WEB SERVICES' IMPACT ON ELECTRONIC MARKETPLACES – THE NEED FOR A TRUSTED THIRD PARTY

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Abstract

This paper addresses the possible impact of Web Services in an electronic marketplace setting. The concept of Web Services suggests decentralisation and a business setting relying on automatic transactions. After outlining a Web Service scenario the paper elaborates on the implications on a 'traditional' third party situation of electronic commerce transactions. This is illustrated by applying the concept of Web Services to data from a conducted electronic marketplace case study. The conclusion regards a proposition that there still is a need for a trusted third party who acts as a guarantor for the involved actors' reliability.

Keywords: Web Services, Electronic Marketplace, Trusted Third Party.

1. INTRODUCTION

The popular topic of Web Services is now said to have passed its hype-curve-pike. Hoped for impacts are being explored through real-world implementations as the concept paves its way into everyday practice. Web Services has been pointed out as a corner stone almost as significant as the mid-nineties commercialization of the Internet. The concept is expected to alter the basis for IT-based business communication internally as well as externally (Lim 2003). In the short history of electronic commerce there has often been a need for intermediation. Business actors in the roles of buyers and sellers have been very much dependent on various middlemen.

The predecessor of Internet based solutions was proprietary EDI-systems (Electronic Data Interchange) with its standardized communication. This specific type of electronic business system was for the most part very expensive and meant large investment in technology and expertise. This implied a need for intermediary actors delivering so called value-added-network services, e.g. supplying infrastructure and mapping data between various internal formats.

With the Internet and web-based solutions third party actors also came to play another role, operators of electronic marketplaces became crucial (Senn 1998). Beyond supporting one-to-one relationships electronic marketplaces facilitates multiple matching of buyers and sellers. This model of doing business-to-business electronic commerce has been widely acclaimed but also associated with some distinctive restrictions (Dai et al. 2002). The promises of searching business partners through a centralised meeting place might imply delimiting the total set of prospective customers. Adjusting internal systems to a specific (non-standardized) solution might mean inertia when it comes to systems support for change and future needs.

The contemporary concept of Web Services has been pointed out as a solution to problems of this kind. One of the concepts' key issues is i.e. that business actors can utilize external system capability based on situational requirements instead of choosing a centralized third party solution (Lim 2003). This would indeed affect the relationships between different actor roles in a marketplace setting. Some authors tend to address these issues in terms of an evolution (e.g. Ratnasingam et al. 2002) while others propose Web Services to be the "death knell" of third party electronic marketplaces (Zyl 2002).

The focus in this paper is set on how existing marketplace structures will be affected and altered due to the impact of the emerging concept. Is Web Services at all applicable or would its entry mean replacing the need for third party marketplaces?

The purpose is therefore to investigate how a Web Service solution would apply in a "traditional" electronic marketplace setting. Following the discussion of above, we will pay special attention to the middleman role in a 'Web Service-induced' marketplace setting.

2. METHODOLOGY AND MOTIVATION

The proposed 'investigation' in this paper is carried through by an empirical illustration of a Web Service use situation. This is done by applying the concept of Web Services on empirical data from a case study on so-called local electronic marketplaces (LEMP) (Ågerfalk et al. 2002). The Web Services concept is outlined in two main areas. A formal description of standard specifications peer see and a discussion at a more conceptual level. The empirical data was collected in a interpretative case study (e.g. Klein et al. 1999) on two locally targeted electronic marketplaces (Ågerfalk et al. 2002).

The empirical illustration is using a set of identified marketplace actor categories for outlining relationships based on a Web Services induced situation. The motivation for using the local marketplace as illustrative setting is that of its simplicity when it comes to exemplifying actions of parties involved.

The motivation for doing this work – the answer for the 'so-what-question' is twofold. First of all we understand the evolution of Web Services to be of significant importance to the forthcoming, general direction of electronic business. This issue has been highlighted by key practitioner actors as well as

researchers in various forums the last few years (Stal 2002). Existing third-party marketplaces and their actors will accordingly be affected by this 'new order'. Further we believe existing practice and knowledge regarding third party marketplaces ("pre-Web Services") to be a natural point of departure when trying to understand the new setting.

We believe that plain descriptions of standards and general discussions regarding the perils and promises of Web Services have been properly covered by the IS-research community by now (e.g. Chen 2002; Hagel et al. 2001; Lim 2003; Stal 2002; Tsalgatidou et al. 2002). That includes putting this 'new' topic in a general electronic commerce context. A seemingly fitting next step would be to study the outcome of implementations and looking for aspects of interest from empirical failures and success stories. The direction of this paper is however somewhere in between these two 'phases' and thereby represents a type of contribution we find as lacking. By illustrating a situational adoption we hope to make grounds for the posing of more specific questions.

The paper is structured as follows: the next section (no. 3) introduces the electronic marketplaces to convey the study's context and our application area of interest. Section 4 outlines the concept of web services. This is done by giving a brief notion on Web Services evolution, definition and standards followed by a 'usage scenario'. The subsequent section number 5, is something of a synthesis where the aim is to theoretically connect the drawbacks of existing electronic marketplaces to the promises of Web services. Section 6 is a brief presentation of the empirical circumstances of the marketplace case study. Section 7 starts out with presenting our analysis where the mentioned 'usage scenario' (from section 4) are applied to our empirical data to illustrate and elaborate on possible outcomes. This is then followed up by relating our applied scenario to the theoretical synthesis (of section 5). The last section recapitulates our purpose in a concluding discussion.

3. ELECTRONIC MARKETPLACES

The concept of *market* was introduced in to the English language during the twelfth century and then referred to the actual locations of livestock trade (Selz 1999). The Greek equivalent *Agora* is even older and denotes the ancient city square where people met to trade and socialize (Zimmermann 1995). Today the term 'market' is used in a broader sense but still basically depicts the same economic mechanisms (supply meets demand in an often open price competition). According to Bakos (1998) a market provides for three basic functions: (1) the matching of buyers and sellers; (2) the facilitation of information-, goods-, service- and payment exchange and (3) the supplying of an institutional infrastructure (a legal and regulatory framework for acting). In today's informationalized reality of electronic business the physical constraints of such markets however has decreased. The concept of *electronic marketplaces* (EM) confirms this notion. An electronic marketplace (EM) can have an explicit focus on business actors (e.g. EMs such as Covisint) but also be targeted directly at consumers (e.g. Ebay). Since the Internet became the dominating interaction medium the area has experienced a vast interest from the research community – see Soh & Markus (2002) for a comprehensive electronic marketplace classification and Grieger (2003) for an up to date literature review. In this paper we confer to Bakos (1991), often used, general and definition:

"An electronic marketplace (or electronic market system) is an interorganizational information system that allows the participating buyers and sellers to exchange information about prices and product offerings." (Bakos 1991)

Technology should be apprehended as *enabler* (i.e. Davenport 1993) of this possible way of organising business interchange: technology effects not only *how* things can be done, but also *what* it is possible to do. A common strive today is therefore trying to understand the interplay between organizational and technological aspects in context.

4. THE CONCEPT OF WEB SERVICES

Web Services are, to put it simple, based on the idea that applications should be able to interact with other applications regardless of platform or programming language. There are of course more important aspects to this and we will shortly give a deeper presentation of Web Services. First of all we will outline a short background explanation on how and why Web Services have emerged.

4.1 The emerge of Web Services

Even though Web Services as a concept is something new the idea behind it is not. It has rather emerged from a search after standards that started since the need to share data between different applications begun.

Distributed application development has been an important field ever since typical computing moved from encapsulated jobs on centralized mainframe computers to peer-networked minicomputers and workstations. (Ogbuji 2002)

From the beginning of the distributed applications there was no focus on that data should be able to be exchanged between applications located on different platforms implemented in different languages. The focus was to keep it isolated in a well-integrated environment meaning that the system was built to work on a specific platform using a specific technology to exchange data. The problem was that every developer used their own architecture to build systems, which meant that there was no reusability of the systems since they were so hard integrated with the platform and hardware that the system was implemented on.

In the late 80s there were some organisations that tried to change this. Distributed Computing Environment (DCE) came up with an idea to standardize Remote Procedure Calls (RPC). At the same time Object Management Group (OMG) introduced Component Object Request Broker Architecture (CORBA) and Microsoft introduced Component Object Model (COM), which made DCEs attempt futile. This was over all an improvement since there were only two major standards regarding distributing data to choose from. This also meant that focus did change.

Systems integration became one of the most important considerations in the choice of technology and instead of standardization on a platform, IT managers looked for standardization on a networking technology. (Ogbuji 2002)

This standardization then should include (*ibid.*):

- Suitability both for distributed operation within an application, and the use of generic services across applications. In other words: the ability to support both software developers and systems integrators.
- Suitability for exchanges within an organization and between organizations, requiring cross-platform support and a data-driven focus.
- Concordance with existing Internet infrastructure as much as possible.
- Ability to scale as the number of nodes, heterogeneity of nodes and the complexity of each node's needs increase.
- Solid internationalization.
- Tolerance of failure. Networks where nodes are very tightly coupled together often suffer catastrophic failure when one node goes down. This is a serious problem for heterogeneous networks.
- Strong support in general software development and business workflow management tools from a rich choice of vendors.

- Suitability for the most trivial request/response exchanges as well as handling the most sophisticated orchestration, transaction and security concerns where necessary.

The standardization should, accordingly, be rather open, shared and include concordance with existing Internet infrastructure. This leave key issues to resolve since the Internet environment is inherently insecure. Hewlett Packard (HP) was the first that took most of the above-mentioned needs into consideration and made what was to be the first Web Services architecture. They were also the first to introduce the expression Web Services. But HP are today not as recognized regarding the work with Web Services as Microsoft, ARIBA, Oracle, Sun Microsystems and IBM who has been very active in the process behind the standards related to Web Services.

4.2 Defining Web Services

There are almost as many definitions of Web Services as there are companies involved with the phenomena. In this paper we will use the official W3Cs Web Services definition:

"A Web service is a software system identified by a URI, whose public interfaces and bindings are defined and described using XML. Its definition can be discovered by other software systems. These systems may then interact with the Web service in a manner prescribed by its definition, using XML based messages conveyed by Internet protocols." (W3C 2003a)

W3Cs definition of Web Services, includes both architectural and technical aspects. Also, the organisation stands free from developers of the technology, which makes it an objective definition; hence we use the definition in this paper.

Now, let us expound our earlier explanation on what a Web Service is:

A Web Service can be a simple application that uses well-defined standards to interact with other Web Services through Internet protocols. It takes a request, processes it and returns an answer. So far there is nothing new that separates Web Services from other types of applications. What is new with Web Services is that it is unnecessary for the one service to know the exact location of another service. It could use a registry, similar to the yellow pages, to locate what it searches for. This registry stores information such as *where* to find a Web Service, *what* it does and *how* to interact with it.

4.3 Web Services related Standards

Web Services' (W3C 2003a) strength is that it is derived from emerging standards, which we will describe further in this chapter.

The first standard for describing and structuring data is Extensible Markup Language (XML) (W3C 2000). The standard runs under W3Cs protection and became a recommendation back in 1998 The main usage of XML is to exchange data and because it is internationalised, extensible and independent of platform it can also be used as an integration tool.

XML should be considered as a suite of standards, seen in three levels of abstraction; XML definition language, XML Document Type Definition (DTD) or XML Schemas Definition (XSD) file and XML document.

A XML definition language is a meta-language; hence new markup languages can be defined. The W3C have defined two recommendations. The first, XML 1.0, is a set of production rules and defines the syntax for XML documents. The other recommendation (W3C 2001), XML Schema 1.0, defines structure, data types and usage of a XML Schema document. These recommendations can be used to define XML DTD files and XSD files. DTD and XSD define structure, property and content of XML documents and validate the instance, i.e. the XML document. The validation assures the correctness of the instance. The instance of the XSL Language (W3C 1999), i.e. the XSL file, is used for transforming the XML document to a proper format for presentation, e.g. XHTML.

The second standard is the Web Services Description Language (WSDL), which describes the interface of a Web Service. WSDL (W3C 2003b) uses XML to specify properties of a Web Service such as *what* is does, *where* it is located and *how* it is invoked.

The third standard is Universal Description, Discovery, Integration (UDDI). UDDI makes it possible to publish information about business and services. It can be used to check if a given partner offers a specific service or to locate such a Web Service. The UDDI specification (UDDI.org) uses XML Schemas. The Schemas defines business entities and business services. Business entities describe information about businesses, i.e. name, description, services offers and contact information. Business services describe more detailed information about each service being offered.

Protocols that Web Services use for communication are the Hypertext Transfer Protocol (HTTP) and the Simple Object Access Protocol (SOAP). HTTP is the set of rules that specifies file exchanging over the Internet. SOAP (W3C 2002) is an adaptation of XML-RPC and is a standard for sending and making remote procedure calls over the Internet, independent of platform and programming language.

All these standards and protocols have several important and necessary impacts on Web Services, shown in table 1.

Table 1. Web Services' related standards

XML	Standard for describing, structuring and validate data. XML is also internationalised, extensible and independent of platform and programming language.
WSDL	Standard that uses XML and describes the interface of a Web Service.
UDDI	Standard for publishing and searching information about businesses and services.
HTTP and SOAP	Protocols for sending and receiving messages over the Internet, independent of platform and programming language.

These standards and protocols enable Web Services´ architecture to be run over Internet in an open, unmonitored and shared environment.

4.4 A Web Service usage scenario

To make it clearer how all these standards relate to Web Services we will describe a complete usage scenario. The same scenario will be further operationalized in using our empirical illustration from the local electronic marketplace setting in section 7 below.

A company assumes the role of *service provider* (SP) when publishing information about Web Services and information about its business in an UDDI registry. This activity is denoted as '1' in figure 1 below. The SPs act of publication is in other words an offer including software applications addressing some specific need. Tsalgatidou & Pilioura (2002) uses a clarifying distinction between a business and a architectural perspective in discussing Web Services' roles. From a business perspective one can view the SP as the owner of the service. From an architectural perspective on the other hand it is more appropriate to understand the SP as "the platform that holds the implementation of the service" (*ibid.* p 137).

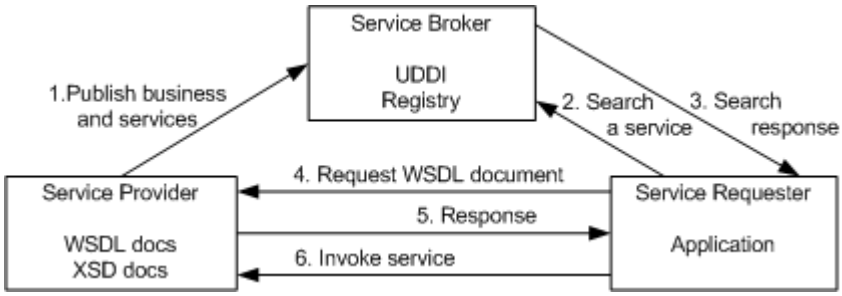

Fig. 1, Example of usage of a Web Service (Inspired from Tsalgotidou and Pilioura, 2002)

The service provider then accordingly uses a UDDI registry hold by a service broker (SB). The SBs role from a business perspective is therefore to act as a transparent intermediary. The architectural issue concerns storing as well as managing the access to the repository of actor information and the services they offer.

A company is a service requester (SR) when it performs searches in the UDDI registry for a specific service (denoted as activity 2 in figure 1). The UDDI registry responds with sending information of the possible matching service (3). From a business perspective this process of matching concerns fulfilling the requesting actors' needs. Again using the architectural view a service requester should be understood as the actual application searching for and calling upon a specific Web Service. The SR must now send requests (4) to the SRs Web Service that are of interest to obtain WDSL documents (5) that defines each Web Service. The SR thereafter has the information needed to invoke the Web Service (6). The data itself is sent in XML format and the communication is then enabled by HTTP and SOAP.

If a service is invoked the SP may have to change its role to become a SR if it needs to obtain further assistance to process the service by using the same procedure as stated above.The example shows a typical usage of a Web Service, which provides a decentralized, open and shared environment.

5. WEB SERVICES IMPACT ON ELECTRONIC MARKETPLACES

As introduced in section 1 above, existing solutions for 'traditional' Internet based electronic marketplaces has shown to involve some problematic drawbacks. This section will take the discussion a bit further and outline the possible restrictions connected to the proposed possibilities in the Web Service concept. We will however first present a framework for understanding electronic marketplaces for the sake of contextualizing the 'new' concept's possible impact.

Schmid and Lindemann's (1998) widespread reference model (EM-RM) of electronic marketplaces have been used in a variety of ways. The model depicts that it is both possible and required to address the electronic marketplace phenomena from different perspectives at different levels (Figure 2).

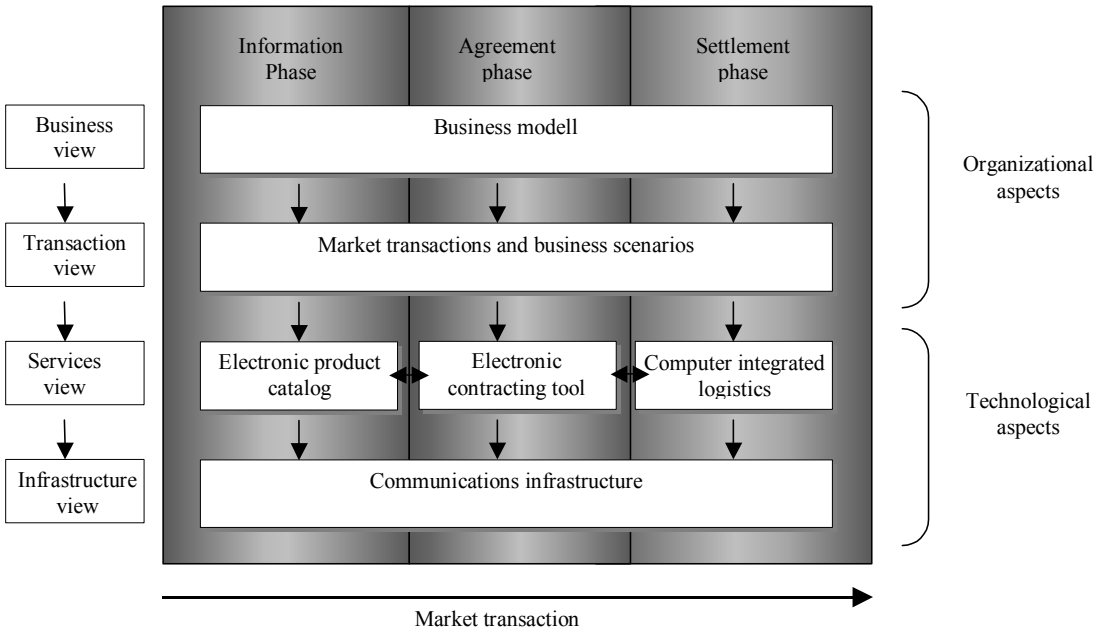

Fig. 2 The EM-RM model (Schmid & Lindemann, 1998, p. 196)

At the highest level one can choose to view an electronic marketplace as a *business model*:

"[A business model is …] *an architecture for the product, services and information flows, including a description of the various business actors and their roles; and a description of the potential benefits for the various business actors; and a description of the sources of revenues."* (Timmers 1998, p. 5)

The business model of a third party marketplace involves actors in roles as *marketplace host buyers*, *sellers* and *information suppliers* (Schmid et al. 1998). The marketplace is then operated by a marketplace *host* that offers the technology but is also a guarantor for certain aspects of quality regarding the marketplace services. The operator therefore can be seen as a trusted third party that buyers and sellers commission to act as intermediary.

The next EM-RM level – the transaction view – highlights the business interaction that takes place between the marketplace actors. Thereafter follows the service view (the information system architecture) where various marketplace services are enabled by a repository of information handled by a set of dedicated applications (*ibid.*). At the bottom level lays the IT-infrastructure as the actual backbone enabling the services.

We believe a holistic view, as delivered by this reference model, to be crucial for understanding the interplay between organizational and technological aspects. As mentioned in section 2 a multitude of research publications on Web Services regards the upper two levels of EM-RM (organizational aspects) or the two lower (focusing the technology). Our approach is trying to understand the interplay between the different levels and the point of departure is that the Web Service concept has an impact at all levels. The aspect of information technology as *enabler*, is then a key aspect here (i.e. Davenport 1993): technology effects not only *how* things can be done, but also *what* it is possible to do. That is, new technological solutions for underlying infrastructure and arrangements of how to handle services could possibly alter what transactions an electronic marketplace can deliver (see figure 2).

To pinpoint the proposed need for Web Services it is possible to use Ratnasingam & Pavlou's (2003) disposition in table 1. The authors (*ibid.*) present a set of ideal typical differences between "traditional

business-to-business applications" and systems following the Web Services concept. Our interest is quite naturally to derive a third party marketplace situation.

Table 2. Comparison of traditional business-to-business applications and Web Services

Traditional business-to-business applications	**Web Services**
Centralized	Decentralized
Contained and controlled	Open and unmonitored
Limited, defined user base	Unknown, unlimited user base
Secure (risk minimized)	Exposed (open to random events)
Proprietary	Shared
Fixed, well-defined, compiled	Built dynamically, on-the-fly
Incremental scale based on known demand	Unlimited scale, based on unknown, unpredictable demand
Staged, periodic changes	Continuous, ad hoc changes

The restrictions of existing electronic marketplaces have to do with what is sometimes called 'technology lock-in' of participators. Investments in a *centralized* electronic marketplace might mean excluding business opportunities found elsewhere. The investments concern adjusting internal systems and/or operations to fit a specific marketplace solution. Such adjustments will seldom be applicable when the same actor e.g. wants to participate in another marketplace. The possible expansion of a marketplace's *user base* (e.g. supplier/customer base) depends on the willingness of the *controlling* third party operator (Dai et al. 2002).

As table 1 suggests Ratnasingam & Pavlou's (2003) means that such drawbacks can be handled by Web Service-solutions. The 'control' of a business-to-business functionality would in the extension be possible to promote to the technology itself. Aspects of trust, earlier projected at the marketplace host (e.g. confidence in company reputation) can now to a higher degree be assigned the technology it self (Ratnasingam 2003). Such a scenario would then exemplify a case where technological development enable altering the core in an existing business model.

The promises of Web Service induced electronic marketplaces also include mean for covering the technology lock-in restriction of a fixed IS-architecture. The need for new marketplace services (se section 4 above) could be invoked on the fly.

6. A CASE OF LOCAL ELECTRONIC MARKETPLACES

As mentioned in section 2 we will use the empirical findings from a conducted case study as input for illustration. As indicated above, a case study of two web sites with a geographical local focus has been conducted. Objects of study are the Swedish websites Lokaltidningen and SkaraborgOnline, which can both be categorized as local electronic marketplaces (Ågerfalk et al. 2002). Lokaltidningen originates from a web-based newspaper that has expanded into an electronic marketplace. The editorial content is complemented with locally focused information such as weather forecasts, sports results and information regarding organizational activities. Lokaltidningen also includes a section that provides an electronic mall of webshops. The actors behind the webshops are retailers who also manage physical stores located in the area. Besides the local content and shopping facilities, a vital part of Lokaltidningen is its discussion forum. The forum concerns everyday life and focuses on local themes, such as current events and politics.

SOL shares scope and basic ideas with the described situation of Lokaltidningen with a local operator in terms of a small Internet firm. SkaraborgOnline is however more of a joint venture, based on co-operating parties. The most prominent partner is Torget.se that is a nation-wide electronic marketplace with a consumer focus. SkaraborgOnline presents local news feed from another partner and like Lokaltidningen the site hosts a discussion forum. The site also includes search facilities committed to local content.

A case study outcome central for the analysis in this paper was an identified set of actor categories. We are going to use the three following categories for our illustrative purpose (section 2):

- The LEMP host that coordinates the marketplace activities, managing the shared marketplace structure. This includes the host as system owner providing access to, developing and maintaining the IOS-architecture as well as the IT infrastructure.
- The habitant is the 'tenant' of a LEMP, either as non-profit or business actor. The typical commercial habitant is a retailer managing a web-shop as well as a physical store located in the target area. The non-commercial habitant can be a sports club or another local organization with a need for disseminating information.
- The visitor category consists of site users that also are the prospective customers of the inhabiting retailers. Since the motive for marketplace use is a local interest, a visitor may however well be seeking information that is not related to commercial activities.

7. SERVICING THIRD PARTY MARKETPLACES

The first part of the following section presents how a third party marketplace could be arranged by the help of Web Services. The presentation is obtained by using the LEMP setting (section 6) for exemplifying and outlining the roles and activities on an UDDI-based marketplace. The second part takes the empirical illustration as a point of departure for stressing the specific demands of an electronic marketplace service broker.

7.1 An UDDI-based marketplace setting

The local marketplace host would be responsible for managing the UDDI registry and therefore adopt the role of service broker (SB). As mentioned in section 4.3 the specifications for "packaging" repository contents as well as the supposedly issues of technology trust (Ratnasingam 2003) comes with the standard. The LEMP setting however leaves more to the third party broker than hosting the registry. The function as trusted third party implies that the marketplace host, to some extent, vouches for the liability of the prospective business partners. To emphasize this circumstance we will use the notion of a *trusted service broker* (TSB) in the following.

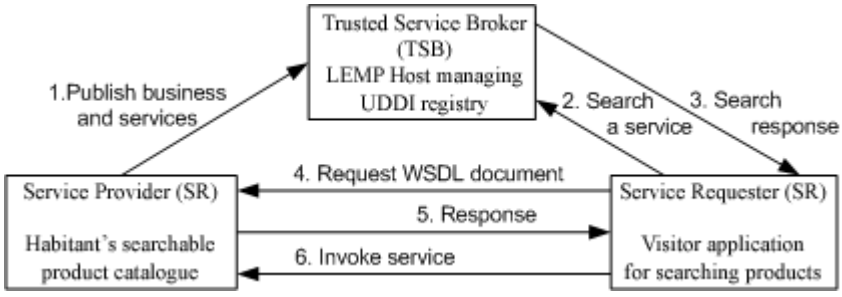

Fig. 3, An illustration of Web Service use in a LEMP setting.

According to figure 3 the service requester (SR) of a Web Services LEMP is the visitor (or the visitor application, see section 4.4).

In our, non Web Service induced, case data the visitors of SkaraborgOnline (section 6 above) that wanted to buy products accordingly trusted Torget.se to work with trustworthy habitants. Torget.se had an ethical policy as well as guidelines of what is considered to be a 'good' web-shop (Torget.se 2003).

In a Web Services equivalent to this scenario a marketplace TSB is needed to clearly specify and communicate the criteria for habitants allowed to register their services to the repository. Articulating such criteria means spelling out the rules of the game for the chosen business model. Taking part of the marketplace interaction then means accepting the rules.

The habitant, when accepted as participator, acts as service provider (SP). This implies that the habitant publishes information about the company, their business and their Web Services on the UDDI registry managed by the marketplace host. This information is stored together with the URL to that specific Web Service and it is the URL the visitor application will receive when requesting information on the service.

A LEMP example would be when a prospective buyer wants to use the service to search for a specific product among the commercial habitants connected. This makes it possible to obtain a WSDL document with instructions on how to invoke the Web Service of 'product search'. The proceeding communication between the visitor's and the habitants' Web Services are then enabled by HTTP and SOAP. The data itself is sent in XML format and thus visitor and habitant implementations based on different platforms are able to understand each other.

7.2 The need for a trusted third party

We have so far in this paper illustrated what a Web Service induced third party marketplace would look like. Such an electronic marketplace would theoretically have the potential of being decentralized in functionality and prepared for variations in volumes of habitants and visitors (see table 1). Another advantage would be that there are no longer restrictions excluding short-term relationships. Ideally habitants on such a marketplace would be able to choose the best deal possible in every situation. As already mentioned our illustration does not liberate the marketplace host from the role as a trusted third party.

With an all decentralized marketplace solution relying solely on built-in technology trust, it would be possible to do business with virtually anyone. There would however still be a need to verify the trustworthiness of various business partners. In the long run it might then again be easier to and less time consuming to choose a long-term relationship with a seller they know they can trust.

A solution would be to have someone that ensures that the actors involved at the marketplace are reliable, there need to be a service broker adopting the role of a trusted third party, a trusted service broker (TSB). The long-term relationship would then be between the habitants and the marketplace (the same as today). This of course means that the user base won't be unlimited since the habitants in the marketplace must be approved of this third party.

Keeping the centralized core in 'hosted' electronic marketplaces would not be to hold back Web services potential. It would on the contrary be a construct sensible to the interplay between enabling technology and its organizational impact. The setting would mean that Service Requesters do not have to investigate the opposite parties trustworthiness every time since they trust the service broker according to the good old business model.

A trusted service broker also has a responsibility to make sure that there are enough suppliers located on the EM. Changes in Service Providers services will not affect the Service Requester since they have short-term relationships as long as the information in the UDDI registry updates accordingly. A TSB that stands as guarantor have to take action if a Web Service or business has inaccurate information about them stored in their UDDI registry.

8. CONCLUDING DISCUSSION

The empirical illustration shows that the concept of Web Services has a potential in taking existing electronic marketplace settings to a higher level. We thereby believe that the third party structure will be needed also in future applications. A promise of the Web Services concept is that since it is build upon derived standards there will be a higher degree of technical trust that can reduce the need for trusting a middleman. Web Services has the potential to change the balance between business partners in an electronic marketplace setting. In recapitulating the EM-RM model this would mean when technological aspects has an altering impact on the organizational levels. We agree that Web Services makes it technical possible to build functional Electronic Marketplaces (EM) where actors may interact unmonitored, using a Universal Description, Discovery, Integration (UDDI) registry. UDDI makes it possible to publish information about business and services and to locate such service.

But the actors may have difficulties to put their confidence in such a marketplace setting. Therefore we suggest highlighting the continuous importance of a trusted third party also in a Web Service setting and suggest the Trusted Service Broker.

This actor will manage the marketplace functionality and the registry, which will create a better possibility for the actors to put their trust in the EM. A trusted service broker with knowledge about the specific market connects actors, i.e. Service Provider and Service Requester. These actors may have little or no knowledge about the other parts' reliability. The middleman guarantees that the communicating actors are reliable due to setting up rules for initial participating. The service broker is also responsible to ensure that there are enough actors participating meet the demands of buyers and sellers. The Web Service setting means that short-term relationship become easy to set up – the centralized old-school marketplace idea directs the need for long-term relationships to the TSB.

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