Comparison and Implementation Challenges in E-Commerce and M-Commerce (B2B) Web Sites

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--**ABSTRACT**---

This paper discusses a bit on E-Commerce and M-Commerce first. Apart from that it discusses importance of both of these digital commercial techniques along with B2B E-Commerce technique.

The main emphasis is given on ebXML which is widely used for B2B transactions. Along with this it also discusses about other B2B Frameworks as eCo, BizTalk, cXML, RossetaNet frameworks by discussing their security, communication protocol, repositories, message formats, ontology, etc. In short it also discusses various characteristics of all above specified B2B Framework.

Apart from above comparisons, this paper discusses about sample scenario of online business that belongs to E-Commerce or a new concept called M-Commerce. This is explained by showing High-Level overview between two companies using ebXML. At last this paper discusses about a solution for framework implementation for SMEs (Small and Medium Enterprises).

Keywords - **E-Commerce, M-Commerce, B2B, eBusiness, SMEs, Web Services, XML, XML Schema, ebXML, eCo, BizTalk, cXML, RossetaNet, Framework, COTS**

I. INTRODUCTION

Today all of we are aware about online shopping. Being IT people, most of us are also definitely aware about online transactions using Mobile which is termed as M-Commerce. We go for various types of online transactions today. With the increased usage of Internet and Information Technology in world, there is a significant interest in doing business online.

Today most of the businesses are turned into "eBusiness", especially Clothing, Footwear, Electronic Gadgets, Accessories, etc. You name it and its there on eBusiness. eBusiness is the electronic incorporation of all the business processes and operations within the organization that includes but is not limited to : production, sales, marketing, human resource management, supply chain management, e-commerce, etc. [6]
Hence, we need to understand the whole process of eBusines. Here we are concentrating more on Business to Business transaction rather then going for individual B2C (Business to Customer) transaction. This is the reason we are emphasizing on ebXML and other frameworks which are mainly used for B2B.

II. eBUSINESS WITH SMALL AND MEDIUM ENTERPRISE (SME)

Today most of the business organizations or we can say SMEs go for online business. Most of them have online retail store where customer can have view of various types of products and along with that they can go for online shopping too.
In order to achieve business growth many organizations go for various tactics like better GUI, better description of products, buy back policies, payment after receipt. In the beginning of eBusiness era, it was much difficult for SMEs to do business online and provide various features.[11]
If we see as high-level overview of common eBusiness strategies, they seem to be almost similar. Especially when we are talking about B2B transactions they are similar between most of SMEs. In this paper we will compare existing B2B frameworks, providing a new approach that will enable the typical SME to carry out large subset of business process within the company and its clients through the usage of internet by resulting competitive advantes of online transactions.

III. eBusiness / B2B Frameworks

As a matter of fact there are lots of publications on B2B frameworks. Some publications compare various frameworks based on characteristics [1][8]and some based on other parameters. Some publications advance to presenting architectures and systems of applying e-business frameworks to B2B integration. Overall, the significance on e-business frameworks [10] is increasing with rising implementation figures of them.
As usual majority of eBusiness / B2B Frameworks are of course based on XML architecture as XML is platform independent which can be utilized by any hardware / software platform. A paper which conducted by Software Research and Development Centre – Turkey [1], gives good comparison of some eBusiness / B2B frameworks

such as eCo, RossetaNet, Microsoft's BizTalk and Ariva cXML. Here the authors describe the architectural specification and business scenarios for each of the frameworks The main thing about all of these are, they define Business Process and Transportation or Messaging as main component for doing business online with Distributed Computing environment.

But obvious the overall theme of all of these frameworks are same but the way how Business Process and Messaging is defined, various from one framework to another framework. Most of them of course work on XML based architecture due to platform independent feature.

IV. Comparing various eBusiness / B2B Frameworks

Some famous B2B Frameworks are available as discussed in Turkey paper. They are eCo, BizTalk, cXML, RossetaNet and the main on which we will discuss "ebXML". Most of them work on HTTP as a communication protocol and their message format is XML due to platform independency requirements.

The following section mainly talks about ebXML. Along with that it will compare various B2B Frameworks which are listed above.

A. ebXML

The word "ebXML" stands for "electronic business XML". Obviously, the important component behind ebXML is XML only. ebXML provides XML based infrastructure which makes it globally available due to its interpretability, security and consistent manner feature.

We have explained the same in the main figure of this paper when "CompanyA" is dealing with "CompanyB" [2] in order to go for B2B transaction as E-Commerce / M-Commerce. As per the paper written by Huemer, following are the most important concepts in order to understand process framework of ebXML. Some of the important concepts are :

- **Business Process :** Defined as models, a XML-based specification language that formally defines public business processes that allow business partners to collaborate.

- **Business Messages :** Expressed in XML, Core components provide the business information encoded in business documents exchanged between business partners and naming conventions.

- **Trading Partner Agreement :** Specifies parameters for businesses to interface with each other. Expressed in XML

- **Business Service Interface :** Implements Trading Partner Agreement – Expressed in XML

- **Transport and Routing Layer :** the actual XML data between trading partners

- **Registry / Repository :** Provides a "container" for process models. It contains a set of services that enable sharing of information between interested parties. This shared information is maintained and managed by the ebXML Registry Services. Submitted content to registries may be XML schema and documents, process descriptions, Core Components, context descriptions, UML models, information about parties and even software components.

Additionally, **Collaboration Protocol Profiles (CPP)** and **Collaboration Protocol Agreement (CPA)** are XML documents that encode a company's e-business qualifications and two companies' e-business agreements. The CPP defines a Party's Message-exchange capabilities and the Business Collaborations that it supports. The CPA defines the way two Parties will interact in performing the chosen Business Collaboration.

The **ebXML messaging services (ebMS)** provide a general-purpose messaging system. The ebMS defines the message enveloping and header document schema. EbXML messages can be transported over communication protocols such as HTTP, SMTP, etc. The ebXML Message Service is designed to allow reliability, persistence, security and extensibility to messaging [9].

B. Comparison of B2B Frameworks

So far we discussed only about ebXML and some of the terms which are used while going for common B2B framework in general. As we discussed and named earlier, there are many other B2B frameworks which are used apart from ebXML. As the paper targets ebXML, we have emphasized more on it, but at the same time – we will also go for comparison of B2B Frameworks in below section.

As stated earlier, other B2B Frameworks apart from ebXML are "eCo", "BizTalk", "cXML", "RossetaNET", etc. Let su compare all these along with ebXML.

Feature	eCo	BizTalk	cXML	RossetaNete	ebXML
Security	Optional	Uses existing standards	Authentication used in Message Header	SSL with HTTML, digital certificates and signatures	Security optional, SSL with HTTL digital certi. and signatures
Communication Protocol	HTTP	HTTP / MSMQ	HTTP	HTTP / CGI	HTTP, SMTP, FTP
Repositories	Local	Centralized	Not Specified	Not Specified	ebXML, Registry, local or centralized
Message Format	XML documents	BizTalk documents made of BizTags	XML documents	XML documents	XML documents
Ontology	Common business Library	Collection of BizTags	Collection of XML tags	Technical and business dictionaries	Collection of XML tags with technical specification
Document Conversion	Not specified	BizTalk Mapper offers conversion	Not specified	Not specified	Not specified
Automated Business Process	It is mentioned in documentation but not specified	BizTalk Server allows automatic processing	Not addressed	Allows to define but no tool to automate them	Allows to define but no tool to automate them
Implementation	COTS	BizTalk Server, COTS	COTS	COTS	COTS

The purpose of comparing these frameworks is to show first of all the similarities between these frameworks, and thus obtaining information what is a trend in this technology and second to try to define the optimal framework of all, based on the features specified above.

First common characteristic between the above mentioned frameworks is the message format, which, in the majority of new frameworks is based on XML documents, due to the fact that XML is self-describing text file that works alike database and is fully independent of any platform, DBMS or similar. The ease to use XML documents makes these frameworks available for integration with existing systems for e-business.

Second common characteristic between these frameworks is the communication protocol, where in the most cases is HTTP protocol, which is very common for the infrastructure, because it is based only on the Internet connection and a Web browser.

- Third characteristic in common is the ontology, which is in most of the cases based on the technical specification of the framework.

- Finally, as seen from the table, they all have issues while implemented, meaning that they all need

Commercial Off-The- Shelf (COTS) software in order to process B2B messages.

What makes these frameworks different is the actual type of XML document they generate, the ease and the cost to integrate them and the available documentation online.

Based on the above mentioned differences, I think that due to the available documentation and the ease to integrate ebXML is one of the widely spread frameworks that is used nowadays and is a good baseline to create COTS or Open Source software on top of its specifications.

V.IMPLEMENTING B2B FRAMEWORK

In order companies to do business online with other companies is not as simple as it sounds. Before everything, these companies need to understand the messages the other party is sending. Even before that, they need to find these companies electronically, implement custom software for B2B collaboration (B2B frameworks) and then finally agree on some trading [10].

Now let us go through following example of B2B Framework between "CompanyA" and "CompanyB" which uses ebXML as a framework.
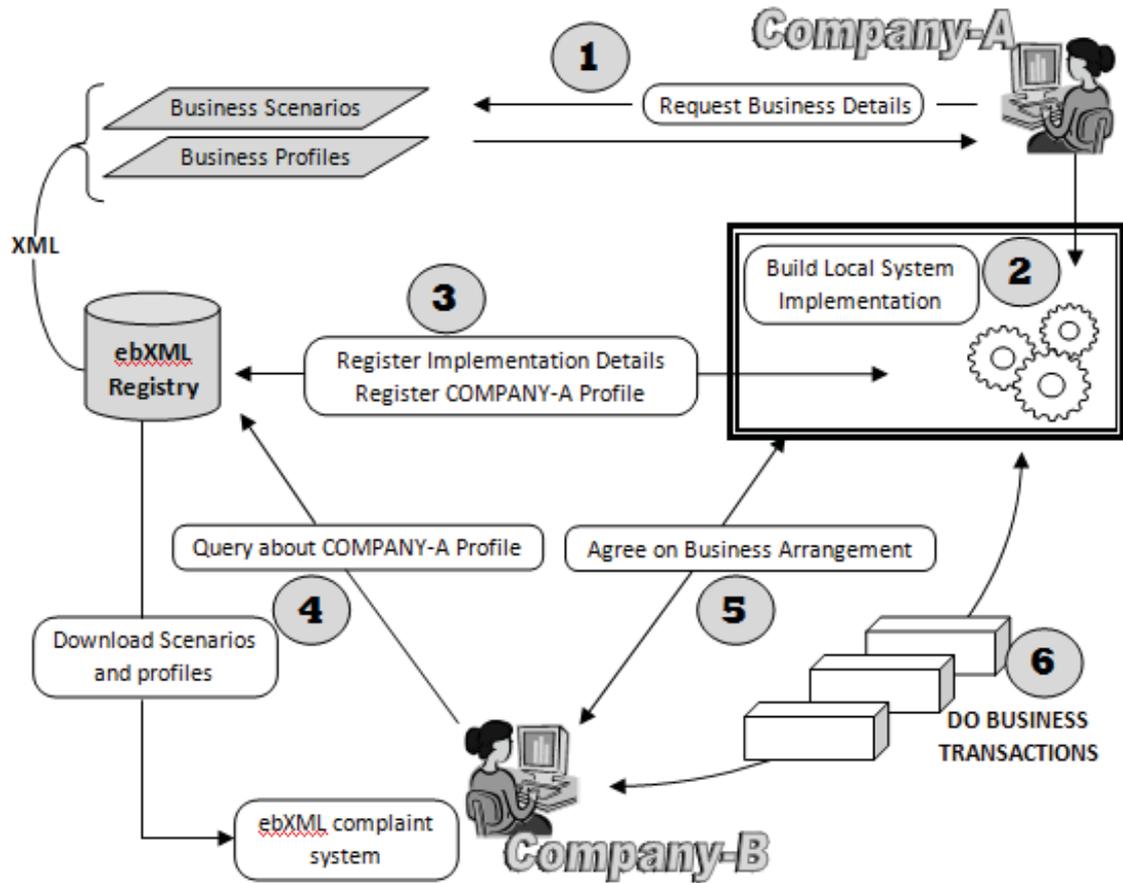
Figure : High-level overview of ebXML interaction between two companies

Company A (Figure 1) will first review the contents of an ebXML Registry, especially the Core Library which may be downloaded or viewed there. The Core Library will allow Company A to determine the requirements for their own implementation of ebXML and whether ebXML is appropriate for their business needs [5].

Based on a review of the information available from an ebXML Registry, Company A can build or buy an ebXML implementation. Here comes the problem of implementation and administration of the ebXML. Figure 1 proposes that Company B uses something like this prepackaged application [5]. This prepackaged application is discussed in the next section.

The next step is for Company A to create and register a CPP with the Registry. Company A can contribute new Business Processes to the Registry, or use the available ones. The CPP contains all the necessary information for the future partners that will determine the business roles in which Company A is concerned, and the type of protocols this company is prepared to engage in for these roles.

Once Company A is registered, Company B can look at Company A's CPP to determine that it is compatible with Company B's CPP and requirements. Now Company B should be able to negotiate a CPA automatically with Company A, based on the conformance of the CPPs, plus agreement protocols, given as ebXML standards or recommendations [5].

Finally, the two companies can begin actual transactions. These transactions are likely to involve Business Messages conforming to further ebXML standards and recommendations.

As seen from the above scenario, there is a need for standards in order to do the actual transactions online. Standards can be divided to standards defining schemas for exchanged messages and standards defining both the processes and the message schemas associated. RosettaNet and ebXML specify ways for describing also processes [4].

If ebXML is implemented, SME's will deal only with message schemas, since the majority business processes are already defined by big companies and they are common for most trade partners. Example: GetPrice, GetQuote, Order and similar, are business processes that are common and in most of the cases are pre-defined.

One solution to comply with these standards is the actual local system implementation. This is why in the proposed Figure 1 there is an addition of a "Middleware" layer, an application solution that will convert data (orders) to specific standards as requested by companies to do business online.

VI. MIDDLEWARE APPLICATION

A very good option for SMEs is to try to implement ebXML as one of the standards that is accepted widely by companies. If implementation costs are high then a simpler approach using "Middleware" application using Web Services can be used.

The easiest way to create this "middleware" application is to use the Web Services (WS) architecture. WS allow data communication through HTTP protocol and results in XML documents which are exactly what the B2B frameworks have in common.

Creating these Web services by SMEs is not as easy as it sounds. But, if there is a third party Web Services that deal only with the translation of XML business documents, then this implementation may become easier.

The proposed middleware solution is a subject of another paper where details on implementation will be posted as well.

CONCLUSION

By giving in-depth information on ecommerce and making business online, especially Business-To-Business (B2B) ecommerce, the paper shows the importance of using standardized business transactions online.

The comparison of some of the existing B2B frameworks and ebXML as one of the most widely spread frameworks explains that there are common characteristics between all B2B frameworks, but there is always an implementation issue, especially when we discuss about Small and Medium Enterprises (SMEs).

The sample scenario used in the paper is extended by providing a proposal to remove the barriers for entrance in the B2B e-commerce area for SMEs. This proposal, also referred as "middleware", is a good way to use the widespread Internet technology, Web Services, acting as a translator of these business messages, thus making SMEs gain competitive advantage without any bigger investment in commercial off-the-shelf (COTS) software.

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