOA is designed to address. By merging SOA into their Enterprise Architectures, organizations can deliver better business functions more flexibly, rapidly, and efficiently; they can drive cross line-of-business business process implementations and as a result bring new products to market faster and improve customer service levels. They can drive costs and complexity down as they identify and eliminate duplicate applications and functions across previously siloed business areas.

SOA is forcing companies to not only be able to change and change rapidly, but also to keep changing continuously. Not only do companies need to automate business processes wherever possible, but they must also be ready to change their organization to implement these processes flexibly and efficiently. As is evident from our journeys into OO, then component architectures, and now SOA, the key to success is changes in behaviors across the enterprise.

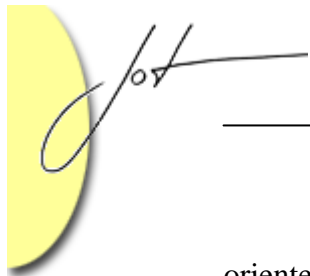
## 2 APPROACHES TO CHANGING ENTERPRISES

*“During the last few years, a new understanding of the process of organizational change has emerged. It is not top-down or bottom-up, but participative at all levels—aligned through a common understanding of a system.”* – Peter Senge, *The Fifth Discipline*  
<http://www.amazon.com/gp/product/0385260954/104-9043635-7773525?n=283155>

Senge's seminal work on organizational change and learning facilitates changing enterprises through five disciplines:

- Personal Mastery is the individual's motivation to embrace change through learning and become better by cultivating the tension between vision and reality.
- Mental models are a technique that can be used to foster creativity as well as readiness and openness to change and the unexpected.
- Building Shared Vision so that the organization may build a common commitment to long term results and achievement.
- Team Learning is needed so that the learning is passed on from the individuals to teams (i.e. the organization as a whole).
- In the fifth discipline of Systems Thinking people learn to better understand interdependency and change through a holistic systemic view of the organization as a function of its environment.

Most of the techniques that we have used to facilitate a significant technological change (e.g. OO) focus on a few of these disciplines, and have therefore resulted in mixed results. As an example, many of the early initiatives around OO focused on the first discipline – that is getting the skills and mental models of individuals from procedural



oriented to object oriented (e.g. see my papers "OO Learning AntiPatterns: Rewiring Data and Functional Thinkers into Object Technology Developers", Journal of Object-Oriented Programming, Vol. 11, No. 8, pp. 59-63, SIGS Publications, October 1999, and "Object-oriented shock therapy", Journal of Object-Oriented Programming, Vol. 9, No. 4, pp. 17-19, SIGS Publications, July-August 1996.) These efforts led to work on developing learning patterns that helped establish the best practices in ensuring effective learning <http://www.pedagogicalpatterns.org/>.

More recently, the focus has been on patterns that facilitate change across the entire organization or enterprise – however, the scope has been limited to a particular aspect of the change. For example, organizational change to facilitate agile development <http://www.amazon.com/gp/product/0131467409/104-9043635-7773525?n=283155>, and patterns to get individuals to introduce new ideas into the enterprise <http://www.awprofessional.com/title/0201741571>.

Of course, a successful implementation of SOA requires change across both business and IT environments within the enterprise. To facilitate such comprehensive change, we need to have an approach that facilitates Senge's five disciplines as well as allows focused patterns and best practices to be applied – that is, a change framework. This change framework is best facilitated through a governance model.

### 3 GOVERNANCE

SOA governance enforces the use of discipline to maintain consistency and relevance within the service lifecycle. As shown in Figure 2, SOA governance ensures effective change within the enterprise through appropriate organizational structures, best practices and established processes. SOA governance is needed to bridge the gap between business and IT by allowing traceability from business goals down to services, and Key Performance Indicators for measuring the results of those services. The SOA governance model provides the appropriate framework to answer the following questions:

- What has to be done? The activities needed to define, specify, implement, and maintain services and their enabling components.
- How is it done? The decision that ensure that appropriate actions can be performed on SOA entities, including how to identify the right services and how to validate that services are created using the technology standards that have been mandated and that enable their reuse across the organization.
- Who has the authority to do it? The roles of the SOA Authority (e.g. an SOA Center of Excellence) and associated organizations, and their responsibilities in SOA governance.
- How is it measured? The definition of appropriate checkpoints within the projects and associated processes to ensure that the SOA principles, policies and practices



are enforced and that the SOA itself is kept vital to meet the ever changing needs of the Enterprise.

SOA governance aligns IT to business needs through the concept of “service domains.” Service domains are a way of dividing up service responsibility along certain categorizations – functional, technology, or application-centric are common divisions. For SOA adoption at higher levels in the organization, a funding model must be put into place that supports the development of common services, and the reuse and maintenance of those services. Domain owners are responsible for maintaining the applications that support their exposed business services. They are also responsible for maintaining and monitoring the Service Level Agreements (SLAs) of their existing services as well as negotiating SLAs between different domains. The provisioning of metadata for services is critical to both business and IT users. The metadata can provide integral usage information, as well as information to ensure that the services can be monitored and managed.

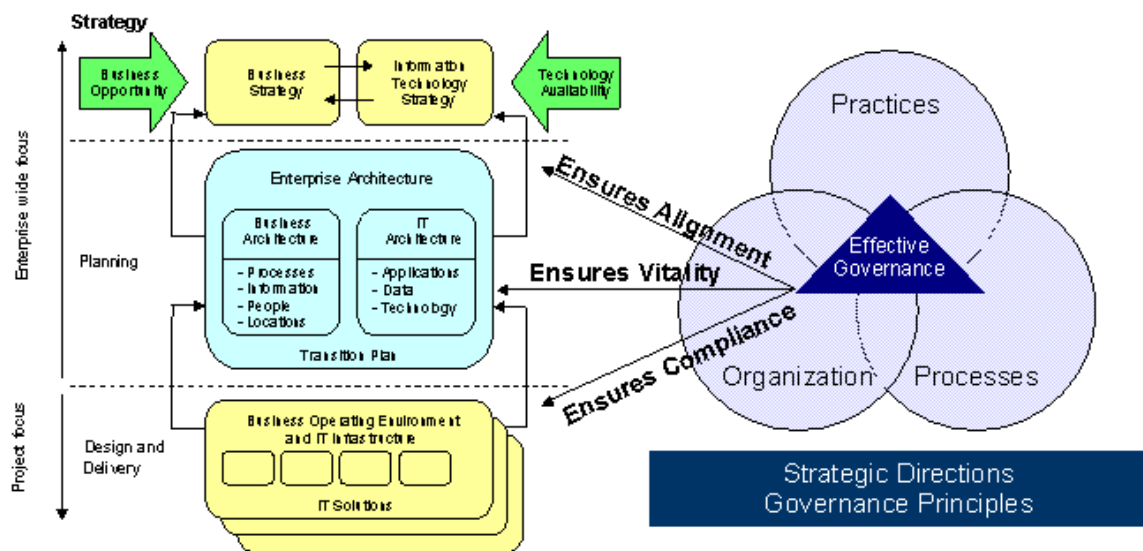


Figure 2: Governance in the context of Enterprise Architecture

SOA governance applies to the entire service lifecycle – from development through operation. The service development lifecycle involves modeling and identifying business services, designing interfaces and quality of service requirements for those services, implementing new services, assembling services, and deploying the services into production. Once the services have been deployed, as additional requirements are developed and operational information is available, the services will undergo change management and mature through iterative development. As services are deployed, the infrastructure is configured to provide qualities of services such as security. Services are frequently monitored to measure how they are meeting their SLAs, for performance and capacity information, and for problem detection.

Any implementation of governance should be centered on the four pillars of Enterprise Architecture: people, processes, technology, and services. A best practice to implement an enterprise IT and SOA governance is through a Center of Excellence (CoE). Underpinning the strategy of aligning business and IT, the SOA CoE is the focal point of service orientation to create organizational efficiency, maintain the agreed SOA vision to create a competitive advantage; and determine checkpoints in the ongoing work to ensure vitality and compliance with the SOA vision. The SOA CoE ensures quick decisions by making the service lifecycle highly visible through clearly defined decision rights and by establishing support nets to ensure that governance processes are not inhibiting. The SOA CoE can also ensure a smooth and practical transition for the Enterprise by establishing the new roles needed to foster SOA, providing hands-on training for these new roles, and ensuring a phased approach. This phased approach to establishing the SOA governance framework begins by assessing the maturity of the organization and the IT environment and by prioritizing the work based on the enterprise strategy. Once the focus of the work is clear, the next step establishes plans and checkpoints for the evolutionary change and for communicating this to the organization's stakeholders in both business and IT. As the plans are put in place and reviewed with the larger audience and pilot projects are started, the approach is refined and adapted to the environmental and cultural requirements of the Enterprise. After the SOA governance is operational and is observed and managed, changes in strategy, organization, and capabilities will require continuous improvement and adaptation, to align with the needs of the business.

## 4 FINAL WORDS

I have been a proponent of assets through my entire professional career. In particular, the seminal work of John Vlissides, Erich Gamma, Ralph Johnson and Richard Helm on OO design patterns have had a profound impact on me and the entire technical community. I wanted to end this column by paying my respects to John, who recently passed away <http://c2.com/ppr/wiki/ComponentDesignPatterns/JohnVlissides.html>. John, thanks for impacting change in my mental models, and may you rest in peace.

### About the author



**Mahesh Dodani** is a software architect at IBM. His primary interests are in enabling communities of practitioners to design and build complex on demand business solutions. He can be reached at [dodani@us.ibm.com](mailto:dodani@us.ibm.com).