

Presenting a New Methodology for Implementation of E-Business Systems with Multi-Layer Security (MLS) Agents

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Abstract

In this paper, a new model and methodology for implementing E-Business systems and projects has been introduced with focus on its security aspects. Multi-Layer security has been covered all of E-Business transactions and can guarantee all of security-based tasks in E-Business modules. It has been called "MLS agents" in presented model of this paper. Since the security level is the most important for E-Business involvements, this research has been focused on this subject for making a high trustful environment of E-Business actions.

Keywords

E-Business, security level, Multi layer security (MLS) agent, E-transaction, business strategy

I. Introduction

When people hear "e-business," they generally think selling over the Web. Electronic Business or e-business in short refers broadly to the use of technologies, particularly the Information and Communication Technologies (ICTs), to conduct or support to improve business activities and processes, including research and development, procurement, design and development, operation, manufacturing, marketing and sales, logistics, human resources management, finance, and value chain integration. A subset of e-business is e-commerce, which describes the buying and selling of products, services, and information or making transactions via computer networks, including the Internet. The main difference between them is that e-commerce defines interaction between organizations and their customers, clients, or constituents. On the other hand, e-business is also encompasses an organization's internal operations. In other words, these two can be used interchangeably.

In details, e-business can be defined from the following perspectives:

- A. Communications: Delivery of goods, services, information, or payments over the computer networks or any other electronic means.
- B. Commercial (trading): Provides capability of buying and selling products, services, and information on the Internet and via other online services.
- C. Business process: Doing business electronically by completing business processes over electronic networks, thereby substituting information for physical business processes.
- D. Services: A tool that addresses the desire of governments, firms, consumers, and management to cut service costs while improving the quality of consumer service and increasing the speed of service delivery.
- E. Learning: An enabler of online training and education in schools, universities, and other organizations, including businesses.
- F. Collaborative: The framework for inter- and intra-organizational collaboration.
- G. Community: Provides a gathering place for community members to learn, transact, and collaborate.

Simply, e-business could be any system that suppliers, distributors, or customers use the ICT, particularly the Internet, as the basis for conducting their business operation, for example:

- Communicate with clients or suppliers via email;
- Send email to other organizations to order supplies;
- Sell or promote products or services via a web site and/or email;
- Publish a web site to provide public information about the business;
- Use the Internet for online banking and paying bills;
- Research information about customers and competitors using web sites;
- Provide technical or customer service by email or web site; and
- Manage and distribute internal organization documents via an intranet.

II. E-Business Implementation Types

The topic of e-business will often includes the transacting business or exchanging business-related information between:

A. Business to Business (B2B)

It typically takes the form of automated processes between trading partners and is performed in higher volumes. B2B can also encompass marketing activities between businesses, and not just the final transactions that result from marketing. B2B also is used to identify sales transactions between businesses. In other words, business making online transactions with other business(s). B2B e-business focuses more on creating highly efficient and transparent markets that would transform the structure of industry value chains.

B. Business to consumer (B2C)

It describes activities of commercial organizations serving the end consumer with products and/or services. In other words, it is an exchange and transaction of information, products or services between a business and a consumer(s). The B2C e-business can help limit set up costs of merchandising store, save salesperson, as well as develop a more efficient supply chain.

C. Consumer to consumer (C2C)

It is an Internet-facilitated form of commerce that has existed for the span of recorded history in the form of barter, flea markets, swap meets, garage/yard sales and the like.² In other words, consumers sell directly to other consumers.

D. Business to government (B2G)

Businesses conduct transactions electronically with government regarding various business licensing or reporting requirements or where businesses sell products or services to government. In other words, government buys or provides goods, services, or information to/from businesses or individual citizens.

E. Business to employee (B2E)

Information and services made available to employees online. For example, as in B2E portal, where a company or organization intranet that is customized for each employee. It includes specific information and personalized data such as personal hyperlinks, stock quotes, sports scores and news clips. It could even include a video feed to their children's day care center.

The following are a few examples of leading companies and organizations who have changed the landscape of businesses and trading communities:

1. B2B:

www.alibaba.com

It is an English-language website primarily serving Small and Medium-Sized Enterprises (SME's) in the international trade community, with nearly two million registered users from over 200 countries and territories. More than 300,000 people visit the site every day, most of them global buyers and importers looking to find and trade with sellers in China and other major manufacturing countries.

2. B2C

www.amazon.com – It is the most well known Internet's retailer. It was firstly launched in July 1995 and today offers online customers the biggest selection of more than 20 product items such as books, CD, toys, home improvement products, women accessories, shoes etc. The web site seeks to be the world's most customer-centric company where customers can find and discover anything they want to buy online.

3. C2C

www.ebay.com – eBay trademarked slogan is “The world's Online Marketplace”. People come to eBay to buy and sell items in thousands of categories from collectibles like trading cards, antiques, dolls, and house wares to practical items like used cars, clothing, books and CDs. Buyers have the option to purchase items in an auction-style format or items can be purchased at a fixed price through a feature called Buy It Now. The web site has recorded 4.4 million transactions everyday, and the aggregate eBay economy traded \$34 million worth of goods in 2004.

4. B2G

www.gprocurement.go.th (only in Thai language version) – The Office of Prime Minister is coordinating the development of Thailand's E-Government Procurement (EGP) as a project that aims to reduce cost, improve productivity of public procurement, raise transparency in government, provide business with better access and more efficiency to government markets. In this regard, the web site was launched to consolidate e-procurement announcement from many public agencies. The next phase of online e-purchasing is under developed. The web site is managed under the Office of Public Procurement Management, Comptroller General's Department of Ministry of Finance. According to the Guideline of e-procurement enforced in February 2006, every purchase that value above 2 million baths (approximately US\$ 50,000) must be preceded by the method of e-procurement.

III. E- Business Evaluation And Aspects

The evolution of e-business/e-commerce became more

prominent with the Internet, particularly the World Wide Web or web, revolution. E-business, that we know of today, has been around for a little over ten years. However, its predecessors, such as Electronic Data Interchange (EDI), Material Requirements Planning (ERP) and Enterprise Resource Planning (ERP), have been around for more than 40 years and still evolving. EDI is the electronic communication of business transactions, such as orders, confirmations and invoices, between organizations. Although interactive access may be a part of it, EDI implies direct computer to computer transactions into vendors' databases and ordering systems. Though, the predecessors cannot rival the exponential growth and acceptance of transacting business over the Internet.

In 1970s, innovations like electronic funds transfer (EFT), funds routed electronically from one organization to another (limited to large corporations), created a new way of doing business or making transactions. In 1990s, the Internet commercialized and users flocked to participate in the form of dotcoms, or Internet start-ups. 1997 saw the introduction of a brand new phrase – e-business, it was seen as a step on from e-commerce (Amazon.com established an e-commerce web site in 1995) and referred to more than just buying and selling via the Internet. In 1999, the emphasis of e-business shifted from B2C to B2B. Then in 2001, the emphasis again shifted from B2B to B2E, c-commerce, e-government, e-learning, and m-commerce. By looking at the trends, e-business/e-commerce will undoubtedly continue to shift and change.

Many companies and organizations have joined the e-business bandwagon at different level depending on their own needs and opportunities. Many small companies and organizations start accepting the e-business concepts by creating informative materials through brochures and simple web sites. Now, most medium- and large-sized companies and organizations have a web site and many of those web sites are capable to take and process orders instantly. Most large corporations have comprehensive and innovative portals that can collaborate seamlessly among all parties involve.

IV. E-Business Systems Stakeholders And Involved Parts

A. Stakeholders

The Government agencies, businesses in the private sector including SMEs, technology providers, customers, and trading partners have all been identified as key stakeholders and have important and essential roles to play in a national e-business framework. E-Business relationships are formed with the following types of stakeholders:

- Internal stakeholders: Management and staff
- Suppliers and manufactures
- Customers
- Intermediaries
- Financial institutions
- Service providers
- Associations
- Web communities
- Etc.

B. Major players (examples)

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V. E-Business Strategic Models

Based upon changes in technology, several new business models have developed around the globe. Most of them are in the field of insurance distribution, but also innovative business models with respect to the complete value chain are being developed. Since a large number of new companies and business concepts are coming onto the market at the moment, the following overview does not claim to be comprehensive.

A. Different business models for Internet distribution are being developed

Table 1 : Business models for Internet distribution
Source: Swiss Re Economic Research & Consulting

Model category	Business models	Examples
Insurance company websites	Online sale of traditional products	renins.com GeneraLife.com WebInsurance.com Progressive.com
Financial portals	Portals for financial services and/or insurance	Wingspan.com llife.com eBanka.com (planned)
Point-of-sale portals	Websites linked to specific events	AutoByTel.com BabyCenter.com
Aggregators	Independent price comparisons	InsWeb.com Quicken.com Quotesmith.com QuickQuote.com LowestPremium.com EHealthInsurance.com Einsurance.de
Online risk markets	Online markets for exchanging risks or entire risk portfolios	GRX.com CATEX.com CreditEx.com TradeWeather.com
Reverse auctions	Insurance clients put their requirements out to tender	insureXL.de

Almost all insurers now have a website providing information on the company, its products and contact details. Companies such as Winterthur with Web Insurance in Europe or Progressive in the US go one step further, allowing users to take out insurance cover online as well. Progressive even offers a facility for comparing quotes with those from competitors.

The attraction of internet distribution to clients is limited if they have to spend a fair amount of time familiarising themselves with each website. A number of all-inclusive financial portals take advantage of a regular flow of visitors to their website, and offer standard websites for financial and/or insurance products. The idea is to develop a brand name that becomes a byword for finance and/or insurance products on the Internet. This encourages repeat visits, so that clients who use this website to perform their bank transactions online, for example, might decide to use the opportunity to take out insurance cover at the same time.

Apart from the possibility of marketing insurance products complementary to other financial services, websites are also used that are linked to certain events where insurance is called for. Such point-of-sale portals try to reach possible insurance clients at the point when a need for insurance is generated. Examples include online car or real estate markets, as well as websites based on themes such as “Starting College”, “Career Change”, “Weddings” “Parenthood” or “Retirement”.

Such point-of-sale portals are a good opportunity for insurers to target their products effectively at potential clients. At the same time they take into account the common argument that insurance products are sold rather than bought.

The business models described above all have the same drawback: the Internet client is usually not able to compare quotes from several insurers easily. "Aggregators", also known as navigators, supermarket sites or malls specialise in providing quotations from different insurance companies for comparison purposes. The service is often supplemented by general information on insurance products as well. Some aggregators, such as InsWeb, Quicken Insurance, Quote smith and eHealth Insurance, already have four or five years' experience in operating this business model.

A new type of business model has recently emerged in the business-to-business segment, known as online risk markets. These internet providers act as brokers between trading partners - usually insurers, reinsurers and large corporate clients - looking to swap large risks or entire risk portfolios. Examples include the providers Global Risk Market Place, INREON for reinsurance and CATEX for catastrophe risks, both of them relatively new ventures.

Insurance clients may also use the Internet to place a large risk themselves. These "reverse auctions" are particularly suited to big corporate clients who put their insurance requirements out to tender and then select the most competitive offer. A purchasing group could also use this facility as well: an automobile association, for example, looking for the cheapest insurance cover only for its members.

B. E-business leads to automation and facilitates the break-up of the value chain

Traditional insurers perform almost all stages of the value creation process themselves: underwriting, distribution, administration, claims settlement, asset management. Rising cost pressure will force them to review their fully integrated business model. New information and communication technologies are making it easier for insurers to break up the value chain and outsource individual functions to specialised providers. This would allow insurers to concentrate on those links in the value chain where they enjoy a comparative advantage. National borders are becoming increasingly unimportant, so that labour-intensive tasks can also be performed in low-wage countries.

Many specialised providers already exist or are currently being set up in many countries. Companies such as Annuity Net pursue a pure Internet strategy and offer products developed specifically for Internet distribution - in this case index-linked annuities for the most part. In addition to supporting clients when deciding which fund products to choose, they offer the possibility to change fund products during the term of the policy. Therefore the policy is flexible and can be changed at any time. The administration of the changes are handled via the Internet. Business models are therefore possible where clients can directly influence their policy online, for as long as it is in force. Clients also are able to change their own address details, policy deductible or other risk-related data.

In the B2B segment, in particular, business models that simplify the administration of insurance policies have emerged. Winterthur-Columna, for example, has developed a system that allows medium-sized companies to administer their own pension scheme contracts, with the insurer automatically adjusting the premiums and benefits. In addition to allowing

flexible and easier administration of policies the Internet also allows insurance companies to consider outsourcing the complete administration process. The US company Mynd, for example, provides various back office functions for insurers. Insurers may also offer the reporting of claims through the internet. Clients are able to track the progress of claims settlement online. Besides insurance websites there are several specialised companies that offer such possibilities. Dekra, a German specialist in the field of monitoring the technical security of cars, offers insurers the possibility to manage their motor claims online. On this website, insurers, garages, clients as well as lawyers have access to information on the stage of their claims settlement and can manage their claims. Another example is Cyber settle, a US company that tries to settle disputes between lawyers and insurance companies regarding liability claims. Lawyers and loss adjusters can secretly submit their proposals for the level of compensation via the internet. Cyber settle then compares each side's proposal. If they are within a defined bandwidth, the system calculates a mean value in order to reach a settlement. The participants agree beforehand to accept any such arbitration settlement as binding.

Another interesting development is being pioneered by various start-up companies, such as Ineas in Europe or General Life in the US. These insurers sell traditional insurance products via the internet, but use e-business technology for consistent outsourcing. Both companies operate with a very small workforce. Their actual core competence is the design and structuring of products, as well as operating an internet sales platform. All other tasks are outsourced to specialist partner companies. Their main aim is to achieve efficiency benefits and offer clients additional services. Although such companies have not managed to acquire significant market share to date, they do present a threat to established insurers because of their potential cost advantages.

VI. Importance Of Security Implementation In E-Business Systems

Since high volume of transactions in E-Business systems, role of security is very important for all of E-Business involvements and stakeholders.

The security level in an E-Business system can be defined as several layers, but the main scope of this designing is how to use the most protection instead of most designing, in other words, it is so important that all of stakeholders in an E-Business system can be covered and protected by a security model.

Mistakes in designing and implementing security layers and levels can make some unwanted problems in E-Business networks, especially in trust on services and money transactions.

In this paper, a new model for perfect coverage of security in E-Business systems will be presented in next chapter.

VII. Multi - Layer Security Model (Mls) For E-Business Systems

This model includes four layer of security which has been related to stakeholders and involved aspects in an E-Business system. These four layers have internal and external relation and are with security packages that are unique for each layer. These security packages are supporter of security systems with their definitions.

A. Business Layer:

This layer is the first layer for coverage of security packs. All of transactions in business types should be covered by its

security layers .

B. Customer Layer:

This layer is the most important layer for implementing security layers, because that the most transactions in stakeholders and money transferring is from this layer. Thus, it should be designed with more accuracy and with consideration all of its aspects.

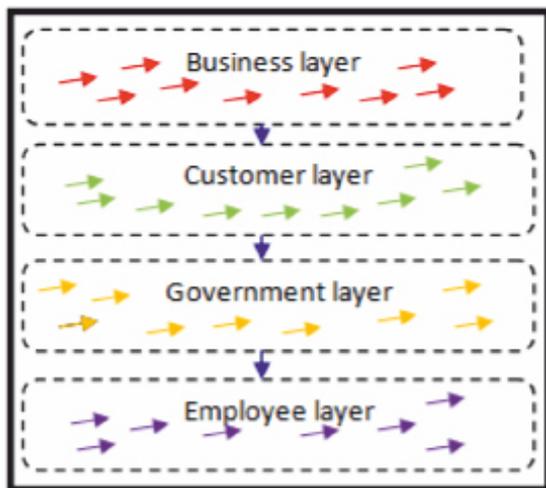
C. Government Layer:

When a side in an E-Business system is related to governmental aspects, it will be more important for protecting information and data in addition to making a safe environment for trading and business transactions. So, it can be positioned as the second important layer in E-Business Security.

D. Employee Layer:

Importance of security level implementation of this layer is mainly up to organizations and their data and information. It can be classified in government layer.

Fig. 1 shows internal relations and role of security packages in these internal parts with all of external and combinational relations between aspects of an E-Business system with full security covering.



Note : each → is the symbol of security package in layers

Fig. 1: security package locating in internal layers

VIII. Conclusion

In This paper, a new and applicable methodology for increasing security level of E-Business layers introduced and presented. The most benefits of implementing these systems are in defining an unique layer for E-Business stakeholders and involved aspects and unifying all of secure transactions between E-Business layers from Business to Customers. Making a safe environment for money , data and information transferring can be made by using these layers. In these cases, multi-security agents can protect all of secret-based data and information and provide a trust platform for doing E-Business transactions.

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