APPLICATION OF E-LOGISTICS FOR SMES IN CHINA

Yi Zhou
Shahaboddin S. Matin
APPLICATION OF E-LOGISTICS FOR SMES IN CHINA

Yi Zhou
Shahaboddin S. Matin

Master thesis

Subject Category: Industrial Engineering and Electronic Logistics

Series and Number 8/2008

University College of Borås
School of Engineering
SE-501 90 BORÅS
Telephone +46 033 435 4640

Examiner: Göran Stjernman
Supervisor: Farid Rohani
Client: Högskolan i Borås, Sweden
Date: September 2008

Keywords: SME, e-commerce, e-logistics, logistics, EG, China
Acknowledgements

First of all we wish to give our thanks to our supervisor Farid Rohani for his support throughout the course of our thesis with which we managed to finish the research within the determined time limit. We’d like to thank Fredrik Jonasson, the Trade Lane Sales Manager of DHL Express in China, for his insights and filling out our questionnaire and Rank sheet.

We are also obliged to Wang Ying who is responsible for Business Development and Contracting of Volvo Logistics in China, Henrik Danielsson, Head of Beijing office, Swedish Trade Council and also Jonas Eriksson, working in Logistics Consultants, for their kind answers and their times that they devoted to our questionnaires and Rank sheets.

We also appreciate the efforts of professor Kenth Lumsden which gave us a chance to participate in the Logistics & Transport Conference 20–22 May 2008, which was held in Gothenburg. And at the end we appreciate all friends and university staff who motivated us
Abstract

By the rapid development of electronic commerce, many problems are emerging in logistics systems within developing countries. For developing countries such as China, India, and other southeastern countries, Logistics is becoming a major part of GDP and logistics cost constitute a large portion of supply chain costs especially for businesses with international relations which is being more and more widespread in parallel with development of IT and e-commerce.

Such an interactive juxtaposition of logistics and e-commerce motivated us to look at how small and medium sized enterprises (SMEs) are run, and of course through a lens that sees these two concepts together. Another point that spiced our motivation was the bloom of virtual businesses especially those with one head in developing countries and the other in developed countries. According to The CIA 2006 fact book, there are 137 million internet users in China. As e-commerce and its logistics support systems in China have a huge effect in the global trade, we have targeted our thesis case towards China.

We have narrowed down our case to Chinese SMEs, which are small and medium sized Enterprises located in china; as SMEs, which their number has reached to 42 million, are now responsible for more than 90% of China's industrial output [1]. How the Chinese Electronic business should manage the way logistics must be integrated with e-commerce is the study which the thesis concerned about. In this research we are going to argue the barriers to ecommerce adoption in China, logistics-based barriers to successful SME establishments in china and also put up some suggestions upon possible strategies that can facilitate this process.

We have concluded the thesis with two models, one for e-commerce adoption inside SMEs and the other one for Business to Business (B2B) and Business to Customer (B2C) e-commerce development. We didn’t make any effort for developing a strategy for logistics leg of e-logistics due to the limited size of research and time barriers. The property that differentiates this study from previous similar studies is that here we face business environment in a different way and consider culture and government as two most important features of Chinese business environment.

Keywords: SME, e-commerce, e-logistics, logistics, EG, China
# Content

1. Introduction ........................................................................................................... - 1 -  
   1.1. Purpose and Objectives .................................................................................. - 1 -  
   1.2. Methodology ................................................................................................ - 2 -  
2. History .................................................................................................................. - 4 -  
3. SMEs in china ...................................................................................................... - 6 -  
   3.1 SME e-Attributes ............................................................................................ - 10 -  
   3.1.1 The tactics for dealing with SME e-Attributes: ........................................ - 11 -  
4. E-commerce ......................................................................................................... - 13 -  
   4.1 E-logistics framework ..................................................................................... - 13 -  
   4.2. Taxonomy of e-commerce applications ....................................................... - 18 -  
   4.3 Barriers to E-commerce adoption in SMEs ................................................... - 21 -  
   4.3.1 Cultural e-readiness .................................................................................. - 21 -  
   4.3.2 Organizational E-readiness ....................................................................... - 24 -  
   4.3.3 Market forces ............................................................................................. - 27 -  
   4.3.4 Supporting industries ............................................................................... - 28 -  
   4.3.5 Government readiness ............................................................................. - 29 -  
5. Electronic government .......................................................................................... - 31 -  
   5.1 E-government Framework ............................................................................ - 31 -  
   5.2 History and current development ................................................................. - 32 -  
   5.3. Problems ..................................................................................................... - 32 -  
   5.4. Suggestions .................................................................................................. - 35 -  
6. Logistics in china .................................................................................................. - 37 -  
   6.1 Chinese logistics problems ............................................................................ - 37 -  
   6.2 Current developments: .................................................................................. - 38 -  
   6.4 Delivery for B2C and C2C in china .............................................................. - 39 -  
   6.5. Major measures for supporting development strategies: ........................... - 41 -  
7. The results of the Thesis ....................................................................................... - 41 -  

v
7.1 E-Commerce adoption model .......................................................... - 41 -
7.2 The B2B e-logistics model: SME-3PL ........................................... - 44 -
7.2.1. Model for E-logistics activities: ............................................... - 45 -
7.2.2 The B2B E-logistics model: SME-3PL ....................................... - 47 -
7.2.3. The role of E-government ....................................................... - 50 -
8. Conclusions .................................................................................... - 52 -
9. References ..................................................................................... - 55 -

List of Figures
Figure 1........................................................................................................5
Figure 2....................................................................................................16
Figure 3.....................................................................................................39
Figure 4....................................................................................................44
Figure 5....................................................................................................47
Figure 6....................................................................................................48
Figure 7....................................................................................................50
Figure 8....................................................................................................51
1. Introduction

In the today’s market network economic has an indispensable place and Electronic Commerce is playing its main role in the play with its well-known co-player which is nothing but logistics. As a result the knowledge of logistics management which is applied for managing the material and information flows throughout the supply chains must be kept up to date as a feasible study tool box for virtual business activities as any transaction and virtual activity will ultimately end in a physical flow.

Based on the logistic definition from Council of Logistics Management (now known as Council of Supply Chain Management Professionals) [2]“Logistics is the process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption for the intention of conforming to customer requirements.” E-commerce help logistics to control these flows more accurately and on a real-time behavior.

1.1. Purpose and Objectives

In this research we are going to argue the barriers to ecommerce adoption in china, logistics-based barriers to successful SME establishments in China and also put up some suggestions upon possible strategies that can facilitate this process.

The current bottleneck in the process of e-commerce development in a typical supply chain is the logistics management which acts as the main constraint and in the developing countries can be expected in the aggravated form and can be scattered into three main aspects: logistics of payment systems, logistics of distribution systems, and logistics of security systems. As such these two concepts i.e. logistics and e-commerce are mutually related in this study.

In the of figure 2, the whole idea about how we have looked at the concept of e-logistics in this thesis is illustrated. E-logistics can be concerned as a combination of e-commerce and modern
logistics. In our study we call these two elements the two legs of e-logistics. E-commerce driven logistics management feeds the logistics leg of e-logistics with prompt information by logistics base, this new type of logistics and distribution of the commodity demand more information, automation, and social modernization, which reduces inventory and the backlog of funds, and leads to reduced logistics outlays and improved financial and social benefits.

E-commerce logistics companies provide technical conditions and market environment, and for the logistics functions of integration and logistics enterprises to achieve economies of scale in their operations to create favorable conditions. So the e-commerce enterprises by the true support of the logistics characteristics and the establishment of macro and micro e-commerce logistics management have made design and execution of their corresponding models two inevitable necessities. This research is an effort to design feasible models in order to ease the process of e-logistics adoption especially for Chinese SMEs. These models include B2B e-logistics model and e-commerce adoption model. Future researches can focus to complete the set of models necessary for e-logistics implementation.

1.2. Methodology

The thesis is built around 6 implied facts from previous researches:

1. The huge difference between global logistics and Chinese logistic development
2. The companies E-commerce is based on information
3. Four New technology introduced to Chinese Company(EDI, GIS, Code, GPS)
4. The main players in the thesis are: Third party logistics providers, SMEs, government and consumers.
5. The business environment issue: Culture and government
6. Standard development approaches and strategies

The research process can be summarized as follows. Some of the following steps are done almost simultaneously as they were developing each other during the research:
1-collecting information upon problems and solutions regarding application of e-logistics for SMEs in China, from both English and Chinese articles

2- Evolving ideas by analyzing problems and solutions

3-developing hypothesis for strategies and models

4- Research upon possible mismatches and solve the research gaps

5-maturing strategies and models

6- Developing conclusions

One of the important issues which we suffered from during the research was the lack of scientific articles and researches upon the subject. The why is that e-logistics, especially in the ecommerce leg which expained in the introduction, is highly relied on updated information and so makes lots of previously done researches useless. Such a constraint motivated us to face towards the less reliable references such as news sites, white papers, and interviews. We have also put up questions with which one can develop them into question lists in future studies for more accurate results.

That’s why the reader may find lots of websites mentioned as references. We have made all the necessary efforts to grab information from reliable and impeccable websites. One of the most important information gathering parts in the thesis was information gathering for Chinese culture features and Electronic government, as they were playing crucial role in developing the models. Future researches can apply recommended questions in their question lists and rank sheets for precise and particular information on model assumptions.

Question lists:

We developed different question lists for different parts of the thesis: culture, EG (Electronic government), and e-commerce readiness. The question lists we developed for e-commerce readiness was designed as blank, so that can be used particularly in every and each of the SMEs
that the models are going to be used. We put lots of time on designing the question lists so that they keep a reasonable balance between question list efficiency, which is the time will be taken for questions to be answered, and effectiveness, which is the effect that the result of evaluation will have on the precision of implementation.

Rank sheets:

Ranking the e-logistics activities was one of the important steps in developing the second model. The point that must be indicated here are that the rank sheets and question lists was filled up by a limited number of experts. As a result, although the answers gave interesting insights, they cannot be adopted as scientific and totally reliable outcomes.

2. History

According to the World fact book [3], the Chinese population with the age range of 15-64 years which constitute 71.7% of total population was 1,321,851,888 by July 2007 est. This range of age is known to be able to apply IT-based facilities and is potentially able to participate in electronic supply chains. That’s why today’s China is acting like a black hole which absorbs investment, entrepreneurs and business people who are interested in virtual business and those looking after price-based leverage points.
Referring to figure 1, we have illustrated a summary of what can be captioned as the e-commerce history of China. The concept of e-commerce emerged in China in around the year 1993, when the foreign businesses in China started to use EDI to simplify trading processes. 1994, was the year when the country’s first network –called the National Computing and Networking Facility of China was established, and connected to the global Internet through a joint-venture project of the China Academy of Science, between Tsinghua University, and Peking University. The Ministry of Trade and Economic Cooperation setup and organized the China International Electronic Commerce Center in 1996 in order to help researching and promoting digital Business. It was about 1997 when Internet-based E-commerce was launched in China, and took a sudden boom in a ‘leaping’ pattern.

By the year 2004, in the phase called the “Permeation” Phase, the total number of Internet-users in China had grown to 94 million, making China the second largest Internet user market in the world. The adoption of the Internet was largely concentrated within the ten most developed provinces and autonomous municipalities, especially those along the East Coast, (although the same thing can be recognized today, there are efforts to make a balance).
The direct involvement of the central government is vital in order to promote such a hi-tech innovation i.e. the Internet. Such an involvement is an indispensable enabler in every an each country and that’s why we have regarded this item as a components in both models. Enabling government policies, such as liberalization in trade and telecommunications, are likely to have the prime impact on the adoption of e-Commerce. Government policies make ICT (information and communication technology) and Internet access more inexpensive, as well as increase pressure on businesses to take on e-Commerce to compete.

The Government is providing supervision on policymaking, monetary investment, infrastructure expansion, education, human resources development, market transforming and service improvement. The Chinese Government right now controls, censors and monitors all aspects of the Internet, and the international entry, which connects China to the World Wide Web. This is done in order to restrict access to politically harmful information and to safeguard national security. Business-to-business e-Commerce, the largest sector by value and volume, in addition to business to customer type of e-commerce can get harm by such policy. Although we are not going to go through the political issues, there is no doubt that all business booms have one head in politics, as such all these politic-oriented oppositions and dissatisfactions can be regarded as hold-back in even in the current business movements.

3. SMEs in china

According to the news about ‘The development of full-scale e-commerce processes’ from a reliable news board [4], Number of small and medium-sized enterprises hits 42 million by the year 2007. At present, number of small and medium-sized enterprises within China has reached 42 million, including individual industrial and commercial households, i.e. all the household gadgets, machines and facilities being used within homes by families, making up 99% of the total number of enterprises, with a growing amount of contributions to the economic boom.

The final value of goods and services that have been offered by SMEs are roughly 60 percent of the total GDP. The tax revenue turned over to the state formed 50 percent of the total revenue,
and SMEs grant more than 75 percent of city jobs. SMEs are also the main driving force behind technological innovation. At present the SMEs have formed 65% of China's invention patents and 80% of new manufactured goods development [4].

SMEs frequently develop the level of the nation's openness and liberality to the outside world; the ratio of SMEs concentrated on labor-intensive goods exports, including garments, textiles, toys and shoes, reached more than 90 percent of every export [4]. In the ground of high technology, SMEs' percentage of exports is also increasing progressively.

We have divided these SMEs into domestic and foreign SMEs. Foreign SMEs can be classified into 5 classes:

1-Joint venture

2-representative office

3-WFOE: wholly foreign owned enterprise

4-FICE: foreign invested commercial enterprise

5-service companies

Throughout the thesis when we mention the word SMEs, we are concerning all the above-mentioned classes except when we notify any particular class.

Current potential problems for operating an SME in china:

1- Evaluating potential partners: one of the important aspects in developing an SME is to develop its partnerships and business relations, in which evaluating the potential partners will make a crucial step. The problem is that most SMEs cannot afford true information gathering and evaluation due to lack of experience, and fund.
2- Demand for lawyers: when the SMEs start to move from theory into practice, one of the first-in-queue problems is their lack of familiarities with business law in contracts, which is necessary to make the most of regulatory and legal framework.

3- Different place demand different experience: business owners from elsewhere are arrogant with their experience and underestimate ups and downs of Chinese business.

4- Intellectual property Copyright: when an SME comes up with an innovative idea, other SMEs will rush to covet them.

5- Experience in management and Entrepreneurship: management concerns about the records of the company and what the company has already done, in order to improve them, in entrepreneurship we take a look at the future in order to proact to refrain from react. It is important that SMEs be armed with true managers, Workers and entrepreneurs. Lots of SMEs fail in their establishments since they couldn’t articulate these three totally different and crucial roles.

There are also two other reasons, but they are rooted in the fact that china is a developing country not due to Chinese culture or nature of SMEs:

1- Presence of Strong informal relations: Relation which is called GUANXI in Chinese has a particular place in business relations like lots of other developing countries and can affect SME success in various angles e.g. purchasing department may buy articles from their Ex-business partners, Friends, and families at higher than market rate.

2- Profits return to board of directors: this event which is a normal phenomenon in today’s SMEs in developing countries bars job satisfaction and prevents the staff to put their ideas and their whole person into the job as they feel apart from the business after a while and will feel like a sole labor.
Now let’s take a look at SMEs and their business nature and their potential behavior from the view of international business environment. According to [5, 6, and 7] The SMEs some major weak points and power points as follows:

Weak points:

i. Ownership of less technology: Due to low level of technology which is usually observed, low level of ICT diffusion can be seen in most SMEs in developing countries such as china.

ii. Be deficient in Finance and human resources: the financial weakness is a common issue among SMEs, which leads to their inability to absorb skillful personnel and veterans.

iii. Low level of investment: financial (money to invest) infrastructure and consequently lack of adequate resources to invest in IS and IT, as major determinants of e-Commerce adoption is a major disadvantage in SMEs which want to try on e-markets.

iv. Weak structural Inertia:

One of the most important factors here is accounting system performance. According to [8] in SMEs employing fewer than 20 people, there are hardly ever any cost accounting systems for allocating even direct costs. In SMEs with 20-50 employees, the cost accounting is similarly in poor form. In the strategy that is developed here the accounting system plays an important role as it must be able to do Cost-benefit analysis in a meticulous way, since SMEs are pretty sensitive to the revenue margin and on the other hand, according to recent Chinese regulations upon granting licenses based on business plans, a wrong financial speculation leads to wrong amount of investment that is needed for business and can have unrecoverable consequences.

Power point:

i. Free mind and creativity: as people can be used up easily in their whole person, and also rush of newly graduated and young people

ii. Flexibility: quicker to adapt to meet new market needs
iii. High esteem and enthusiasm: every member of the SME can have the same goal, and be motivated easily

iv. Simple structures: the complex structure of the firm may deter the implementation of new systems, the fewer numbers of organizational echelon levels helps to management involvement which will be elaborated later.

3.1 SME e-Attributes

According to [5, 9] we can imply that SMEs which try on an e-business suffer from some dire attributes which act as important inhibiting factors in China:

A)-Restricted access to computers: This may be the result of the lack of funds to purchase equipment and technology

B)-Lack of enterprise-wide information sharing: This is due to two main issues as follows:

I. Lack of internal trust: The history reveals that The Chinese have a long tradition of distrust, which can be known due to the hostile social psychological and sociological environment. Information, as a key source of power in Chinese business culture, is only passed selectively to individuals who are established as trust-worthy people or more widely used as “insiders”. This issue puts off free information flow to “outsiders”, and therefore hinders the adoption and dissemination of business e-Commerce in China.

II. Problems in understanding: As the Chinese languages are succinct and concise in words, but rich in meaning, and also more than 56 different languages are used in 56 provinces. By using an electronic information sharing system, the subtle cues from tone of voice, facial expression and body language, which would otherwise be interpreted for full understanding of the words, would be missing.

C)-Intolerance towards failure: this is also a common attribute due to the fact that SMEs are very sensitive to their revenue margins and as a result must be very flexible to adapt to market in a fast way. Such sensitivity implies the need for strong business models.
D) Incapability of dealing with rapid change:

As many of the business-to-business e-Commerce activities are visible on the Internet and the wide connectivity of the Internet in itself accelerates information and resource mobility, competitors may soon imitate what firms are doing. This leads to quick market changes, and therefore it is important for firms to be capable of dealing with rapid change.

Inhibitors of rapid change in Chinese companies can be summarized as:

1- limited scope of information sharing due to two first reasons: Without immediate and correct information, it is impossible to deal effectively with changes, or even to detect the changes
2- Need for market orientation: China is now on its way to become market-oriented. However, according to [4], a socialist market economy will not be achieved until 2010, and will not become mature until 2020.

3.1.1 The tactics for dealing with SME e-Attributes:

The following Ideas have been interpreted from previous studies in which different solutions and alternatives were put up to paralyze SMEs formerly mentioned weak points, and are supposed that can be used in Chinese and international SMEs in china in order to enable them to leverage upon their power points and curb the effects of their weak points. These ideas are going to be transformed to fit the adoption model:

Cost accounting:

1- Developing the concept of activity based costing: although the full scale development of ABC is not an easy task for an SME but researches point out that applying this point of view in parallel with the legacy accounting system can make more realistic outcomes
2-Benchmarking: developing this concept in the systematic we and how to apply correctly can solve lots of problem. AS we will note again later, this solution is tied with information sharing platforms in which the government can facilitate by maturing the Electronic government.

Human resources:

1- outsourcing the skills which is not available

2-Employing young graduates and leverage up on their enthusiasm, creativity and learning power

Organizational structure: as SMEs typically do not suffer from organizational complexity, they can leverage upon this flexibility to adapt to market in a better way. According to [10, 11], The Entrepreneurs must consider some issues in structuring their structure:

1- Developing a structure in which incubation is possible for creative minds. In such a flexible structure creativity is transferred into innovation as smoothly as possible, leading to optimized exploitation of young human resources from both inside and outside the enterprise.

2- Consider the effect of management involvement

3- Consider the value of information about rules, taxes, and regulations: this factor returns to the readiness of government to govern and regulate SMEs and e-Commerce. The role of E-government emerges here again as it can incredibly remove the abuses and vast wastes of time and recourses due to lack of knowledge that exists in lots of SMEs, especially international ones.

Trust:

Resolutions to trust problems can be summarized as follows:

I. When the problem of trust is about quality and price of products: although it makes no problem for widely known commodity products and brands, the quality is an issue which
can be resolved smoothly by government. In our models EG is responsible for the quality issue and authentication.

II. When the problem of trust is non-repudiation of online transactions: two alternatives are usually put up here which are freezing deposit, and acquiring credit from government, again through EG in our models.

III. A common issue which comes up here is that Why not networked IT systems like ERP, the reasons which are usually mentioned are:

1- 99 % of enterprises are SMEs: the typical features of SMEs i.e. high cost, oriented towards flexibility not formalization, documentation and transparency, makes this solution inefficient to be employed in small size enterprises.

2- Management resistance: although SMEs suffer less in comparison with larger enterprises, it is still one of the setbacks.

Budgetary

Intermediary e-market: for those SMEs which are financially delayed, this can be a golden solution. By intermediaries SMEs don’t need to set up their own websites, although they will face the other head of tradeoff which is common issues usually said about a longer supply chain.

4. E-commerce

4.1. E-logistics framework

As illustrated in Figure 2, e-logistics has evolved from modern logistics and e-commerce. Modern logistics itself has evolved from traditional logistics.
Traditional Logistics is the goods storage, transport and its subsidiary formed by the logistics business activity patterns. As communications and information technology backward, logistics operation of information sharing and communication become difficult.

Logistics operation only can manage the independent operations, such as transport, storage, handling, transport, and so on, and mainly used in the circulation field.

Modern logistics is the basis of modern information technology, integrated transport, storage, handling, packaging, distribution, circulation, processing, reverse logistics, customer service and logistics functions, such as information processing and formation of integrated logistics activity patterns. Its essence is to use modern information technology, and logistics technology to transform traditional logistics process, control and innovation. Logistics range from circulation field expanded to the entire production process, that is, supply, processing, assembly, sales and reverse logistics, implementation of integrated logistics management, which along with EDI, INTERNET technology and the development of e-commerce and logistics based on the information the development of networks, and expand the scope of supply chain management.
The main reason for the modern logistics industry cannot meet the development of electronic commerce:

Firstly, the shortage of professional employees in distribution of logistics. In developed countries, the education and training in logistics and delivery is developed, and formed a more reasonable distribution and logistics employee education and training system.

Comparatively speaking, Chinese education of logistics and distribution are still very backward, the institutions of higher learning in the majors and courses based logistics is only about 10, out of all colleges in China accounted for about only 1% [35, 36, 37];

The master level education has just begun start; Doctoral areas haven’t started yet; training methods adopted by enterprises to train their employees are infrequent [35, 36, 37].

Secondly, according to personal implications, environment of development of logistics and distribution systems needs to be highly deepened. That the system environment is primarily the financing system, the transfer of property rights system, market access system for human use, or withdraw from the system, and the social security system plays important role in providing the right environment. Two important aspects in such an environment are ‘logistics resources’ and ‘configuration of the market’. While the logistics enterprises are improving their efficiency, it is necessary to relate all kinds of logistics resources together inside and between enterprises and carefully inspect the market configuration and define the right re-configuration of resources and market (if possible); although the marker reconfiguration is an uphill battle and is out of range and not feasible by most enterprises. As reasonable economic enterprises must be in accordance with the logistics of re-allocation of resources; any negligence about these changes may lead to a business downfall in the long run. Vertical and horizontal integration of enterprises, i.e. the integration of same-kind enterprises and different-kind enterprises along one supply chain respectively, can be regarded as a solution to this issue as they help optimization of resources utilization.
According to [12] by the end of 2008, China is expected to have 280 million Internet users. The number of internet users against E-commerce act roughly according to Metcalf’s law. We have three main flows in supply chain: information, monetary and product. E-commerce is usually responsible for two first flows, but products can also be delivered in an e-based form providing they are not real e.g. softwares, e-books, and services. Although in logistics of physical products e-commerce can have a crucial role especially when we have ship-to-order like Amazon or manufacturing strategy is engineer-to-order (ETO), make-to-order (MTO), or assemble-to-order (ATO).

Advantages in e-commerce adoption

The following advantages can be seen in either macro level, micro level (intra organizational) or both:

i. Low entry costs: A company can establish itself on the Internet, and be open unlimitedly for a wide range of businesses, with a very small investment. There are thousands of companies with plain, inexpensive sites that are extremely successful in their markets.

ii. Reduced transaction costs Dealing with customers over the Web, whether to process orders or to attend to customer support, is cheaper than traditional marketing methods. For example, Dell Computer Corporation estimates that they save eight dollars each time customers check the status of their order at the Dell Web site, instead of calling the company.

iii. Provides access to global market With a traditional business, the target market may be the local community or, with a higher advertising budget, may extend to neighboring communities. The Web extends the reach of even the smallest businesses and allows them to market products globally and experience the marvelous upshots of Metcalf's law.

iv. New sources of revenue: Virtual services with high margin e.g. advertising, subscription, transaction, intermediary,
v. Less dependency on forecasts: forecasts have always been an inevitable source of cost and failure, by setting up a strong e-commerce there will be no need to turn back to forecasts.

vi. Provides for online distribution: The Web enables businesses to distribute data and software online

vii. Secures market share: Getting a business online will protect its current offline market share from being eroded by an online entrepreneur

viii. If a business enters the e-commerce market too late, competitors who have already established their Web presence may make market entry more difficult.

ix. Better control over supply chain management: There are numerous web-based exchanges that connect buyers and suppliers in real-time having a significant impact on procurement and supply chain management. Most of the B2B activity falls under the sphere of portals that dynamically match buyers and sellers or e-procurement, where buyers and sellers are aggregated. [1]

Discouragements:

i. Typically suffers from some weak points People concern:

ii. Afraid of their Money disappears out in cyberspace; some keep the motto “we want the real thing”. They want to be able to be able to feel the product, quality and appearance. To get uprooted, this issue can be seen from two aspects: purchasing behavior, and trust.

iii. Lots of customers tend to see the products they buy and also see the money we spend to be in control over our own economical balance. People today are looking for secure, trustable and timesaving resources to assists their daily routines. There is no time for mistakes and double-checking and there is no time for living a life insecure.

iv. E-commerce is also reducing the job opportunities drastically. The consumers buying power is getting poorer, which kills the small business and increasing the gap between small companies and big ones.
Despite all inhibitors mentioned above, According to a survey done in [13], the majority of the executives believe that Web-based e-Commerce allows a small business to keep pace or push ahead of the competition. This belief may reflect the Web’s ability to equalize the competitive arena because the Internet hides the size of the company.

4.2. Taxonomy of e-commerce applications

B2B

This class of electronic commerce involves together electronic trade marketplaces and direct market links between businesses. Business-to-business commerce contains online wholesaling, in which businesses sell goods and services to other businesses over the Web by: 1-B2B website 2-B2B portal 3-EDI (internet or extranet)

B2C

The two foremost challenges faced by B2C e-commerce are building passage and sustaining customer loyalty. Due to the winner-take-all temperament of the B2C composition, many smaller firms find it thorny to enter a market and remain competitive. In addition, online shoppers are awfully price-sensitive and are easily lured away, As such, acquiring and maintaining new customers is trickier than traditional businesses.

C2C

Consumer-to-consumer (or C2C) EC includes the electronically-assisted transactions between consumers through some third party. An ordinary example is the online auctions, in which a client posts an item for sale and other consumers bid to purchase it; the third party normally charges a flat fee or commission.
Some Famous C2Cs in china are Ebay china, toabao.com, and paipai.com. There are some Barriers to C2C: 1-goods quality, 2-seller credit, 3-safe payment, and 4-goods delivery

Another issue about C2C in china is that although the total price is cheaper but people pay a higher amount of money for delivery which actually has no value.

Purchase price= retail price +delivery cost

Consequently we should consider a balance between B2C and C2C; there is a competition among them.

If we want to make a summary from this trade-off, we can say as follows:

B2C: cheaper delivery cost, less well known than C2C e-markets, less varied goods, higher credit, assured quality, high good price.

C2C: cheaper price, known websites, high variety, unique goods.

If we want to assure SMEs successful establishment, we should consider this competition at the corner of our strategic programs.

B2E

Business-to-employee (B2E) electronic commerce exercises an intra-business network that allows companies to offer products and/or services to their employees. Normally, companies use B2E networks to mechanize employee-related corporate activities and processes.

In SMEs, B2E EC can be applied in both Front office layer (efficient and automatic communication with clients by web based tech. e.g. web portals), and back office layer (communication among cooperative organizations).

B2G
Another type of e-commerce, in which necessary information, transactions e.g. taxes, loans, etc. are mutually transferred between SME and e-government. B2G is one of the crucial backbones of a reliable e-business platform in a country which plays an important role in our models. Lots of activities within the models such as Authentication, SME ranking and credit data, privacy and security issues, etc. must be considered in this type of e-commerce.

Mobile commerce

The mobile e-commerce usually gives rise to B2C and C2C kind of e-commerce and is outside the fence of this thesis.

What we need for a successful e-commerce:

We have insisted upon knowledge of utilization, as there is no use in something when we don’t know how to use it. The main factors affecting e-commerce success have been reflected as:

• Information technologies and knowledge of utilization

• Telecommunications technologies and knowledge of utilization

• Internet technologies and knowledge of utilization

• Supply chain management concepts and knowledge of utilization

• Equilibrium platform for above-mentioned factors and knowledge of utilization: for instance we may remind the conflict between Moore's Law for exponential development of transistors and dependant technologies, and Wirth's law for downward speed of softwares. Contradicting the technological improvements, the softwares are becoming slower and slower, since the designers and programmers give unnecessary importance to the show-off, graphics and layout instead of functionality.
4.3. Barriers to E-commerce adoption in SMEs

Now let’s take a look at the factors that hold back SME’s e-commerce adoption particularly in developing countries. Some of the barriers are special to China, e.g. those related with fussy cultural and governmental details.

4.3.1 Cultural e-readiness
Developing countries often have diverse cultures and business philosophies, which bound the applicability and transferability of the e-commerce models planned by Western countries. Although the helpful attributes of e-commerce overshadow negative forces, they are not momentous enough to overcome cultural inhibitors.

1-Credit-Card Culture: for B2C and C2C

According to [14] Chinese customers are conservative shoppers and are not willing to purchase on credit or engage in e-commerce deals. The numbers primarily seem to support such arguments as China’s household savings rate is hold at 40% comparing with less than 1% in the U.S. Credit-card diffusion is low, with fewer than fifty million cards in circulation for a promising middle class of 250 million.

While China's Internet users will hit more than 140 million by the middle of 2007 and will surpass the U.S. as the largest group within the next few years, as previously mentioned, critics hold that e-commerce will never take off in China since, as a subject of culture, Chinese do not like it.

But the question that comes up here is that, do these statistics and conclusions incorporate the gradual shifts in consumer habits in China that have been taking place in the last decade? Unfortunately the common voice is a echoing no. but there is another idea that, this common voice is all from skeptics; These skeptics fall short to look at the shifting demographics of
China's consumers. Businesses are now being led by a younger generation that is prepared to buy on credit and shop in online supermarkets. According to [14] in an assessment made among Chinese youth between the ages of 18 and 28 in Beijing, Shanghai and Guangzhou, more than 80 percent said they were ready to buy items online and over 70% said they are eager to use a credit card if they could.

The results signify that old stereotypes of Chinese consumers can no longer be attributed to the increasingly prosperous middle-class youth segment of people. This bodes well for multinational companies that hope to tap into China's fever for Web 2.0 and e-commerce.

It is true that the older generations of Chinese used to save a lot of money, as they lost their pensions and are bothered about high medical costs. That’s why lots of economists look at such age ranges and quarrel that China's economy will have problems in the future if the government cannot jump-start consumer expenditure.

This is the place where social sciences can have some words, and take part in important decisive arguments and correct socially-rooted mistakes make in other fields of knowledge.

Nevertheless, a lot of these economists have been too simplistic in their analysis of the future of China's family savings rates in the imminent decades. Expenditure patterns are very dissimilar for Chinese born after 1970s.

These juvenile professionals want to enjoy their status in the market and spend almost all of their salary on items such as mobile phones, clothing, and cosmetics. In center of attention in the survey context was a group conducted in Beijing, in which they found that more than 70 percent of young women making between $500 and $2,000 a month.

The surveys in [14] prove that Chinese between the ages of 18 and 28 save very small or in fact buy on credit since they are so optimistic about China's economy and their own earnings power in future. Their salaries are frequently rising as the competition for even junior talent is severe.
The youth segment in China, crushingly desire credit cards. Until early 2007, the date when the survey is published, there were fewer than 50 million credit cards in China in comparison with more than 1.1 billion debit cards. However, the year 2006 saw the adding up of 15.6 million credit cards and also 200 million debit cards, accordingly more and more Chinese are using credit cards.

The main reason for the fact that few people have credit cards in China, according to our findings, is not despite some news, that they do not want one of them, but that it is too difficult for the average Chinese person to get permitted for one. They need to spend far too time-consuming dealings with an inefficient legacy system of bank services, where consumers often have to stay in tedious and long queues to see a teller, except those that have something called VIP cards.

Today Chinese banks are forced to issue more credit cards to keep flocks of Chinese shifting their money to foreign lenders. According to [14] The China Daily newspaper conducted an online poll that showed that 57% of people wanted to change their savings to overseas banks once they are able to. As such Chinese banks are enduring with the reform and see credit cards as an imperative component of their futures if they want to keep pace with the demand and stand on an international market.

According to [14] Millions of Chinese youth spend hours each week playing online games, designing and writing blogs, chatting, and streaming music from online portals. To facilitate online transactions and preserve active users, many of these Internet sites have issued virtual money that can be exchanged for goods and services. Chinese netizens (people who usually work with internet as a daily need) like virtual currency because gathering some does not necessitate a credit card or a bank account. According to these studies and some other previous studies still the future of Chinese behavior up on online purchasing is vague and it can even be extended to business-to-business environments.

2-Problems in Communication:
This kind of problem which mostly affects B2B type of e-commerce can be fit into three titles as follows:

- Vague communication: due to the complex nature of language as previously mentioned. There is a need to explore approaches for translating the meanings not words

- Lack of trust: this feature will be elaborated later

- Instruction-based behavior: they are meticulous with instructions. There is a need for fool-proof systems, and also careful supervision during building instructions as one cannot expect them to do more than instructions.

4.3.2 Organizational E-readiness

According to [6, 7, 15, 16], it can be implied that Perceived organizational e-Readiness can be evaluated according to the following factors. We have provided a set of questions in each section with which practical evaluation is possible:

1-Awareness: Represents perception of e-Commerce elements in the organization environment; which includes comprehension of their meaning through an understanding of e-Commerce technologies, business models, requirements, benefits and threats and projection of the future trends of e-Commerce and its impact. This awareness can be evaluated through a set of question lists from Top managers and executives. Considering [6], plus the need for a realistic cost accounting, the following questions can be put into the question list:

Are we aware of b2b e-Commerce implementation in our partner organization?

Are we aware of b2b e-Commerce implementation in our competitor organization?

Are we aware of Opportunities and threats involved in e-business adoption?

Are we aware of B2B e-Commerce business models?

Are we aware of true cost and benefits of implementation?
Are we aware of Impact on the business processes and how the business is run afterwards?

Are we aware of to what degree a Fail to adopt will be a competitive disadvantage?

2- Commitment: Reflects enough energy and support for e-Commerce from all corners of an organization and especially from the strategic apex. It refers to having a clear-cut e-Commerce vision and strategy championed by top management, e-Commerce leadership and organization wide support of e-Commerce ideas and projects. The following questions can be put into the question list [6, 7, 15, 16]:

Do we have a clear vision on B2B e-Commerce implementation?

Is the vision widely understood throughout the company?

How much champion do we have for B2B e-Commerce initiatives?

Is senior management among champions?

3-Resources:

As we said before SMEs in china as a developed country are facing serious problems considering lack of resources. Here we narrow it down to e-commerce to get a deeper insight about how lack of resources can bar e-commerce adoption which is defined here as one leg of e-logistics success. According to [6, 16], these resources can be divided into human resources, technological resources and business resources:

a- Human resources: Refers to the availability (accessibility) of employees with adequate experience and exposure to information and communications technology (ICT) and other skills (such as marketing, business strategy) that are needed to adequately staff e-Commerce initiatives and projects. The following questions can be put into the question list:

Are our employees computer literate?
Do they have sufficient Chinese language skill in both written and communication?

Do our employees have unrestricted access to computer?

b- Technological resources: Refers to the ICT base of an organization and assesses the extent of computerization, the flexibility of existing systems and experience with network based applications. Experience with network-based applications. The following questions can be asked:

Is the Organization well computerized with WAN and LAN?

Do you have high bandwidth connectivity to the internet?

Do you have flexible systems as far as e-based adaptability goes?

Do you have Customizable system?

c- Business resources: This covers a wide range of capabilities and most of the intangible assets of the organization. It includes the openness of organizational communication; risk taking behavior, existing business relationships, and funding to finance e-Commerce projects. The organizational culture and shadow organization hugely affects this factor. Apart from contents studied from [6, 7, 15, 16], we have also added one more Virtual assets which is incubation system or ability to transform creativity into innovation. The following questions can be asked:

Are our people are open and trusting with one another?

Do we enjoy open communication throughout the organization?

Do we have information sharing culture?

Do our staffs rely on family and close friend ship relations in their mutual trust?

How is the grass root B2B (business to business) and B2C (business to customer): how deep is our information sharing, how many folks and ordinary people are reached, how many small businesses are reached?
To what extent failure can be tolerated in the organizational culture?

Are we capable to deal with rapid changes?

Are we capable to identify hidden cost drivers?

Are we capable to identify hidden risks?

Can we make use of creative minds and can our business culture accept young graduates?

4- Governance: How the organizations apply the strategic, tactical and operational decision models to govern their business activities and e-Commerce initiatives. Here we consider Roles, responsibility, and accountability in e-Commerce initiatives. Apart from contents studied from [6, 7, 15, 16], we have also added one more capability which is accounting systems. The following questions can be asked:

Are decision-making authorities clearly assigned to B2B e-Commerce initiatives?

Do we analyze all possible changes to stakeholders during implementation?

Do we follow a systematic change management process?

Do we consider metrics for measuring impacts of e-Commerce initiatives upon stakeholders?

Do we have a good accounting system, see all activities and cost sources, and are we able to distinguish and measure all hidden costs and revenue sources?

4.3.3 Market forces

For assessing market forces we need to evaluate organization’s business partners such as customers and see if suppliers allow an electronic conduct of business. According to [17] it can be done in three steps:
I. First step: find market characteristics by surveying vendors, customers (what they want-order qualifying criteria- and see how much weight they have to gain what they desire) and competitors.

II. Second step: surveying existing strategies to identify internal constraints and direct development efforts in the optimized way.

III. Third step: order winning criteria: find, prioritize and weighting critical purchasing factors. This part is hugely integrated with physical, virtual and government-based Infrastructures, culture, e-government and demand. In a customer survey we may concern:

What makes a customer not to buy online?

According to [18] the following factors can be an answer to this question:

i. The goods is not delivered on time
ii. No trust in the quality
iii. Secure payment
iv. No trust in the website

Following questions can be put in this section of question list:

Are customers ready to do business on the internet?

Are Business partners ready to do business on the internet?

How it will affect our competitive edge and order winning criteria?

How it affects the order qualifiers?

Do we consider critical purchasing factors?

4.3.4 Supporting industries
This section of e-readiness concerns mostly about infrastructures. The following questions may be asked for a simple evaluation:
Is Reliable and efficient telecommunication infrastructure present?

How is the technology infrastructure of commercial and financial institutions?

Is efficient and affordable support from local IT industry present?

Are effective and affordable Security services such as SET and SECE present?

4.3.5 Government readiness

Studying the Chinese government is very important as it shapes one of the modules in the strategy. According to recent researches the government support is relatively positive towards e-Commerce adoption in China. We need to answer the two following questions:

1-What is the current situation of government in the global view:

Although it seems that the Chinese government has evolved and matured to fit into a global market, many economists do not believe this. The reality is that earnings have not balanced in China yet. The elucidating fact is that the state own companies have been developed hugely.

The vivacity of Chinese economy primarily comes from the growth of private companies in the competitive fields. In other words, private enterprises are; for the most part, in downstream sectors; while state-owned companies are mainly in upstream sectors. All the state-owned companies in the downstream sectors end in bankrupts, and most of the private companies are just struggling to survive. However, when downstream private companies grow up, their need for energy, raw material, electric power, telecommunication, and haulage also increase enormously. But entry into these upstream fields for private companies has been acutely controlled by government. That’s why state-owned companies can make a good income even to this day [19].

This can be illustrated by an interesting paradigm by Prof. Zhang Weiyang [19], here is his quote:

“Let’s take an example. Assume there are five boys in a family. If all the sons are idle and lazy or if four of them are lazy, the family will not survive. But if there is only one idle son, and
others are hard-working in work, the family will subsist sound. More probable, the four hard-working boys work very diligently to make money, and then give it to their parents; consequently, the lazy son is making a better livelihood than anybody else.”

This is why lots of global and domestic SMEs still are worrying about their profits margin. As a solution we can return to Prof. Zhang Weiying, which recommends deeper Change in the role of government, accessibility of funds and infrastructure for private sector. Right now government is planning for strict business plans from Investors. The problem is that as mentioned previously newly born SMEs, or those do not have suitable experience in china, cannot make a meticulous business plans. On the other hand, changing the business plans can be hugely costly due to legal issues, customs, and Chinese business laws.

i. SMEs can less rely on their flexibility, and this will affect the e-logistics (mostly physical branch)

ii. They are not able to produce meticulous business plans due to lack of knowledge, budget and bargaining power, and for international SMEs, also lack of Chinese connections.

2-How government can help to the e-commerce leg of e-logistics:

For doing this we need to evaluate organizations’ assessment of the preparation of the nation state and its various institutions to promote, support, facilitate and regulate e-Commerce and its various requirements. As a simple evaluation and according to [6, 7, 15, and 16], one can ask the following questions:

Does the government have Effective laws to protect consumer privacy?

Does the government have Effective laws against cyber crimes?

Does the government have Conductive legal environment for e-business?

How is the Commitment of government to support e-Commerce?
5. Electronic government

EG acts as catalyst in the successful establishment and development of SMEs. In this research EG is looked at as a crucial backbone not only in the Chinese business, but also in all developing and developed countries, although it plays a more important role in developing countries as their flourishing SMEs normally has one head in a developed country. For china which is seen as bull’s eye for a huge number of investors and entrepreneurs, EG must not be neglected. Here in this research we have an elaboration on EG as it acts also as a vital enabler for our model.

5.1. E-government Framework

“E-government involves electronic relationships between the government and different entities. There are four major but sometimes overlapping types of e-government, namely Government to Citizen (G2C), Government to Employees (G2E), Government to Business (G2B), and Government to Government (G2G)” [26,27].

In G2C the governments provides the information and service to the citizen for example the social security administration and new policy of the government.

G2E refer to the relationship between the government and their employees, the government publish the information to their employees through the internet like the payment for each month.

“G2B. Government interaction with the business community is essential to economic development. Similar to the G2C, the G2B relationship is intended to facilitate smooth operation in the market. While businesses can transact many online services from the government, a major proportion of online transactions between them involve procurement i.e. the hiring of contractors or acquisition of goods and services by the government ”[26].

“G2G is government bodies or agencies work together and provide services to one another. This kind of interrelationship may bring gains in the management and utilization of public resources.”[26]
5.2. History and current development

China’s development of e-government began with the office automation. In the 1980s, China's government established the office automation (OA) project, built a variety of internal information office network, and also established national economic information; statistics and so on more than 10 automated information systems, the Central Bureau have been more than 40 ministries [20, 21, 22, 23, 24, 25]. The establishment of an information centre, all for the future of e-government development laid the foundation. 1993, the State Council Informational Leading Group developed a "national" 9th Five-Year "plan and vision of the Platform for 2010", the State Council called on the then Department of Electronics and related departments to coordinate, supervise and implement several major information projects. At the end of that year and officially launched the ""Three Golden project" " (Golden Bridge project, the customs project, Golden card project)."Three Golden projects" proposed and implemented the formation of a powerful wave of information technology for government, businesses and households have had a strong impact. These are the foundation stage of E-government development. At present, e-government in China has become a popular concept. Chinese government information technology and e-government has made significant progress [20, 21, 22, 23, 24, and 25].

5.3. Problems

Recent years, the development of e-government in China have made some achievements in the affirmative, due to the China's economic, social development and the imbalance in many ways the basis of relatively weak, China's e-government development is still only at an early stage, there are many theoretical and practical issues need analysis, there are many practical problems need to face and resolve. China's e-government development in the main problems can be summed up as follows:

1. There is no deep understanding of E-government, certain blindness existed

First, just regards e-government as the computerization of government departments, speared the work and the e-government, regardless software development and government business process integration. Only to use the computer system to mimic the traditional manual Chief processing
mode, the result of many Government departments of computer equipment to become senior typing tool, or as a display, not play their due role. Second is simply the electronic equivalent of the Government Chief Internet that the government's policies, rules and regulations onto the Internet on everything Down, not the Chief of traditional tools and network services combine to provide a full range of services; Third, it is part of the civil servants concerned about the development of e-government will pose a threat to their own vested interests, are in conflict with the e-government, negative emotions.

2. E-government development planning and overall lack of uniformity of standards

There is a very important experience in the world's leading E-government well developed countries that is the central government to strengthen unified planning, organization and leadership, systematic deployment of e-government development. In China, due to the regional development imbalances and other reasons, the government and departments in the implementation of e-government, cannot be balanced, resulting in vertical and horizontal separation, the lack of consistency of data protection, information sharing cannot be achieved effectively, a large number Low-level redundant construction to the country has caused tremendous waste. E-government standards in the research and development of the work, because of differences in the needs of government agencies, technical complexity, coupled with a late start, so there are many difficulties.

3. The overall level of e-government applications is still relatively low

During the China's e-government development process, there are such as "China's electronic customs," Zhong guan cun "Digital Park" and a series of successful cases, but these can only be regarded as isolated cases, China's overall development of e-government still stay at a lower level. Specific problems: First e-government applications still limited in the basic administrative system, the NPC(North Pacific Cable) and the CPPCC(Chinese People's Political Consultative Conference) systems such as the application also has lagged behind the other is still a large number of local governments and related departments of the e-government construction in the
original stage; Third, many governments are still in the stage of the Internet information on the practical application of e-government or almost empty, although some opened e-mail, some e-government projects, but most a mere formality, work of the task is still arduous, and there are still many problems.

4. E-government legislation lags behind

Laws and regulations is the basic force to ensure that e-government in an orderly manner. China's electronic signature law on August 28, 2004 at the 10th National People's Congress Standing Committee 11th meeting, was adopted by vote, with the promulgation of the law and implementation of electronic signatures will be with the traditional handwritten signatures and seals the same The force of law, means that access the Internet with "identity card", this also signifies that China's first "real sense of information law" has been formally established. But compared with other countries or some backward, as the British Government in May 2000 passed the Electronic Communications Act, established electronic signatures and other electronic certificates in a court trial can be used as evidence. But so far, China's electronic signature on the application is small, in many ways still in the basic blank.

5. There is no correct understanding of security of EG.

People often raise the attention towards the safety of E-government; security is the most important issue of e-government. E-government information related to state secrets and high-sensitivity core of the Chief of protection involving the maintenance of public order and administrative supervision of the implementation of accurate, involving the provision of public services for the community's quality assurance. However, the e-government construction, there are three incorrect concept of security: First, the government security seen too important to spend a high price for the purchase of equipment ensure information security, restrict the public's visit, which will inevitably lower The effect of the use of e-government and the other is that too much to the community to provide the relevant information will make the government work into a passive, often to highlight information security grounds "intercepted" in this society open to the
relevant information; third is that information Security is only a technical issue. In fact, many domestic and international information security incidents are caused by man-made, it is necessary to prevent such accidents from taking place, it is necessary to information security laws, regulations, and improve the system, and so integrated, tackling both the symptoms and can play a role. Therefore, in the treatment of e-government security issues, it is necessary to ensure that e-government systems "adequate" security, but also adhere to the "moderate" security, to avoid overkill, resulting in the development of e-government from going astray.

5.4. Suggestions
Learn from the successful experience of development E-government developed countries, with China's reality, in promoting the development of major e-government can take the following solutions:

1. Increase understanding of concepts and create a good environment for favorable development of e-government.

E-government development is a complicated systematic project, government departments at all levels must have a correct understanding. First of all requests from the principal party and government leaders at all levels beginning. Because the implementation of e-government will involve all relevant government departments with vested interests, if not the principal leaders of the support and participation of the development of e-government is bound to be a mere formality; Second require the broad masses of the civil servants truly establish "governing for the people" Thinking, recognizing that e-government is implementing the "three represents" important thinking of ways and means, "serving the people wholeheartedly" of the action; once again asked all relevant government departments "system thinking" to overcome ideological and selfish departmentalism, Overall interests of the overall situation, China's e-government development has entered a new stage.

2. Develop practical planning and development of e-government organizations
From developed countries and China's Shanghai, Guangdong South China and other places of practical experience in e-government development, the development of a viable e-government development planning and organizational structure is to ensure orderly development of e-government, an important condition for a steady advance. If there is no scientific and rational, targeted development plans and responsibilities clear, coordinated and effective organizational bodies as a protection, the development of e-government is not bound to unified standards, data is not compatible with low correlation domain, poor information sharing and a range of issues, Both the government work will bring new chaos will seriously damage the image of the Government.


E-government related to national security and the normal operation of government work, the security requirements of natural extremely important. But on this issue should be divided into two points of view, it is necessary to see that the Government of the high importance of information security, but also because of security concerns cannot influence the development of e-government process. From the strengthening of preventive and eliminate human factors start to improve safety management of e-government level.

E-government threats to the safety of the main external factors and internal destruction penetrated two areas. The invasion can be taken outside the firewall settings, both inside and outside the network implementation of physical isolation and other methods to guard against; internal damage including damage computer systems, including ultra virus handle official business, theft of confidential data. To effectively prevent internal damage, on the one hand we must improve the relevant policies and regulations of the building, particularly the government's information network construction, management and maintenance should develop the necessary requirements and constraints, so that saboteurs could be no loopholes drilling; On the other hand the government Departments must also constantly improve the anti-virus, anti-hacking level, it will undermine the eradication activities in the embryonic stage, to ensure the reliable operation of e-government.
6. Logistics in China

6.1 Chinese logistics problems

China is the largest stock of the online trading network. "The entire network" is used in B2B e-commerce. Although the logistics industry have made a certain development, at present China's development of the logistics industry in general is still lagging behind, specifically the following problems:

1. Logistics concepts are outmoded, and the lack of modern logistics concept. On the modern logistics industry in raising the level of transportation, promote economic development and increase economic benefits sufficient understanding of the role.
2. Business environment is relatively backward, causing unreasonable distribution logistics, the low level of professional services, logistics disproportionately large share of self-employed, professional logistics agency services are not fully utilized; fragmentation at the same time the management system is also restricting the development of a logistics management.
3. China Logistics Information Service System and the backwardness of the network system also restrict the development of logistics industry, which restricts the logistics industry specialization, the development of integration.
4. Conflict in applications: couriers and 3pls utilize independent and different software packages and systems which need to be integrated. Logistics industry is the development of an institutional environment to be perfect. Logistics development across regions and departments to the constraints needs unification and standardization. China is still not a complete logistics and regulations, which has hampered China's modern logistics industry intensive operations advantages.
5. Logistics lack of professionals, China's institutions of higher learning to set up the logistics of the majors and courses rarely. Logistics-service personnel constraints lower the overall level of China's development of the logistics industry.
As we can conclude from above-mentioned issues, in china there is a lack of 3PLs which are proficient in managerial logistics solution and the focus is physical. One of the most important results from this issue that has a serious effect on the Chinese supply chains is the problems with cold chain ([12], [14], [18], [19], [20], and [24]).

6.2 Current developments:

Figure 3. shows the current trend towards absorption of investment throughout china. There are 9 spots in the map. The blue spots show the mature business centers in china and red spots are those in which government is trying to absorb domestic and international businesses to invest. As we mentioned before around 99% of active business in china today are SMEs. The source for this map is National Bureau of Statistics of China and Logistics & Transport Conference 20–22 May 2008.

In the map presented in the Figure 3. we tried to demonstrate the importance of logistics infrastructure including rivers (RO-RO vessels), airborne, railroad and roads in supporting this vision.

Cold chain impediment

According to [30] Food-industry executives estimate that China loses about 30% of its produce and meat between the source and the consumer. A.T. Kearney [30] estimates the economic losses from the lack of proper cold chain in China is about $15 billion a year. Today China has about 30,000 refrigerated trucks and 250 million cubic feet of cold storage, according to A.T. Kearney [30]. To serve China's growing middle class with effective safety levels, China would need 365,000 refrigerated trucks and five billion cubic feet of cold storage by 2017. So this issue also must be added into the final agenda, and it is worthy to be considered when designing the strategies. According to [31] the development of cold chain standards is very slow compared to the growth in the logistics industry. There is a need to invest for logistics systems supporting the
cold chain including farm products, as well as pharmaceutical and similar industrial-based products.

Figure 3. The current moves for Investment in China ([28], [29])

6.4. Delivery for B2C and C2C in China

We have studied over current alternatives for any delivery in China. According to varied but informal online inquiries we made from different agencies; Delivery entities in China are as follows:

C2C deliveries in China are made as follows:

- China Post: regular mail (1-2 weeks), EMS i.e. express mail service (2-7 days)
- Express delivery companies (1-3 days)
B2C deliveries in China are made as follows:

- China Post: regular mail (1-2 weeks), EMS
  I.e. express mail service (2-7 days)
- Home delivery service (1-6 days)
- Urgent home delivery service (1-3 days)

The figures inside parenthesis indicated the expected delivery time in days. This is a holistic framework that must be used in parallel with the model, but the information varies widely from one point to another. As mentioned earlier the hint is that we should never forget how big china is, and as far as our personal implications go, there is not even one Haulage Company, 3PL or 4PL which covers the whole country.

Most Current challenges:

1. Distribution Bottlenecks
2. High Inventory Costs
3. Damages and Losses in Transit
4. Underdeveloped IT Systems
5. Weak and Unreliable Transport Structures
6. Difficulty in Quick Response to Change in Demand
7. Lack of Logistics Understanding in China
8. Logistics Had a Supplementary Role

And, the last but not the least issue, we should point out the Passenger-freight infrastructure:
The need for freight transportation in increasing and there is no urgency for passenger transportation. Let us mention here again that these challenges is based on our personal implications and we couldn’t find any formal statistics or report upon these challenges.

6.5. Major measures for supporting development strategies:

We have already discussed various important issues that must be done for both governments and SMEs. Here again we put these issues into other words and in more generic words and from government point of view, in this way there will be three Major measures for supporting development strategies which are:

i. Liberalize trades i.e. opening up the system to allow competitors from other countries to come in

ii. Stabilize growth i.e. keep up the improvement measures from going downwards, at least in a steady state

iii. Mitigate trade conflicts: characteristics, business behavior and factors which are different in china and other business partners e.g. safety of the products, quality, safe transportation, etc.

7. The results of the Thesis

7.1 E-Commerce adoption model

In the following Figure 4 we have developed a model for E-commerce adoption which is an implication from previous studies especially from [6, 7, 15, 16, and 17]. The figure demonstrates the three main phases toward e-Commerce adoption. First of all there is a need to study environmental or external e-readiness which has divided into four categories which we have already elaborated upon them. These factors are not under the control of organization and must
be considered through setting up the business or reengineering the processes and surely through investment absorption.

In the second phase we need all the things that we must apply for changes, we should answer the two main following questions to assure we have necessary tools in our toolbox:

1-what changes should be made and on which activities?

2-how they should be made?

i. First step: develop a cost model. A realistic method of allocating overhead cost to products, markets and activities. ABC (activity based costing) can be used as a proven approach, although it is also proven that ABC experience, insight and devotion.

ii. Second step: at the same time and in parallel, detecting activities that affect ability to meet customer’s needs

iii. Third step: developing a list of potential improvement techniques

In the first step of implementation phase, the necessary changes must be made and all necessary resources and funds that have previously calculated must be meticulously employed. The changes will be made upon people, investment and finance, facilities and systems (both legacy and Information Systems). There will be a mutual effect between the change process and organizational e-readiness which is an internal factor and thus under control.

In the second step of implementation phase the adoption starts and can reach various levels of maturity. According to [6], the levels of e-commerce adoption maturity are as follows:

I. No e-commerce (no email, no internet)
II. connected e-commerce (email, internet)
III. static e-commerce (publish of information on web with no interactivity)
IV. interactive e-commerce (website accepts queries, emails)
V. trans-active e-commerce (online sell and purchase and customer service)
VI. Integrated e-commerce(integrated with back-office systems and its business transactions).
Many researchers have accepted interactive e-Commerce as the beginning of e-Commerce.

In the third step of the implementation phase, we differentiate between entry-level adoption and its extent. We refer to the Adopt as initial e-Commerce adoption and the next as the institutionalization of e-commerce. The third measure of implementing adoption, institutionalization, indicated the extent of e-Commerce utilization. In this step the organization is able to understand and use e-commerce towards its business concept within the business scope and model.

For an SME in china, especially an international one, institutionalization ;the third step, is a very important step, especially when it comes to intruding the business models which they have to hand in to the government for starting their business; as by doing this, be deliberate or not, the government may charge the company with a huge fine. An immature institutionalization cannot enable the SME to utilize e-commerce towards its own business scope, and such an e-commerce failure may delude the company to a different scope which will be very misleading and costly. Even if the company change its heading towards a new business scope based on a meticulous financial evaluation the cost of intruding the business rules may still remain. As such a naïve institutionalization will lead to a higher cost.
Figure 4. E-commerce adoption ([6],[7], [15], [16], [17])

For Institutionalization e-based know-How guides the SME through utilizing e-commerce concepts in tactical and strategic decisions including:

1- Water proof e-commerce adapted agreements and contracts

2- Continious improvement and strong stand in market

3- Ease of future change in business scope and flexibility

7.2 The B2B e-logistics model: SME-3PL

Since the model developed is a SELF-SERV model i.e. a standalone model which acts independently, a declarative language (no computation and figure, just present logical relationships) is needed for translating processes within the model into programs; As such Dynamic programming or any figure-free and logic-based programming fits into our need here. By presenting the model details within logical relationships we give enough flexibility to the
model to be performed in diverse environment. We insist on a declarative language due to the decentralized form of common layer (As we will explain more later on) in the model in which the resulting composite services must be executed in a peer-to-peer and dynamic environment i.e. the agents in the system communicate directly together and not necessarily via a hub. According to [32] it gives us the environment which; as we will clarify later, can be adapted to the Chinese culture more smoothly, mostly because it makes the model more secure and private. Quan Z. Sheng. Et al, [33] have developed a platform for developing a flexible declaratively composed services in which XML linkages has been used, similar to our model. One may say other alternatives than XML can be used; the answer to this question is out of range of this study but XML linkages help the model to be used easily in a global scale without any especial infrastructure, and also be able to get expanded more easily.

7.2.1. Model for E-logistics activities:

We consider these activities for an E-logistics process within a non-manufacturing SME:

Information, negotiation, settlement, payment, delivery optimization, delivery fulfillment, Reverse logistics and feedback

For optimizing the model first we need a prioritization framework in which we get a true vision upon how each activity affect the total model performance. For doing this we consider three attributes controlling complexity, value (how much is the perceived value from the customer POV, what we will lose if a mistake occurs or quality drops), recoverability (to what extent mistakes can be traced and recovered).

We also can try to develop tactics for improving each attribute and also Develop strategy for effective juxtaposition of tactics. The following results are from previous studies and our implications from various literatures and also from rank sheets filled out by some people mentioned early in the acknowledgment section:

1- Information (low, high, high)
2-Negotiation (medium, high, low)

3-Signing the contract and Settlement (low, high, low)

4-Payment (high, high, low)

5-Delivery optimization (high, medium, high)

6-delivery fulfillment (medium, high, low)

7-reverse logistics (high, low, high)

8-Feedback and Idea absorption (high, low, low)

Numbers 4,5,7,8 are ranked high for controlling complexity, 1,2, 3,4,6, ranked high for perceived value and 2,3,4,6,8, ranked high for recoverability. For more focus the payment item, has taken all extremes and that’s why we had so much focus on the Banking automation and also EG that can authenticate and automate government related payments.

All these activities together form the e-logistics process. These activities must act within e-logistics framework which is showed in the lower part of figure 1.

Elements in modern logistics:

   i. Physical System: inbound logistics, outbound logistics
      Local supplier, Non-local supplier, urban transport, Freight transport, Warehouses, Cross-dock areas
   ii. Information System:
      Human resources, Infrastructure, Data quality
   iii. Management System:
      Logistics knowledge, Supply chain management, Global best practice
7.2.2 The B2B E-logistics model: SME-3PL

The B2B e-logistics model also can be seen as an e-commerce model as it mainly focuses on the e-commerce leg of e-logistics. The main difference between B2B E-Logistic Model (figure 5, 6) and the first e-commerce model (Figure 3) is the view from which the model is applied and looked. In the first model the e-commerce is studied and discussed from the SME point of view. We discussed that model in a way that it could help to both domestic and international SMEs to establish in China according to formerly discussed environmental specifications in China. In the B2B which is considered here there are one SME and another one is a shipping service company such as a 3PL.

**Figure 5. SME-3PL model one: Common Layer**

Advantages to this model:

i. Homogeneous logistics software applications

ii. Dynamic data binding mechanism

iii. 3pl and SMEs publish web based services

iv. Integration of all supply chain partners

v. Leverage on flexibility: Fast change of business scope

vi. Infomediary: Data sharing platform
vii. Low redundancy, low transaction volume
viii. Supply chain transparency
ix. New technology integration
x. Able to be highly secured
xi. More Efficiency in complex and
xii. Controllable activities

Figure 6: SME-3PL model 2: Peer to Peer

Advantages to this model

i. No need to find a single supply chain owner
ii. Less dependability on trust!
iii. No need for Back office integration and BPR
iv. Simple network, easy establish
v. Incompatible back-office systems can work
vi. Able to be evolved to the first model
The figure 7 illustrated the function of SME-3PL model 2. The SME form the RFQs i.e. requests for quotation, in the legacy environment, in the RFQ there are information about the weight, package & pallet sizes, kind of goods, Source & destination, limitations (e.g. height & width of carrier, trailer & container, dangerous goods) and the deadline to which 3PL can send back the quote. Legacy environment send the RFQ to its Transformation layer, Transformation layer codes the data into XML in security signature (e.g. Java security signature); the XML string will then be sent to server that dispatches the string to 3PLs and other shipping services. The list of valid 3PLs can be updated from an official database through an e-government link, since it’s a constantly growing figure in china. The request then is received by the 3PL server, which has acceptance criteria according to the list of valid digital signatures plus any custom criterion which filters RFQs according to its field of data (Source & destination, weight, package & pallet sizes, kind of goods and limitations). Then the server sends the data into Transformation layer which aggregates the requests, decodes them, sorts them and sends them into the 3PL legacy environment where the requests will be processed. A DSS or a fully automated application can be used to analyze the feasibility, analyze the economical feasibility and produce the quotes. If the fully automated application is used, the data absorption can be put to the back of server excluding the transformation environment, since the input can simply be in XML codes. The 3pl sends the quote to the SME server again throughout its transformation layer and server.
Figure 7. The Function of SME-3PL model 2

The same as model two but we have the common layer here. Which acts as a national platform? According to current cultural and attitudes toward government, Figure 6 is discouraged despite the fact that it enjoys multiple motivators like decrease of redundancy in links, lower transaction volumes, faster settlement of optimal deal, higher security (from government point), simplicity and transparency in the value chain and also high potential for future development and integration with sophisticated technologies. But due to wide-spread lack of trust and also current firm and convention-based tied among current SMEs and 3PLs this model is not motivated in this study, although the second model easily gives way to be evolved into the first model.

7.2.3. The role of E-government

We have already covered e-government and its weak points and mentioned relative suggestions.

Here we look at its generic place within our model and see how it is make the necessary linkages to other entities which are 3PLs and SMEs in the first model but 3PLs, SMEs and common layer in the second. In the second model the whole EG function is transferred to the common layer and
integrated with other ISs (information systems) including EPS, DSS (Decision support systems), MIS (Management information systems), KWS, office systems and TPS. An umbrella function such as ERP can also be used here. ERP also can be regarded as a resolution for the trust problem, although its complexity and opposition of organization insiders, i.e. those who have unfair profits within organization, and managers has made its implementation infeasible for most SMEs.

In the Figure 8 first model on the other hand government needs to act in a peer-to-peer behavior. This model demands a higher level of ICT technology and infrastructure, and the control of all agents involved within the system is very difficult, at least in a synchronized way. As a result, illegal business transactions can be more easily possible, and a lower level of optimization can be done for the system since there will be less holistic statistics and strategic information.

![Figure 8: The role of E-government in SME-3PL](image)

Figure 8. The role of E-government in SME-3PL
8. Conclusions

From the most strategic view its Infrastructure is improving but not fast enough to keep up with China’s growing economic engine

China Needs Investments In:

1. Hard Infrastructure

Roads, Airports, Ports, Railways, Highways, Inland Waterways, Warehousing, Telecommunications

2. Soft Infrastructure – Information Technology

Software, Hardware, Personnel, Conceptual Frameworks, Internet

How SMEs which feel unable to compete according to above-mentioned issues, can survive:

1- Direct investment: investment upon setting up hubs, warehouses, berths, ports, distribution facilities, logistics parks, container yards, highways, bridges, etc.

2- Outsource

3- Merger & Acquisition: The quickest way to establish an existence and expand is through merger or acquisition, which enables the acquirer to own a network over night. It has been a very popular strategy for the SMEs in the China market, if not a dominant strategy so far. Except for a few exceptional top SOEs (state-owned-enterprises), all SMEs are at their initial phase of growth barriers:

i. They are not strong enough to merge or acquire others.

ii. Second, there prevalently exists local protectionism. If a logistics company based in region A wants to merge another in region B, the government of B will become very alert: will the transaction harm the local economy? Why shall this business be acquired
by 'foreigners', not locals? This concern significantly lowers the chance of a successful deal.

iii. There are governance problems. As the parent company may not consider the acquired companies as its own, the employees of the acquired companies won't consider themselves a part of the parent company, resulting in management difficulties. All these factors must be considered in the first and second phase of e-commerce adoption model we have presented before.

4-Franchising: according to the definition in the Oxford English Dictionary: 'Franchising ... has become a method of very quickly establishing a distributive network for a product or service.' Since logistics services heavily depend on the distribution channels, it's very appealing to leverage franchising in the logistics industry. Franchising means 'the authorization granted to an individual or group by a company to sell its products or services in a particular area. This could be done by imbedding the brand within warehouses, distribution centers, shipment service providers & trucking companies and other service chains and supermarkets. This solution works well with the B2B e-logistics model we have already resented.

5-Strategic Alliance: The strategic alliance of FedEx with Kodak was innovative yet unsurprising. These two companies can compensate for each other: Kodak has a long established network that penetrates the communities and neighborhood (which logistics companies are usually not very accessible to), and FedEx has a long-range international reach. Strategic alliance can still compensate for the partners' weaknesses such as infrastructure (facility, warehouse etc), network (reach for the remote region, for example), capacity (ability to offer different services to common customers), etc. The B2B e-logistics model we have already presented can also be used here but some problems are expected. Among all of them the issue of trust is the most prohibiting factor as far as our reflections from Chinese culture goes.

At the end we preferred to put the insights we got throughout the research, in order to be helpful for future readers:
a) There is a Need for models in order to standardize the e-logistics development path

b) Culture and government hugely affect adoption models especially for those acting globally

c) In the case of China, Utilizing the model with common layer for the e-commerce leg of e-logistics is not recommended as it is in conflict with various business environment specifications

d) Models applied in micro view and in macro view should be homogeneous with each other, as Macro structures support the Micro ones and Micro ones sustain the Macro ones
9. References


[35] Shanghai’s education group set up for logistics, 2007, available at:


