EasySOA: Service Design & Monitoring

Business Requirements Document

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</tr>
<tr>
<td>Authors</td>
<td>EasySOA partners: Inria / EasiFab, Bull, Nuxeo, Open Wide, Talend</td>
</tr>
<tr>
<td>Contributors</td>
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Appendixes

- refer to the ITIL French Web Site, http://www.itilfrance.com
1. Context

This document is produced on behalf of the EasySOA consortium, which collaborates at building the EasySOA Open Source platform, whose goals and results are shown at http://www.easysoa.org.

As shown in the Figure below, main goal of EasySOA is to add a light and agile layer around the “traditional” SOA middleware architecture.

This current Business Requirements document about the relationship between Service Design and Monitoring contributes to the overall EasySOA platform, focusing on one component of the EasySOA Integration outcome by describing the business-oriented point of view of this component.

This point of view is driven by the “Service” concept, as described in a former EasySOA's deliverable (refer to the Analysis and Design document about the EasySOA SOA Business Core Model), and particularly by the following key concepts defining a “Service”:

- a service is a logical representation of a repeatable activity that has a specified outcome. It is self-contained and is a “black box” to its consumers
- a service contract defines the terms, conditions, and interaction rules that interacting participants [service providers and consumers] must agree to (directly or indirectly). A service contract is binding on all participants in the interaction, including the service itself and the element that provides it for the particular interaction in question
- a service contract separates the concerns of how all parties agree to provide or use the service from how any party implements their role in that service – or from their internal
Specifically, the chosen business-oriented point of view will describe the SLA (Service Level Agreement) part of such a “Service Contract” and how the QoS (Quality of Service) Monitoring is required by business to be able to control Services and Service Contracts exposed within an Information System.

This document addresses the following items:

- the business context, and the expectations of any IT department, based on standard practices
- the business requirements as defined in the context of the EasySOA Integration component
- the specification of the EasySOA Integration Service Monitoring system
2. The Business Context

Nowadays, IT departments aim at enhancing the visibility and the quality of the services they are delivering to their users and clients, inside the enterprise and outside. In this context, service delivery is one among other IT activities, which is under deep evolvement, in particular to apply best practices related to business process management, e.g. those proposed by the ITIL standard for ITSM, IT Service Management (refer to http://www.itil-officialsite.com/home/home.aspx).

So, IT departments are becoming service providers, and are evolving to ever changing processes for Service Design (refer to http://www.itilfrance.com, the French Web Site related to ITIL).

Service Design relies on 5 main axis:

- design of service solutions: approach and processes to formalize how to provide services in terms of functional content, resources and required and future volumetric
- service management tools and systems: support to manage and control services throughout their lifecycle
- design of technology architectures, monitoring architectures and technology tools enabling service delivery, including SOA
- design of IT processes: support of IT activities for delivering services (design, transition, production, exploitation, enhancement of services)
- design of measurement and metrics systems, support of all the items enunciated here above

Particularly, Service Design needs to identify service internal requirements:

- the service itself
- the service components
- the relationships b/w service and components, and b/w the components themselves
- the measures and metrics necessary to control the achievement of service goals
- the regulatory and internal security levels

Among the processes necessary for Service Design, the Service Level management process has received particular attention for us. Key definitions related to this process are shown here under:

- SLA (Service Level Agreement): agreement b/w the service provider and one or many clients. Defines the service levels in terms of availability, capacity, security and continuity
- OLA (Operational Level Agreement): agreement b/w the service provider and its teams or functions. Defines the expected service levels related to technical services under responsibility of the related teams, in terms of availability, capacity, security and continuity (if any)
  - UC (Underpinning Contract): contract b/w the service provider and an external provider. Defines the expected service levels related to technical services, in terms of availability, capacity, security and continuity (if any)
This figure shows two main categories of services (as defined and managed in a Service Catalog):

- Business Service: client view of the service
- Technical Service: IT view of the service, as a support service, a hardware service, a software service, an application service, or a data service, with relationship to the business service. It's the core of the IT activities
An example of a service (for banking business) is shown hereunder.

![Diagram of business and technical services](http://www.itilfrance.com)

This example shows that an IT service is mainly composed as follows:

- a business service (e.g. “Service bancaire de base”), consumed by the client, relying on a business contract, involving business service level management
- one part of the business service is supported by the IT service delivered by the IT department (e.g. “Service de support e-banking”), consumed by the client as an IT business user, relying on an IT contract, involving IT service level management
- IT components, including applications, infrastructure, networks, XaaS platforms, messaging and security services, …

Our purpose is to specify and implement the Service Monitoring system, compliant with the business context as identified here above, and part of the EasySOA Integration component.
3. EasySOA Integration component: Service Monitoring business requirements

First, let's have a look and remind about our exemplary use case “Smart Travel”, chosen for our first developments and prototypes in the context of the EasySOA platform. “Smart Travel” is a candid and simple example of a system providing any US user with a “Book_Trip” service, helping him to get some local (French) typical proposals for his trip, according to some parameters keyed by the user about the trip he wants to do in France, such as the city to visit, the travel period, the related weather forecast, the related exchange rate (good or not), etc. The proposals as computed by the “Smart Travel” system will be delivered to the user, both in US and French language, thanks to the usage of a “Translation” service.

The following diagram shows the business process (under BPMN notation) to be implemented by the “Smart Travel” system, as follows:

- upper lane: “User”, “Book Trip” service
- middle lane: “Galaxy_System” provider system through an orchestration service, “Check Meteo”, “Get Exchange Rate”, “Translate” services, rule-based processing to compute the proposal
- lower lanes: “Meteo_System”, “Currency_System”, “Translation_System”, external systems providing the related services “Meteo_Service”, “Exchange_Rate_Service”, “Translation_Service”
The client contracts with the “Smart Travel” business service company for a “Book Trip” business service, according to a business contract, including the definition of legal terms related to the provider's duties and the consumer's duties, the description of the business service to be delivered, and the service-level agreement describing the different levels of the service to be delivered (Gold, Silver, Bronze) with the related pricing conditions.

To support the “Book Trip” business service, the “Smart Travel” company delivers the “Book Trip” IT business service, built, deployed and ran over the EasySOA platform. This business service needs other IT technical services and components:

- internal ones, such as “Check Meteo”, “Get Exchange Rate”, “Translate”, the business processing and the technical service orchestration components
- external ones, such as “Meteo Service”, “Exchange Rate Service”, “Translation Service”, provided by external providers (“Meteo_System”, “Currency_System”, “Translation_System”)

The “Book Trip” IT service is managed according to a business IT service contract, including the SLA described as follows:

- “Gold”: IT service maximum response time, within the service daily period from 9 am to 6 pm

[Diagram: Description of the “Smart Travel” system (at runtime)]
pm

• “Silver”: IT service maximum response time, within the service daily period from 7 am to 9 am, and from 6 pm to 9 pm
• “Bronze”: IT service maximum response time, within the service daily period from 9 pm to 6 am

The EasySOA Service Monitoring system will be built to meet the business requirements as illustrated here above:

• description of the model of the “Smart Travel” system, in terms of IT services and components composing the system, and in terms of SLA/OLA as agreed b/w all the parties involved. The model is designed, implemented and deployed thanks to the EasySOA Registry component
• specification, design and implementation of the Service Monitoring system, part of the EasySOA Integration component, to measure, monitor the quality of service delivered by the “Smart Travel” system, and control the service level of the “Smart Travel” system as agreed.
4. EasySOA Service Monitoring system: specification

The EasySOA Service Monitoring (SM) platform (see the overall description here under) supports to measure quality of services (in terms of response time, and the SOA infrastructure latency as well) and control services level agreements.

The main components of the EasySOA SM platform are shown in the figure here under, provided by the “Business Service Monitoring” actor, are the following ones “Probe_Service”, “BizEvt_Mgr”, “Model_Service”, “Alert_Mgr”, “KPI_Mgr” and are described here under.

Main features of the EasySOA SM system are as follows:

1. The service orchestration (see “Galaxy_System” actor) is ran over a SOA infrastructure. In the context of the EasySOA platform, this SOA infrastructure is based on the TALEND ESB

2. Throughout the service orchestration execution, technical events will be intercepted and managed by the SOA monitoring infrastructure (see “Monitoring_Infra” actor). In the context of the EasySOA platform, this SOA monitoring infrastructure is based on the TALEND ESB SAM (Service Activity Monitoring) platform (see TALEND ESB SAM description, refer to http://www.liquidreality.de/display/liquid/Talend+ESB+Service+Activity+Monitoring).
each service call within the service orchestration, 4 types of events (“Evt” in the figure here above) are processed:

- **REQ_OUT**: service request from client side
- **REQ_IN**: service request from server side
- **RESP_OUT**: service response from server side
- **RESP_IN**: service response from client side

These events, and the related data (see TALEND ESB SAM description) are processed and stored in the SAM Database.

3. The EasySOA SM system proposes a Probe Service (refer to the “Business Service monitoring” actor) which is able to periodically read the TALEND ESB SAM Database, and process the relevant data. In the context of the EasySOA platform, this Probe Service is based on the JASMINE Probe Manager.

4. The “BizEvt_Mgr” component of the EasySOA SM system allows to compute 2 main measures for each service call:
   - Service Response Time, computed as (RESP_IN – REQ_OUT)
   - SOA Latency, computed as (REQ_IN – REQ_OUT) + (RESP_IN – RESP_OUT)

These 2 measures are related to services as known by the “Model_Service” component of the EasySOA SM system, e.g. “Check Meteo Service”, “Get_Exchange_Rate_Service”, etc. In the context of the EasySOA platform, the “BizEvt_Mgr” component is based on a JASMINE new Collector class, whose name is “QoS Event”, and the “Model_Service” component is based on the EasySOA Registry (see examples, refer to https://github.com/easysoa/EasySOA/wiki/Importing-an-SCA-Model).

5. The “Alert_Mgr” component of the EasySOA SM system allows to log and graphically visualize in real-time the measured data related to services, and store the historical data in Database. In the context of the EasySOA platform, this component is based on the JASMINE Monitoring and Quick Visu features, through a graphical user interface (“Mon_UI” component). Another main functionality is proposed by the “Alert_Mgr” component, such as detection, graphical visualization and notification of alerts, computed from the measured data by configuration of rules (threshold, limits, etc.). This component is based on the JASMINE Notification Manager (for configuring and coding alert rules) and the Monitoring features (for visualization, see “Mon_UI” component).
Figure: EasySOA Service Monitoring: QOS Event Probe Manager (JASMINE)
6. At the end, the “KPI_Mgr” of the EasySOA SM system allows to compute service level indicators, and to control the service levels as agreed (SLA and OLA). In the context of the EasySOA platform, this component is based on a new JASMINE component, whose name is “Adapter”, which is able to read historical data for a given time period, from the JASMINE Database, to control the SLA or OLA (Gold, Silver, Bronze, or Violation) for the related period and for the relevant services, as known in the EasySOA Registry. In the case of the “Smart Travel” system, we will be able to control the “Book_Trip” IT Business Service level, with relation to the relevant SLA. Relevant dashboards are generated to visualize the Service Health in the EasySOA Registry (see examples, refer to https://github.com/easysoa/EasySOA/wiki/Soa-sanity-check-dashboard).
To conclude, and in summary, the EasySOA Service Monitoring platform, as defined and described in this document, will be able to deliver quality of service information, and service level indicators, both to:

- the IT staff (e.g. the IT department of the “Smart_Travel” business service provider), who will be able to monitor the quality of service of the IT business service delivered (“Book_Trip”) to the “Smart_Travel” system's users, and control the OLA of the services delivered by its own IT providers (“Meteo_Service”, etc.)
- the business user (e.g. the representatives of the “Smart_Travel” business service company), who will be able to control the service level of the IT service delivered to its client (“Book_Trip”), support of its business service (“Smart_Travel”).