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The National Consortium for Justice Information and Statistics

Global Reference Architecture Service Specification Development Workshops: A Primer for Facilitators

By James Douglas
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Purpose

The purpose of this *Technical Brief* is to provide meeting facilitators a best practice approach to service specification development using the Global Reference Architecture (GRA) based on the experience, expertise, and lessons learned from the Global Services Task Team (STT).¹ Facilitators must have knowledge of GRA concepts, specifically regarding service design and the service specifications.

The Global STT was created by the U.S. Department of Justice (DOJ) Bureau of Justice Assistance at the recommendation of DOJ's Global Advisory Committee (Global)² to define and document the process for developing service specifications. Global has prepared two resource documents to provide standards and a methodology for developing service specifications:

- *The Global Reference Architecture Service Specification Package, Working Draft v1.0.0* describes the contents and structure of a Service Specification Package (SSP).³ An SSP is a structured package of documents, diagrams, models, and templates that provides both a business description and a technical implementation description of the service. SSPs incorporate open standards and technology best practices for information sharing.

¹ The U.S. Department of Justice, Bureau of Justice Assistance, in consultation with the DOJ's Global Justice Information Sharing Initiative, formed the Services Task Team in 2009, consisting of representatives from government and private industry, whose mission was to assist justice practitioners in identifying and designing a set of GRA *Reference Services* to advance justice information sharing nationwide. For GRA background, see <http://it.ojp.gov/default.aspx?area=nationalInitiatives&page=1015> and a SEARCH podcast at <http://it.ojp.gov/documents/Search-JRA-Podcast.mp3>. The author of this *Technical Brief* is Chair of the STT.

² See <http://it.ojp.gov/default.aspx?area=globalJustice&page=1019>

³ This package is available for download at <http://it.ojp.gov/docdownloader.aspx?ddid=1217>

- A companion document, *The Global Reference Architecture Service Specification Guidelines, Working Draft V 1.0.0*, provides authoritative guidance on how to construct and implement an SSP.⁴

This *Brief* focuses on the steps within the SSP development methodology that involve interactions with subject matter experts (SMEs) and provides a step-by-step guide to working with SMEs to gather the business information needed to develop a service specification. This *Brief* also includes background information and suggestions to facilitate a service specification development workshop.

The key to successfully identifying requirements and designing services is to involve a representative group of potential service consumers and providers. The methodology outlined in this document has been tested in a workgroup setting involving both business practitioners (SMEs) and technologists. SMEs participated in this process both through on-site workgroups and off-site conference calls, providing the crucial business knowledge required to develop accurate and complete service specifications.

Based on the experience of the STT, the following suggestions, guidance, and lessons learned are offered as a practical approach to successfully identifying and documenting service requirements.

Developing Service Specifications

The overall outcome of the service identification and design process is to develop service specifications to support information exchange between justice partners. A **service specification** is a “blueprint” that allows business analysts to specify and document the business requirements of a service, and provides technical analysts with the technical details required to implement the service in practice.

It is important to note that the goal of the Global Services Task Team was to develop **Reference Service Specifications**: These are considered service specifications that meet the majority of service requirements for a typical exchange implemented across the country, but may require additional modification to satisfy specific policies and requirements within a real-world service implementation. Reference Service Specifications are intended to be used by justice practitioners nationwide to accelerate their own service specification development process. As such, the goal of each reference specification is to address most, but not all, requirements—and the “80/20” rule is followed, wherein 80 percent of what all agencies require will be provided, with the understanding that the remaining 20 percent would be customized locally.⁵

Business Requirements Workshop

A key step in the service specification development process is to accurately capture the business requirements associated with the exchange(s). The most effective way to do this is to meet face-to-face with SMEs in a workshop setting where they can focus on this task.

The overall goal of the workshop is to capture as much business process information as possible from the SMEs with the intent of distilling the information later into a service specification. The

⁴ This version was released December 2011. It is available for download at <http://it.ojp.gov/docdownloader.aspx?ddid=1215>

⁵ The Global site provides reference service specification packages: <http://it.ojp.gov/default.aspx?area=nationalInitiatives&page=1015#RefSSPs>

role of the workshop facilitator (technical analyst) is to guide the SMEs by leading business discussions that provide the facilitator with the information and requirements necessary to develop a service specification. The goal of the facilitator is to learn and document *what* practitioners do and to a more limited degree, *how* they do it as it relates to information exchange and processing.

When preparing for a workshop, facilitators must arrive with the following preliminary models and/or documents, which participants will review and modify based on meeting discussions:

- Capability model
- Service overview (description, purpose, scope)
- Business scenarios (including information flow diagrams)
- Service interaction models
- Information models (high-level documentation)
- Service interoperability requirements

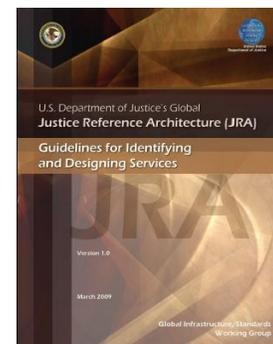
The following sections of this *Brief* address how to develop each of these models and/or documents.

Capability Model

Examine Drivers and Objectives – The first step in the service identification and design process is to define the scope or “focus area” to be addressed. To determine scope, examine business drivers and associated objectives within the larger scheme of overall business information sharing goals. Questions such as “What are the specific pain points or areas where things could be made more efficient through the exchange of information?” can help crystallize the scope of the problem. Typically, the focus area (e.g., warrants, booking) is determined prior to the workshop. This knowledge allows the facilitator to build the preliminary models mentioned above. Final models should confirm the identification of potential services and associated exchanges that address the business drivers and objectives. Identifying drivers and objectives, in turn, helps identify capabilities.

Identify/Prioritize Capabilities – Core to the service identification and design process, which is outlined in the Global document *Guidelines for Identifying and Designing Services, Version 1.0*,⁶ is to identify and prioritize capabilities.

From the GRA perspective, a capability represents “*An activity performed by a consumer or provider yielding a result of measurable value [real-world effect] to one or both.*” A service, therefore, is the means by which one partner (consumer or provider) gains access to a capability offered by another partner.



⁶ U.S. Department of Justice, Global Infrastructure/Standards Working Group, March 2009. Available for download at <http://www.it.ojp.gov/docdownloader.aspx?ddid=1070>

The GRA specifically focuses on identifying those capabilities that require intersystem or computer-to-computer communications and exchanges. Typically, these capabilities are outward-facing and cross either internal or external organizational or governance boundaries and are associated with the exchange of information either directly or through an application. Ultimately, these capabilities will manifest themselves as service candidates for design and implementation.

A key benefit in focusing on business capabilities is that while organizational structures and business processes are *transient*, the essential capabilities and requirements of businesses tend to remain *constant* over time. A business capability abstracts the people, processes, and procedures associated with a given business function. The decomposition of the business into capabilities provides the decoupling of business activities from these processes and procedures to identify the underlying services (service contracts) that will be implemented through service specifications.

Model Capabilities — Capability modeling helps identify *what* a business does. It is not concerned with *how* the business is performed (e.g., business process model). A capability model illustrates external visible behavior (outcomes) as real-world effects (RWEs) associated with capabilities. Ultimately, these capabilities are exposed as services based on service-oriented architecture (SOA) concepts.

The capability model captures the capabilities that a line of business should have in order to achieve and fulfill the business drivers through information exchange. The capability modeling process includes the following steps:

1. Determine business drivers and objectives.
2. Define a focus area (business function) in which to identify specific capabilities.
3. Identify capabilities.
4. Prioritize the identified capabilities.
5. Select priority capabilities as service candidates for further review and analysis.

Identifying and modeling business capabilities is typically performed through a **Business Capabilities Analysis**, also referred to as a “Business Functional Decomposition.” The business functional decomposition process results in a hierarchical model of the **business functions**, **capabilities**, and **real-world effects**, as illustrated in figure 1.

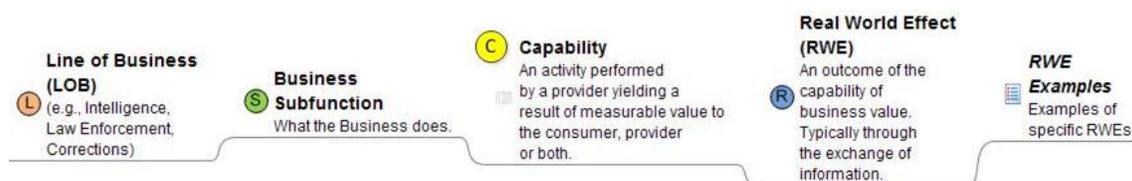


Figure 1: Capability model components and definitions

Note that the capability model includes real-world effects associated with specific capabilities (figure 2). A number of RWEs can be associated with a single capability. Typically, these RWEs are an exchange of information and will be associated with service actions during service development. The facilitator must lead the practitioner discussion when building or revising a capability model and help choose those capabilities deemed “priority candidates” within the pre-determined focus area.

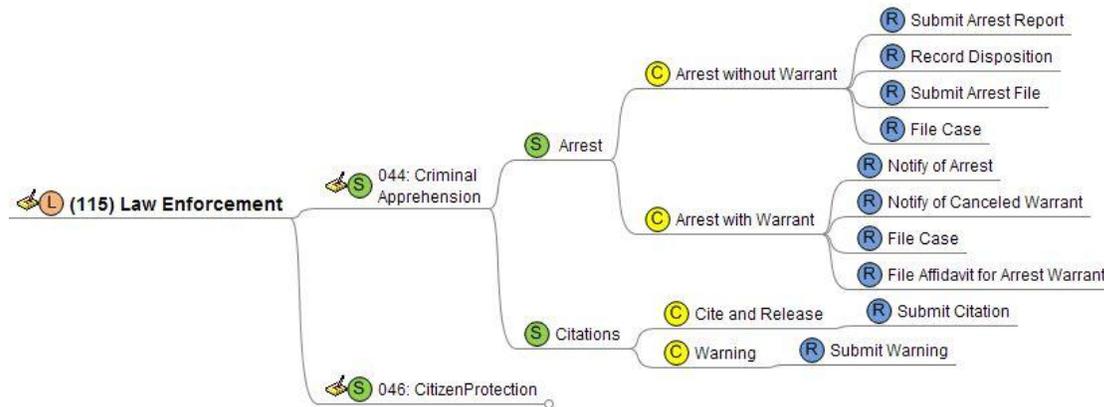


Figure 2: Example - Capability model branch (law enforcement)

In advance of the workshop, facilitators should prepare a preliminary/draft capability model that depicts an initial representation of the capabilities associated with the previously identified focus area. To develop a capability model, simply use a spreadsheet or a hierarchical modeling tool such as FreeMind.⁷

Service Overview

Define Service Overview Components – Based on the business focus area and a list of priority capabilities, the facilitator will lead the workshop discussion to define the initial description, purpose, and scope of the service(s) to be designed. Defining the scope at this stage of the process provides a framework for further discussion and modeling of business scenarios and information flows associated with the priority capabilities and RWEs. When working on scope, defining what *is not* in scope is often just as important as defining what *is* in scope.

Business Scenarios

Document Business Scenarios – The facilitator must develop process flow diagrams based on the service overview and priority capabilities. These diagrams should not identify specific services; rather, they should capture the business scenarios and processes through primary and alternative flows associated with the exchange of information.

The process flow diagrams (figure 3) depict business activities, events, and the exchange of information across business boundaries. The information exchanges identified in the flow diagrams will ultimately become the messages associated with specific “actions” in the service specification. The workgroup needs to create and review these process flow diagrams prior to moving to the next step, **Service Interaction Modeling**.

⁷ See http://freemind.sourceforge.net/wiki/index.php/Main_Page

Facilitators will be able to identify and develop specific services based on the models developed at the workshop. Keep all workshop discussions at a business/information exchange level.

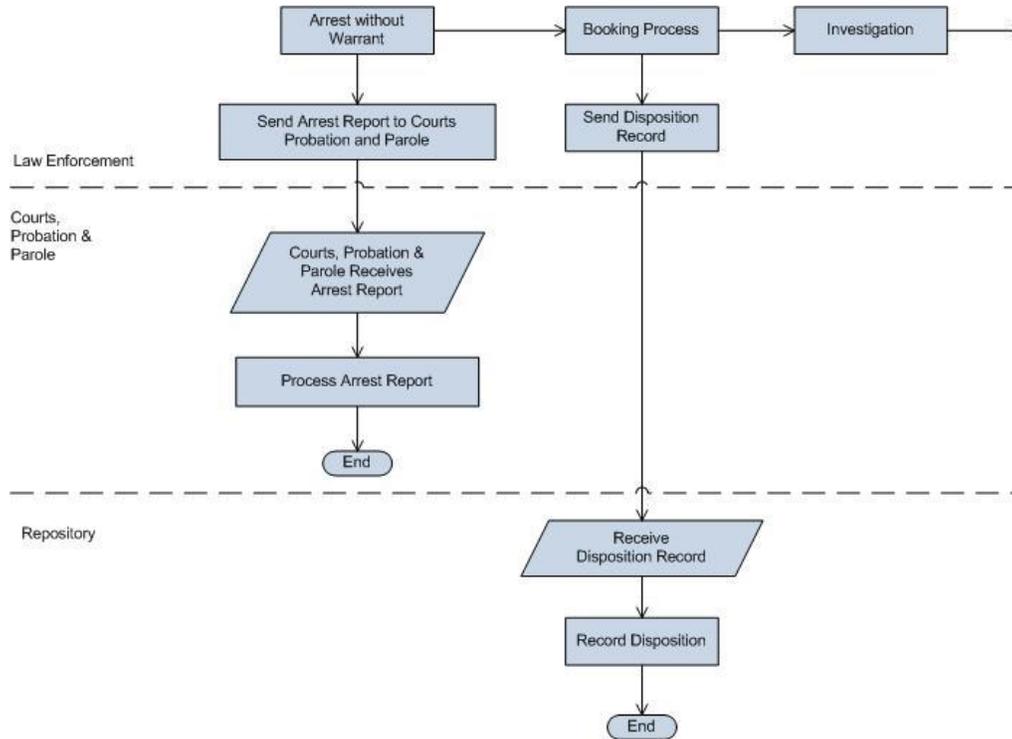


Figure 3: Process flow diagrams

Service Interaction Models

Illustrate Service Interactions – Service interaction models illustrate the service interactions (exchanges) between information consumers and providers. Service interaction modeling allows workshop participants to develop a detailed analysis of potential services. This modeling is typically based on the business process flow diagrams and is developed using Business Process Modeling Notation (BPMN).⁸ BPMN is flow chart-based notation for modeling interactions through information exchanges. SMEs assist the facilitator in validating the service interaction models.

An important step in confirming or validating service candidates is to analyze the interaction between various lines-of-business through information exchanges. This step allows the service candidates to be evaluated from an *exchange-centric* perspective. Figure 4 illustrates an example of a service interaction diagram for the “Arrest without Warrant” capability previously shown in figures 2 and 3.

⁸ See <http://en.wikipedia.org/wiki/BPMN>

In the BPMN diagram, it is important to use the following conventions based on BPMN notation:

- Lines-of-business or consumers/providers are represented by the shaded **pools**.
- Service actions are represented by **message events**.
- Service messages are represented by **message flows**.

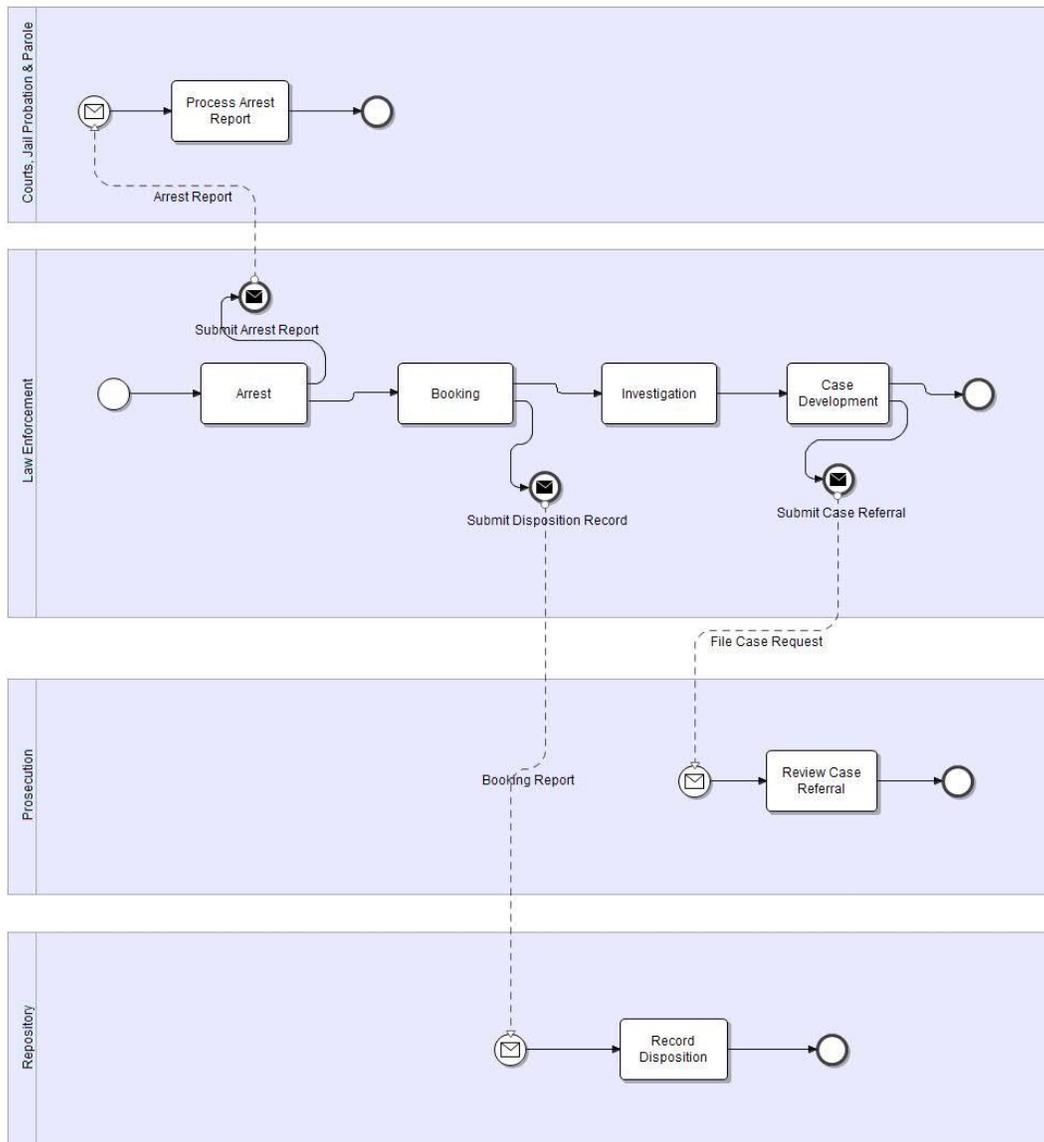


Figure 4: Service interaction diagram (Arrest without warrant)

Information Models

Identify Content of Messages – Where service interaction models illustrate those actions or RWEs associated with priority capabilities, information models identify the *content* of the messages associated with the actions. The facilitator must walk the workgroup through the process of identifying specific message information objects (e.g., Person) and associated elements (e.g., Name, Address) for each exchange identified in the service interaction (BPMN) diagram using high-level tools such as a spreadsheet, FreeMind, or other tool.

Equally important to identifying the element name is defining the element or object. Often in cross-domain environments, specific terms like “case” have different meanings, and it is important to capture these distinctions while working with the practitioners. The facilitator should also capture specific information content and format requirements, if applicable. In many circumstances, existing information models (class diagrams or spreadsheets) from previously developed National Information Exchange Model (NIEM) Information Exchange Package Documentation (IEPD)⁹ provide a good draft model to work from when discussing the information model for any given exchange. Ultimately, the facilitator will transform the high-level representation of the information model(s) developed during the workgroup session into a detailed specification.

Service Interoperability Requirements

Discuss Interoperability Requirements Prior to Service Design – As previously mentioned, the discussions in the workshop should focus on the exchanges of information between lines of business. The facilitator will use the models developed during the workshop to begin to formulate specific services based on the GRA principles associated with service design. However, it is important to discuss specific interoperability requirements associated with the exchanges between a consumer and provider prior to service design. Interoperability requirements to be discussed during the workshop in the context of those information exchanges identified in the BPMN diagram are as follows:

- Policies and contracts.
- Security requirements.
- Privacy requirements.

Lessons Learned

Based on the experience of the STT, the following lessons learned are offered as ways to improve the effectiveness of the SME workshop and capture accurate requirements, which are critical to the successful development of service specifications.

1. **Be prepared in advance of the workshop.** The facilitator must develop draft models and documents in advance of the workshop for each task outlined in this document. Share the models with the workgroup prior to the workshop. These models provide initial thoughts and discussion starting points for the workgroup.
2. **Describe the service specification development process, including those tasks to be addressed both during and after the workshop.** The workshop provides the business information necessary for the facilitator (technical analyst) to develop both the business and technical artifacts of a service specification.
3. **Keep technical discussion at a minimum.** The majority of the technical work will be done *after* the workshop. Make the best use of SME time and effort by remaining focused on business-level issues and desired outcomes based on potential information sharing solutions.

⁹ For information, see the NIEM website, <https://www.niem.gov/Pages/default.aspx>, and the NIEM IEPD Clearinghouse website, <http://it.ojp.gov/framesets/iepd-clearinghouse-noClose.htm>

4. **Avoid “scope creep.”** Keep discussions on point to the task at hand. When the conversations begin to wander out-of-scope, bring it back to the appropriate topic.
5. **Listen.** The facilitator will learn a lot about the business during the workshop beyond the specific tasks outlined in this document. Much of what is learned will be directly or indirectly incorporated into the service specification as narrative, notes, etc.
6. **Team up.** Two meeting facilitators should conduct the workshop and split the load. While one is facilitating a session, the other should take notes, edit models based on the discussion, etc.
7. **Expect a Service Specification Development Workshop to take 1½ to 2 days.** For a typical SME, this represents a major time commitment; therefore, the time invested must be used wisely and the facilitator must ensure that the value proposition of the workshop is made clear.

Conclusion

Global has developed useful Global Reference Architecture resources for service design and service specification development:

- *Guidelines for Identifying and Designing Services v1.0*¹⁰ provide a detailed methodology for service design, as outlined in this *Technical Brief*.
- These two resources provide a standard for developing service specifications; they provide a design methodology, as well as define what a service specification contains and how to develop a specification:
 - *The Global Reference Architecture Service Specification Package, Working Draft v1.0.0*¹¹
 - *The Global Reference Architecture Service Specification Guidelines, Working Draft V 1.0.0*¹²

The purpose of this *Technical Brief* has been to share the lessons learned and best practices available to facilitators who wish to leverage these tools to develop information sharing services using the GRA. This information is based on the application of GRA methodologies in practice during real workgroup settings. Following this approach, the business stakeholders will ensure that technology investments are fully meeting their needs, and technical implementers will have the knowledge, tools, and techniques needed to deliver effective information sharing solutions.

¹⁰ Available for download at <http://www.it.ojp.gov/docdownloader.aspx?ddid=1070>

¹¹ Available for download at <http://it.ojp.gov/docdownloader.aspx?ddid=1217>

¹² Available for download at <http://it.ojp.gov/docdownloader.aspx?ddid=1215>

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Captain Thomas W. Turner
Chairman

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Executive Director

Scott M. Came
Deputy Executive Director

SEARCH
7311 Greenhaven Drive, Suite 270 • Sacramento, CA 95831
(916) 392-2550 • (916) 392-8440 (fax) • www.search.org