Utilising the Surging Potential of E-commerce:
A Case of Hour Glass Supply Chain

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1. INTRODUCTION

Decade of nineties saw two significant developments with far reaching implications; bringing down of iron curtain and the exponential growth of "Internet". However, the impact of the latter has been phenomenal. It would not be wrong to say that Internet has redesigned the way we live and undertake economic activities. Ever since the launch of Windows 95 and Intel Pentium chip, the Internet has grown at an exponential rate, never witnessed before in any industry.

At the turn of the century as many as 387 million people were hooked to Internet [UNCTAD (2003), p. 2]. As this bubble of Internet expanded, it started engulfing every aspect of life and business. The sheer difference of processes on Internet resulted in new terms as e-commerce and e-business to be coined up.

In five years since 1995, Internet grew from simple information searching to controlling under sea robots. The biggest market penetration however, has been online retail stores and business to business (B2B) commerce. Online shopping has its potential because of its easy access by the customers and B2B commerce has its attraction in the savings achieved by implementing e-processes. Another advantage of doing business on Internet is the audit trail, with which any dubious transactions, from anywhere in the world could be traced back to its originator.

In the beginning of this decade, the e-commerce was estimated to the tune of US$ 354 billion. This is slated to expand to US$ 9 trillion in just five years and continuing at the same pace through this decade, see Figure 1.

This paper looks into the exponential growth of e-commerce, different sectors and e-supply chains. It develops a new concept in e-supply chain—Hour Glass Supply Chain (HGSC); detailing how this e-supply chain can help in the transition of Pakistan's economy into e-economy. In this context this paper also elaborates as how

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Pakistan can draw benefits by transforming into an e-economy. The e-commerce and estimates are discussed in Section 2. While Section 3 briefly discusses the e-supply chain, Section 4 presents the new concept of HGSC. Pakistan's transition to e-economy is presented in Section 5. A hypothetical proposition of working of HGSC is made in Section 6. Main e-commerce markets are elaborated in Section 7 and concluding remarks appear in Section 8.

2. THE E-COMMERCE —B2B AND B2C—ESTIMATES

"Electronic Commerce is delivery of information, product and services via Internet by automating business processes (e-business process) using Internet technologies". At the moment e-commerce is divided into two main sectors, business-to-business (B2B) e-commerce and business-to-customer (B2C) e-commerce, with B2B having 95 percent share of e-commerce expanding at 1.5 times annually, approximately (Figure 1). The main factor contributing the such phenomenal growth of the B2B sector is the amount of cost savings achieved by simply turning the business processes into e-business processes. Figure 2 shows the percentage of cost savings achieved within different industries by implementing B2B e-commerce. The maximum cost savings achieved are in the industries/economic activities of: electronics, forest products, freight and transport, ICT, steel and media and advertisement. B2C is also expanding at a high rate, but its share remains at 5 percent of all e-commerce, Figure 1.

**Fig. 1. Estimates of Increase in Global E-commerce.**
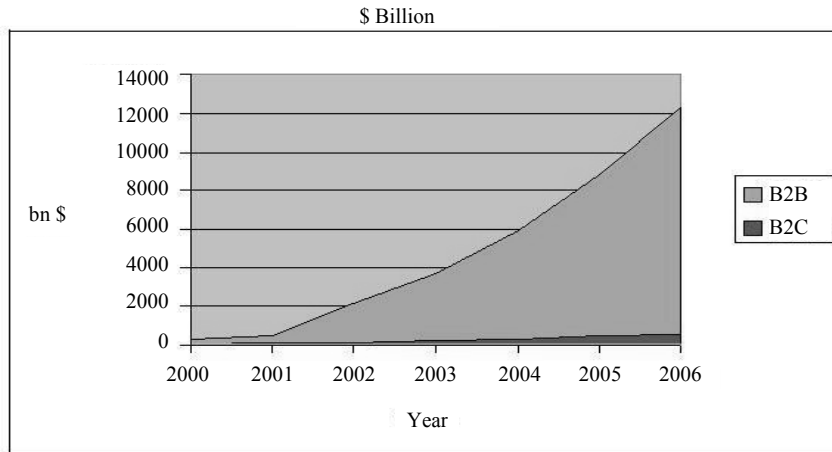
Source: Based on UNCTAD (2002)/Tables 4 and 6.

Fig. 2. B2B Cost Savings by Industry.
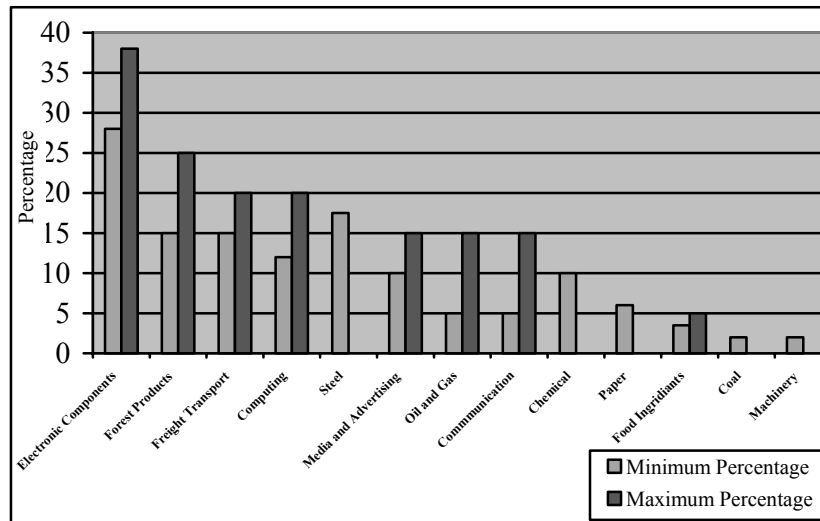
Source: Based on UNCTAD (2002)/Tables 4 and 6.

2.1. Global Shares in E-commerce

In 2002 the global e-commerce stood at US$ 2.29 trillion with North America holding the 73 percent share. This share will fall to 58 percent within four years, while the global e-commerce is still increasing at the same rate, to US$ 12.84 trillion in 2006, as Figure 3 shows. This void is expected to be filled by the EU and the Asia Pacific region because they have the infrastructure to support e-commerce and the governments there are moving ahead with their bid towards e-commerce.

**Fig. 3. Estimates of Worldwide Shares in E-commerce.**
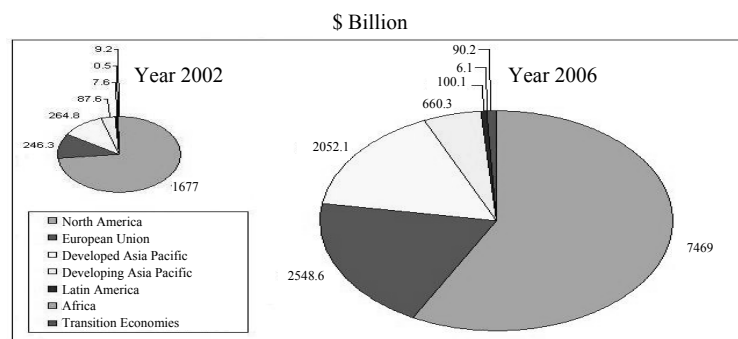
Source: Based on UNCTAD (2002)/Table 5.

3. THE E-SUPPLY CHAIN

"An e-supply chain is a component of e-commerce which encompasses the coordination of order generation, order taking and order fulfilment/distribution of products, services and information using Internet technologies". The e-supply chains have become a necessity in today's business. Multinationals like Cisco, Ford, GM have either implemented e-supply chain or are transforming their businesses to it. Advantages of using e-supply chain include reduction in costs, speeding up of product production cycle, customer satisfaction and staying one step ahead of the market. In simplistic term, e-supply chain is an electronic version of a road. Same as a road provides access for the farmers to far away markets, e-supply chain does it electronically.

In e-supply chain, different entities involved from the conception to deliverance of a product or service are connected together in a network with automated flow of information. The supply chains like that of Cisco are implemented by the Multi National Companies (MNCs) and owned by them. The MNC sits at the top of the chain initiating every order. The MNC puts orders to its assemblers based on its forecasts/plans, which connect to manufacturers who in turn to their suppliers. This structure of supply chain is usually termed as "Pyramid Supply Chain (PSC)" because of its structure, Figure 4. All the e-supply chains of today are structured as PSC.

Fig. 4. Structure of Pyramid Supply Chain (PSC).
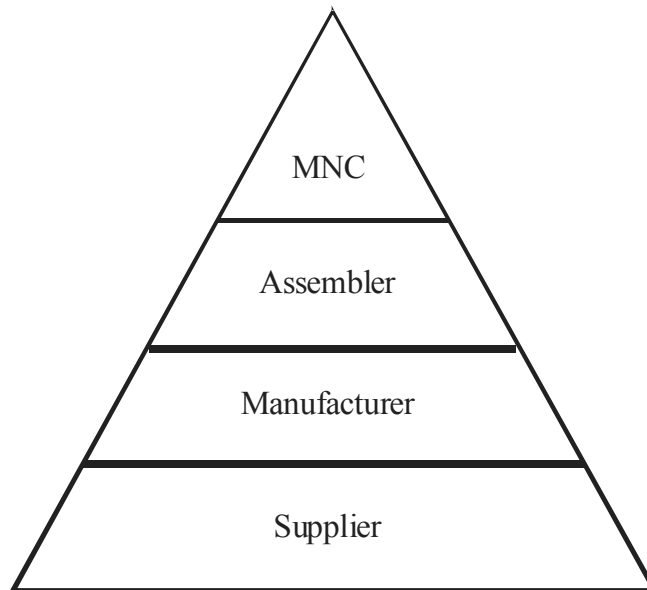
Companies implementing Pyramid Supply Chain (PSC) have advantages over the traditional companies like reduction of time to market, but it is not without its dark side. The biggest is the total dependency of the entire chain on one company. The company is the owner of the chain and if the company goes bust, every entity on the chain is adversely affected and the chain dies out. The other disadvantages include the threat of artificial inflation because at the bottom level all suppliers are not connected to the supply chain, communication is usually one way, and a strict limitation to the number of trading partners connected to the chain is implemented.

4. HOUR GLASS SUPPLY CHAIN (HGSC)

The drawbacks of PSC (Pyramid Supply Chains) can be countered by a new type of e-chain—the Hour Glass Supply Chain (HGSC). It is specifically catered for a nation wide e-economic culture and is not dependent on one entity.

HGSC (Hour Glass Supply Chain) is an e-supply chain structured like an hour glass, with customers at the top and grassroots suppliers at the bottom, see Figure 5. The purpose of HGSC is to provide a platform on which every entity in an economy can join and transact, using Internet technologies. Its structure creates unprecedented opportunities for small companies and grassroots suppliers to participate and profit using the potential of Internet. However the biggest strength of HGSC lies in its independence. No entity will own the chain, while the involvement of many MNCs in the chain will provide much more business opportunities for suppliers and manufacturers. Along with, the benefits of PSC like lower costs of doing business, creation of new markets, and improved services and sales are accompanied as well.

It may be pointed out that Grady Means and David Schneider [Means and Schneider (2000)] have done work in the similar direction, giving the names Value Added Community (VAC) to a brand owner operating in close cooperation with an outsourced network, and MetaMarket to a community created by relationships amongst contiguous VACs [Means and Schneider (2000), p. 6]. However the biggest disadvantage of MetaMarket is the ultimate resultant of dominance of a few global players [Means and Schneider (2000), p. 36]. Practically these few players would be having hundred percent authority; the rest dependent on them.

4.1. Structure of HGSC

A typical PSC is structured into a four layers, while HGSC is structured into six layers. The positive aspect is that HGSC does not divide the four layers of PSC into six layers, but it includes two more from the outside; customers at the top and the grassroots suppliers at the bottom, thus making the chain more flexible and feasible for a developing economy.

Level 1. Grassroots Suppliers

It is one of the strengths of HGSC that it involves the grassroots suppliers such as farmers and fisheries, in the chain, thus starting a process in which the

middleman between the factories and grassroots suppliers would be eliminated, eventually. This will result in more profits for the grassroots suppliers and cheaper raw material for the factories, ultimately yielding cheaper goods for the customers, and reduction in the time of production cycle.

Level 2. Suppliers

These are the middlemen between the raw material producers and the factories. In the early life of the HGSC, they would be included at level two but as the economy progresses to e-economy, the chain would render middlemen useless, creating a direct communication link between the grassroots suppliers and the factories.

Level 3. Manufacturers

The factories producing the manufactured goods and assembly parts for other products, such as sound cards, microprocessors for computers are at this level.

Level 4. Brand Owners

These are the big companies and MNCs which assemble the products from assembly parts like Cisco and Dell, selling directly to the customers by online shops or to retail stores.

Level 5. Retailers

As the economy races towards e-economy, the role of retailers at level 5 would become less and less critical, with the customers buying directly from the companies by their online retail shops.

Level 6. Customers

The behaviour of the customers would also change with the growth in e-economy, demanding faster and better products. The customers, howsoever the chain changes, would always remain at the top of the chain.

Fig. 5. Structure of Hour Glass Supply Chain (HGSC).
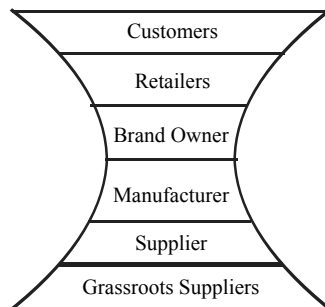
4.2. Three Stages of HGSC

The ultimate aim of HGSC is to help in the transformation of economy into e-economy and removal of all middlemen in the chain. This will require time and gradual evolution. For this, HGSC is divided into three stages, each stage marking a significant evolution of the economy towards e-economy. When HGSC reaches to the third stage; Hour 3, it can be safely said that the economy is ready to be called an e-economy. The three stages are:

1. Hour 1.
2. Hour 2.
3. Hour 3.

4.2.1. Hour 1

This is the first stage of HGSC, in which the implementation of HGSC will begin.

Implementing HGSC

The implementation of the HGSC will have to start at small scale. A small number of entities will join the chain. This starts the process of transformation of economy into e-economy. Separate and new processes and system will be created to handle the e-companies, hence creating a sort of mini e-economy within the economy. For the time being the two economies will run parallel to each other, one economy based on HGSC and the other traditional economy. Meanwhile the efforts will be made to update the rest of the economy into e-economy. The new businesses and companies would automatically have a head start by starting as e-companies. When other businesses see the profits of being on the chain they will have an incentive to join. Over the time, though slow, the economy would become ready to be transformed into e-economy.

Characteristics of Companies in Hour 1

The main characteristics of companies in Hour 1 stage of HGSC would be:

(1) only the core information required for the transfer of products from grassroots supplier to customers will be incorporated on HGSC;
(2) manual interaction will be required for the transfer of information between different levels;
(3) every entity will manage its part of the product production cycle independently and will follow its own methodology to deal with its part of the product production cycle.

In Hour 1, the chain will also be needed to be divided into two parts. The big companies when they join the supply chain, would never want to share their data by

every entity on the chain, be that even useless data. Small companies or the new born would not have any problem as they would have nothing to hide. There is needed two structures for these two categories of companies; one with secure and limited but very fast access for big companies and second, slower speed may be but with very easy accesses. We can call the former as Motorway (MW) and the later as GrandTrunk (GT). If one pays, he can travel on Motorway (MW), fast and secure, otherwise jam packed GrandTrunk (GT), free and easy access.

4.2.2. Hour 2

The HGSC would be considered in Hour 2 (the second stage), when the delivery dates to the retailers would be planned by the companies along with suppliers and manufacturers. Secondly the companies using GT HGSC would start transferring to MW HGSC. The characteristics of companies in Hour 2 stage of HGSC would be:

(1) Planning jointly the capacity of product development by the entities at different levels of the same production cycle. This is including the jointly planned delivery dates.

(2) In second phase the methodologies of individual entities would evolve, to include stages dependent on other parties.

4.2.3. Hour 3

HGSC would jump to third and final stage when the orders would be planned in collaboration with all the entities involved at all six levels. Secondly, majority of the companies would be using MW HGSC, with the small number left on GT quickly transferring to MW HGSC. The main characteristics of companies in Hour 3 stage would be as follows.

(1) The product development life cycle will merge into one cycle managed by all entities.

(2) There will be fully automatic information transfer from first level to the sixth level and backwards.

(3) There will be only one methodology in use throughout the chain, with different stages of the methodology dealing with different levels' entities.

(4) The influence and number of retailers would be decreased to a minimum because the customers would be getting cheaper goods directly from the companies and the companies would also be encouraging this, as they would earn more profits this way.

This is the ultimate potential of HGSC.

4.3. Comparison of a Traditional Company to a Company on PSC and HGSC

Pyramid Supply Chains (PSC) marked a genuine change in the working of companies and inter-company businesses. The implementation of new PSCs is still going on and is expected to take some time for e-supply chains to fully permeate to the world over businesses. However, the winners seem to be the ones who adopt to this before others do. Cisco and Dell are gleaming examples. HGSC though not every different from PSC, but broadens the horizon of the companies working in, and wanting to join in. In Table 1, a comparison of the working of a traditional company

Table 1

Comparison of a Traditional Company to a Company on PSC and HGSC

	Traditional Company	PSC (e.g., Cisco)	HGSC
Innovation	In-house	Purchase the needed technology or even competitor	Establish a partnership with the technology developer establishing a "virtual company"
Production Cycle Time	5 years app.	6-18 months	Less than 18 months
Suppliers	Many	Few and nearly fixed	Few but open field for newcomers
Supplies	Indirect and many layered	Few layers	Direct
Internal Processes	Manual and time consuming	Fast and using Internet technologies	Fast and using Internet technologies
Manufacturing	Mostly in-house	Out-sourced	Out-sourced
Assembly	In-house	Out-sourced	Out-sourced
Sales	In-direct and many layered	Few layers	Direct to end-users and retailers
Delivery	Company owned	Out-sourced	Out-sourced
Customer Support	In-house	Self-service	Out-sourced/self service
Customer Contact	9-5 by phone, fax, mail	24x7 on web	24x7 by phone, fax, mail and Internet using Internet technologies
Size of Company	Bigger the better	Physical size and assets small compared to traditional company	Physical size and assets very small compared to traditional company
Competition	Monopolistic	Open competition but difficult to compete against established players	Open and level playing field for competition with established names
Transparency/Information Sharing	No/none	Limited	100 percent
Optimisation	Depends on Parent Company	Depends on market and parent company	Depends on any entity in the chain
Dependency of E-supply Chain		If parent company falls the entire chain falls	Not dependent on any entity. Failed company will be simply replaced by new player
Supply Chain Failure		One point failure	Too distributed to fail
Book Closing		Less than one week	One day
Activity on E-supply Chain		Initiated by the owner company	Initiated by any entity on the supply chain

to a company working in PSC and to a company in HGSC is given. The comparison is based on the ultimate potentials achievable theoretically and is not a generalisation of companies in three environments. Cisco, however has managed to achieve nearly all these goals through the implementation of PSC.

5. PAKISTAN: MOVING FROM ECONOMY TO E-ECONOMY BY HGSC

Internet is world's largest single market, and the countries all over the globe are transforming their economies to succeed into the new century by benefiting from the Internet. This transformation into e-economy is needed in Pakistan if we are to draw greater benefits from an expanding market.

An e-economy lays an infrastructure for the suppliers, giving them a chance in the international market and if this economy moves forward at the pace an e-economy should, it has the potential to level the field for breeding homegrown brands and entrepreneurs. Advantage of e-economy over traditional economy is the low cost, quick evolution in reaction to the changing world and transparency in the economy.

The e-economy is in its infancy in Pakistan and the country needs to nourish its own entrepreneurs otherwise international entrepreneurs may take over then.

E-economy is not something we can escape from. What we have in our hands at the moment is to decide who will control this e-economy twenty years from now. Right now two important developing countries—India and China—are drawing benefits of computer-based processes. If e-commerce is implemented, web technologies utilised, the cost savings achieved as a result, would give that extra edge which would put Pakistan a step ahead of China and India. The remarkable savings achieved by e-commerce B2B can be seen in Figure 2 above.

The quite oftenly referred statement of Bill Gates, "If the 1980s were about quality and the 1990s were about reengineering then the 2000s will be about velocity" is true in all aspects when we are talking about e-economy. But not the speed only. "In the New Economy the network will be the business and at the speed these forces are taking shape, early adopters will be richly rewarded and latecomers severely penalised [Means and Schneider (2000), p. 38]".

5.1. Government Initiatives

This decade we need to have "technological determinism" where social changes are an effect of technology. For this the government needs to take some serious initiatives. For example the government can make it mandatory to give its contracts only to the companies and institutions which are on the HGSC or would have to register on HGSC after getting the contract. This way the government can give a head start towards the transformation into e-economy. The major initiatives required, are discussed below:

5.1.1. E-Government

Rather than putting resources in reforming the already stagnated system taking years for the process, it is always a quicker way to have a fresh start. Hence having a completely new system for the e-businesses, while leaving the traditional as it is, is the fastest way of implementing the e-government. This infrastructure will be small in the beginning and manageable. As the e-economy grows, the infrastructure will do so as-well.

The first step of transforming itself into an e-government is in which all its transactions such as: paying of bills, taxes, expenditures, voting, inquiries, etc. are carried out on-line. This requires having computer databases, which also leaves zero percent chances for corruption and frauds. Taking the example of the city development authorities like Capital Development Authority (CDA), Lahore Development Authority (LDA); they would be putting their databases online, thus making them available to the public via Internet. Also, the government would have to work for making available information on the work of different ministries as well as their detailed expenditures, including overseas tours online. This is required to boost the country into the realm of "e".

5.1.2. HGSC Directory/Portal

Every entity which registers on the HGSC should be registered on an online directory. A directory modelled like yahoo.com would make it easier for the international businesses to access Pakistani businesses. The main purpose of the HGSC Directory would be to provide a place where seller and buyer can make contact.

In MetaMarket, a similar type of role has been assigned to eMarketMakers, where they have to earn the trust of both seller and buyer but it is limited to that of online directory [Means and Schneider (2000), p. 27].

5.1.3. E-company

The registration of an e-company should be online with automatic registration on the HGSC Directory. The time required to register a new company in Pakistan would be reduced to mere minutes and a confirmation from the government should be sent within three days. Other incentives like 5 to 10 years of tax exemption should also be seen through. This takes us to the next question "What is an e-company".

5.1.3.1. Definition of E-company

A definition of e-company suited for Pakistan has to be introduced, to consider the current situation of Pakistan. "Any new company or business, if they are linked on HGSC and have a website should be considered as e-company". Though this is a very broad definition, but it is needed for at least five years to allow small companies to mushroom. After this a new and stricter method can be imposed.

5.1.4. E-commerce Zone

Creating an e-commerce zone should be another incentive by the government. We have India (Bangalore), USA (Silicon Valley, Smart Valley), Ireland, and Malaysia (Multimedia Super Corridor) already doing this. In Bangladesh, though it is not a zone, but privately initiated organisation Techbangla has the purpose of bringing the billion dollar computer industry into Bangladesh. The purpose of e-commerce zone is to have a place where very fast Internet access, technology exhibition, seminars and so forth are easily available.

5.1.5. E-tax

The e-companies also require a new tax system, an e-tax system where the tax can be submitted online, without the hassles of manual interactions. As the e-companies would be linked to HGSC, every transaction recorded online, any frauds would be automatically checked. All e-tax system would require is a computer department with customised software. E-tax would be able to achieve two very important goals:

(1) zero percent fraud and corruption chance by the e-businesses;
(2) no harassment of the tax-payers by the tax officials.

5.1.6. E-complaint

Government needs to setup an e-complaint office for frauds related to e-commerce which would respond and finish its enquiries at very quick pace.

5.2. Business Initiatives

Other than the government taking the initiatives, the business sector needs to take some responsibilities. Though there are many sectors and ways in which businesses need to participate, but the two most important are e-banking and digital cash. The two have been explained below.

5.2.1. E-banks

The foundation of e-commerce and e-supply chain is based on a system where funds are transferred electronically. This requires either upgrading today's banks to support electronic transactions or creating e-banks specifically for electronic transfer of funds. Though, there are problems discovered in online transactions, but with time, as they are discovered, they are also solved with the same speed. Also the new encryption mechanisms are turning this more secure and impenetrable. E-transactions are turning out to be much safer, cheaper and faster than traditional methods of funds transfer.

5.2.2. *Digital Currency*

"Digital Currency represents a system in which currency is transferred within an environment such as Internet, using computers". It is an alternative to credit card and paper currency and is catching up because it enables micropayments and minipayments and the buyer stays anonymous.

(1) Micropayments refer to payments between 1 to 25 cents.
(2) Minipayments refer to payments between 25 cents to 10 dollars.

Digital currency has two main systems:

(1) E-cash; in which cash is stored electronically in the computer.
(2) Smart card; in which cash is stored in a card which can be topped up.

It is anticipated that micro and mini payments would be one of the sectors of e-commerce with biggest growth. The potential of micropayments will be achieved when today's free websites like cnn.com will start charging a token fee like one cent to access their website. One cent will not matter much to the user but with million views per day, it would yield substantial turnover to for the company. This is said to increase from $ 1.5 billion in 2002 to $ 2 trillion by 2005 [UNCTAD (2002), p. 95]. Good news regarding micropayments for Pakistan is that majority of it will be regarding the sale or transfer of information, which only requires computer and Internet connection by the company but an infrastructure of digital currency in the economy as well.

Internationally, private investors have already started pumping money into digital currency, seeing the expected returns. These systems include:

(1) first virtual Holding Inc.'s Payment System;
(2) Mondex Smart Card's Payment System;
(3) Digicash Inc.'s e-cash System;
(4) Cybercash Inc.'s Cyber Coin System;
(5) Digital Corporation's Millicent.

So far, none of the systems has caught the sizeable share of the market as aimed. This is still open for the competitors.

6. WORKING SCENARIO OF HGSC—
A HYPOTHETICAL PROPOSITION

An official in a village informs the villagers about the benefits of the HGSC. The lifeline of the village is apple. Every farmer in the village owns a small garden of apple trees. Hearing about the benefits of being on the HGSC the villagers come together and decide to register on the chain. The first step is having a computer and Internet link. Being a small village in a remote wilderness, both seem difficult.

First, there is no way every villager can afford a computer; secondly there is no Internet Service Provider (ISP) in or near the village. With the two problems they contact the officer who suggests them to the nearest branch of the e-bank. The e-bank gives them a suggestion that instead of every villager buying a computer which is simply impractical, the best suit would be that all of them come together to buy one. This still is difficult for them as it requires some money—say for example twenty thousand rupees—and all together either they do not have or do not want to invest this much money in something they have never heard or seen before.

The e-bank tells them that it will loan them one computer on easy annual installments coinciding with their sales, which they all agree. Next comes the question of operating the computer. The consultant at the e-bank branch tells them of a school which is conducting a crash course specifically designed for operating and troubleshooting computer/Internet. There are two young adults in the village who have studied five classes and are the most educated. They are chosen for the crash course. The institution is in the nearest city and has a small hostel as well. The education is also paid by the bank as part of the loan. In one month the two are ready and come back to the village which takes them to the next problem of connecting the village computer to the Internet. The government has already given the incentive that the call to the ISP in the nearest city will be free, so they connect to the internet and register in the GT HGSC. Each villager will get his separate account and he will give the price and approximate quantity and date of the riping of apples and wait.

An apples supplier in Lahore also hears about the HGSC and decides to register. He goes on the website and learns about the two types of chain. He realises if he has to buy from the farmers, he will have to register on GT HGSC and to sell to the jam factories he will have to register on MW HGSC. There is no harm and he registers his company on both as supplier of apples. The harvesting season arrives and the farmers fill in the amount of apples they each have, deciding to wait no more than one week for a deal through HGSC. Because after that they will start loosing money on the fruit.

Next day the supplier logs on and finds out that in the village the apples are ready. He sees the quantity and the price and selects to buy. Instantly the money is transferred from his bank account to the individual bank accounts of the villagers. 0.001 percent is deducted from the sale profit of the villagers as a token tax. A copy of the sales is sent to the e-tax office where it automatically updates the records. An order is automatically sent to a transport company to get the trucks ready for transporting so many apples from point A.

Supplier then logs on the MW HGSC and sees that a jam factory has put an order for a large quantity of apples. He instantly fills in to supply the apples. Money is transferred from the account of the factory to the supplier. A token e-tax of 0.001 percent is cut and copy of the transaction is sent to the e-tax department. The MW HGSC software then asks the supplier if he wants to give the destination to the

transport company for his apples and he fills in the address of the factory.

Trucks reach the village and are loaded. Next day they reach the factory. In less than a week the jam jars are ready. In the meanwhile an international jam supplier, by the efforts of Pakistan High Commission incentives and advertisements comes to know about the HGSC and registers on the MW HGSC. He registers as apple jam supplier and as he finishes his form gets a message that a factory in Pakistan has ten thousand jars ready. He gets the facts and figures from the HGSC and factory websites and puts an order for a sample. The sample is rushed to him and next he puts the order for five thousand. The money is instantly transferred from his overseas account to the account of the factory in Pakistan. A charge of 0.001 percent as a token tax is cut from factory's profit, receipts are generated and sent to the e-tax department and the HGSC is automatically updated that now only five thousand jars are left.

A shipping company which has already registered on the HGSC for shipping overseas receives the details of the order and gets ready for the shipment.

6.1. Advantages of HGSC

Level Playing Field. Small and new companies would be the foremost beneficiaries of HGSC having exactly the same playing field as the established giants and the moment a new company comes up with a new idea, instantly every entity on the supply chain would know. This nearly eliminates the problems of marketing and also in getting to big companies for contracts.

Incentives for New Companies. The big players in the markets would have to do a tedious planning and analysis for converting their businesses to e-business environment, while the new players would start from scratch in an environment which caters for an e-supply chain.

Book Closing. Companies linked to HGSC, as their entire business record is online, they will have the capacity to close their books on daily basis.

Transparency. Those who are on the chain, must be transparent, at least in certain respects, otherwise they will not able to do business.

Fixed Prices. There will be one price for every customer. There will be no room left for negotiations. All the contracts would be drawn based on advertised prices, hence creating a level playing field for all buyers, big or small. A supplier will place order based on the prices of the farmers on the HGSC, hence having no chance for negotiations. This will ultimately result in better commercial ethics and benefits to the customer in cheaper and fixed price goods.

Speed. New ideas can be created and launched at an amazing speed. Many times faster than the traditional approaches and with many times less capital.

7. MAIN MARKETS IN E-COMMERCE

E-commerce evolving, sometimes on daily basis, is engulfing every kind of business and industry at an enormous rate. Three of the most anticipated industries

within the e-commerce and expected benefits in e-Agriculture are discussed below with their expected potential.

7.1. Business Process Outsourcing (BPO)

BPO is one of the biggest markets of e-commerce, expected to be nearly ten percent of all B2B by 2006-7. With the growing costs of services in USA and EU the MNCs are looking more and more towards Asian and South American countries for cheaper outsourcing, Brazil, China, India, Ireland, Israel on their top list. Even the R&D is now being outsourced. Just India gets $ 573 million of R&D outsourced to it.

With time, outsourcing is becoming more and more dependent on e-commerce and Internet technologies. E-business solutions, customer care, back office operations are some of the services which are being outsourced. BPO is estimated to rise from US$ 300 billion in 2001 to US$ 1 trillion by 2007 as Figure 6 shows.

Fig. 6. Estimates of Business Process Outsourcing Market.
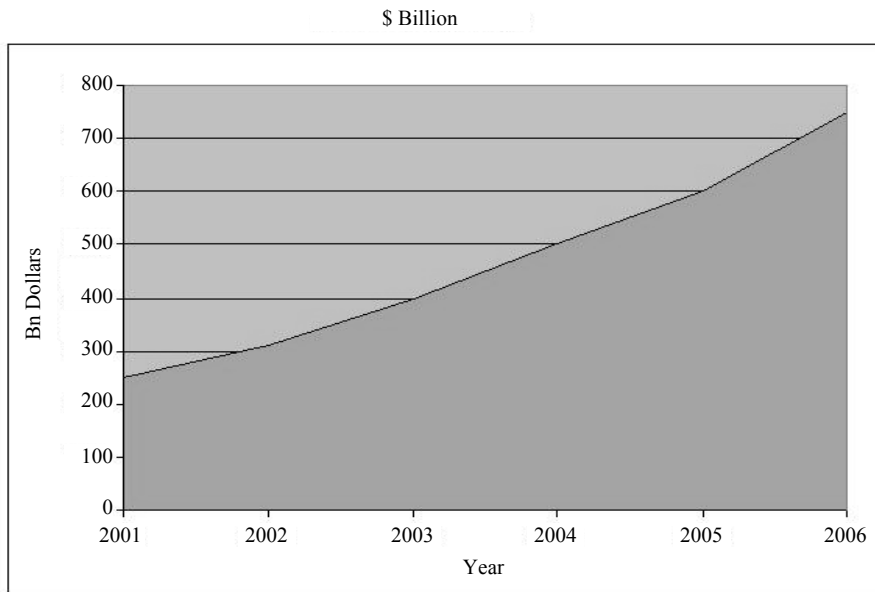
Source: Based on UNCTAD (2002)/Chart 37.

7.1.1. Indian Exports and Software and Software Outsourcing

India with its sound infrastructure for software industry, is cashing huge sums in this sector. In 2002 India's software related exports were US$ 8 billion while

Pakistan's entire exports summed up to be US$ 9 billion! Software is a diverse industry. Table 2 is summarising the main exports of India related to software and software outsourcing. It lays out the diversity of fields in which a country can cash in.

Table 2

Key Indian Software and Software Services Exports in 2002
in $ Million

Legacy Application Management, Maintenance, and Upgrades	2,100
Custom Application Development	2,350
Package Software Integration	350
E-business Solution	600
Wireless Internet	100
System Integration	110
Network Infrastructure Management Services	65
Consulting	55
Customer Interaction Centre	350
Back Office Operation	600
GIS	400
Research and Development	575

Source: UNCTAD (2002), Table 40.

If Pakistan is to be able to get a share of this trillion dollar market, it needs to have a sound infrastructure, at least in specific zones.

7.2. E-tourism

"E-Tourism is one of the fastest growing e-commerce sectors [UNCTAD (2001), p. 41]". In USA and Europe the online travel booking rose from $ 8 billion in 1999 to $ 15.5 billion in 2000 and is expected to be between $ 18 billion and $ 25 billion by 2007. Added advantage with online bookings is that it removes the necessity of having international offices and advertisement funds. If the names of the tourism related companies are well listed on e-directories, the customers would find them, if they are giving what the tourist wants.

Other than the huge sums involved in direct tourism related bookings, the tourism related services similarly is a big industry. In 1999 US$ 4.5 trillion were generated by selling tourism services to foreign tourists and by 2010 this is expected to rise to US$ 9 trillion [UNCTAD (2001), p. 42]. If tourists start coming to Pakistan, tourism related services will automatically get a boost. But unlike other e-businesses, e-tourism is more involved with physically reforming the tourist attractions, than the electronic advances. The advantage e-tourism gives is nearly

cost free advertisements and direct access to customers, while sitting thousands of miles from them.

7.3. E-publishing

In simple terms, it is the publishing of information in electronic format. It is being predicted as one of the biggest sectors of e-commerce to increase exponentially. "The consequences of e-publishing can be compared to those resulting from Gutenberg's invention of the printing press [UNCTAD (2002), p. 160]". This industry is expected to have more benefits for the developing nations than the developed. With the enormous budgets required for mass publishing and distribution, e-publishing turns out to be the perfect medium for competing with the big industry players. Publishing includes the industries of electronic media and computer media. In case of America, this industry accounts for about US$ 90 billion, see Table 3.

Table 3

Estimated Revenues Generated by Exports of US Industries

Industry	Billion $
Computer Software (Games and Applications)	60.74
Motion Pictures, TV and Video	16.69
Pre-Recorded CDs, Tapes, etc.	9.41
Newspapers, Books and Periodicals	4.03

Source: UNCTAD (2002), Table 27.

Competing with this giant is nearly impossible, but on the Internet size does not matter. An author can put his story online, selling one dollar per copy. If ten thousand people download it, it would be 10,000 dollars for this unknown author and 10,000 views on Internet is considered negligible.

Same is the case with movies and music. They can be put online and sold for, say one dollar per view. Online games hold the same promise. Computer software has already started being sold on the Internet, without requiring a physical retail shop. Newspapers, periodicals hold the same promise but they all require a sound infrastructure and a digital currency system.

7.4. E-agriculture

Agriculture is another sector which promises significant gains by implementing B2B, as a recent study shows [UNCTAD (2003)]. USA has already started B2B transactions in agricultural and related commodities and it is estimated that USA will conduct US$ 211 billion in online trade in food and agricultural trade which represents 12 percent of all B2B e-commerce of USA [UNCTAD (2003), p. 161]. In India (Teauction.com), the tea industry saved Indian Rs 1.6 per kilogram,

and accounted for 6 percent of total tea auctioned in India by using web [UNCTAD (2003), p. 170], however it is expected to expand considerably as such auctions are well established in the industry. The same system as used by is now being used in Sri Lanka. Similar success is seen in Brazil, regarding coffee industry.

8. CONCLUSION

E-commerce has fast emerged as the most important tool in facilitating and furthering trade. The growth in e-commerce in the recent past has been phenomenal; it is also growing fast. Different sectors of e-commerce are racing forward not in months but even weeks. Some services of e-commerce e.g. Internet Security have to evolve in mere hours to remain competitive. The major characteristics of e-commerce are that unlike traditional industries, majority of services and businesses on Internet require neither huge infrastructure and office spaces nor the huge set up cost. It only requires fast Internet access and fast computer. Thus has great scope for developing countries with sufficiently trained manpower. The policy-makers and business leaders in Pakistan need to see as how quickly respond in utilising this huge market potential and also catch with those already in the field.

The HGSC presents such an opportunity. Additionally, it also supplies a platform on which Pakistani businesses can launch themselves in global market with a thrust.

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