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SOA Maturity Model - Guiding and Accelerating SOA Success

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Executive Overview

Service-Oriented Architecture (SOA) is not just another product or technology to be added to the IT environment. Rather, SOA requires significant and often fairly far-reaching changes to truly reap all the benefits of adopting SOA. To successfully adopt SOA, a company must create a plan that addresses the full extent of the changes required for SOA.

For the past eight years Oracle has been working with a wide variety of companies that are in various stages of SOA adoption. This experience has been captured in the Oracle SOA Maturity Model such that this collective experience can be used to measure the progress of an SOA initiative and, more importantly, can identify specific capabilities that are lacking or lagging and are therefore inhibiting the SOA initiative. A remediation approach for each of the identified inhibitors can be determined from industry best practices and prior experiences. These remedies can then be prioritized and used to create a plan, called the SOA Roadmap, to put the SOA initiative back on track.

Having an SOA Roadmap based on a comprehensive SOA Maturity Model that is constructed using a proven approach and is based on years of collected experience and best practices accelerates the SOA adoption and dramatically reduces the risks associated with the transformation that SOA requires.

Introduction

This paper describes the Oracle SOA Maturity Model and how the model is used to accelerate SOA adoption by identifying specific capabilities that are either completely lacking or which are lagging with respect to the other capabilities necessary for successful SOA adoption.

SOA Maturity Model

The SOA Maturity Model defines the following key concepts: capabilities, domains, maturity, and adoption.

Capabilities and Domains

The SOA Maturity Model includes over ninety **capabilities** that capture the best practices that Oracle has collected over many years working with a wide variety of companies. These

capabilities provide the detail necessary to truly measure and guide the progress of an SOA initiative.

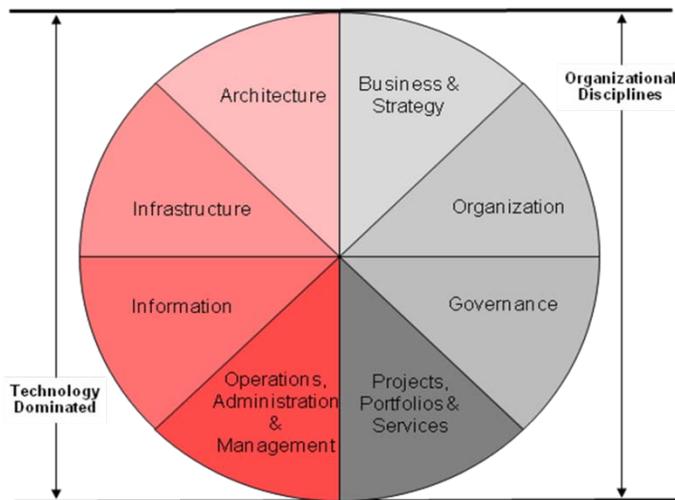


Figure 1: SOA Maturity Model Domains

The SOA Maturity Model uses the concept of **domains** to classify and organize the related capabilities. As depicted in Figure 1, there are eight domains in the maturity model:

Business & Strategy - Contains capabilities that provide the high-level constructs that allow the SOA initiative to proceed. This includes such things as business motivation, expected benefits, guiding principles, expected costs, funding model, etc.

Architecture – Contains capabilities concerning the definitions of the overall architecture and guidelines for various practitioners to ensure adherence to the architecture.

Infrastructure – Contains capabilities concerning the service infrastructure and tools that provide the technical foundation for the SOA initiative.

Information – Contains capabilities concerning the information aspects of SOA, e.g., providing Information as a Service (IaaS). This includes shared data models, message formats and schemas, master data management, content management, etc.

Projects, Portfolios & Services – Contains capabilities concerning the planning and building of services and the service usage guidelines of service consumers.

Operations, Administration & Management – Contains capabilities concerning the post deployment aspects of solutions based on a service-oriented architecture i.e. the operations, administration, and management aspects of SOA.

Organization – Contains capabilities concerning the development of corporate competency around SOA including the organizational structure and skills development.

Governance - Contains capabilities concerning the governance structures and processes that support and guide the SOA efforts. Maturity and adoption of an adequate amount of governance is a leading indicator of the overall SOA success.

These eight domains, although interrelated, are sufficiently distinct. To succeed at SOA adoption, an organization must adequate progress in all of these domains. Inevitably an organization will be more advanced in some domains (and further in some of the capabilities within a domain) than others. Therefore, it is important to be able to measure the relative maturity within each domain (and capabilities therein) and across domains to identify areas that are lagging. Once the lagging areas have been identified it is possible to formulate remedies and thereby improve the success of the overall SOA initiative.

For example, an organization might have a Reference Architecture that was widely disseminated, had been reviewed and accepted broadly, but lacked significant elements (e.g. service versioning strategy) required to provide a complete architectural vision for SOA. Both having Reference Architecture and a service versioning strategy are best practices and both are therefore captured in the SOA Maturity Model as capabilities.

For each capability included in the model, a description for each level of maturity and level of adoption is provided. Although there is always some level of subjectivity when measuring capability, these descriptions minimize the subjectivity injected, and thereby provide, as best as possible, an objective measure of both maturity and adoption.

There is still considerable debate on what constitutes SOA best practices (e.g. REST versus Web services); therefore, the SOA Maturity Model remains technology, standards, and product agnostic while still capturing the major tenants of a complete SOA strategy.

Additional capabilities are added as more best practices emerge and when new associated technologies gain prominence. For example, cloud computing and mobile computing have

both become prevalent in the last few years; therefore a complete SOA approach needs to account for them. Thus, new capabilities covering cloud and mobile have been added to the SOA Maturity Model. The details of the SOA Maturity Model will continue to evolve as more experience with SOA is gained. This allows the specifics to morph and improve as industry and Oracle knowledge of SOA advance.

Maturity

Within the software industry, maturity is frequently related to the Capability Maturity Model (CMM) and the CMM successor, the Capability Maturity Model Integration (CMMI). The SOA Maturity Model parallels this understanding and measures SOA capability against defined maturity levels. The levels of maturity used in the SOA Maturity Model (from highest to lowest) are:

Optimized – Metrics are being consistently gathered and are being used to incrementally improve the capability. Assets are proactively maintained to ensure relevancy and correctness.

Managed – The capability is being measured and quantitatively managed via some type of governance structure. Appropriate metrics are being gathered and reported.

Systematic – The approach has been reviewed and accepted by affected parties. There has been buy-in to the documented approach and the approach is always (or nearly always) followed.

Opportunistic – An approach has been decided upon and is being opportunistically applied. The approach has not been widely accepted nor adopted. It may be informally defined, or if documented, may exist primarily as “shelf ware”.

Ad Hoc – Awareness of SOA exists and some groups are embarking on building services. There is no SOA plan being followed.

No SOA - There is no SOA approach being taken. SOA is not underway.

The maturity levels progress from ‘No SOA’ up to ‘Optimized.’ These levels define the path an organization usually takes moving toward SOA maturity. SOA by its very nature requires coordination, cooperation, and a common vision to be successful; therefore, it is necessary to

define the strategy before it is possible to be truly successful at repeating it and then ultimately optimizing it.

Adoption

Adoption measures how widely SOA is being accepted, embraced, and applied within the enterprise. For smaller organizations within a single line-of-business, maturity and adoption are usually tightly related since there is a single approach to SOA being followed by the entire organization.

However, within large companies with multiple divisions or lines-of-business this is not usually the case. It is common to have one or more divisions that are relatively mature in SOA while other divisions are not even attempting SOA. The SOA Maturity Model handles these situations by providing a separate measure for adoption level. This allows a single division to be effectively evaluated for SOA maturity while still capturing the lack of widespread adoption as a separate measure.

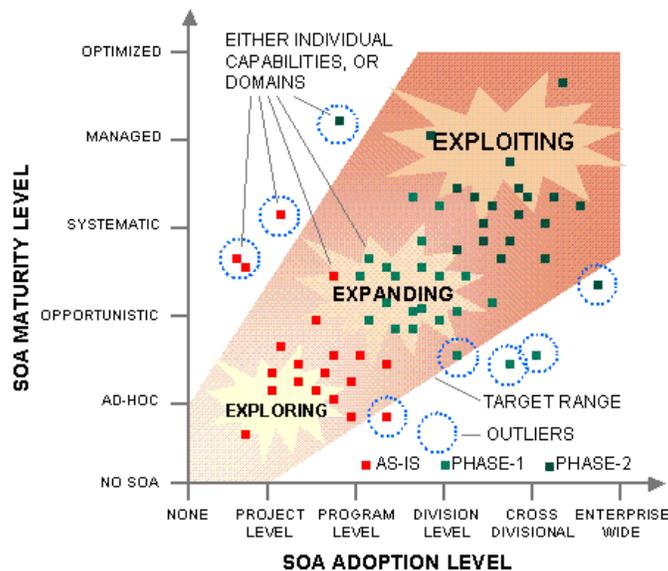


Figure 2: SOA Maturity Model – Measures both maturity and adoption levels

For small organizations, it may be desirable to ignore the adoption dimension altogether and simply measure maturity. Conversely, for very large organizations with a goal to achieving a broad SOA adoption, it may be desirable to measure the maturity for each division or line-of-business separately and then provide a single measure of adoption across the enterprise. It should be noted, however, that for the realization of many of the key SOA benefits, some level of adoption across the organization is critical.

The levels of adoption used in the SOA Maturity Model are:

Enterprise Level – The capability is implemented consistently across the enterprise i.e. all divisions or business units are applying the same approach.

Cross Division – The capability is implemented by multiple divisions using a common approach i.e. the approach is being shared or is spreading to multiple divisions.

Division Wide - The capability is implemented consistently across a division or business unit. A division or business unit is led by an executive at the VP level or higher.

Program Level - A relatively small group of projects (program) share an implementation of the capability. The program is under a single management structure below the VP level and encompasses less than an entire division or business unit.

Project Level - Individual projects implement the capability as appropriate for that specific project. There may be informal and unregulated sharing across projects.

No Implementation - There is no current implementation anywhere in the organization of the capability being measured.

In order to properly measure the overall progress of SOA initiative in a large organization, the maturity of the individual capabilities **and** the degree of adoption of such capabilities across the organization is vital. At this time, this approach is unique to the Oracle SOA Maturity Model.

Maturity and adoption levels for some or all of the capabilities or for the domains can be plotted as shown in Figure 2.

Applying the SOA Maturity Model

A detailed assessment of an organization requires interviews of a variety of roles within the organization including executives, enterprise architects, developers, project and program management, operations, etc. The assessor then uses the details of the SOA Maturity Model to assign levels of maturity and adoption for each capability. These scores can then be presented in a variety of forms depending on the audience and the amount of detail desired.

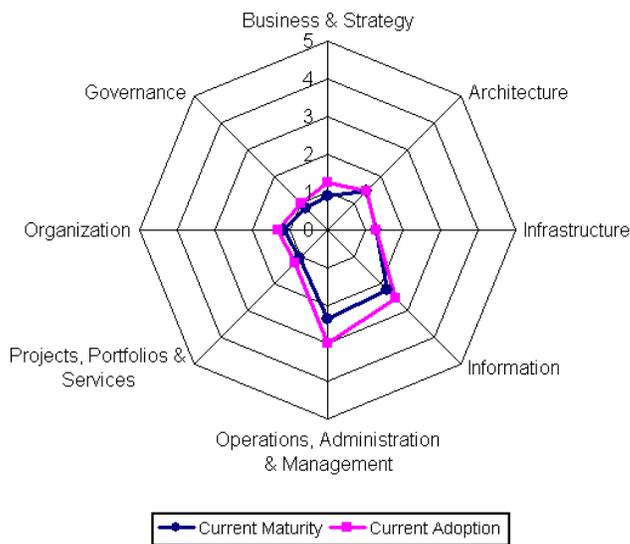


Figure 3: Spider Graph of Maturity and Adoption

For example, a spider chart (Figure 3) can be created by averaging the maturity and adoption scores for the capabilities within each domain. This type of graph provides a high-level view of the overall maturity and adoption for the organization and can be used to highlight domains that are lagging with respect to the other domains.

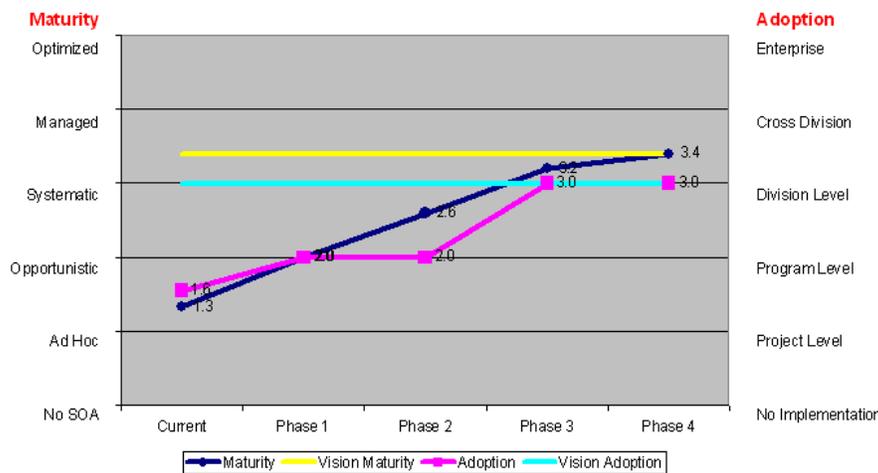


Figure 4: Maturity and Adoption Over Time

The assessed values can also be used when defining a phased approach to improving the SOA initiative. A key input to the phased approach is the level of maturity and adoption that the organization needs to achieve in order to meet the goals of the SOA initiative. This level of maturity and adoption is called the 'vision' for the SOA initiative. Figure 4 shows how the vision can be achieved over a multi-phase roadmap.

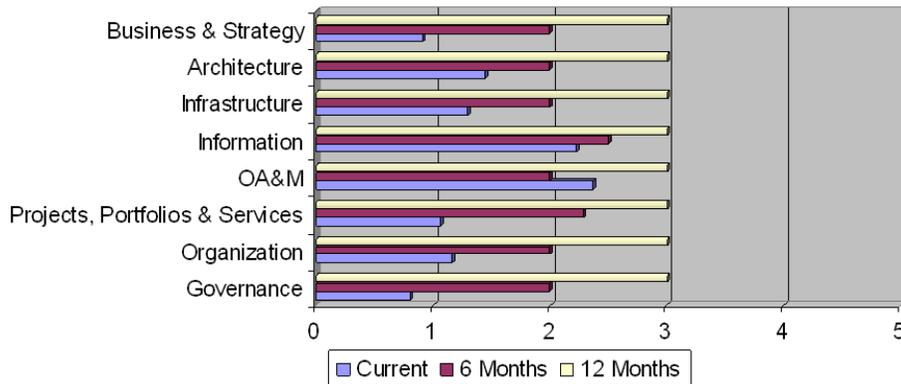


Figure 5: SOA Roadmap Phases

The bar chart in Figure 5 illustrates how maturity will improve based on two phases of the SOA Roadmap. It shows which domains are lagging and shows that these domains will receive the most attention in the first two phases of the roadmap.

This level of detail is appropriate for an executive, but for the SOA program manager, much finer detail is needed so that an actual plan for improving SOA capabilities can be created. One such detailed graphic is the SOA capability heat map as shown in Figure 6.

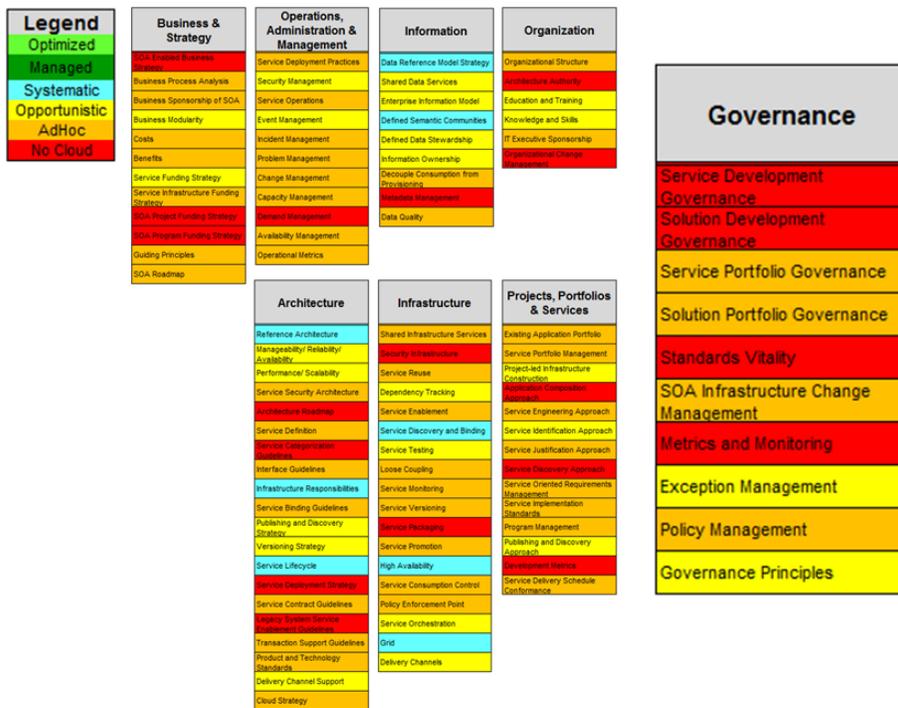


Figure 6: SOA Capability Heat Map (domain Governance highlighted for illustration)

The graphic in Figure 6 illustrates the maturity via color coding for each capability e.g. the red colored capabilities have a maturity level of 'No SOA'. For example, the above graph shows that within the Governance domain, there is no capability for governance of service development. Clearly this is then an area that requires improvement and that improvement plan becomes part of the SOA Roadmap.

Plotting maturity versus adoption can also illustrate some capabilities of interests as shown in Figure 7. This graph plots the maturity and adoption for all of the capabilities on a single scatter plot.

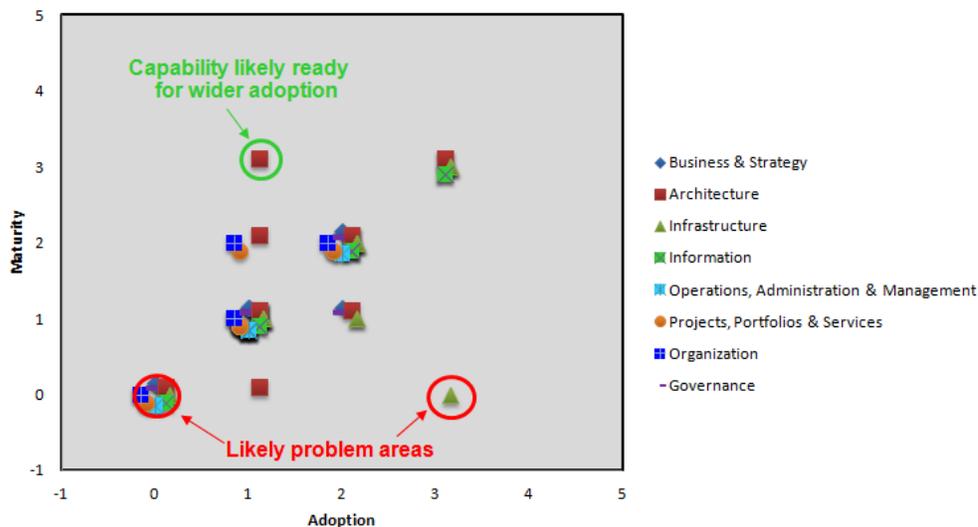


Figure 7: SOA Capability Scatter Plot

Of particular interest are the outlier scores since these tend to be either areas requiring improvement (closer to either axis) or areas showing excellence (farther away from the origin). For example, a score with high adoption value and low maturity may indicate a wide usage of a poor practice (with its potential negative effects) while a score with high maturity and low adoption values may indicate an opportunity to spread a well-understood best practice that could be embraced by more organizational units fairly quickly i.e. an easy win.

The graphs described are only a representative sample of the types of graphs that can be created to analyze and present the SOA capability scores. The real value is not in the graphs *per se*, but rather the detailed, accurate, complete measurement of the progress of the SOA initiative which can be used in a variety of ways to improve the success of the SOA initiative.

Conclusion

SOA can reduce integration cost, increase asset reuse, increase business agility, and ease regulatory compliance. The synergy between cloud computing and SOA has been noted by a variety of industry pundits; therefore organizations interested in cloud computing will gain significant benefits from a mature SOA. Achieving these benefits requires a systematic, widespread, holistic, and proficient application of SOA best practices.

The Oracle SOA Maturity Model includes more than ninety capabilities that reflect industry and Oracle best practices. This provides the details necessary to accurately measure the progress of an SOA initiative. The measurement of the SOA implementation progress can be analyzed to find areas that need improvement. These areas can then be addressed by applying industry and Oracle best practices to increase the success of the SOA initiative and drive greater value for the organization.



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