The Final Year Project (03-04)  
Project Proposal

The ebXML Workflow Visual Toolkit:  

guiding novice businessman towards the e-business world

Name: Sung Gi Ling  
Student ID: 00031229D  
Course: FT-BAC (61010)  
Supervisor Dr Vincent Ng To Yee  
Date: 03 October, 2003
# Content

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Proposal Organization</td>
<td>4</td>
</tr>
<tr>
<td>Background Study</td>
<td>5</td>
</tr>
<tr>
<td>E-Business Strategy</td>
<td>5</td>
</tr>
<tr>
<td>Business Collaboration Framework</td>
<td>6</td>
</tr>
<tr>
<td>Technological evolution in e-business ~ from EDI to ebXML</td>
<td>8</td>
</tr>
<tr>
<td>What is ebXML</td>
<td>10</td>
</tr>
<tr>
<td>Problem Identification</td>
<td>16</td>
</tr>
<tr>
<td>Objective</td>
<td>18</td>
</tr>
<tr>
<td>Methodology</td>
<td>19</td>
</tr>
<tr>
<td>Tentative Schedule</td>
<td>20</td>
</tr>
<tr>
<td>Timeline</td>
<td>20</td>
</tr>
<tr>
<td>Expected Deliverables</td>
<td>20</td>
</tr>
<tr>
<td>Estimated Resources</td>
<td>21</td>
</tr>
<tr>
<td>Reference</td>
<td>22</td>
</tr>
</tbody>
</table>
Introduction

Throughout the past few decades, the business world was changing from a paper based world to an electronic based world. The terms “e-commerce” or “e-business” became so popular that many companies would like to share the competitive advantages from putting their business on-line. Though very popular, it is nevertheless rather limited to large companies only. The main reason is due to the high development cost to start an e-business.

Hoping to help small and medium size enterprise in participating in the e-business world, a new e-business solution is developed collaboratively by OASIS and UN/CEFACT. This is the ebXML framework.

In view of the development of the ebXML, this project will be focused in implementing a visual toolkit to facilitate enterprise in building their e-business with ebXML.
Proposal Organization

This proposal can be separated in the following sections:

- **Background Study**
  
a. A study on the e-business strategy and the business collaboration framework (BCF)

b. A brief description on the ebXML framework

- **Problem Identification**
  
This part will define the problem statement of the project

- **Objective**
  
This part will describe the expected achievement of the project

- **Methodology**
  
This part will describe the way in which the objective will be achieved

- **Schedule**
  
This part will list a tentative schedule for conducting the project. It also contains the expected outcome for each scheduled event

- **Estimated Resources**
  
This part will list out all the resources needed for doing this project

- **Reference/Bibliography**
  
This part will list out all the reference paper or bibliography that currently used for doing this project
Background Study

E-Business Strategy

Over the past years, the e-business strategy e.g. EDI, is technology specific. With a technology specific strategy, companies have to put effort to plan for their business solution in order to fit with that particular technology. Take EDI as an example, companies who want to deploy EDI as an e-business strategy must spend resources to identify their data requirements in order to map their data to the EDI messages. This process is required for each trading partner implementation, and for each EDI message with that partner.

UN/CEFACT is now investigating in a new e-business strategy. It focus in facilitating international transactions, through the simplification and harmonization of processes, procedures and information flows, and so contribute to the growth of global commerce. In short, UN/CEFACT’s vision is to provide “simple, transparent and effective process for global commerce” [4]

UN/CEFACT describes such strategy as a technological-neutral e-business vision. Its primary objective is to find a solution that would make e-Business technology widely available, non-obtrusive to the business process, and cost effective for all organizations of any size, anywhere. In another word, the solution should separate the “how” from ‘what’. [5] This means that the business process and business information (what) should be independent of the transport mechanism (how). In such way, the e-business model can be applied to whatever technology may surface.
Business Collaboration Framework

Following the technological-neutral e-business vision, UN/CEFACT has developed the Business Collaboration Framework (BCF). The primary goal of the BCF is to capture the business knowledge that enables the development of low cost software components to help the small and medium size companies and emerging economies engage in e-Business practices [5].

The BCF use a top-down approach to perform the information interchange in e-Business. It can be separated into 4 steps.

1. **Transfer Knowledge**
   
   In this step, business experts define the boundary around the business problem, identify the affected business processes, business objectives, stakeholders and constraints. UN/CEFACT has developed worksheets to guide this process and assemble additional business objective requirements.

2. **Create the Business Model**
   
   With the information gathered in the first steps, a business collaboration model can be created. The model should be technology-neutral and implementation-neutral. There will be a BCF library which stored some reusable models that are created by other modelers.
3. **Transform business model into business collaboration schema**

   In this step, the model is transformed into a technology-neutral and implementation-neutral format using the business collaboration specification schema of the BCF.

4. **Implement the business model**

   This is the step where technology applies to the model. The production rules will be developed that bind the technology-specific syntax in this step to the BCSS in the previous step. This would then be used to create executable software and information exchanges.
Technological evolution in e-business ~ from EDI to ebXML

Some analysts have described the evolution in e-business as a movement from tactical applications with limited scope towards increasingly strategic e-business initiatives.

At the very beginning, most organizations viewed information technology as supporting tools for internal business applications. Networking was just limited to being used within the organization.

The idea of applying information technology to perform B2B or B2C activities became popular with the widespread of Internet use starting from the mid-1990s. From here onwards, “e-commerce” or “e-business” became a famous terms that many organizations started to implemented their own system for this purpose.

In order to support external electronic commerce transactions with traditional business partners, companies invested heavily in Electronic Data Interchange (EDI) software solutions. EDI referred to the application-to-application exchange of business information in a standardized electronic format. It gave companies the prospect of eliminating paper documents, reducing costs, and improving efficiency. People at first believed that EDI allowed companies of all sizes to conduct business in an ad hoc fashion, without prior agreement of any kind. [1]

EDI, however, had its own drawback. On one hand, small and medium-size enterprises could not afford the heavy investment cost in implementing EDI. On the other hand, the EDI enabled e-business was centered around a dominant enterprise that imposes proprietary integration approaches on its trading partners.
Until recently, the development of the Extensible Markup Language (XML) became more popular for defining data interchange formats in new e-Business applications in the Internet. Due to the low investment cost of using W3C XML in facilitating e-business, XML was felt to offer opportunities for small and medium-size enterprises.

XML enables more open and flexible business transactions than EDI. But there were downsides of the adoption of XML. One of them was a proliferation of XML-based specifications, many of which are overlapping, thus causing confusion and unnecessary duplication of efforts among users. [2] In addition, companies with large investments in EDI had encoded substantial experience in Business Processes. They will not abandon them without a good reason.

The Electronic Business using extensible Markup Language (ebXML) therefore intended to provide a framework in which EDI's substantial investments in Business Processes can be preserved in an architecture that exploits XML's new technical capabilities. [1]
What is ebXML

According to the official site (www.ebxml.org), ebXML is referred to as a modular suite of specifications that enables enterprises of any size and in any geographical location to conduct business over the Internet. It provides a standard method to exchange business messages, conduct trading relationships, communicate data in common terms and define and register business processes. The ebXML framework is collaboratively worked out by two organizations: The United Nations Center for Trade Facilitation and Electronic Business (UN/CEFACT) and OASIS. These two parties work closely to develop a framework which offers an “open technical framework to enable XML to be utilized in a consistent and uniform manner for the exchange of electronic business data in application-to-application, application-to-person and person-to-application environments” [3]

ebXML Vision

According to the Requirement Specification of ebXML published in May 2001, the ebXML technical specifications are intended to create a Single Global Electronic Market.™ To create this single global electronic market, the ebXML technical specifications:

- SHALL be fully compliant with W3C XML technical specifications holding a recommended status
- SHALL provide for interoperability within and between ebXML compliant trading partner applications
- SHALL maximize interoperability and efficiency while providing a transition path from accredited electronic data interchange (EDI) standards and developing XML business standards
- SHALL be submitted to an appropriate internationally recognized accredited standards body for publication as an international standard
How it works

This section is going to demonstrate how 2 companies can start their e-business using ebXML. In the following scenario, a one-to-one business transaction is used in order to simplify the demonstration. Of course, the ebXML framework allows more parties to be involved in a business process.

Fig 1. A business scenario showing the steps for 2 trading partners to engage in the e-business transactions

Step 1  Request business details

Company A reviews the contents of the ebXML Registry and decide to build his own ebXML compliant application.
Step 2  Register implementation details and company A profile

After implementing the ebXML compliant application, Company A then submits its own Business Profile information to the ebXML Registry. This profile describes the companies’ ebXML capabilities and constraints, as well as its supported business scenarios. These business scenarios are XML versions of the business processes.

Step 3  Query profile

Company B, another company that has deployed the ebXML framework, query on the registry to search for any relevant company that it may partner with.

Step 4  Download Company A profile

Through the registry query, Company B discovers the business scenarios supported by Company A.

Step 5  Make business agreement

In order to engage in the business scenarios by ebXML, Company B has to submit a proposed business arrangement, which outlines the mutually agreed upon business scenarios and specific agreements, directly to Company A. The agreement also contains information pertaining to the messaging requirements for transactions to take place, contingency plans, and security-related requirements.

Step 6  Start business transaction

If company A accepts the business agreement, Company A and B are now ready to engage in e-business.
ebXML Framework Components

Having understanding how companies can use ebXML in conducting business, the components in the ebXML framework are going to be discussed in this section.

The main components of the ebXML framework include:

- **Business Process Specification Schema (BPSS)**
  
  BPSS is used to defines “public” business processes with the XML-based specification language. It focuses on:
  
  1. the collaboration of trading partners,
  
  2. the binary collaborations that trading partners are engaged in, and,
  
  3. the business transaction activities perform in the context of the collaboration.

- **Core Components**
  
  Core Components provide the business information encoded in business documents that are exchanged between business partners. These components are tagged with universal identifiers and facilitate multilingual environments. Companies can assemble these core components into structures, thus making re-use of common business structures and eliminate overlapping is possible.

- **Registry/Repository**
  
  Registry/Repository can be viewed as an information center that provides a set of services to enable sharing of information among companies. The shared information is maintained as Business Information Objects (BIOs) in an ebXML Repository and is managed by the ebXML Registry Services. In general registry enables discovery and repository enables retrieval.[2]
Collaboration Protocol Profiles (CPP)
CPP describes the specific capabilities that a company supports and the service interface requirements that need to meet in order to exchange business documents with this particular company. The information includes the contact information, industry classification, interface requirements, messaging service requirement etc. In order to use ebXML for trading, the company should register their CPP in the ebXML Registry such that all parties can find one another and discover the business process that each supports.

- Collaboration Protocol Agreement (CPA)
CPA represents the intersection of 2 CPPs and is mutually agreed upon by both partners who wish to conduct e-business using ebXML. Different from CPP, which defined the capabilities of the partners that are able to support, CPA is referred to the capabilities of the partners that will actually support in the business transaction.

- Messaging Services
The messaging services is based on SOAP with Attachments, and allow the transportation of arbitrary types of business contents.

How ebXML facilitate e-business
Prior to ebXML, most organization use EDI as the e-business framework. Many companies, however, find EDI expensive and difficult to implement. The cost and difficulties include:

- Cryptic message syntax that is hard to understand
- Expensive private value added networks (VANs) is needed
- Expensive software and service for EDI
All these difficulties have blocked small and medium-size enterprises away from entering the e-business world. Having an understanding on the problem with the EDI framework, the ebXML developing parties therefore looks for ways to solve the problem and try to work out a framework that allows more companies to take advantage from it.

First, ebXML use the economies of scale presented by the Internet to breaks through the obstacle of high implementation cost. Also, the conventions established by ebXML are available publicly. These conventions encourage software developers to build packaged applications based on the common structure and syntax of ebXML messages and dramatically lower the cost of exchanging business data.

Secondly, ebXML use XML as a basis of data exchange. XML is an open and freely available document from the World Wide Web Consortium and has the support of the world's leading technology companies. XML also supports Unicode that enables the display and exchange of most of the world's written languages. As XML is an open and free standard, companies would have low implementation cost using XML.

Thirdly, the standardization of business process enables a more easy way of communication among partners. The ebXML offers businesses of all sizes a common message structure and syntax for exchanging business data over data networks like the Internet using XML. Without ebXML, companies face the prospect of interacting with multiple vocabularies, most focusing on specific industries or functions that cannot talk to each other.
Problem Identification

The ebXML framework is a new approach for companies to conduct e-business. It is believed that this framework will provide opportunity to, not only large companies, but also small and medium size companies to start their own e-business. But the problem is “how to encourage companies to start their e-business with ebXML?”

According to the study of UN/CEFACT, there are 4 requirements for a company to start their e-business:

1. Familiar
   The environment of conducting e-business should be familiar by the business person.

2. Trust
   The e-business application should exactly do what the business person wants to do in an accurate and security way.

3. Convenient
   The business person is not required to have technological skill in conducting the e-business.

4. Profitable
   By conducting e-business, the company must find it cost-saving or opportunities producing.
The ebXML framework focuses on the business activities of a company. Before conducting a business with other ebXML compliant partners, the company has to submit its own business process specification which clearly defines its business collaboration information into the repository. It sounds reasonable that the IT department should take the responsibility of preparing such XML-based profile. However, people in IT department may not understand the business process inside a company as clear as other business people do. In contrast, those business people will not be able to prepare a XML-based profile without the technological knowledge. Under such situation, the first 3 requirements (familiar, trust, convenient) listed above cannot be achieved. Companies will still not willing to develop their e-business with ebXML.

In view of such obstacle to develop e-business with ebXML, an ebXML Workflow Visual Toolkit is therefore proposed to help novice user with business expertise to develop the XML-based company profile (BPSS and CPP).
Objective

This project is focused on developing a visual toolkit for novice people to define the business process and prepare the business profile. The visual toolkit should provide a set of graphical notation that allows user to define the business process in a drag-and-drop manner. After the business process is defined, an appropriate Business Process Specification Schema, which can then be added to the ebXML repository, will be produced.

With this visual toolkit, it is expected that:

1. The business people, with their business expertise, can clearly and accurately define the company business process on their own. They need not explain to those IT colleagues what they want the e-business process do.

2. The IT colleagues can focus on how to implement an environment facilitating the ebXML framework. The development time can thus be minimized
Methodology

The project development can be separated into 3 different phases:

1. Analyzing the Business Collaboration Framework (BCF)

   As discussed in the background study, UN/CEFACT has developed the BCF which is a technological-neutral e-business strategy. It has also defined some common business process which can be found in the repository. This phase will focus in studying the BCF and the common business process defined by the UN/CEFACT. It is expected that the visual toolkits will follow the top-down approach as in BCF such that the business process can be modeled and convert to an ebXML-compliant specification.

2. Designing a set of graphical language

   The study on the common business process in the previous phase will help in designing a set of graphical language for the visual toolkit. During this phase, the graphical representation method of UML will be referenced.

3. Implementing the visual toolkit

   After designing the graphical language, the implementation of the visual toolkit will be started. The visual toolkit will be developed based on the object oriented technology using Java.
Tentative Schedule

Timeline

<table>
<thead>
<tr>
<th>Event</th>
<th>Start Date</th>
<th>End Date</th>
<th>Duration (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 0 Problem Identification</td>
<td>01-09-03</td>
<td>03-10-03</td>
<td>33</td>
</tr>
<tr>
<td>Phase 1 Analysis</td>
<td>04-10-03</td>
<td>31-10-03</td>
<td>28</td>
</tr>
<tr>
<td>Phase 2 Design</td>
<td>01-11-03</td>
<td>09-01-04</td>
<td>70</td>
</tr>
<tr>
<td>Phase 3 Implementation</td>
<td>10-01-04</td>
<td>14-03-04</td>
<td>64</td>
</tr>
<tr>
<td>Phase 4 Testing and Documentation</td>
<td>14-03-04</td>
<td>27-04-04</td>
<td>44</td>
</tr>
</tbody>
</table>

Expected Deliverables

Phase 0
- Proposal which clearly define the project objective and scope (4 week)

Phase 1
- Analysis report on how BCF can be applied to this project (4 week)

Phase 2
- A design specification for the graphical language and interface (3 weeks)
- A functional specification for the visual toolkit (1 week)
- An object-oriented design on the visual toolkit (2 week)

Phase 3
- Coding for the system (9 weeks)

Phase 4
- Test plan (3 weeks)
- Final report on the visual toolkit (3 weeks)
Estimated Resources
Reference

[1] ebXML, Technical Architecture Specification version 1.0.4,


[3] ebXML, EbXML Requirements Specification version 1.06,

[4] UN/CEFACT, UN/CEFACT’s e-Business Vision

[5] UN/CEFACT, Technology in the context of e-Business