BUSINESS TERMS
Model for a Telecom Operator Business View of SLA

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Abstract: The rapidly growing service-oriented economy has highlighted key challenges and opportunities in ICT-supported service and product lifecycle management. From a service consumer point of view there is no standardized way to locate, evaluate, negotiate and monitor services. Composition of third party services is fraught with uncertainty due to absence of definitive SLAs. Moreover, there is a lack of a standardized, homogenized and extended-used model for a set of business terms for SLAs that allows an automatic negotiation of products with customers and with third parties. So, from the service provider perspective, creating customized service offerings, negotiating with individual customers, and translating from business requirements into specific internal provisioning manifestations consumes valuable time and resources. Furthermore, there is no mean to create attractive products composed by several different services coming from different domains and consolidate the underlying SLAs in a business customer-faced SLA. Ultimately, the service marketplace is frustrating and cumbersome for both service providers and consumers: a significant opportunity has arisen for a holistic SLA-management framework, able to understand and manage such a set of integrated and homogenized set of business parameters.

1 INTRODUCTION

The ongoing transformation of a product-oriented economy towards a service-oriented economy has come to a critical point. IT-supported service provisioning, aggregation and commercialization have become of major relevance in all industries and domains. However, the nature of these services is typically quite static, because it requires significant effort to create service offers, to negotiate provisioning and business details with customers and to manage and control provided services.

From a business point of view, there is a need to hide provisioning low level details to customers. In this way, there is a gap in the management of Business SLAs that drives the product lifecycle. Business SLAs, which contain basically business terms for the implied services in the product sale, have to be translated to lower layers SLAs (software and infrastructure levels), so the product provision could be properly performed (Theilmann,2008). From this perspective, it is essential to provide a mean to create true integrated Business SLAs from atomic services and build product offerings with a homogeneous set of business terms that can be rapidly understood by customers, hiding lower level details.

Furthermore, in multi-provider and multi-domain scenarios where is possible to create products with services coming from different domains, it is essential to be able to consolidate the different SLAs of the composed service into a unique business SLA. Moreover, the set of business terms proposed has to be used between providers, so the composition of products from third-provider services can be easily and faster made. The integrated SLA will be the one negotiated with final customers, so that underlying services requirements, multi-domain provisioning difficulties and business relationship between providers are hidden to customers. The creation and composition of such a holistic SLA, and its following monitoring and assessment, is a challenge that must be faced in order to be able to build attractive and proper product offers in the top of the future frameworks and clouds (Comuzzi, 2009).

The aim of this paper is try to make a definition of the needed business terms for B2B transactions that have to be consumed by final customers. New business environments need to be automated in some

issues, such as product discovery and contracting. But it is also essential to define the business terms to be agreed. Furthermore these relationships between customers and providers have to be supported by business SLAs built from artefacts, terms and features that are introduced in this paper, such as business terms.

To do so, the paper firstly briefly summarizes the state of the art on the industrial approaches related to business SLA models. Following, it is defined and explained a business model. In section 4, the paper proposes a set of business terms in which the SLA model could be based. Next, it is presented how the business model could be applied in the telecom industry. Finally, we state the main conclusions extracted from the paper and the future works in this line.

2 INDUSTRY APPROACHES

There have been many efforts to try to consolidate a set of definitions concerning enterprise information, especially business data. Therefore, there are many standardization organizations working on this; the TMForum (TeleManagement Forum, 2010) and the ITSMF (Information Technologies Service Management Framework) (ITSMF, 2010) currently are the most relevant at ICT business level. Consequently, the most important ones in this field have been achieved in initiatives, such as: SID (Shared Information and Data Model) (TeleManagement Forum-SID, 2010), ITIL (Information Technology Infrastructure Library) (ITSMF-ITIL, 2010) and eTOM (enhanced Telecom Operations Map) (TeleManagement Forum-eTOM, 2010).

The eTOM is the most widely used and accepted standard for business processes in the telecommunications industry. The eTOM model describes the full scope of business processes required by a service provider and defines key elements and how they interact. This model also includes a specific process for SLAs.

On the other hand, ITIL concentrates on IT Service Management capabilities, focused on the kind of services and service management that IT systems provide within organizations, independent of the kind of business or industry sector concerned. These reference frameworks (eTOM and ITIL) can be considered as complementary. eTOM provides the "big picture" while ITIL details the operations processes addressed and a view of process interfaces.

The other initiative identified is the SID, but this will be explained in detail in next subsection. However, the relationship between eTOM and SID is following the NGOSS initiative (TeleManagement Forum-NGOSS, 2010), where first, it is necessary to establish a business analysis, and then, it is defined the data analysis. In the NGOSS initiative eTOM supports the business analysis and SID initiative supports the data analysis.

2.1 SID Model

SID is a set of comprehensive standardized information definitions aiming to be the common language for building easy to integrate OSS (Operational Support System) and BSS (Business Support System) solutions. It has a specific model for SLA agreements.

The SID model focuses on what are called "business entity" definitions and associated attribute definitions. A business entity is an actor or object of interest to business such as customer, product, service, or network, with attributes describing the entity. Together, the definitions provide a business-oriented perspective of the information and data that it is needed to run in an organization.

With eTOM, the SID model provides enterprises with not only a process view of their business but also an entity view. That is to say, the SID provides the definition of the 'things' that are to be affected by the business processes defined in the eTOM. The SID and eTOM in combination offer a way to explain 'how' things are intended to fit together to meet a given business need.

The SID model also defines attributes for Business entities and relationships between them and is represented using an UML model that provides an architecturally oriented business view of business entities, their attributes, and relationships to other business entities.

In the following figure, the domains and the level 1 of Agreements Business Entities of the SID Business Model are presented:
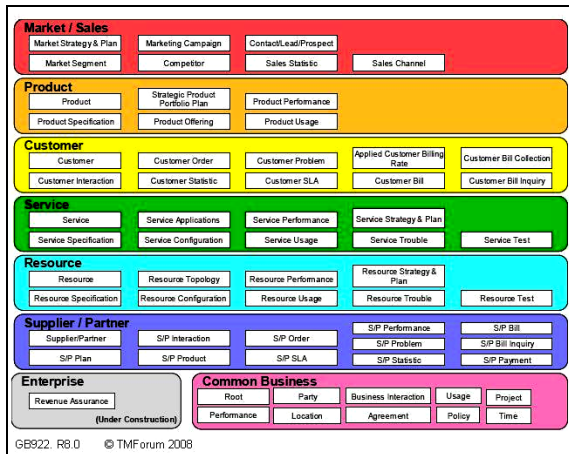
Figure 1: SID domains.

SID model has a common entity specific for agreements called Agreement. An agreement is a contract or arrangement, either written or verbal and sometimes enforceable by law, which involves a number of other business entities, such as Services, and/or Resources.

SLA is a type of agreement represented in the SID model by the Service Level Agreement entity. Both entities – Agreement and Service Level Agreement – consist of items which make the link between the SLA and the Product/Service/Resource it applies to.

For this purpose, SID Service Level Agreement Item entity establishes relations with entities in different domains.

2.2 SLA Management Handbook

There is another relevant reference framework, the SLA Management Handbook series (TeleManagement Forum-SLA, 2010), this is a handbook to assist two parties in developing a Service Level Agreement (SLA) by providing a practical view of the fundamental issues. The parties may be an "end" Customer, i.e., an Enterprise, and a Service Provider (SP) or two Service Providers. In the latter case one Service Provider acts as a Customer buying services from the other Service Provider. For example, one provider may supply network operations services to the provider that supplies leased line services to its customers. These relationships are described as the Customer-SP interface and the SP-SP interface.

The perspective of the SLA Management Handbook series is that the end Customer, i.e., an Enterprise, develops its telecommunication service requirements based on its Business Applications.

These requirements are presented to a Service Provider and the two parties begin negotiating the specific set of SLA parameters and parameter values that best serves both parties. For the SP, the agreed-upon SLA requirements flow down through its organization and become the basis for its internal management and control of its Quality of Service (QoS) processes. For the Enterprise Customers, the SLA requirements serve as a foundation or a component of its internal network services or business services. The SLA requirements define and limit the offer and the consumption of the service for both parties that are joined. It means that affect to the consumption of the customer and the offer, service level and support of the service by the service provider.

3 BUSINESS SLA MODEL

This section presents the Business SLA Model as a series of inter-related UML Class Diagrams. The starting point was the identification of the main concepts of the SLA model from the business point of view as basis for the construction of a Business SLA Model. The business models is then translated to a collection of Business SLA Parameters , which has been defined as business terms

This work is based on a generic SLA model defined in the SLA@SOI project and described in (SLA@SOI, 2009). Class diagram in figure 2, taken from (SLA@SOI, 2009) captures the main notions concerning SLAs. The class Agreement is a symbolic artefact representing a potential Agreement between a Customer and a Provider concerning the delivery of a Service – e.g. an agreement which has been proposed, but which may still be subject to further negotiation. The subclass SLA, instead, denotes an actual ServiceAgreement – i.e. one that has been formally accepted by both Customer & Provider.
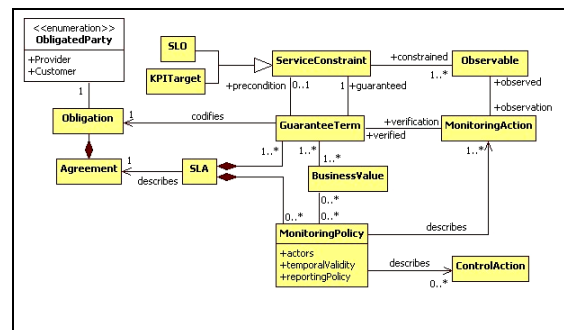

Figure 2: SLA Model classes.

The SLA comprises a set of GuaranteeTerms – each of which describes an Obligation on the part of the either the Customer or Provider to respect various ServiceConstraints. These Obligations, in turn, may be associated with various penalties or rewards - termed BusinessValues.

In the previous paragraphs we have described a generic SLA Model, valid to express the agreement conditions in any of the layers of the IT stack. In the following, this model will be refined introducing business-specific concepts.

This generic model can be particularized introducing business-specific concepts as service upgrade procedure, SLA update procedures, backup & recovery mechanisms, information about the service support system, termination information, tarification and billing .

The SLA may also contain appropriate monitoring policies – i.e. rules governing how monitoring of the service is going to be implemented. The SLA Monitoring model is further decomposed in Figure 3:
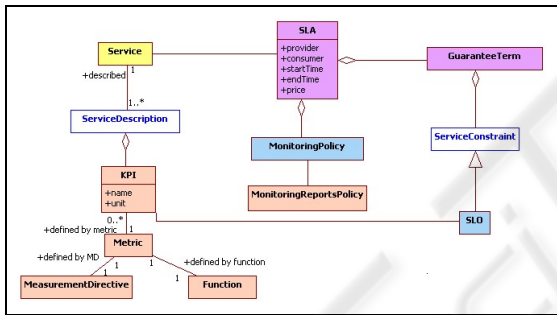

Figure 3: Monitoring model.

A KPI (Key Performance Indicator) is used to define measurable and exposed properties associated with a service, such as response time and throughput. The properties are used to express service level objectives (SLOs). The exact definition of a KPI is provided by a Metric, which also specifies how to measure or to compute the Performance Indicator.

A Metric is composed by a set of parameters that are measured from a service providing system (MeasurementDirective) or computed from other metrics and constants (Function).

The SLA has attached a set of MonitoringPolicy, which describes the monitoring activities: parameters to be collected and measures to be made, data collection and measurement intervals, and aggregation intervals.

The SLA should include a description of the monitoring reporting activities. , including reporting specification (content, format, frequency, delivery mechanism...) and the description of the procedure to request changes in the reporting process.

Apart from the monitoring, one of the most important topics from the business point of view is the tariff and billing procedures. In Figure 4, the billing part of the SLA model has been magnified:
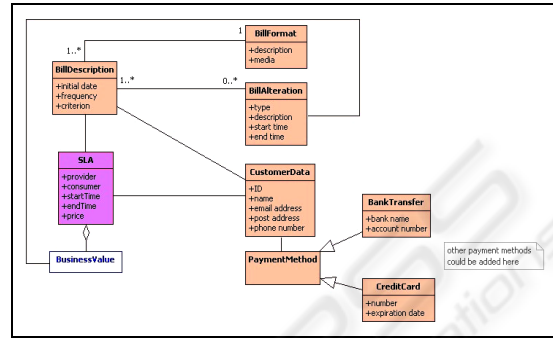

Figure 4: Billing concepts and model.

A BillDescription describes the detailed structure of the customer's bill. It indicates when to initiate the bill creation, as well as the frequency of the billing. It also specifies the billing mechanisms, detailing how the service is charged (i.e. for service usage).

This description should include a BillFormat, representing the presentation format of the bill. This bill may be sent to the customer through various media (for example, email, post mail ...).

The data needed for the billing process are represented by the Customer and PaymentMethod classes. Customer encapsulates all the customer data needed to contact him, i.e. name, address, e-mail, phone number. The PaymentMethod class represent the method used for payment. As an example, two subclasses have been included in the figure: BankTransfer, which includes the name of the financial institution and the account number where the bill will be charged, and the CreditCard, defined by the card number and the expiration date. Other payment methods can be added by extending the PaymentMethod class.

In some cases, the usual billing charge may suffer an alteration, represented by the BillAlteration class. The type attribute indicates the nature of the discount, i.e. a promotion, a reduction due to a violation of the signed SLA, or even an increase derived from a penalty applied to the Customer.

Next section shows in detail how this Business SLA Model has been translated into specific Business Terms to be included in the SLA document.

4 BUSINESS TERMS

In the following lines we explain the different aspects, terms and features that may be expressed at business level in the SLAs.

Functional Description: The offered service must be detailed in terms of the features and functionality supported and available to customers.

This information must to be completely enriched with service categorization and/or specification in order to be able to classified it. Also it must be appropriate to add semantics details that can be used to explain the full description of the service.

Business Model Supported: All the information referring to the selling process must be defined and described in detail, to avoid ambiguity for the customer. The business model description should detail:

- Offer types associated with the Quality of Service supported for each one
- Pricing model
- Billing and payment constraints
- Modification and alteration of prices if applicable
- Restrictions and constraints

Penalties: Detailed specifications about the penalties incurred when problems arise in the consumption of the service. This information is attached to the guarantee terms definitions that explain in detail how the different agreed terms are used. Each Guarantee Terms defined in the SLA must to be expressed in terms of parameters that express the conditions to be evaluated, the KPI target to be fulfilled and the evaluation characteristics to be taken into account for checking the generation of the penalty. In this way it is necessary to specify the periodicity of the checking explained before (assessment time interval) and the economic value associated to it to be generated.

Termination Clauses: The termination clauses have to be automated and they have to accommodate both parties in the contract. The termination of the SLA can be triggered by certain customer aspects as well as by certain service provider constraints. Also it must be defined the conditions below to be communicated to the parties.

Service Information Events, Monitorization and Reports: It must be possible for the final customer to select the kind of information that they wish to obtain automatically and how it has to be monitored. This information is defined in terms of events monitored as well as reports associated with the customer's service. For instance a customer that uses a storage service may want to know how large their storage consumption is per day). This information is just used to report customer, and might not be correlated with Guarantee terms of the SLA. Features about the reporting that can be defined can be based on different parameters:

- Type of report (based on service activities parameters, only on penalties of the SLA, …)
- Communication channel for sending the reports to the customer (i.e. by email, by SMS/MMS,…)
- Report frequency (i.e. hourly, diary, monthly,…)
- Content customization of the report

Support Mechanism and Contact Details: It must be possible to specify the kind of support offered to the customer should they have a problem or inquiry. The support information provided should include timetable details as well as details of the different support channels available. For instance, it may specify a telephone number and the days and hours of availability. This information is complementary to the contact data of the customers or service providers such as, their whole names, telephone and fax numbers or the email address.

Other important aspects to be taken into account are the supporting procedures. It specifies how the support team will responds to an error communicated by the customer, that is, the level of severity of the errors and the associated times to respond and solve to them. The supporting procedures, usually define different levels of the support, based on the kind of problem that can arise. With the classification of the problem, the supporting procedures and timeline defined is different. That information is very important in the consumption of the services and it has to be clearly defined.

Disaster Recovery and Data Security in IT Systems: It must be possible to define Backup/Restore policies in order to guarantee the persistence of information, if the service offered to the customer manages and stores data. Also it must be possible to define the security mechanisms that are employed by the service. The terms and features needed for whole business service must to be concreted also in the SLA:

- Backup: Specifies how the system will make a backup of the important information in terms of the frequency, the mechanism type (full, mirror, incremental) and the estimated time needed to do this.
- Recovery: Specifies how the system will perform a service recovery in case of a fatal error in terms of the mechanism type (full, mirror, incremental) and the estimated time needed to do this.

Changes to Terms in the Service: The process to update the service conditions or characteristics must also be considered. It must also be possible to define the mechanism used to inform the customer about such changes. Also it must be possible to define the frequency of updating process, how the customer will receive the actualization, notification or the instructions to install it (if it is something that depends on the customer operation).

Customer/Provider Requirements and Constraints: In many cases, it is necessary for the customers or providers to express some requirements in terms of limits or constraints in the service consumption. Usually these aspects are related to legal constraints to be followed by the customers or providers of one specific country, because they are imposed by the relevant Regulatory Authority.

Example constraints may include:
- Personal data storage cannot to be stored outside the country
- Maximum prices and/or quality shall apply
- Restrictions in sharing of personal data with third parties associated with the service provider
- The prohibition of delivery advertisement
- Personal data usage restrictions for specific tasks (e.g. data mining)

5 BUSINESS APPLICABILITY

So far, we have showed a business SLA model and a set of terms associated to it. But how can they be applied in the Telecom operator business?

Until recent times, the classic business Telecom operator was associated with the network, even when its prior service, voice, was offered over an ad hoc one, the public switched telephone network (PSTN) that evolved from an analogue and fixed network to digital and mobile ones.

Nowadays the environment has changed. The advances in technology have allowed the modification of the service concept. So the service provider can offer services available at any time or place, accessible using any kind of access network and regardless of the kind of device you use. Also new roles have appeared: services providers, infrastructure providers, content provider, telco provider … as well as new actors which can assume different roles.

Google is a clear example: in its beginning Google was a simple information searching engine and nowadays it has announced its entry in the telecommunications business with its project to deploy a high-speed network in United States.

On the other hand, telecommunication companies are attempting to expand their traditional business and become smart players in the content management market. The boom of the mobility and the connected devices has open new business possibilities. The future trend is that mobile devices will be used for the remote management of services in our daily life as part of what has been called Digital Personal Environment. The content and the communication channels and devices will be deeply linked. Telcos are aware of the increasing importance of software, that will allow the management of this foreseen on-line world. Moreover, users become prosumers, participating in the service creation and generating income. Telecommunication companies want to take advantage of this, and they are already creating platforms to help the developers sharing with them the profit of the applications. Wholesale Applications Community is an example of this type of platforms. This alliance, being launched by twenty-four of the world largest phone operators, aims to make it easier for developers to build and sell apps irrespective of device or technology.

The challenge of entering new markets also implies that the business model of the Telecommunication companies must evolve from the traditional model of customer proximity, high margins and high commitment to a one with distant relationship with the customer, lower margins and lower commitment.

This new marketplace must support the registration of multiple heterogeneous services, from different providers (prosumers) and industries, guaranteeing at the same time the quality of the delivered services, and maximizing revenues. New relationships and agreements among participants will be established, allowing the creation of new services by composing atomic services of different providers (Bueno, 2008).

The new situation requires the coherent management of the supplied services, and Service Level Agreements (SLAs) are a mean for doing this. SLAs specify the conditions under which services are delivered, but they can also be used for managing the provisioning and runtime functioning of the services. The end-to-end governance of the service lifecycle expands across the business, software, infrastructure and network layers, and therefore the SLAs must also be translated across the different layers. In this environment a precise definition of the business terms comes of crucial

importance, since they subsume the relationship not only with the customer but also with a third-party provider. A Business SLA may specify for instance the levels of availability, quality of service, performance, billing methods and even the penalties when the agreement is violated. These business terms will allow the automatic negotiation with customers and third parties in this new marketplace, and the translation to lower level SLAs helps to the automation of the provisioning procedures and runtime QoS monitoring and adjustment.

6 CONCLUSIONS AND FURTHER WORKS

The Business SLA terms have been identified to fulfill and define the business relationship between customer and provider in automated systems that can be used in business to business approaches.

This approach is based on a deeply study of the Business SLA Model and other different works based on SID and eTom framework from TMForum.

The results of this paper identify and define a proper Business SLA model for telco industry approach. In this line, it is presented a set of business parameters that should be present in this kind of business SLA model and could help in the automation of SLA lifecycle processes, specially in negotiation processes between customers and providers. Moreaover, they are strongly recommended to be used in B2B environements in scenarios where customers consume multi-provider and multi-domain products.

Further works will be focused on the concretes parameters and values of the business terms in each specific aspect and also in the study of new marketplaces in which providers can co-create and reuse services from others.

This new products will be consumed by end customers who will not be aware of the services (and the providers and domains involved in those services) that may exist behind the consumed product. However, the added value services that are aggregated or composed from different parties, have to guarantee the quality of service offered and have to share the revenues and penalties that can be triggered under different circumstances of service consumption. Consequently and for obvious reasons, end customers will not be aware of this dependency and complexiy of the services.

We have to provide the novelty tools to build the new business environments than can interact in different marketplaces and scenarios.

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