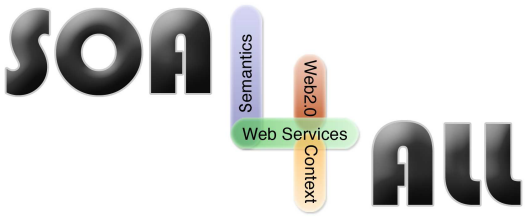

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D10.1.1 Business Scenarios and Models

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2.1	13/03/2009	Final version review	John Davies (BT)
Final	16/03/2009	Overall format and quality revision	Malena Donato (ATOS)

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Glossary of Acronyms

Acronym	Definition
APPS	Applications
C2C	Consumer to Consumer
CSPs	Citizen Servicer Platform
D	Deliverable
EC	European Commission
EU	European Union
e-Tom	Enhanced Telecommunications Operations Map
GUI	Graphical User Interface
ISP's	Internet Service Providers
JAIN	Java APIs for Integrated Networks
21 CN	BT's 21st Century Network
OSS	Open Source Software
OTT	Over the Top
PARLAY	Telco Standard for defining Services
PHP	Hypertext Preprocessor (HTML-embedded scripting language)
QOS	Quality of Service
S1	Scenario 1
S2	Scenario 2
SaaS	Software as a Service
SID	Sensory Integration Dysfunction.
SDK	Software Development Kit
SMS	Short Message Service
SLA	Service Level Agreement
TCO	Total Cost Ownership
VOIP	Voice over Internet Protocol
WP's	Work Packages

Executive Summary

This document describes a set of typical SOA4All scenarios and its potential business models. In particular, four services scenarios from SOA4All are identified: one End-user Integrated Enterprise Service Delivery Platform, two Telco 2.0 and one C2C e-commerce scenario. Each one of them includes a brief summary of the scenario overview, actors involved, services, target market and the role that SOA4All technologies plays in each one of the scenarios described.

According to these SOA4All scenarios some potential business models are identified. In order to determine the potential of the business models, we plot business models against the scenario considered in terms of their weaknesses and strengths.

In addition, three annexes are included at the end of the document regarding the business model definition, the e-business models categorisation and future trends for web business models. They help to make understood the importance of developing a business model as well as the main reasons for the selection of one or another business model.

To sum up, this document also highlights the business value of SOA4All technology in relation to the services scenarios defined.

1. Introduction

1.1 Introductory Explanation of the Deliverable

This report focuses on all the business aspects should be taken into account to be successful in the “real world”. Technical results are needed to come up with innovative solutions, but business models are also essential to make everything run. Service scenarios are considered based on the work after the first year (including Case studies) to figure out the possible business models, of which the weakness and strengths of each business model is provided as a matter of comparison between solutions.

1.2 Purpose and scope

The purpose of this document is to provide a brief description the current business models in the different SOA4All scenarios considered.

1.3 Structure of the document

Besides the executive summary and the introduction the document focuses on:

- Chapter 2 outlines the SOA4All Business Value that includes key business value indicators, SOA technologies business value and how the three uses cases of the SOA4All match these indicators.
- Chapter 3 contains the definition of the four SOA4All critical scenarios. Besides the overview of each scenario, main actor involved, target market, services and SOA4All technologies role are highlighted.
- Chapter 4 summarizes main potential business models to be matched to each scenario. In addition, the viability of each business model will be measured in terms of weakness and strengths points.
- Chapter 5 outlines the conclusion that summarizes the point addressed on the document.
- Chapter 6 collects some references that give additional valuable information.

In addition to the references, three annexes are considered just at the end of the document concerning relevant definition of what a business model is according to different authors, the e-business models categories and the future trends of the web business models.

2. SOA4ALL Business Value

2.1 Key performance indicators for Business Value

The primary motivations for investing in new technologies that create business value are basically three:

- **Efficiency gain**: Doing the same job faster, cheaper, or with fewer resources than it was done before. The key measurement is cost savings.
- **Effectiveness gain**: Doing a better job than before, improving quality, making other resources more productive. The key measurement is return on assets (ROA), a financial indicator of how profitable a company is relative to its total assets.
- **Business Edge** (other strategic advantages): Changing some aspect of what the business does, resulting in strategic advantages such as growth, new value capture, mitigation of business risk, improved agility in responding to new needs, improved Customer Relationship Management (CRM), Enterprise Resource Planning (ERP) and Business Process Management (BPM), less capital re-investment, reduced vulnerability to fraud/liability/litigation, outsourcing, etc. Key measurements are return on investment (ROI) and return on equities (ROE).

Another relevant financial estimate that besides measuring efficiency is also good for comparison of technologies/systems, is Total Cost of Ownership (TCO) designed to help enterprise management assess direct and indirect costs related to the purchase of any capital investment, such as -but not limited to- computer software or hardware. TCO is the purchase price of an asset plus additional costs of operation, or said in another way, it is the sum of all the costs related to the technology/solution to be implemented, the software, maintenance costs, support services, training fees, license fees, update fees (if any), etc.

If the benefits represented by these three priority categories –efficiency gain, effectiveness gain and business edge- outweigh the costs and risks associated with making the whole change, we have something to consider.

2.2 Business Value of the SOA technologies

The main business value of SOA4All is to apply the SOA paradigm at a Web-scale. As complement to SOA, by using only semantic is possible to reach a SOA technology, adapted to the web complexity , that take into consideration the service context for its discovery, composition and execution. The idea behind SOA is to treat business and IT functionality being delivered as a set of services, where the services are self-contained and independent of the context or state of other services.SOA approaches as a business strategy process to achieve key goals covering quicker time to market with innovative offerings, reduced integration costs associated with mergers, and greater productivity throughout the enterprise.

According to the paper “Optimize the business outcome of SOA” released by HP company, SOA business value consists of rapidly modify business processes, quickly address new competitive threats and accelerate the introduction of new products and services into the market. Service-oriented approach delivers IT systems as a set of reusable services that can be assembled easily to create a composite application that automates a business process. In addition to this, Forrester consultancy considers the

SOA business value concentrates on one hand on business innovation because SOA accelerates the optimization of the company business process to face global market changes in order to achieve the expected results. On the other hand, SOA also improves the user productivity as well as increase considerably the flexibility of the IT infrastructure. The figure 1 displayed below shows the benefits that the SOA solutions can deliver to companies.

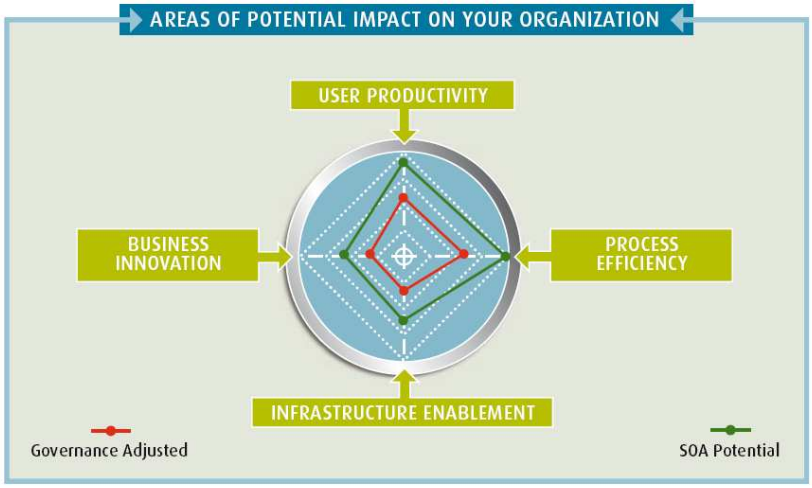

Figure 1Find out where SOA benefit your business the most

Source; SOA Value Assessment Brochure, Forrester, 2007

Enterprises everywhere are moving toward SOA to align IT with business goals.IDC consultancy considers that for 2012 at least by 50% of large companies will come up to SOA with respect to the 10% of companies that currently have adopted Service Oriented Architecture. Beyond the technological, economic and social reasons, 60% of companies that have not used SOA yet recognized that is not a main priority. That is why companies need to start to have much more feedback between IT departments and the business units by matching SOA to the business process.

2.3 How SOA4All Uses Cases address the Business Value Indicators

2.3.1 End-user Integrated Enterprise Service Delivery Platform Use Case

The main advantage of the envisioned service delivery platform for the platform customer (here: public administrations) in comparison with state of the art solutions is an efficiency gain because (1) the platform allows the automation of processes / workflows that were (semi-)manual before, (2) end users (civil servants) can handle simple process development tasks themselves instead of requiring a (more expensive) IT development project, (3) development tasks that cannot be handled by end users and are executed by the internal IT department or are outsourced to third party service providers will be faster and cheaper due to the seamless interaction, (4) the platform is a shared process repository so that new processes or modifications become immediately visible to all users, and (5) the modularity of SOA allows public administrations to buy only those services they really need (instead of complete products), reducing the TCO of their IT infrastructure. Second, the platform also has

the benefit of an effectiveness gain because the platform allows civil servants to handle different requests of a constituent (citizen or business) in a central place, leading to better service for the constituent. Besides this, for service providers, resellers, and consultants, the main advantages are a potentially larger market reach and easier market access (because for service consumers / public administrations it is easy to try out and integrate their services, if satisfactory), an efficiency gain because of an easier integration and development process, and improved agility because of a faster interaction with customers (e.g., when developing a new service) and market trends in general.

2.3.2 BT Use Case (Web 21 C Ribbit[1])

The use case aims to provide tools with a focus on end users with limited technical experience, thus opening up Ribbit to a greater number of people (i.e. increased revenues). Currently the technical knowledge required to use Ribbit restricts the number of potential users. The SOA4All project will provide an Efficiency/Effectiveness gain over the current way of working by providing an easier and more effective way of utilizing Ribbit, thus increasing usage of the services. The project will encourage collaboration amongst users by proving community support via the web 2.0 tools developed. The tools will aid users to collaborate and share their work, allowing users to re-use and enhance existing service compositions or applications. This will give a Business Edge by enhancing loyalty amongst customer, decreasing their change of changing to a rival service

2.3.3 C2C E-Commerce Use Case

Efficiency gain is not the major motivation and not directly influenced by introducing a C2C e-Commerce framework to an ISP's product portfolio. The capabilities and features of this product (described in D9.1.1) are currently not available with the existing e-Commerce solutions that webhosting providers and ISP's would normally use. However, Effectiveness gain is of major importance, as the current solutions for e-Commerce applications available to ISP customers lack in flexibility and extensibility. Usually these tools are not very intuitive and difficult to use for non-experts. Thus, improving the quality, scope and usability of current products is a direct objective for developing the e-Commerce framework in WP9.

In what the business edge is concerned, new products can be created by leveraging the results of WP9. The e-Commerce framework enables the customers to not only create web pages, blogs and picture galleries, but also e-Commerce applications of different levels of complexity. Thus, an ISP can offer more comprehensive solutions, incentivizing the sale of additional products. In the competitive market of ISPs and webhosting providers this serves as a distinct advantage. For the customers themselves the e-Commerce framework also provides additional benefits: the possibility of integrating third party services and the tool support to combine these services into complete e-Commerce applications means a reduction of business risk (by being able to select between different providers and selecting services with an optimal price-value ratio based on previous experiences, ratings and recommendations). In addition, being able to access and include added-value services provided by a service broker, enables customers to use services such as credit rating

[1] BT acquired Ribbit (www.ribbit.com) for $100m in Autumn 2008. It replaces the Web21C SDK initiative.

checks or fraud detection, thus further reducing their risk of setting up a new business.

3. Definition of the SOA4All Scenarios

3.1 Short summary of the SOA4All Scenarios

3.1.1 End-user Integrated Enterprise Service Delivery Platform Scenario

The use case is actually about building a service delivery platform with the EU Services Directive scenario being only an example that could be implemented on top of such a platform. The goal of the use case is to build a service delivery platform for public administrations. This platform will allow civil servants to handle typical administrative procedures (such as a permit approval process). More specifically, using the web-based tools of the SOA4All Studio, public servants can search, model, annotate, modify, share, analyze, and execute administrative procedures in the form of lightweight business processes. These processes may be composed of enterprise services (hosted by SAP), public web services (hosted by third party service providers), and human activities (to be executed by end users). For public administrations, the main benefit of such a flexible and open service delivery platform is the possibility to quickly address new challenges and requirements, e.g., such as the ones formulated by the EU Services Directive.

3.1.2 Simple- BT End-user Scenario

Web21C[2] is the name given to the platform over which BT will provide next generation services on top of its all IP-based 21st Century Network (BT 21CN). BT will provide some of these services but also third parties will provide others. Web21C is central to BT's transformation from a traditional telecommunications company to a converged software and services business. Web21C will allow third parties to use BT's network as a platform for delivery of their services, for which BT get revenue. In late 2008, BT acquired Ribbit (www.ribbit.com) for $100m. Ribbit is part of the Web21C programme and replaces BT's previous Web21C SDK initiative in exposing telecommunications functionality via a web-based platform.

Some characteristics of this scenario are listed below:

- Easy to use interface for creating simple Telco applications
- Some semi automatic composition
- Links to GUI components
- Web 2.0 community for encouraging innovation

3.1.3 Complex- BT Service Resellers Scenario

The scenario focuses on making a business from reselling BT while label services. It focuses on main topics;

- More, complex composition of BT services, internal company services and OSS
- Service management requirements (QOS,SLAs fault handling)
  - Telco Domain Ontology's (e.g. SID, eTom, ParlayX)

3.1.4 C2C e-Commerce Scenario

The C2C Service ecommerce use case will be entirely focused on providing an easy

[2] http://web21c.bt.com/

way for end users to use third party services offered through the framework, enabling them to build ecommerce applications in order to market and sell their own products. End customers are able to use various SOA4All-enhanced tools offered through this framework to build their own end customer applications. While people may use the SOA4All results to build generic applications, the e-Commerce framework will provide e-Commerce specific functionality and will itself also use the SOA4All services for achieving this. For example, it will provide typical Web Shop functionalities such as a shopping cart feature and an access to payment providers using the SOA4All service orchestration and communication facilities.

3.2 End-user Integrated Enterprise Service Delivery Platform Scenario

3.2.1 Introduction

The use case “End-user Integrated Enterprise Service Delivery Platform” developed by SAP WP7 has the public sector as its target domain. The goal is to build an integrated service delivery platform for public administrations with which they can handle their administrative procedures in a more flexible than this is the case with state of the art solutions. The use case envisions an open and flexible service delivery platform where administrative procedures are handled over a central portal. Administrative procedures are composed of semantic web services; either provide by SAP or third party service providers. These services can be combined in different ways so that new procedures can be created or existing ones can be adapted easily. The platform is designed such that these tasks can be done by “regular” civil servants who have the required business knowledge (but who do not need deep IT knowledge).

The platform will therefore allow administrations to constantly adapt their procedures in a simpler and more cost-efficient way, e.g., when implementing new requirements such as the ones raised by the EU Services Directive. It will allow public administrations to implement the single point of contact principle to handle a diverse range of service requests, it will ease the interaction among constituents and administrations, and it will lower the TCO for the administration when compared to a traditional software application.

3.2.2 Scenario Overview

The focus of the use case is on the usage of the service delivery platform within public administrations. As an example, a typical City is considered. Civil servants of that city can use the platform to handle typical administrative procedures (such as a permit approval process). More specifically, using the web-based tools of the SOA4All Studio, public servants can search, model, annotate, modify, share, analyze, and execute administrative procedures in the form of lightweight business processes. These processes may be composed of enterprise services (hosted by SAP), public web services (hosted by third party service providers), and human activities (to be executed by end users). A typical sequence of actions to create a new process may be:

- After logging in to the SOA4All service platform, a civil servant searches for an existing process (using keyword search or predefined categories) for the administrative procedure considered.
- Finding none, the civil servant can compose a new model by connecting services and human tasks, guided by pre-configured patterns and supported by wizards, if necessary

- The civil servant annotates the new process with meta information (e.g. categories, textual comments, etc) and saves all in the shared repository of the platform, so that other users can re-use the process at a later point in time
- Following, the civil servant deploys the process so that it can be executed on demand

In addition, constituents can issue service requests via the City's Internet portal. Such requests are then handled by the responsible civil servant via the service delivery platform. A typical constituent will perform the following steps via the Internet portal of the City where he wants to register his business:

- Search for existing services in order to fulfil his special needs related to the opening of a new coffee store branch.
- Select the services that fit best to his needs.
- Issue a service request, i.e., start the administrative procedures.
- View the status of his request.

In this use case, the clear scope of the constituent is the consumption of services. The constituent will benefit from a single platform providing every kind of service.

3.2.3 Services

The service delivery platform will allow non-technical end users to search, model, modify, share, and execute lightweight business processes. These processes are composed of enterprise services (hosted by SAP), public web services (hosted by third party service providers), and human activities (to be executed by end users).

3.2.4 Target Customer Areas

Local/national/federal authorities and Government departments have been identified as the main target market for the SAP solution. They will benefit by having an integrated software solution to manage and execute their administrative procedures in a flexible and cost-efficient way, e.g., to address new requirements such as the ones of the EU Services Directive. The solution will also allow the simple integration of third party solution and consultancy providers, e.g., in case an administration requires a novel service or needs support for a more complex adaptation task.

3.2.5 Role of the SOA4All Technology

The SOA4All components will be used to build an integrated service platform. This platform will be under the control of a public administration so that they can compose SAP and 3rd party services (see details in D7.1 and D7.3)

To do this, the scenario will need components from all SOA4All WPs, basically:

- WP3 for annotating services with semantics
- WP5 for discovering 3rd party services
- WP6 for modelling and executing processes (which are combinations of several services)
- WP1 for the unified communication among all components and the data storage
- WP2 as the graphical frontend to all these components

3.3 The End- User Scenario

3.3.1 Introduction

A user survey of the Web21C SDK platform (now replaced by Ribbit) was conducted by BT to try to gain more insight into the demographic the SDK users, and collect some feedback to help with improvements. The survey was conducted by contacting all the current users of the SDK, and asking them to fill in a survey. Out of the respondents that replied, a smaller group were contacted for a more detailed telephone interview.

The result revealed that there were roughly two distinct sets of users: (i) Casual users who are interested in the possibility of creating web applications and smash-ups using Telco services, for fun or to share with friends (ii) Business focused users who see the opportunity to either resell BTs services, or integrate online Telco features into a current business.

S1 will focus on the first set of 'casual users', and investigate how SOA4All technology can be used to help these users create web applications, mash-ups and compositions in the simplest and most effective way possible.

3.3.2 Scenario Overview

The scenario involves building up Web Service composition to create a new web application using a Ribbit service as a starting point. As the focus of S1 is on casual users building and non-critical applications, the scenario will involve minimal security or management infrastructure.

Users will undertake a similar sequence of steps each time they design a new application, although the specific services may differ. The sequence below outlines the generic steps that will be taken:

- User logs into the system.
- Selects option to create new Telco application.
- User selects various context parameters to help shape selection (see section 2.1.5 for details).
- User searches for appropriate service by using one of a number of methods
    - Searching via keywords or more complicated semantic queries regarding goal of service and input/output.
    - Browsing a hierarchy of services sorted by topic
- From combination of context and selected services, system decides matching services suitable to compose. Services can be individual atomic services from BT and third parties, or can be composed services already created and exported with the SOA4All architecture by other users.
- Users select starting service as basis for composition.
- User selects service and brings into workspace.
- The system helps user to 'wire' service into composition, by offering matches to input and outputs (or possibly via some mediation service), or plug-in GUI component to enable input of information.
- Where system cannot help, the user may have to manually work out wiring between services. These are captured by the system for re-use in future

compositions. interaction with web 2.0 community.

- Repeat steps 5-7 until composition is complete.
- User can further design GUI or add code to finish.
    - Execute service to test. Further Iterations of 5-8 until composition is completed to satisfaction.
    - Completed application can be saved and shared with other users of the community.

3.3.3 Services

- Authentication: Allows application developers to create and control authentication realms for their applications, including management and authentication of users.
- Call Flow: Allows rapid development of voice-enabled software applications and services.
- Conference Call: Allows application developers to place and control conference calls from their applications.
- Inbound SMS: Allows you, your application, or your organization to receive and process SMS text messages from any mobile phone or mobile network
- Messaging: Allows application developers to send SMS messages from their applications.
- Voice Call: Allows application developers to place phone calls from their applications.

3.3.4 Target Customer Area

The survey conducted on current SDK users revealed that 60% of are in the group targeted by S1. Their main motivation in using the SDK is for personal interest, with the aim of using the Telco services to either create interesting smash-ups/applications, or simply use directly because of the attractive price plans offered by the SDK. An interesting result of engagement with this user group was that a significant percentage had limited programming experience. This meant that the current method of using the SDK (via a Java, C# or PHP API) was causing problems, and creating a barrier preventing some people using the SDK.

3.3.5 Role of the SOA4All technology

S1 describes a situation in which SOA4All technology is used for creating simple smash-ups of BT services and other popular services on the web. The aim is to make it easy for novice users to get access to the facilities of the Ribbit SDK and combine them with other services on the Web. SOA4All will be used to overcome some of the current problems that limit the uptake of the SDK, primarily the technical knowledge required and familiarity with a programming language such as Java. The following table shows which SOA4All work packages will be used in the course of S1. The following symbols indicate the usage:

	**Yes** Work package outcome will heavily be used

	**Partly/Maybe** Work package outcome will partly be applied depending on the actual progress of implementation
	**No** Work package outcome will not be used directly within this scenario

WP	Task	Deliverable / Prototype	Use
WP1	T1.2	D1.2.2 - WSMO Data Grounding Tool	
Service Web Architecture	T1.3	D1.3.3 - Distributed Semantic Spaces: A Scalable Approach To Coordination	
	T1.4	D1.4.4 - SOA4All API V2 (service bus)	
WP2	T2.1	D2.1.6 - Provisioning Platform Prototype	
Service Deployment and Use	T2.1	D2.1.7 - Service Modelling Tools Prototype	
	T2.2	D2.2.3 - Consumption Platform Prototype	
	T2.3	D2.3.3 - Monitoring & Management Tool Suite Platform Prototype	
WP3	T3.2	D3.2.5 - Repository Reasoner for WSML	
Service Annotations and Reasoning	T3.2	D3.2.6 - Rule Reasoner for WSML	
	T3.2	D3.2.7 - Description Logic Reasoner for WSML	
	T3.3	D3.3.2 - Established Ontology Tag Clouds	

WP	Task	Deliverable / Prototype	Use
WP4	T4.2	D4.2.2 - Service Context Ontology Stack	
Service in Context	T4.3	D4.3.2 - Contextual Ontology Repository	
	T4.4	D4.4.1 - Service Parameterization From Context Mechanism	
	T4.5	D4.5.2 - Mechanisms For The Acquisition Of Service Context From Social Networks	
WP5	T5.3	D5.3.2 - Service Discovery Prototype	
Service Location	T5.4	D5.4.1 - Service Selection And Ranking Prototype	
	T5.5	D5.5.2 - Service Adaptation Prototype	
WP6 **Service Constructions**	T6.1, T6.2	D6.2.2 - Prototypes, Tool Integration (containing the integration of the two advanced prototypes of both Lightweight and Adaptive service composition)	

Table 1Role for SOA4All Technology in Scenario 1

3.4 The Business Reseller Scenario

3.4.1 Introduction

S2 will be developed in the second half of the project, and aims to utilise all the technical results of the projects. As it is based on a business scenario, it has additional requirements that stem from the need to have a greater level of control over the execution of services, monitoring and fault handling. S2 will inherit all the requirements from S1, but includes additional requirements describing below. The scenario is outlined below, but is likely to be developed further as the project progresses. This section will be updated at M18 to include a more detailed analysis and description

3.4.2 Scenario Overview

The scenario description below gives an example of the sequence of steps that will be taken to design a new 'business reseller' application. In this case, the example of a VOIP application is given, but in practice, the sequence of steps taken will be similar in any application that is created.

- User logs onto system and chooses to create new VOIP application using BT SDK VOIP services.
- User wished to integrate VOIP service with its own Billing and Authentication services
- The User selects the 'Web Service mark-up wizard' and enters the endpoint of its

Billing and Authentication services.

- The system parses the Web Service definitions and presents user with options to mark-up the services semantically.
- The User selects an industry standard Telco ontology, from available ontologies and begins process of linking concepts to the data in the Web Services. Where syntactic matches are found, the system offers suggestions for mark-up.
- When mark-up is complete, the services added to the user's private pool of available services in the SOA4All platform.
- The user begins the process of creating a new 'business class' composition (selecting the appropriate context parameters), and selects the VOIP service as the primary service from BT.
- The users selects that he wishes for a service level agreement (SLA) to be attached to this service. He is presented with a number of SLA parameters (such as minimum downtime), from which he can choose the correct level required. The system stores these context parameters for the SLA.
- From the starting VOIP service the user begins to build up a composition using his own billing and authentication services.
- The system helps user to 'wire' service into composition, by offering matches to input and outputs (or possibly via some mediation service), or plug-in GUI component to enable input of information
- Where system cannot help, the user may have to manually work out wiring between services. These are captured by the system for re-use in future compositions. interaction with web 2.0 community
- When the composition is complete, it is invoked. A monitoring tool oversees the execution, and ensures that the SLA conditions are not breached. If a particular SLA parameter is breached, then depending on the 'context' a particular action will be taken (such as sending an error report BT).

3.4.3 Services

In S2 the reseller will build a complete service offering by using BT services and including additional functionality or OSS by combining with their own services. The services could potentially be anything depending on the business. The business may simply resell a simple BT service (such as VOIP), but include its own branding. In this case it would only need to add its own OSS services (such as billing and authentication). Alternatively the business may choose to incorporate a BT service into a more complicated offering, such as adding an SMS facility to an existing service.

3.4.4 Target Customer Area

The survey conducted on current SDK users revealed that approximately 40% are in the group targeted by S2. Their main motivation for using the SDK is for a business interest, to either resell BTs services directly, or incorporate into another business offering. These users have different needs than that of the casual users targeting in S1. From the perspective of the end customer it is not BT who is providing the service, but the reseller. This means the reseller requires BT to provide a reliable service, and needs a higher degree of management and accountability for services. In addition, the end customer will not be paying BT directly for use of the services; the reseller will be

responsible for the relationship with the end user.

3.4.5 Role of the SOA4All Technology

S2 will Use SOA4ll technology to design and compose their more complex end user applications to resell or use as part of their business, incorporating BT white label Ribbit services, their own services & OSS and some BT OSS services. Enable people to create a business incorporating BT services, without complex face to face contract negotiations and manual work to integrate services. This will enable businesses to go from 'idea to product' in minimal time.

The following table shows which SOA4All work packages will be used in the course of S1. The following symbols indicate the usage:

	**Yes** Work package outcome will heavily be used
	**Partly/Maybe** Work package outcome will partly be applied depending on the actual progress of implementation
	**No** Work package outcome will not be used directly within this scenario

WP	Task	Deliverable / Prototype	
WP1	T1.2	D1.2.2 - WSMO Data Grounding Tool	
Service Web Architecture	T1.3	D1.3.3 - Distributed Semantic Spaces: A Scalable Approach To Coordination	
	T1.4	D1.4.4 - SOA4All API V2 (service bus)	
WP2	T2.1	D2.1.6 - Provisioning Platform Prototype	
Service Deployment and Use	T2.1	D2.1.7 - Service Modelling Tools Prototype	
	T2.2	D2.2.3 - Consumption Platform Prototype	
	T2.3	D2.3.3 - Monitoring & Management Tool Suite Platform Prototype	

WP	Task	Deliverable / Prototype	Use
WP3	T3.2	D3.2.5 - Repository Reasoner for WSML	
Service Annotations and Reasoning	T3.2	D3.2.6 - Rule Reasoner for WSML	
	T3.2	D3.2.7 - Description Logic Reasoner for WSML	
	T3.3	D3.3.2 - Established Ontology Tag Clouds	
WP4	T4.2	D4.2.2 - Service Context Ontology Stack	
Service in Context	T4.3	D4.3.2 - Contextual Ontology Repository	
	T4.4	D4.4.1 - Service Parameterization From Context Mechanism	
	T4.5	D4.5.2 - Mechanisms For The Acquisition Of Service Context From Social Networks	
WP5	T5.3	D5.3.2 - Service Discovery Prototype	
Service Location	T5.4	D5.4.1 - Service Selection And Ranking Prototype	
	T5.5	D5.5.2 - Service Adaptation Prototype	
WP6 **Service Constructions**	T6.1, T6.2	D6.2.2 - Prototypes, Tool Integration (containing the integration of the two advanced prototypes of both Lightweight and Adaptive service composition)	

Table 2 Role for SOA4All Technology in Scenario 2

3.5 The C2C e-Commerce Scenario

3.5.1 Introduction

The scenario is based on a storyboard involving a customer of the chillydomains

webhosting platform who wants to start with a C2C e-Commerce web site. It also describes how the SOA4All technology will be used to enable the various functionalities provided by the e-Commerce framework and the different roles that are involved in such a C2C scenario (service providers, service consumers, and brokers). The e-Commerce framework will provide prospective users with basic e-Commerce functionalities and the capability of extending their solutions with third party services. It will be based on the SOA4All results and will demonstrate how to use the SOA4All implementations for searching and connecting services and for using them in a real world environment.

3.5.2 Scenario Overview

With the help of the WP9 e-Commerce framework, users are able to simplify their efforts for creating C2C e-Commerce. The steps are used to describe a typical scenario covered by the use case (deliverable 9.1.1):

- The users choose to create their own web shop, after buying a suitable product from the chillydomains ISP platform. In the Sitebuilder application, which is available to all customers of chillydomains, users see several page modules, which they can use to put together their web sites. Choosing the e-Commerce module, they can select from various templates for e-Commerce applications with different functionalities. The users select the “basic web shop” template, which has a number of mandatory elements a web shop should consist of, but also offers the possibility to add additional functionality through both internal and third party services.
- The user starts with something simple: Adding shopping cart functionality. This functionality is already provided by an internal service in the e-Commerce framework. The user selects this option to add the shopping cart functionality to the website with just copying and pasting some lines of code and with 5 minutes of configuration.
- The user then decides to add payment functionality and does the same steps again. This time the e-Commerce framework allows users to choose between a set of known Payment providers and the possibility to add new payment services through a service broker. As it happens, other users have used some of the services in the past and have provided recommendations and rankings. Based on this additional information, users can select from a set of payment services, which should be available to customers of their web shop.
- Now having a shopping cart and payment services, the user wants to connect those services. This functionality is made possible by the SOA4All functionalities included in the e-Commerce framework. A graphical user interface allows the user to orchestrate and connect the 2 services. The possibilities offered to combine the services should be based on simple workflow templates offered by the tool. These templates should reflect a typical order process, and include extension points for additional activities (respectively services added to provide functionalities for these activities).
- Finally, the user now wants to add a service for converting currencies in order to be able to make the webshop accessible for consumers of other countries. Such a service is not provided in the e-Commerce framework, so the user clicks on the “search for 3rd party service” button and uses the search engine to find a currency conversion service. The search engine utilizes the SOA4All discovery

components to find matching services. Again, the user can then use the composition functionalities to orchestrate all services and to connect the new service to those that have already been selected previously. Based on end user context, e.g., geographical information, the composite service would use the currency conversion service to adapt the shown prices of products.

- Having completed the mandatory steps in the creation of the web shop application, users can then publish the shop to their web site and activates the application.
- The webshop is visited by other end users (customers), which can buy products by adding them to a shopping cart and using a payment service. In addition, the original creator of the webshop application can use a monitoring tool provided by the e-Commerce framework to analyze statistics of customers who visited the webshop, including data on service invocation. The user could then use the gathered information to adapt her e-Commerce solution, and also to rate and recommend services to other users.
- Some months later, users might want to include advertising in their site and at the same time, want to incentivise shoppers' participation in that site. An advertising service is the ideal solution for this. Thanks to SOA4All functionalities, the users find and integrate a "collaborative advertising" solution with their existing e-Commerce application, as described in deliverable 9.1.1.

3.5.3 Main actor involved

Main actor involved in this C2C scenario comprises: Services Consumers, brokers and services providers. The diagram would be as follows:

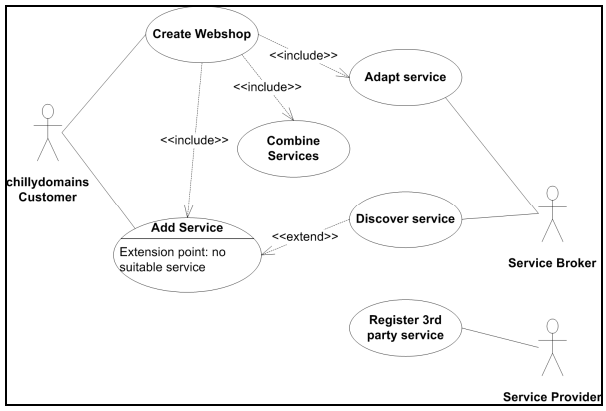

Figure 2:C2C e-Commerce Framework Use Cases

- **The chillydomains customer**: It creates a new web shop, by combining services, which are either available from the e-Commerce framework itself, or added by using the capabilities of the service broker. In addition, the chillydomains customer is able to adapt the services to a certain context, which can depend on user requirements (such as the location of a given user) or to regulatory requirements (e.g., the need to add suitable credit rating checks for certain countries).
- **Service brokers**: they provide the means to discover suitable services, and can offer "service bundles", that is services which are already adapted to a specific

setting and might combine several smaller services to one added-value building block. An example for such a service is given in Section 5.5.3.

- **Service providers:** they offer various services for inclusion in an e-Commerce application, and can register those services with the service marketplace offered by the service broker. Registering a service in this manner enables other consumers to discover more easily those services, and to provide valuable feedback and ratings.

3.5.4 Services

The C2C e-Commerce scenario will provide no Web services to its users. Instead of this, it will provide an e-Commerce service platform that allows users to access services and to compose e-Commerce processes based on the SOA4All work package outcomes. The C2C e-Commerce framework will provide a Web 2.0 like web application allowing users to make use of SOA4All for solving their problems and for allowing them to offer e-Commerce services to their customers.

3.5.5 Target Market Area

The use case focuses the C2C e-Commerce area. As such it mainly targets consumers that want to sell products to other consumers. For example, customers of an ISP can use the framework described by the use case to create a web shop allowing them to use services from third parties in order to offer e.g. credit card payments.

- Chillydomains customers are customers of the chillydomains webhosting platform. They buy different products from the chillydomains web shops, which enables them to build their own web sites, including eCommerce applications. Based on the bought product, different third party services for payment, delivery etc., will be available to them for the creation of their own applications.
- Shop customers are users who want to buy in a chillydomains customer's shop, but are not necessarily chillydomains customers themselves. Data about these customers needs to be evaluated, as according to their profile, different services should be customized. As an example, if a customer is from a specific country or region, different fraud detection and payment regulation mechanisms need to be enforced during the payment process. The customer's data will also be managed by appropriate services of the platform.
- Affiliates can resell services or service bundles to other customers, but are not necessarily chillydomains customers themselves. Services can be offered through other chillydomains products to the chillydomains customers, i.e., Hanival would add third party services offered by affiliates to the pool of services which are available to chillydomains end customers within their respective chillydomains products.
- Advertisers can also be involved thanks to the Collaborative Advertising services that incentivize shop customers to participate in the site advertising.
- Service Providers register their services with the service marketplace or provide added value services, by combining several services to service bundles.
- The Service Broker offers a search engine to find additional suitable third party services, and a marketplace, which has the benefit of being able to provide service bundles, or services, which abstract from a concrete implementation, thus providing the means to link different services of the same functionality to

the e-Commerce applications. The services could then be selected according to availability or concrete, context-based requirements.

- As part of our goal to provide chillydomains customers with suitable and intuitive tools to realize their own e-Commerce applications, and using results from the work on service adaptation, we will analyze the characteristics and behaviors of these user groups. The interfaces and available tools will be adapted to the personal profiles of the current user, including language and skill levels, after classifying him or her in a number of categories

3.5.6 Role of the SOA4All technology

WP9 will completely rely on the SOA4All results of the different work packages. All functionality will be provided by the C2C e-Commerce framework will also rely on the results although they might add some e-Commerce specific logic to them

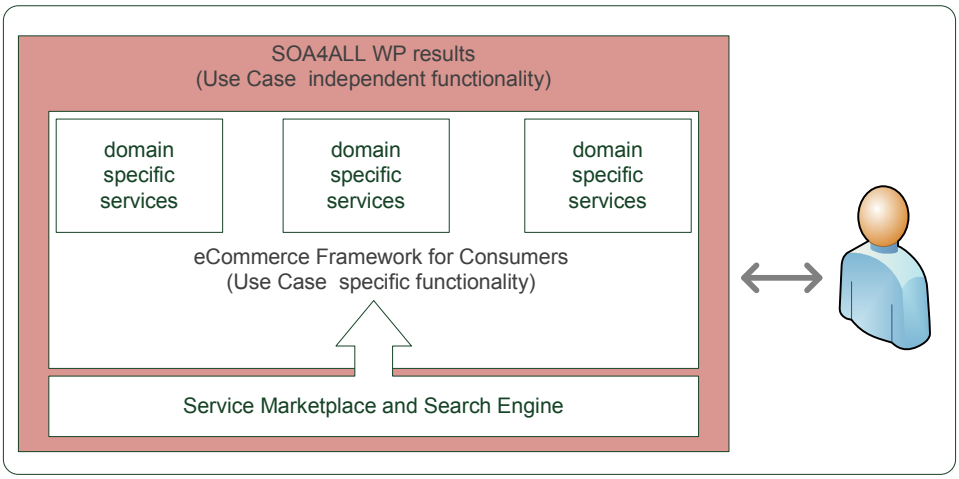

Figure 3: Usage of SOA4All WP results in the WP9 scenario

The following work packages and concrete activities play a major role in the C2C e-Commerce scenario of WP9:

- Annotation and Reasoning (WP3): WSMO-Lite and MicroWSMO will be used for the description and annotation of third party services. In addition, a scalable reasoner is needed to work with possibly large sets of services.
- Service Context information (WP2 and WP6): services to be used in the e-Commerce applications will feature different contexts, for example, often there will be several user views (e.g. using a service in a localized manner) and provider views (constraints on payment services usable by specific users, mandatory credit rating checks etc.).
- Service Discovery and Adaptation (WP5): service adaptation that is needed for aspects such as security, Quality of Service parameters etc. In addition, ranking and selection play roles when similar services are available from several providers.
- Service Construction (WP2 and WP6): An adaptive way to compose services, usable in the ISP's infrastructure, is needed. For Hanival, the tool and service for the composition needs to be integrated with the Sitebuilder application explained in Section 3.2.

The following table shows which tasks from the technical SOA4All work packages will be used in the course of this scenario, concentrating on the most relevant upcoming tasks. The following symbols indicate the usage:

	**Yes** Work package outcome will heavily be used
	**Partly/Maybe** Work package outcome will partly be applied depending on the actual progress of implementation
	**No** Work package outcome will not be used directly within this scenario

Task	Description	Use
WP1: Service Web Architecture		
T1.1	Web Principles and Fundamentals	
T1.2	Web Grounding	
T1.3	Semantic Spaces	
T1.4	Reference Architecture, Integration and Implementation	
T1.5	Testbeds for SOA4All	
WP2: Service Deployment and Use		
T2.1	Service Provisioning	
T2.2	Service Consumption	
T2.3	Service Analysis	
T2.4	SOA4All Studio	

T2.6	SOA4All Process Editor	
T2.7	Recommendation based on User and Usage Data	
WP3: Service Annotations and Reasoning		
T3.1	Semantic Service Annotation	
T3.2	Reasoning with Semantic Service Descriptions	
T3.3	Ontology Instantiation and Ontology Tag Clouds	
T3.4	Web Grounding	
WP5: Service Location		
T5.1	Service Crawling	
T5.2	Service Indexing	
T5.3	Service Discovery	
T5.4	Service Ranking and Selection	
T5.5	Service Adaptation	
T5.6	User and Usage Data	
WP6: Service Constructions		
T6.3	Lightweight, Context-aware Process Modelling Language	
T6.4	Context-aware Service Composition and Adaptation	
T6.5	Adaptive Service Compositions Execution	

Table 3 Technical WP's contribution to the C2C e-commerce scenario

As shown above, the results of all tasks will influence the development of the e-Commerce framework, its internal services, and the functionalities offered by the service broker to a certain extent. From WP 1, the architecture and various other

results are implicitly used, as most other SOA4All components will depend on these. The testbed infrastructure will provide a concrete testing environment, where the various services and tools for the e-Commerce framework are deployed.

Regarding WP2, the e-Commerce framework will need to cover the whole lifecycle of services. Service Provisioning (and accordingly the SOA4All Process Editor) is used partly to allow the users of the e-Commerce framework to set up simple composite services, based on templates. More complex process composition will not usually be needed, as useful composite services will be provided by the framework itself, or by the service marketplace (e.g., see the notion of service bundles introduced in Section 5.5.1).

End users of the e-Commerce framework are going to use the consumption platform as well, for which WP9 would provide a specialized GUI in order to integrate the functionalities provided with the overall process of setting up an e-Commerce application. Additionally, the service broker role provides us with the means of searching for both traditional and semantically annotated Web Services. The services, respectively APIs provided by Service Consumption can thus be used partly by the base WP9 e-Commerce framework (as a GUI for end users), and partly by the service broker (i.e., by adapting their discovery and adaptation process used by the service broker).

Furthermore, Service Analysis will provide useful functionalities for the framework's end users, allowing them to gain statistical information on service usage, leading to adaptations to the services, which they have included in their e-Commerce applications. As an example, users will be able to monitor how customers of their e-Commerce applications use services, and identify unreliable services or other important quality of service parameters.

In order to annotate third party services and enable their discovery, the service broker in the e-Commerce framework will utilize results from WP3 and WP5. Also, service crawling, indexing and adaptation is used to identify and index suitable services for e-Commerce applications, and to adapt them to user needs.

Finally, the results from the Service Constructions work package, WP6, will be used both by the e-Commerce framework itself – to set up templates for typical workflows in e-Commerce applications – as well as by the service broker, in order to set up service bundles, as mentioned above.

4. Business Model into Practice

This section matches the potential business models to the four SOA4All scenarios already described in section 3. In this context, each responsible for the development of the SOA4All scenarios has been asked to rank at least two potential business models for the scenarios defined. In addition to this, main strengths and weaknesses of each business model are highlighted. This has been done in order to establish indications of the perceived potential of respective business models over others with respect to the various scenarios. In order to assess the weakness and strengths of the business models, Gartner has developed a framework and methodology (Business model Scorecard) using six critical measurements described below:

- Financial performance: Are the leaders of the industry returning good margin and providing the cash flow needed to run effective business?.
- Value Creation: How well is the software and Telco industry regarding equity investors?.
- Investment in business: How well is the industry, investing in the future?
- Efficient Use of funds: How is the industry generating cash and using operating cash effectively?.
- Debt Obligations: How much debt has the industry incurred and what is the short term outlook for outstanding debt obligations?.
- Operation Expense Management: How efficiently is the industry managing its operating cost s and expenses to achieve costs and performance goals?.

4.1 The Service Delivery platform Scenario vs. Business Models

4.1.1 Introduction

Turning a software product or Internet application into a profitable and sustainable business requires not only a convincing technological solution but also an attractive business model. Traditionally, software companies deliver software by licensing shrink-wrapped" products sold through retail channels or arrangements with hardware vendors. This conventional way to get revenue in exchange for the value of a proprietary software product consists of selling the customer the right to use the software product. However, in last year's mayor software vendors are moving towards a service oriented model through SOA o the SaaS in order to in order to expand and improve what both solutions can deliver for their business operations. Main reason why enterprises decide to move to SOA is because of the large amount of competitive advantages that SOA offers in terms of reusability, integration and quickly customization of the software solutions besides the cost reduction. According to Gartner, nearly of the 75% that implement SOA achieve a positive ROI in less than 24 months. According to the paper "Changing Software Business released by the Software Marketing Advisor Firm in 2007, several software service options coexist in order to develop a service oriented business models. These comprise:

- **Subscription:** Combines a licensed software model with a subscription component that offers a continuous added value to the customer (e.g., regular

updates).

- **Software as a Service (SaaS):** SaaS represents a challenge for engage new business models. Customers lease software from a vendor that also hosts it and is usually charged a transaction fee per service call, possibly replaced or combined with a monthly subscription fee. This model benefits to the customer in terms of implementation cost and time savings, as well as simplicity. However, despite the emergency of this and other new models, most software is still sold by using the traditional business models.
- **Consulting:** Complementing one of the three models above, consultancy services help costumers to install, optimize, or maintain their IT infrastructure and business processes.

4.1.2 Service Delivery Platform Scenario vs. Business Models

Software services and hybrid solutions companies comprise a large base of assets (an installed user base, combined with long-term service and maintenance contracts).Currently, SAP is a hybrid solution provider that sells pre-packed solutions that also require customization or special integration and installation work. The business strategy for SAP begins with a decision on what offer to the market, in relation to product or services or how to combine both of them. In the case of SOA4All, WP7 allows SAP to launch a new product: an integrated service delivery platform for public administrations (see D7.2). In addition to the product itself, SAP offers its customers also consultancy service for the integration and the use of this product. Thus, revenues could come directly from selling the product and from consultancy services.

According to the scenario described in subsection 3.2 we have considered two potential business models to be carried out by SAP:

1. **SAP uses a standard (licensed) software business model** where the service delivery platform is licensed to a customer from the public sector, together with SAP enterprise services that are required to realize the administrative procedures over the platform. Main strengths and weaknesses from using this model are listed below:

- Strengths of this standard business model comprise, the right-to-use licenses which can be tailored to work in a wide variety of ways; for example, software can be licensed per-user, per-machine, per-CPU (for multiprocessor systems), per-concurrent-user, or for an entire organization or part of an organization (site licensing). Moreover, Software license fees are independent of amounts charged to the customer for services such as technical support, consulting, and systems integration. In addition, this model is widely used around the world as one of the basic software business model.
- Despite of the strengths already mentioned above, this model presents some weaknesses in relation to the high transaction and local administration costs for software which is used rarely by customers. In addition, licensing arrangements can also be overly complicated and difficult for both vendor and customer to administer and the customization and integration tasks need to be taken care of by the customer (or a third party) and this circumstance can bring along a risk of high unanticipated costs.

2. **SAP chooses a hybrid business model** (vendors who supply both on-premise and on-demand solutions) that includes maintenance, upgrades, and maintenance of special product enhancements due to the fact that SAP offers a variety of software, and services to meet the requirements of a public administrations customer. This hybrid solution model can be effective at generating a steady stream of revenues and profits.

In what the strengths are concerned, besides of being a business model widely adopted by software companies around the world, benefits come from two different revenues sources (licenses and services). In addition, this model enables the concrete adaptation of the product to the consumer needs; in the case of the service delivery platform this mostly concerns the provisioning of customer-specific services available via the platform. In this context, the Internet plays a key role in order to ensure the customer fidelity through a permanent technical support. Furthermore, the hybrid model allows several possibilities for creating competitive barriers to protect the vendor cash flow. In this sense, the facilities are used to win customers at the beginning of the purchase process as well as for delivering assistance. However, some weaknesses of this model are represented by the existing price pressure from competitors in those cases in which software licenses generate a high level of gross margins. Furthermore, licensing arrangements can be overly complicated and difficult for both vendor and customer to administer.

Considering the fact that the envisioned service delivery platform will be used in a rather dynamic environment where administrative procedures will be created and changed by users within a public administration, it is to be expected that regular updates of the platform as well as the integration of new services from both SAP and third parties will be required by the customer. Since public administrations usually have only small IT departments they need to outsource such tasks. Thus, a hybrid business model seems to be more appropriate for both SAP and the customer.

4.2 The End-user and Reseller scenarios vs. Business Model

4.2.1 Introduction

Telecommunicationsthe changing business environment.With the increasing tendency of service providers of all types to publish services via the Web and the emergence of Web 2.0 technologies, traditional telecoms companies (telcos) are being forced to evolve. In this section, we overview the so-called Telco 1.0, Telco 1.5 and Telco 2.0 models.

Telco 1.0

The ‘Telco 1.0’ business model is the classic telecoms business model, which has proved successful since the creation of the telecommunications business. Telco 1.0 is the mass market or “regular” business model, offering the customer servicessuch as SMS and voice, and charging for use. There are two key aspects to the classic business model:

- Vertical integration, where the telecoms operator owns (or has control over) the network, and bills users for services making use of the network.
- Simple revenue model, where the operator incurs cost by maintaining the network, buying equipment & content, and receives revenue by billing users for services.

This model has remaining fairly static since the birth of telecommunications, and has

survived many technological advances, such as digital switching networks, fibre optics and the emergence of wireless and mobile communications. Since the whole vertical stack is controlled by the operator they are able to provide services, bill for and support them in a controlled and well understood manner.

Telco 1.5

The rapid take up of high-speed residential Internet access last five years has provided a challenge to the two pillars of the classic Telco business model, as users can acquire services on the network, independently of the operator. This horizontal market structure has been challenging to operators, leaving them essentially as the provider of raw data services, while other 'upstream' businesses make money by providing content and receiving advertising revenue by targeting the customers of their content.In parallel to the Internet boom, the mobile boom has caused a shift in use from fixed line telephony to mobile. Companies such as BT have sought to maintain customers and reduce churn by offering consolidated services, such as offering in an attempt to gain a bigger footprint, and tap into the 'upstream'revenue. Internet based communication services, with protocols such as Parlay [3]and JAIN[4] (Java API for Telecom Networks) have been developed with an aim to bridge the world between traditional telecommunications, and the new Internet enabled world.This period has also seen a large scale investment in infrastructure to keep up with the demands of high speed data services.

The New Telco 2.0 business model

Anticipated business models in the telecomunications sector in the Telco 2.0 era focus on the fact that Telecom industry is moving towards an active collaboration with external parties and allowing 3rd access to telecom capacities in terms of the revenue model and moving into infrastructure services and management concerning the industry.

One route to this more open business approach is the open services ecosystem model being invetigated in the SOA4All project.

Increasing competition from the "Over the top" (OTT) service providers - service and content providers who do not own the network they use - shows the risk for telcos to become "dis-intermediated" from the digital supply chain; that telcos become merely a commodity "dumb pipe" provider. WebCo's typically have advertising-driven business models, whereas telcos collect revenues through usage-based billing. As these two sectors converge, the challenge for telcos is to reconcile the two different business models, finding ways to generate revenue from advertising, while continuing to offer billable services where appropriate. Finally, other changes are apparent such as the rise in virtual social networking, the roll-out of alternative access networks such as WiMax, and the emergence of enterprise mashups where enterprises are using Web 2.0-style applications alongside their more traditional IT assets.

Considering all these aspects, by appropriately positioning themselves in the Web 2.0 world, telcos will continue to evolve and transform themselves from mere "dumb" pipe providers, to providers of "smart" pipes (connectivity with QoS guarantees and SLAs), platforms to support an open service ecosystem and a range of telco and third party applications running on those platforms.Telcos will not only to create new services to address the needs of the long tail, but also allow 3rd party service providers to make

[3] See www.parlay.org

[4] http://java.sun.com/products/jain/

use of telcos underutilised operations and business support systems capabilities to create new service offerings, and hence creating new revenue streams.

Figure 1 below gives a high level view of the kind of platform and tools a telco might offer to allow telco and other services to be published and combined into applications. It can be seen that new growth opportunities will arise from externalising current capabilities, and allowing both the telco itself and 3rd party developers to address long tail demand.

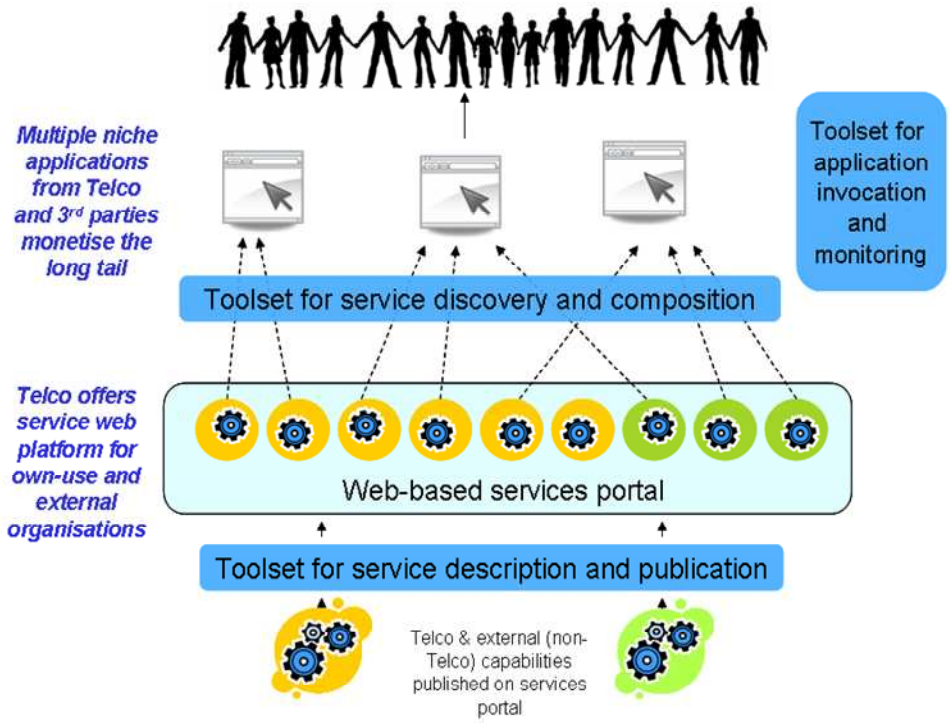

Figure 4 Open Services Web Platform and Tools

4.2.2 BT Web21 Ribbit Scenarios vs. Business Models

For each of the 2 BT Web21C Ribbit scenarios, 2 possible business models are discussed.

1. End-User Scenario

1.1 Utility model

According to Rappa's Utility model definition, the utility is based on metering usage and constitutes a "pay as you go" approach. The subscription model is more common among Internet Services Providers who charge customers for connection minutes. The strength of this model is flexibility for the end user, as users can use the service when they need it and be charged for it on the "pay as you go" approach. This means they pay only for what they actually use and can adjust their usage according to their ability or willingness to pay. This will attract some users to the platform, particularly from the end-user population. However, from the provider's perspective there is also a

weakness, since the model doesn't offer a steady revenue stream.

1.2 Subscription model

This is the typical model for added value services offered by the ISP. For users who are interested in more frequent use of the services (or for a subset of premium services), the subscription model is more appropriate. Strengths of the subscription model bring along that fees will provide a more reliable revenue stream for the provider and ease of use for the user (as the services will be available without restriction). A further point about the subscription model is that it can be combined with the advertising model (certain services can be offered at a lower rate or free when advertising is displayed).However; one weakness to point out is related to customers in terms of the high cost from this utility "pay-as-you-go" model. Furthermore, usage measures are difficult to monitor or verify

2. Business Reseller scenario

2.1 Brokerage model

In this model, the role of the platform provider is to bring buyers and sellers together and facilitating transactions. Main revenues come in a form of a broker charges (a fee or commission for each transaction it enables). A weakness of this model is that the broker success is strongly dependent on the success of the service providers themselves: hosting services which have low usage rates is unlikely to prove profitable. This model also deters customers who want to actually escape the rigid structures and costly pay-per-transaction models of providers like eBay or the Amazon Marketplace.

2.2 Merchant model

Merchants are wholesalers and retailers of goods and services. Sales may be made based on list prices or through auctioning. In this model, which is not necessarily mutually exclusive with the brokerage model, the platform provider uses the platform as a distribution channel for its own services. Its main strengths include the transparency for customers new to e-Commerce, enabling them to directly relate sales to different offers and changes to their web shops and e-Commerce applications. In addition to this, the lack of the distribution channels contributes to simplify the online transactions.

However, main weakness is represented by the difficulty of gaining that visitors of the website become potential customers as well as the potential credit card fraud. In addition, another disadvantage of this approach when combined with the brokerage model is potential lowering of prices in order to make BT's services will be competitive with other services available on the platform. Conversely, combining the two models allows sets of complementary services to be offered from one platform. For example, BT could offer telecommunications services while another provider could offer location-based services.

4.3 C2C e-Commerce Scenario vs Business Model

4.3.1 Introduction

The rapid growth of the e-commerce on the internet has brought new business models on the web. In this context, is where the C2C has become one of the fastest growing

segments of e-commerce thanks to the advent of social networking. In this context, consumer can post classified ads or offers to sell their property to other consumers. Annex 2 contains a summary with the current e-business models according to different authors. Especial mention to the Rappa web business models as one of the main experts on the conventional business model transition to the web business models.

4.3.2 C2C e-commerce Scenario vs. Business Model

The C2C e-Commerce Framework Use Case deals with different roles, each of which might employ various business models. The different roles are detailed in the subsection 3.5.3 of this document. However, because of the purpose of the business model, only the two mayor roles have been considered: One role is the provider of the whole C2C e-Commerce infrastructure, which has been described as a typical Internet Service Provider in D9.1.1, through the e-Commerce framework could of course also be deployed by other providers. The second role of major importance is the end customer, who sets up their own e-Commerce application, based on services supplied by the ISP and by third parties.

According to these main actor involved in the C2C scenario, two potential business models have been considered for each one of them and key weakness and strengths points of both models outlined.

1. Business models for the infrastructure provider

The infrastructure providers which comprises the ISP, and to a lesser extent also the service providers/broker roles would potentially use a Subscription or an Advertising Model.

1.1. **The Subscription Model**

This is the typical model for added value services offered by the ISP. Customers are charged a periodic - usually annual – fee to get access to the products which allow them to create their own e-Commerce applications via the e-Commerce framework.

The major strength here is that the model aligns with the existing products and services offered by the ISP (for traditional products).In addition to this, for vendors, this model is a constant, more predictable revenue stream. In what the customer is concerned, this model allows customers to big upfront fee for the right to use software. It seems that this business model also will become the dominant form of selling software in the next years.

Weaknesses include that the model is decoupled from the actual transactions conducted via the web shops of customers. Customers which generate heavy traffic by attracting other customers to their successful e-Commerce sites would pay the same subscription fee as less active ISP customers.

Within this Subscription model category, the **Internet service Provider model** is the most suitable for the C2C e-commerce scenario in terms of providing network connectivity and related services.

1.2 **The Brokerage Model**

For each transaction made via an e-Commerce application built with the framework, the customers would pay a certain percentage to the ISP. This is the model employed by large brokers for e-Commerce, like eBay.

Main strengths comprise that the revenue is directly correlated to the amount of

successful transactions, which procure no additional costs for the ISP themselves. Furthermore it facilitates transactions in B2C or B2B or C2C markets.

However, weaknesses cover that this model might deter customers who want to actually escape the rigid structures and costly pay-per-transaction models of providers like eBay or the Amazon Marketplace. For the C2C e-Commerce Framework to be successful on a business level, it is needed to incentivise customers by offering them competitive fees compared to the larger brokers.

Within this Brokerage business model category, we have identified three specific models that match the C2C e-commerce scenario: **Transaction Broker, Search Agent and Distributor** would all be suitable. A brief description of the models mentioned above is considered according to Rappa.

The Transaction Broker model provides a 3rd party payment mechanism for buyers and sellers to settle a transaction. In addition, **the Search Agent Model** used to search for the price and availability of goods or a service specified by the buyer or to locate hard-to-find information. To sum up, **the Distributor Model** connects a large number of product manufacturers with volume and retail buyers. Broker facilitates business transactions between franchised distributors and their trading partners.

2. Business models for the customers

The actual end customers, who participate in C2C e-Commerce thanks to the C2C framework, would actually use other models for themselves: The Merchant Model and potentially the Advertising Model.

2.1 The Merchant Model

This is the most basic and traditional model for the customers, who sell actual products and services via their web shops. Sales may be made based on list prices or through auctions.

Strength of this model are the transparency for customers new to e-Commerce, enabling them to directly relate sales to different offers and changes to their web shops and e-Commerce applications. In addition to this, the lack of the distribution channels contributes to simplify the online transactions. However, weakness is represented by the difficulty of gaining that visitors of the website become potential customers as well as the potential credit card fraud.

All business models included in this category, **Virtual Merchant, Catalogue Merchant, Click and Mortar as well as Bit Vendor**, are suitable for the C2C e-commerce scenario.

In this sense, the **Virtual Merchant Model** operates solely over the Web (also known as an “e-tailer”). Besides this, the **Catalogue Merchant Model** is based on a Mail-order business with a Web-based catalogue which combines mail, telephone, and on-line ordering. **The Click and Mortar Model** consists of a traditional brick-and-mortar retail establishment with a Web storefront. Finally, we have **the Bit Vendor Model**, that consist of a merchant who deals strictly in digital products and services and, in its purest form, conducts both sales and distribution over the Web.

2.2 **The Advertising Model**

Customers of the C2C e-Commerce framework could benefit from the flexibility of the

platform, using services like the collaborative advertisement service offered via the framework or by third party providers.

One relevant strength of this model besides being widely adopted by companies a world level is that complements other web business models such as the traditional merchant model and can generate additional revenue for the end customers of the e-Commerce framework.

However, a weakness of this model is that it only work when the volume of viewer traffic is large or highly specialized, which might not be the case for the typical end customer in the C2C e-Commerce scenario. The revenues from advertising are enhanced by the number of visitors to a web and amount of time visitor spent on the web site. From the buyer's perspective, it is usually expensive and it generates the most credit card fraud.

As it happens with the Merchant model category, main business models included in the Advertising model category are suitable for the C2C e-commerce scenario. These models are:

- **Portal:** Usually a search engine that may include varied content or services. A high volume of user traffic makes advertising profitable and permits further diversification of site services. A personalized portal allows customization of the interface and content to the user.
- **Classifieds**: List of items for sale or wanted for purchase. Listing fees are common, but there also may be a membership fee.
- **User Registration:** Content-based sites that are free to access but require users to register and provide demographic data. Registration allows inter-session tracking of user surfing habits and thereby generates data of potential value in targeted advertising campaigns.
- **Query-based Paid Placement:** Sells favorable link positioning (i.e., sponsored links) or advertising keyed to particular search terms in a user query, such as the Overture** trademark "pay-for-performance" model.
- **Contextual Advertising**: Freeware developers who bundle ads with their product. For example, a browser extension that automates authentication and form fill-ins may also deliver advertising links or pop-ups as the user surfs the Web.
- **Content Targeted Advertising:** Pioneered by Google**, the precision of search advertising is extended to the rest of the Web. Google identifies the content of a Web page and then automatically delivers relevant ads when a user visits that page.
- **Ultramercials**: Interactive online ads that require user interaction to reach the intended content.

5. Conclusion

This deliverable has displayed the four SOA4All scenarios in order to show the added value in relation to what we do with the SOA4All technologies. These four scenarios are listed hereafter:

- The End User Integrated Enterprise Service Delivery Platform Scenario from the End User Integrated Enterprise Service Delivery Platform Use Case from SAP.
- The End-user Scenario and Service Reseller Scenario from the BT (Web 21C Ribbit) Use Case.
- The C2C e-Commerce Scenario from the C2C e-Commerce Use Case by Hanival in collaboration with TXT, TIE and SEEKDA.

In addition to this, potential business models have been identified and matched to each of the critical scenarios already defined. In order to well address business models to the scenarios mentioned above, some references to the business model definition, key elements and e-business model taxonomy has been considered in three annexes at the end of the document.

In this sense, we have concluded that conventional software business models will be applied to the Service Delivery Platform scenario in terms of a hybrid or standard licensed software model .However, last year's new service-oriented business models based on SOA and SaaS are emerging in order to attract a large number of software vendors.

With respect to the End-user scenario, both, the Utility and Subscription models would be of interest for this scenario. However, the Reseller scenario to be also developed in the Telco 2.0 use case would use a Brokerage or a Merchant model.

In what the C2C scenario is concerned, several web business models have been identified depending on the two mayor actors involved in this scenario, providers and consumers. Because of the scenario characteristics, it seems that services providers could deploy a Subscription or Brokerage model whilst consumer would be between the Merchant or the Advertising model.

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ANNEX 1 Business Model Definition

The evolution of a business model concept is about changes in its environment and infrastructure. In this sense, some of the most quoted definitions of business model are the definition by Amit and Zott (2000), Rappa (2000), Mahadevan (2000),Timmers (1998),Betz (2000) or Chesbrough and Rosenbloom (2009).According to Amit & Zott (2001) a business model depicts the content, structure, and governance of transactions designed as to create value through the exploitation of business opportunities. A business model includes the design of:

- Transaction content: goods/services; resources/capabilities.
- Transaction structure: parties involved; linkages; sequencing; exchange mechanisms.
- Transaction governance: flow control.

In addition, Mahadevan (2000) considers that a business model is a unique blend of three streams that are critical to the business: The value stream, which identifies the value proposition for the business partners and the buyers; The revenue stream, which is a plan for assuring revenue generation for the business, The logistical Stream, which addresses various issues related to the design of the supply chain for the business. According to Timmers (1998) a business model is architecture for product, service and information flows, including a description of the various business actors and their roles;and a description of the sources of revenues; and a description of the potential benefits for the various business actors.

Porter (2001) described the emphasis in business models on generating revenues as “a far cry from creating economic value”. In addition, Chesbrough and Rosenbloom consider that the term business model is often used, but not often clearly defined. The functions of a business model are as follows.

- To articulate the value proposition, that is, the value created for users by the offering based on the technology.
- To identify a market segment, that is, the users to whom the technology is useful and the purpose for which it will be used.
- To define the structure of the firm's value chain, which is required to create and distribute the offering, and to determine the complementary assets needed to support the firm's position in this chain.
- To specify the revenue generation mechanism(s) for the firm, and estimate the cost structure and target margins of producing the offering, given the value proposition and value chain structure chosen.
- To describe the position of the firm within the value network linking suppliers and customers, including identification of potential complementary firms and competitors to formulate the competitive strategy by which the innovating firm will gain and hold advantage over rivals."

ANNEX 2 E-business Models Categorisation

Enterprises use a portfolio of business models to achieve their strategies and goals. There are thousands of classifications concerning the e-business models taxonomy and classifications depending on the author. The table displayed below, shows main e-business classification according to different authors:

Author **Year of Publication**	**Timmers (1998)**	**Bambury (1998)**	**Linder and Cantrell (2000)**	**Tapscott, Ticoll et al. (2000)**	**Applegate (2001)**
Referred to by the author(s) as	Current Business Models	Taxonomy	Overview of Operating Business Models	B-Web Taxonomy	None given
Criteria for differentiation	Degree of innovation Degree of integration	No consistent criteria	Core profit making activity Relative position on the price/ value continuum	Degree of economic control Degree of value integration	No consistent criteria
Number of categories and sub-categories	11 categories	2 categories 15 subcategories	8 categories 34 sub-categories (not listed here)	5 categories	4 categories
Business Model Categories	E-shop E-procurement E-malls E-auctions Virtual communities Collaboration platforms Third-party marketplaces Value-chain integrators Value-chain service provider Information brokerage Trust services	**Translated real-world business models** Mail-order model Advertising-based model Subscription model Free trial model Direct marketing model Real estate model Incentive scheme model B2B Combinations of the above models **Native Internet Business Models** Library model Freeware model Information barter model Digital products and digital delivery model Access provision model Website hosting and other models	Price model Convenience model Commodity-plus model Experience model Channel model Intermediary model Trust model Innovation model	Agora Aggregation Value chain alliance Distributive network	Focused distributor models Portal models Producer models Infrastructure provider models

Table 4 Taxonomy of E-business models (I)

Author **Year of Publication**	**Weill and Vitale (2001)**	**Eisenmann (2002)**	**Betz (2002)**	**Rappa (2006)**	**Laudon and Traver (2003)**
Referred to by the author(s) as	Typology of Atomic e-Business Models	Generic Internet Business Models	Generic Business Models	Taxonomy of Business Models Observable on The Web	Major Business Models
Criteria for differentiation	Strategic objectives Source of value Critical success factors Core competencies	No consistent criteria	Resources Sales Profit Capital	No consistent criteria	No consistent criteria
Number of categories and sub-categories	8 categories	8 categories	6 categories	9 categories 41 subcategories (not listed here)	7 categories
Business Model Categories	Content provider Direct to customer Full-service provider Intermediary Shared infrastructure Value net integrator Virtual community Whole-of enterprise/ govt	Internet access providers Online portals Online content providers Online retailers Online brokers Online market makers Networked utility providers Application service providers	Strategic finance Strategic enterprise Strategic response Strategic learning Strategic innovation Strategic firm	Brokerage Advertising model Infomediary model Merchant model Manufacturer model Affiliate model Community model Subscription model Utility model	Portal E-tailer Content provider Transaction broker Market creator Service provider Community provider

Table 5 Taxonomy of E-business models (II)

As complement of the previous- business model classifications displayed above, we have keep an eye on the most updated and modern e-business models classification based on the nine major categories of e- business models in practice among Web-based enterprises identified by Rappa[5] and collected in his paper “utility business model and the future of computing services” published in the BM SYSTEMS JOURNAL, VOL 43, NO 1, 2004

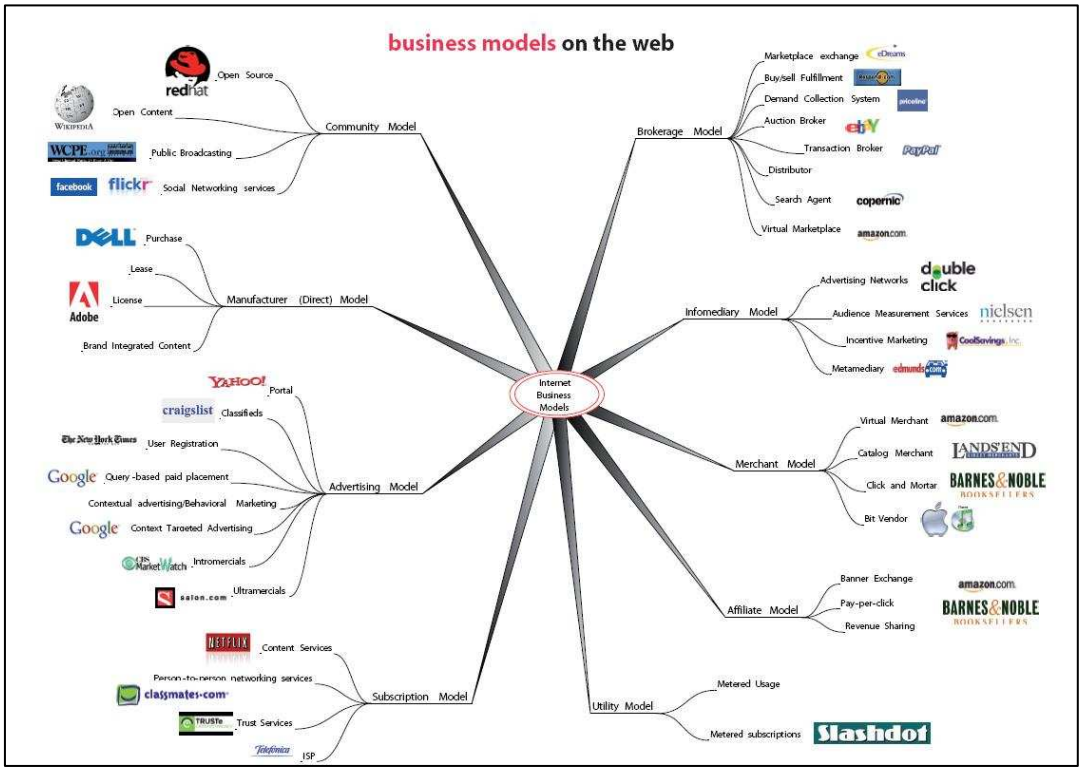

Figure 5 E-business models according to prof Rappa (2006)

In addition to the web Business models schedule displayed above, a detailed summary about main e-business models category according to Rappa are described:

Model	Characteristics
Brokerage model	Brokers are market-makers: they bring buyers and sellers together and facilitate transactions. Brokers play a frequent role in business-to-business (B2B), business-to-consumer (2C), or consumer-to-consumer (C2C) markets. Usually a broker charges a fee or commission for each transaction it enables. The formula for fees can vary.

[5] http://www.1000ventures.com/business_guide/business_model.html

Advertising Model	The web advertising model is an extension of the traditional media broadcast model. The broadcaster, in this case, a web site, provides content (usually, but not necessarily, for free) and services (like email, IM, blogs) mixed with advertising messages in the form of banner ads. The banner ads may be the major or sole source of revenue for the broadcaster. The broadcaster may be a content creator or a distributor of content created elsewhere. The advertising model works best when the volume of viewer traffic is large or highly specialized.
Merchandt Model	Wholesalers and retailers of goods and services. Sales may be made based on list prices or through auction.
Infomediary Model	Data about consumers and their consumption habits are valuable, especially when that information is carefully analyzed and used to target marketing campaigns. Independently collected data about producers and their products are useful to consumers when considering a purchase. Some firms function as infomediaries (information intermediaries) assisting buyers and/or sellers understand a given market.
Manufacturer Model	The manufacturer or "direct model", it is predicated on the power of the web to allow a manufacturer (i.e., a company that creates a product or service) to reach buyers directly and thereby compress the distribution channel. The manufacturer model can be based on efficiency, improved customer service, and a better understanding of customer preferences.
Affiliate Model	In contrast to the generalized portal, which seeks to drive a high volume of traffic to one site, the affiliate model provides purchase opportunities wherever people may be surfing. It does this by offering financial incentives (in the form of a percentage of revenue) to affiliated partner sites. The affiliates provide purchase-point click-through to the merchant. It is a pay-for-performance model -- if an affiliate does not generate sales, it represents no cost to the merchant. The affiliate model is inherently well-suited to the web, which explains its popularity. Variations include banner exchange, pay-per-click, and revenue sharing programs.
Community Model	The viability of the community model is based on user loyalty. Users have a high investment in both time and emotion. Revenue can be based on the sale of ancillary products and services or voluntary contributions; or revenue may be tied to contextual advertising and

	subscriptions for premium
Utility Model	The utility or "on-demand" model is based on metering usage, or a "pay as you go" approach. Unlike subscriber services, metered services are based on actual usage rates. Traditionally, metering has been used for essential services (e.g., electricity water, long-distance telephone services). Internet service providers (ISPs) in some parts of the world operate as utilities, charging customers for connection minutes, as opposed to the subscriber model common in Europe
Subscription Model	Users are charged a periodic - daily, monthly or annual – fee to subscribe to a service. It is not uncommon for sites to combine free content with "premium" (i.e., subscriber- or member-only) content. Subscription fees are incurred irrespective of actual usage rates. Subscription and advertising models are frequently combined.

Table 6 Web business model characteristics identified by Rappa

ANNEX 3 Future trends of the Web Business Models

According to Gartner, independent on the e-business model classification, some key factors such as the consumerization of IT, the impact of the web 2.0 community based technology and process as well as web platforms and the increasing transparency of the web will affect web business models through 2010.In this context:

- The consummerization of Information technology and the technologies and process associated with the web 2.0 are the most important development that is transforming and affecting Web business models and will continue to be the most important factor through 2011. Comsumerization reflects the movement of the centre of information technology to the consuming individual and not the corporate or organizational entity.
- The community aspects of the web 2.0 affect organizational web business model planning by exploiting the network's collective intelligence to refine customer product and services offering and by exploiting viral marketing channels.
- The power of the web platforms as a place for organizations to put and use web bases services, content and metadata will be a key factor in business model planning. In addition, by 2010 companies marketing products will lose another degree of customer interaction to organizations that deploy web platforms initially in consumers and increasingly in the business-to –business space.
- The increasing transparency of the web as a sales and marketing channel will affect the organizations. In this context, one direct result of this increases in the use of the web for an expanding range of consumer and business procurement activity, is transparency to the increasing amount of products and service attributes.

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