Service-Oriented Architecture (SOA)

For <Project>
Version 1.0

<Date created>
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1. Service Oriented Architecture (SOA) Scope

1.1. This section would contain a description of the Service Oriented Architecture and its relationship, as well as impact, to the project. This section should provide the reader with a notion of what SOA intends to achieve.

1.2. Describe what areas of the enterprise are impacted by the architecture

2. Terms and Definitions

2.1. This section provides definitions of any terms that may be needed in order for the reader to understand the terminology used in the document. The author should define any acronym or technical term used in the document that may be unfamiliar to the reader, and it is best to err on the side of too many rather than too few definitions. This also allows the author to frame a word within a specific context, which provides the reader with a common understanding of the author’s definition.

3. SOA Layers

3.1. Orchestration Layer
   3.1.1. Business Processes
          <Describe the business processes which are composed of business and application services>

3.2. Business Service Layer
   3.2.1. Course-Grained Services
          <Describe the services that use applications services. These would be higher level services allowing the use of data types that are business-requirement specific and not dependent on a low level application.>

3.3. Application Service Layer
   3.3.1. Fine-Grained Services
          <Describe the granularity of the services closest to the implementation of the business logic within an application.>

3.4. Application Logic Layer
   3.4.1. Vendor and Platform Specific Details
          <Describe the implementation of a business task, for example calculation of Child Support Payments. An application, such as Oracle Financials will expose these functions as Application Programming Interface (API).>

3.5. Adapter Layer
   3.5.1. Application Programming Interface (API) of an Application as a Service
          <Describe the adaptors used in the applications services. For example describe how the business process would use a commercial off the shelf
product such as SAP or Oracle. If the application is customized, describe how it may function natively with the business process.

3.6. Data Storage Layer
3.6.1. RDMS, XML Repository, Flat Files
<Describe the application-specific databases, enterprise data warehouses, XML repositories, and any others that are relevant.>

4. SOA and User Interfaces
4.1. SOA User Interfaces
4.1.1. Higher Level Services
<Describe higher level services such as graphical user interfaces as relates to the business process or tasks.>
4.1.2. Portal Sites
<Describe the nature of the portal site and its aggregation of information or services from multiple applications.>
4.1.3. Web Sites
<Describe how a web page can invoke services and data aggregation, otherwise known as mash-up specified in Web 2.0 methodologies.>

5. SOA Registry Products
5.1. IBM WebSphere Service Registry and Repository
<Describe how this product will manage the state transition of the service as applicable to the describe architecture.>
5.2. Oracle SOA Registry
<Describe how this product will manage the state transition of the service as applicable to the describe architecture.>

6. SOA and the Enterprise Service Bus (ESB)
6.1. Integration
<Describe the integration capabilities relevant to the architecture.>
- Integration between different databases, EAI middleware, legacy applications, and application server environments such as J2EE and .NET.
- Protocol transformation when transferring data between multiple entities.
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- Service client invocation through client APIs for various languages (Java, C++, C#) and platforms (J2EE, Microsoft .NET), CORBA, and RMI.

6.2. Communications
<Describe the communications capabilities relevant to the architecture.>
- Routing capabilities between various communication technologies such as Web- and EAI-based technologies.
- Support for at least one messaging style (for example, request/response, or pub/sub).

6.3. Service Interaction
<Describe the various service interaction capabilities relevant to the architecture.>
- Support for SOA using interfaces and service operations.
- Support of implementation-independent service messaging and interface models.
- Support of the ability to allow service implementations to be substituted.

6.4. Management
<Describe the various management related capabilities relevant to the architecture.>
- Ability to manage and monitor ESB.
- Capability of integrating into systems management software.

7. SOA and Security

7.1. Authentication
<Describe how the architecture will address identity of users accessing the various systems. This can be knowledge based, key based, or biometric.>

7.2. Authorization
<Describe how the architecture will address what functions users are allowed to perform in the various systems. This can be defined as privileges or access level.>

7.3. Non-repudiation
<Describe how the architecture will address a sender of a message so as to be validated, preventing denial of the result of the process used to authenticate the data.>
7.4. **Confidentiality**  
<Describe how the architecture will protect sensitive information from unauthorized disclosure or intelligible interception. This should adhere to FIPS standards.>

7.5. **Security Standards**  
<Describe how the architecture will address existing industry standards to enforce security, which also may involve encryption technologies.>

8. **SOA Discussion and Conceptual Presentation**

8.1. This section provides the author with an opportunity to discuss the architecture and to set the stage for the specific concepts that comprise the architecture. Some of the information that could be included in this section is listed below.

8.2. **SOA Architecture Concepts**

8.2.1. Architecture concepts would be described in this section. This may include such items as what the architecture consists of.

8.3. **Requirements**

8.3.1. **A Description of the Desired SOA architecture**

A brief description of the expected deliverables to implement, or result from implementation of the architecture would be appropriate in this section.

8.3.1.1. **The Urgency Or Importance of the Architecture**

8.3.1.1.1. The author may choose to discuss the importance or urgency of the SOA, and what impact it may have when it is implemented, or if it is not implemented.

8.3.1.2. **Estimates Of Potential Increased Revenue, Avoidance of Cost Or Improved Service**

8.3.1.2.1. Estimates of potential increased revenue, avoidance of cost or improved service could be included, along with an explanation of the basis for estimates.

8.3.1.3. **Potential Sources for Solutions or Information**
8.3.1.3.1. The author may choose to describe and discuss selected sources for solutions, information, or guidance as appropriate to the implementation of the architecture. This may include such sources as vendors (products), knowledge sources, or other stakeholders.

8.3.1.4. A Description of the Obstacles that May Be Encountered in the Implementation of the architecture

8.3.1.4.1. This section allows the author to describe, or discuss in more detail, any known or suspected obstacles that may be encountered in the implementation of the architecture.

8.3.2. Cost Estimates

8.3.2.1. The information required in this subsection is a general discussion of the cost estimates for the implementation of the architecture, and a brief discussion of impact the funding may have on the project.

8.4. Architecture Section

8.4.1. This section of the document must describe the architecture, discuss the procedures that must be followed to create the architecture, and identify resources and constraints associated with the architecture. The following subparagraphs provide a description of the requirements for this section.

8.5. Architecture

8.5.1. This section describes the details of the architecture.

8.5.1.1. The details of the architecture must be identified to the reader in this section. Using diagrams and/or architecture structure notation is required.

8.5.1.2. A detailed narrative explanation of each aspect of the architecture would be appropriate. The author must provide enough information to convey a thorough understanding of the architecture to the reader.

8.6. Procedures
8.6.1.1. An overview and a detailed description of every procedure that must be followed in order to create the architecture must be provided in this section. The sequence of events appropriate to the architecture should be described, though it may be necessary and appropriate to refer to the project plan.

8.7. Resources

8.7.1. Resources

8.7.1.1. This section would contain details about the required human resources necessary to create the architecture, and the specific roles and responsibilities.

8.8. Risks/Constraints

8.8.1. Risks

8.8.1.1. This subsection is where the author would discuss any risks that are associated with the architecture and/or its implementation, and what has or should be done in order to mitigate those risks.

8.8.1.2. Constraints

8.8.1.2.1. This section may also discuss any constraints that may have impacted the architecture. Some of the known constraints that could be described are:

8.8.1.2.1.1. **Schedule Constraints** – if the system must be in place by a certain time, so the state can support new legislation, etc…

8.8.1.2.1.2. **Data Constraints** – If the system must interface with existing systems, or use an existing database, summarize the fact here.

8.8.1.2.1.3. **Hardware Constraints** – If the system must run on certain hardware, so state.

8.8.1.2.1.4. **Software Constraints** – If the system must run under a certain operating system, database management
system, or communications monitor, or must be written in a certain programming language, or must adapt to a certain package, so state.

8.8.1.2.1.5. Organizational Constraints – If it is necessary to give facts about the number or type of people who must operate the system, policies, practices, geographical locations, so state.

8.8.1.2.1.6. Security Constraints – If there are any known security considerations for the architecture.

8.8.1.2.1.7. Monetary Constraints – If there were any monetary constraints that may impact the architecture, they should be addressed.

8.8.1.2.1.8. Resource Constraints – If there were any resource constraints that may have impacted the architecture, they should be addressed.

8.8.1.2.1.9. Political Constraints – Addressing political constraints impacting the architecture that may be difficult because these constraints are often very sensitive issues. Whenever possible, the political climate that could have had an impact on application of the architecture should be described.

9. Tables

9.1. This section would contain any tables of information that would be useful to the reader from an explanatory or historical perspective.
9.2. Any table should have a heading with 'Table # ' (where # is the table number), followed by the title for the heading that describes concisely what is contained in the table.

9.3. Each table should be placed on a separate page.

9.4. In the text there should be a reference to each Table in this section.

9.5. The table(s) must be correctly formatted and accurately and concisely convey the necessary information.

10. Figures

10.1. This section would contain any figures or drawings that would be useful to the reader from an explanatory or historical perspective.

10.2. Any figure should have a heading with Figure # ' (where # is the figure number), followed by the title for the heading that describes concisely what is contained in the figure.

10.3. Figures must be drawn on separate page.

10.4. There should be a reference to each figure in this section, in the text of the architecture document.

10.5. The figure(s) must clearly describe(s) a relevant aspect of the architecture.

11. Appendices

11.1. Appendices should be used only when absolutely necessary. Generally, appendices are used for presentation of extensively detailed descriptions of a process that may be unnecessary in the body of the architecture document.

11.2. If appendices are included, they should describe the relevant material discussed in previous section(s) of the architecture documentation referencing the appropriate appendix (i.e., 'see Appendix A').

11.3. Appendices should begin on a separate page, immediately following the Figures and Tables sections, and before the References section.

12. Reference Section

12.1. All references that are pertinent to the architecture document must be listed in this section. The section should begin on a new page, and contain the heading ‘References’ in a bold font. The following subparagraphs provide some guidelines for the format of this section. It is unethical to utilize the ideas and/or content from other sources without giving proper credit.

12.1.1. References
12.1.1. All citations appropriate for the subject architecture document must be formatted correctly. There are two parts to a reference citation. The first is the item is cited in the text when it is discussed. The second is the way the complete reference in the reference section is listed. Both are described below.

12.1.2. **Reference Citations (in the text of the architecture document)**

12.1.2.1. Cited references that appear in the text of a document are a way of giving credit to the source of the information or quote that is used in the document. They generally consist of the following bits of information:

12.1.2.1.1. The author's last name, unless first initials are needed to distinguish between two authors with the same last name.

12.1.2.1.2. If there are six or more authors, the first author is listed followed by the term, et al., and then the year of the publication is given in parenthesis.

12.1.2.1.3. Page numbers are given with a quotation or when only a specific part of a source was used.

12.1.3. **Reference List**

12.1.3.1. The References should list all the articles, books, and other sources used in the preparation of the document and cited with a parenthetical (textual) citation in the text. These items should be listed in alphabetical order according to the authors' last names; if a source does not have an author, alphabetize according to the first word of the title, disregarding the articles "a", "an", and "the" if they are the first word in the title.