

SOA Maturity Models

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Service Oriented Architecture (SOA) holds considerable value for organizations of all shapes and sizes. While the core concepts of SOA are merely the next logical evolution in business-centric enterprise design, implementing SOA is far more complex and potentially error-prone than it may appear. Moreover, the sheer scale and extent of SOA warrants a disciplined and measured approach to SOA adoption. To address this need, several SOA maturity models have emerged. In this brief paper, I introduce various models and provide some basic guidance to selecting a model for your organization.

SOA Maturity Models at a Glance

The vast majority of SOA maturity models borrow concepts and even terminology from the battle-tested Capability Maturity Model (CMM) and its successor, the Capability Maturity Model Integration (CMMI), both developed by the Software Engineering Institute (SEI). SEI's maturity models have been used for years to evaluate and measure software maturity and integration processes according to a tiered set of maturity levels.



SOA maturity models tend to borrow liberally from SEI's CMM and CMMI models. They borrow the concept of tiered maturity levels and will even frequently borrow the terminology and progression levels. The difference is that SEI's maturity models are intended to gauge the maturity of an organization's *processes*. SOA maturity models typically attempt to gauge the maturity of *architecture* (although the best models measure both).

An extensive list of SOA maturity models could be compiled based upon a few good google queries. Many of these models are either company-specific or they have been espoused by various SOA experts in the form of blog and/or forum posts. There are, however, three models that have been formally defined and repeatedly applied to yield successful SOA results for enterprise organizations. Those three models are:

- **Web Services Maturity Model** by CDBI Forum
- **Service Integration Maturity Model (SIMM)** by IBM
- **Service Oriented Architecture Maturity Model (SOA MM)** by Progress-Sonic Software and a consortium of other vendors

We will start by introducing each model and highlighting its essential structure and core concepts. Later we will identify some useful guidelines for selecting the right SOA maturity model for your organization.

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Web Services Maturity Model ([View this model](#))

UK-based CBDI Forum promotes the oldest service maturity model (circa 2003) of the bunch. CBDI defines a business and technology maturity model that centers on *Web services* as the dominate technology components within an SOA infrastructure. The model defines four major phases that organizations move through in the process of transitioning to a service oriented environment:

- **Phase 1: Early learning** – This is an exploratory phase in which the focus is technology services and better application integration. Activity is largely directed internally as existing systems are adorned with service wrappers.
- **Phase 2: Integration** – This second phase introduces a focus upon business drivers. Business process modeling and service orchestration emerge. Services become increasingly sophisticated by applying security and reliability controls. External-facing services are also deployed.
- **Phase 3: Reengineering** – Building upon the previous two phases, this third phase applies measuring and monitoring to produce enterprise-class services. Additionally, service orientation becomes embedded in the fiber of the enterprise, impacting the organizational responsibilities, funding decisions, and even product development lifecycles. Increasing attention is given to providing and consuming external services to trusted partners.
- **Phase 4: Maturity** – This final phase is characterized by ubiquitous services that function as a part of federated, collaborative service exchanges. Services are finally customer-centric and process-driven rather than company-centric.

The model goes on to discuss timelines, custom roadmaps, and best practices for applying these phases. More details can be found by reading the [full report](#).

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Although this model has been around the longest and takes a very intuitive approach to SOA maturity, it seems a bit fluffy. It has the right concept of progression, throws around obligatory buzz words, and attempts to address both the technology and business aspects of SOA (there are many SOA maturity models out there that focus entirely upon service technology). However, the model seems to be fairly generic, lacking the level of detail provided by some of the other SOA maturity models discussed later in this paper. Additionally, the final phase, *maturity*, appears to be tossed out there half-heartedly and with very little thought to what that last phase actually entails.

Service Integration Maturity Model ([View this model](#))

IBM, one of the foremost authorities on SOA, defines the Service Integration Maturity Model (SIMM). SIMM aims to facilitate business flexibility through SOA adoption while minimizing risk. IBM's model involves the gradual application of seven levels of SOA maturity. Those seven levels are as follows:

- **Level 1: Silo (data integration)** – Characterized by brittle, ad-hoc integration solutions that do not adapt well to change.
- **Level 2: Integrated (application integration)** – Applications are integrated using proprietary connections and platform-specific

- technologies as a part of an Enterprise Application Integration (EAI) infrastructure.
- **Level 3: Componentized (functional integration)** – Modularization of significant and/or critical applications occurs. Integration efforts are typically based upon well-defined interfaces (contract-driven design).
 - **Level 4: Simple services (process integration)** – Initial seeds of SOA are planted in the form of individual, atomic services.
 - **Level 5: Composite services (supply-chain integration)** – Value chains are constructed to form a service eco-system for on-demand interaction between suppliers, consumers, and brokers.
 - **Level 6: Virtualized services (virtual infrastructure)** – Pervasive decoupling of enterprise resources results in the development of a virtualized service grid. Quality of Service monitoring and management are also externalized through an event-driven architecture.
 - **Level 7: Dynamically reconfigurable services (ecosystem integration)** – Run-time composition and configuration of services is enabled via externalized policy descriptions and business process logic.



The model goes on to discuss strategies and shortcomings associated with mapping SIMM to CMMI. Mapping to CMMI levels, integration capabilities, and associated practices are discussed. Finally, SIMM addresses an incremental SOA adoption planning process and the development of custom roadmaps. More details can be found by reading the [full report](#).

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SIMM defines a very thorough progression of technology capabilities. It comes short, however, in terms of how SOA impacts the organization. Lip service is given to business benefits and an organizationally-focused adoption strategy, but very little attention is given to these important subjects.

Service Oriented Architecture Maturity Model ([View this model](#))

A consortium of vendors led by Progress-Sonic Software has developed the SOA MM, which is explicitly based off of CMMI. SOA MM aims to provide IT decision makers with “a simple framework for benchmarking the strategic value of their SOA implementation, and a model for visualizing future success.”

Modeling itself after CMMI’s maturity levels, SOA MM defines five levels of maturity with respect to SOA adoption. At each level, the model identifies progressive business benefits that the organization will be able to realize. The five maturity levels and key business impacts are:

- **Level 1: Initial Services (functionality)** – Deploy simple services as a part of R&D and/or pilot projects. Also define initial ROI measurement criteria and define organizational needs for SOA.
- **Level 2: Architected Services (cost effectiveness)** – Design and implement an SOA infrastructure based upon standards and planned

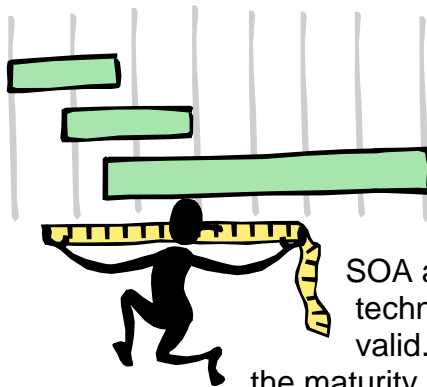
- reuse. Establish architectural leadership and identify SOA informational needs of the organization.
- **Level 3: Business and Collaborative Services (*responsiveness*)** – Establish SOA governance, service lifecycle policies, and cross-organizational partnerships. Move towards, process-centric solutions and engage business and IT in the definition, modeling, and ownership of business processes.
 - **Level 4: Measured Business Services (*transformation*)** – Transform the organization from a reactive approach to solving business problems, to a real-time process-centric business. Establish service performance criteria and associated monitoring infrastructure.
 - **Level 5: Optimized Business Services (*optimization*)** – Continuously improve and refine the organization and associated technology infrastructure. Proactively address business needs and facilitate future strategic initiatives.

In addition to identifying the maturity of SOA adoption and the associated business benefits, the model also maps *scope*, *technical success factors*, *organization success factors*, *relevant standards*, *key goals*, and *key practices* at each maturity level.

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The SOA Maturity Model does a solid job of identifying technical and organizational business impacts of SOA adoption. It also identifies relevant standards and key goals and practices at each level. One area that is perhaps a bit shortsighted is how late governance enters the picture. Governance is a crucial risk mitigation factor for SOA adoption and should exist, in some form, as early as possible.

Selecting an SOA Maturity Model



Although SOA has been evolving and maturing since around 2000, there are still some fairly diverse perspectives regarding the scope of SOA. Some organizations view SOA as the next evolution in distributed computing and system integration, others view SOA as the next logical step beyond component-based enterprise system design, while others look at SOA as paradigm shift aimed at aligning business and technology to achieve agility. Each of these viewpoints is valid. The trouble comes into play when you try and gauge the maturity of an SOA initiative. Do you gauge the maturity of the underlying technologies, the overall architecture, the business processes, or the degree to which the organization has adopted the SOA paradigm?

So how do you select the right model for your organization? The following guidelines may help:

Select CBDI's *Web Services Maturity Model* if:

- Web service components will comprise the bulk of your services
- You want a model that addresses both business and technology aspects
- You want a simple, phase-based maturity model
- Selecting a model from a company that is not selling SOA solutions is an important factor in your decision matrix

Select IBM's *Service Oriented Integration Maturity Model* if:

- You want a model that focuses on the progression of your enterprise technology layers
- You want a more detailed approach to maturing your SOA
- Going with "Big Blue" is an important consideration for your organization

Select Progress-Sonic's *Service Oriented Architecture Maturity Model* if:

- An explicit mapping to CMMI is important to your organization
- You want a model that clearly defines organizational benefits as well as success factors, goals, and practices associated with each maturity level
- Selecting a model developed by a consortium of vendors is an important consideration for your organization

You may decide that you need to develop a custom maturity model for your enterprise's SOA initiative. A custom model may be a tailored version of one of the three models outlined above, a hybrid blend between two or more models, or a completely new model. It is important

that you document, communicate, and effectively train your organization to understand and successfully apply whatever maturity model you select.

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Applying a Method to your SOA Maturity Madness

SOA adoption is a complex process with far-reaching impacts throughout the enterprise. While there are dozens of SOA maturity models that have been defined and applied around the world, three of those models lead the pack. Each model provides a tiered, progressive, approach to SOA maturity with varying degrees of emphasis on business and technology subjects. In the end, you need to select a maturity model that is right for your needs, tailor it if necessary, and then communicate and champion it throughout your organization.

Bio

Kyle Gabhart is a subject matter expert specializing in Service-Oriented technologies and currently serves as the SOA Lead for [Web Age Solutions](#), a premier provider of technology education and mentoring. Since 2001 he has contributed extensively to the SOA community as an author, speaker, consultant, and open source contributor. He maintains an SOA blog at [SOAmatters.com](#). You can reach him by email at kgabhart@webagesolutions.com.