The Face of ICT Exports in Developing Economies: A Case Study
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INTRODUCTION
Information and Communication Technology (ICT) is the study of the technology used to handle information and aid communication. The phrase was coined by tevenson in his 1997 report to the UK government and promoted by the new National Curriculum documents for the UK in 2000. [1]
The beginnings of the ICT industry trace to the birth of the internet in the late 1960s and the appearance of the personal computer (PC) in the 1970s. Its development as currently understood actually picked up momentum in the early 1990s, however, when, assisted by communication technology, the PC and web–based technology joined to emerge as a powerful tool for business and development. Since then, ICT has integrated computing, communications and graphics through digitalization. It has thrived on web sites with the use of broadband optical–fiber lines. It has already made headway into the wireless mode and is becoming more and more personalized with greater use of personal digital aides (PDA).

The pace of technological change has accelerated, driven by both hardware and software innovations [2] These technological innovations have affected the industry in numerous ways possible mainly by increased productivity and better coordination. Amongst others, ICT has been particularly influential in the services industries. For example, the Internet makes it possible to sell a variety of services, airline tickets, financial or insurance products, customer support, data processing or legal, health, education or software consultancy, to name only a few, rapidly, around the clock, and from anywhere in the world. This form of E-commerce is profoundly reshaping many of the existing services industries and creating new services as related technologies develop. [3] These ICT enabled services industries have enjoyed an increase particularly in cross-border trade. The digitization of business processes, coupled with the universality of the Internet, has allowed companies to outsource activities and services to more cost-effective locations as well as to access new clients in foreign markets. This has opened up the door if development for the developing nations where its greatest liability is proving to be its greatest asset. For Example, The huge pool of unemployed University attended, English speaking graduates which had formed up a the major portion of the unemployed sector has proved to be an asset for such countries as this is the same pool of the highly skilled, low cost labor that is required by such countries to stem up the tide of monopoly against the industrial nations and form the basis of a competition on which its ICT sector in its nascent stage is to thrive. Now the developing countries have more of the monopoly over skilled and low cost labor, one of the basic requirements of ICT sector. This has made possible for the developing countries, particularly of Asia and Africa to recognize the ICT sector as a long term investment and thwart the so-called “either/or” argument that suggests that there is a binary choice between using ICT and investing directly in development goals (Pentiums vs. penicillin and basic education). [4], a direct

ABSTRACT
ICTs, by their very nature, serve the economy in a way no other industry does, firstly as fast growing industry by themselves, generating employment and wealth, and secondly by serving as tools for planning, development, and operation of all sectors of economy by improving their efficiency, productivity and management. By making businesses more competitive and economies more productive, ICTs can support faster economic growth and thus strengthen the material basis for development. This paper throws light on some of such numerous benefits that the ICTs, if infused with the industry, or, adopted as an industry in themselves can offer to the developing economies. It focuses on the opportunities that such economies have been losing out to a better and more prosperous economy by comparing the international trade in exports of ICT goods and ICT enabled services with the more developed nations of the world. Finally it focuses on the roadblocks that stop them from doing so and suggests some measures and policies that could be taken to curb out such obstacles, thus making such countries not only as leaders in export of quality ICT goods and services and thus propelling them to a healthier economy, but in the process also setting out the road map for a national information society and for integration into a global knowledge based economy to help build a truly global information society.

KEYWORDS
ICT Exports, Developing Countries, Developed Countries

REFERENCES
example being the results of the ITU studies over the past several decades analyzing the relationship between the growth of ICT, and the economic growth and finding that a direct link exists between a country’s telecommunication penetration and the GDP. [5]

Apart from reaping the benefits of recognizing the ICT sector as a long term investment and reaping the benefits, the social and economic impacts of imbibing ICTs in the economy are numerous. Not only ICTs are crucial to creation of the emerging global knowledge based economy and play an important role in accelerating the pace of economic growth and promoting sustainable development, [6] but by serving as tools for planning, development, and operation of all sectors of economy, thereby improving their efficiency, productivity and management, they ensure their adoption in education, health and other important sectors vital to a nations’ interests which in turn can help reduce the digital divide, one of the major developmental goals of the United Nations

Rightly put in the words of Kofi Annan, Secretary-General of the United Nations, “If the world is serious about achieving the Millennium Development Goal of halving the number of people living in extreme poverty by the year 2015, ICT must figure prominently in the effort. Everyone – governments, civil society, and private sector businesses – has a vital stake in fostering digital opportunity and putting ICT at the service of development.” [7]

**ICT EXPORTS**

Taking in account the advantages that the developing nations have over the other developed partners in account, it is therefore quite obvious to assume the developing countries as global leaders in the context of ICT industries and particular ICT exports. However, the real picture, as becomes evident from a comparison with the developed nations, is staggering. As one of the ways to measure the performance of the developing economies in terms of their capability to develop themselves as leaders in the ICT industry is by taking a look at their exports in the ICT sector, an attempt is made to achieve the objective by comparing the total value of the

1. Exports of computer and information services, and
2. ICT enabled service exports

Of the developed and developing economies.

By studying the trends and the value in these two sectors, it is possible to decipher the performances of the developing economies as compared to the more developed partners and foresee the shortcomings that the developing economies might have to face in the near foreseeable future. Table 1.1 takes a look at the Exports of computer and information services by country. By just taking a look at the Exports of computer and information services, it becomes quite evident that the developing countries lag far behind the developed economies in their effort to sustain themselves as global leaders in the ICT industries. Compared to the Exports of computer and information services of developed nations which is a worth a staggering value of Million US $ 58,653,394,930 the developing nations conjure up a mere worth of trade of Million US $ 14,085,175,906 in the latest available year, 2003. This figure is quite vital to note, considering the fact that the developing nations contain the vast untapped pool of university educated, English speaking graduates which is a vital integrant of the ICT industry, sometimes even more than infrastructure or the issue of propriety rights in the ICT sector.

Charts 1.1 shows the share of Exports of computer and information services of different economies by level of development. Comparing the growth rates of the developing economies with the developed ones, one also sees that the developing economies grew by 28.9% compared to the developed economies; growth rate of 29.3%. This is however noteworthy as it is a significant improvement over the last year when the developing economies grew by just 17.6%. Charts 1.2, 1.3 depict these facts graphically. However, it is also necessary to take a look at the growth rates of the economies from the development perspective. The developed economies grew by 5.3, 9.6 and 29.3 percent in the years 2001, 2002 and 2003. On the other hand, the developing economies grew by 52.7, 19.2 and 28.9 percent in the years 2001, 2002 and 2003. This is interesting as this shows that the growth of ICT has really accelerated in the last years when the need of the hour to view the ICT sector as a major contributor to the development of a vibrant economy was realized. Compared to the world average of 11.7, 11.3 and 19.3 percent respectively, the developed economies do deserve a praise for the characteristic high growth rates. However, it must be realized that the total value of the Exports continue to be far less than the developed economies. Charts 1.2, 1.3 and 1.4 take a look at the rate of growth of the developed economies, the developing economies the world average of the previous years and reveal the astonishing fact of higher growth rates of the developing economies as compared to the developed ones. One more comparison of interest here is a look on the growth rates of the developed economies with the developing ones. As evident from chart 1.5, the developed economies have a comparable growth rate in the year 2003 [29.3 % of the developed economies compared to the 28.9% of the developing economies]. Apart from this, the growth rates of the developed economies are way less than the developing economies. This may prove to be misleading if the fact may not be considered, that, the developed economies find themselves faced with the problems of skilled labor shortage as an increasing bottleneck towards the road to prosperity in this sector. Still the value of the total exports are quite high compared to the developing countries.

Before taking a look at the first of the two, i.e., Exports of computer and information services it is necessary to reveal what do the term ‘Exports of computer and information services’ stand for. As shown below, the term “Computer and Information Services” consists of the following:

- Financial Services
- Insurance Services
- Computer and Information Services
- Royalties and License Fees
- Communication Services
Chart 2.1 depicts the total share of each type of service in the total value of the ICT enabled service exports.

Table 2.1 shows the total value of the ICT enabled services by level of development. Once again it is the developed economies that lead the list with a considerable margin. The developed economies take the lion's share at a total value of 690,968 Million US $ compared to the developing economies’ 136,389 Million US $. This is a staggering 82.63 % of the total exports against the developing countries share of just 16.31 %. The southeast Europe and the CIS manage a share of 1.063 %.

Chart 2.2 shows the share of these economies from a development perspective.

Taking a look at growth rates of the economies from a development perspective, one can see that the developed economies grew by 3.9, 11.3 and 17.5 percent in the years 2001, 2002 and 2003. On the other hand, the developing economies grew by -4.2, 5.8 and 20 percent in the years 2001, 2002 and 2003. Even against the global average of 2.4, 10.5 and 18 percent in the years 2001, 2002 and 2003, the growth rates of the developing economies are quite high. This is important as this shows that the growth of ICT has really leapfrogged in the last few years as evident from the negative growth rates in the year 2001 to a high growth rate of 20%, even higher than the developed economies. This shows that the government and private sector of the developing countries have realized the importance of the ICT sector as an opportunity to development and economic independence. This has been accompanied by heavy investments in the dissimilation of ICTs, adoption of new technologies, building up of modern infrastructure and other integrants necessary for the vibrant growth of the ICT sector. Charts 2.3, 2.4 and 2.5 take a look at the rate of growth of the developed economies, the developing economies and the world average of the previous years 2001, 2002 and 2003 respectively.

If the growth rate of the economies is looked upon, it is evident that the growth rate of developing economies is higher than that of both the developed economies and the global average. Chart 2.6 reveals this fact. However, the share if the total value if the ICT exports is looked at, the developing countries lag far behind the developed nations, with just 16-19% of the total exports while the developed nations lead with more than an 80% share in both the cases.

OBSERVATIONS

It is quite a straightforward viewpoint that apart from the high growth rates that the developing economies show, they do not contribute a large share to the World ICT exports. However, though the total value of the ICT exports of the developing economies is far less than that of developing economies and occupies just a small portion of the total world ICT exports, the growth rates are significantly higher than those of the previous years. In some cases, they even surpass the growth rates achieved by the developed nations with better infrastructure, modern technology, better educational and research facilities and no dearth of investment. The higher growth rates can be explained by the invaluable pool of technically skilled, university educated and English speaking graduates that the developing nations have at their disposal, using which, the developing countries can leapfrog several stages of development that the developed countries had to go through. With this, however, one must not forget that the developing countries are still nowhere close to the developed nations in terms of the total value of the ICT exports. Exporting more than the developed economies is the real challenge for the developing world as this holds the real promise of ICTs: Generating employment, increasing GDP and providing better resources to millions. For bridging the gaps that exist, it is imperative to put ICT firmly in the service of development, for which urgent and concerted action at the national, regional and international levels is required. Many threats have been posed in recent years that may prove to be detrimental to the health of the ICT sector in the developing countries. The much feared slowing down of the US economy, a major importer of ICT goods and services, has begun in the latter part of 2000. This has great implications in further slowing down the growth of the ICT sector in the region where industries concentrate exporting their goods and services to the region. Moreover, the threats that have been posed by China as the ICT center in this part of the world may also prove to be harmful to the interests of the other developing countries of Asia. Apart from the threats posed by international competition and lack of access to international markets, challenges of thriving in a region with ill developed infrastructure, shortage of power, high costs of telecommunications, lack of fast and low cost internet connections and poor ICT policies at the national and international level are some of the numerous challenges posed to the industries engaged in the ICT sector in developing countries.

The only viable solution that exists to overcome these numerous obstacles is the adoption of strong policies that favor the growth of the ICT sector. In the countries that have shown most success in the deployment of ICT, a strong commitment from the head of state to introducing the necessary changes was crucial. This included having the strategies or national ICT committees be directed by the office of the head of state. [9] The Governments of high-income countries are playing a bigger role in ICT in many economic sectors than the Governments of lower-income countries. [10] Since the governments in such developing countries do not commit a strong national policy towards the development of this sector, the growth in the sector remains handicapped.

The following section tries to cover some of the basic problems that have proved as a bottleneck to the growth of the ICT sector.

CHALLENGES

Of the many problems and challenges that should be addressed by public policy makers and the heads of the states, some of...
them which stem up the growth of the ICT sector in the nascent stage of development, are discussed below:

1. Lack of access to international markets resulting in the handicap of certain industries which have the potential to tap the vast markets and increase the exports of ICT goods and services.
2. Lack of adequate and strong sector policies that favor the growth of the ICT sector.
3. Poor or insufficient Infrastructure resulting in the reluctance of foreign investors in companies to invest in the ICT sector of the developing countries.
4. High telecommunication costs proving a hindrance to work in the international scenarios.
5. Low speed and high cost internet access proving impossible to enable traditionally traded form of goods, e.g. books, CDs, movies and computer programmes to be transmitted internationally in digital form.
6. Power shortage hampering the productivity of several small and medium sized firms and additionally increasing the cost of starting up of such an enterprise manifolds, further damping the potential investors’ interests.
7. Lack of Financial resources needed for large scale ICT projects resulted by the lack of interest of both the public and the private sector.
8. Poor laws relating to intellectual property rights making the investors skeptical to invest in setting up of new R&D facilities.
9. Lack of implementation of Cyber laws causing increasing security issues.
10. Heavy duties and levy of taxes in those markets that are major exporters of ICT products and services making the industries a prey to international cut throat competition.

SUGGESTED SOLUTIONS
The need for the continuous improvements and the implementation of concrete steps that make the adoption of appropriate, relevant and strong sector possible mandatory is vital in this ever-changing technological world. This is necessary to fulfill the long cherished promise of forging ahead, or at least catching up with the leading developed economies and achieving the many benefits that only a nation with a strong commitment towards the ICT sector can offer. The following concrete steps aimed at curbing the many handicaps mentioned above, should be taken:

1. The developing countries should negotiate access to for those markets and products in the sectors that find themselves capable of exporting services in.
2. Strong and adequate sector policies should be adopted with an avid interest by the head of the state, the government and the private sector in the minutest details. A strong national commitment like that of China is necessary to speed up the development of the ICT industries and compete with the leaders at the global level.
3. Sufficient investment should be made to develop proper infrastructure relevant and useful for the industries engaged in the production and delivery of ICT goods or services. Involvement of the private sector at this level with a commitment from the government could really prove a boon to not only the industries but also serve as a tool to lure the investors in investing in the country which in return offers considerable returns on investment.
4. Both the telecommunication costs and the availability of high speed, low cost internet should be made an issue at the highest level. This will not only prove to be an input towards the development of the ICT industries but also help in lessening the digital divide, one of the major problems faced by the world today, at par with issues like global warming. The reduction of disparity between information haves and have-nots will also serve to equip other businesses with the benefits of ICTs like speedy and online transactions and reduce the burden on other services. Almost all sectors, like education and health are also poised to benefit heavily from it.
5. The power production should be at par with the country’s demands. This would reduce the unnecessary burden on small and medium sized units to invest money buying generators which could have been used in achieving better quality of products or speedy services; thus enabling them to bid for luring foreign projects and in the process increasing the volume and quality of exports, earning foreign currency, a big need for the developing economies. This can be done by setting up of new power production units based on the existing technology and resources, or buying the latest and most modern technology from the international market.
6. Strict Cyber and Intellectual property rights should be enforced with an iron hand. Setting up of specialized “cyber police” that understands the issues and concerns relating to such subjects is a viable option. Equally viable option is the strengthening of the existing laws and empowering the police with more powers than before. This is necessary if the concerns and enigma regarding the setup of R&D centers in the developing and third world countries of Asia and Africa are to be resolved.
7. Duties and taxes that concern themselves with the products churned out by the ICT industries in the developing world of Asia and Africa, which are still in a nascent stage of development should be in accordance to keep them competitive in the international market. This may mean additional pressure on the already ailing economies and less cash available to address the basic problems like poverty and illiteracy; but some sacrifices are necessary if the
benefits of the ICT sector in the long run are to be reaped.
Unfortunately, almost all of the above steps require huge amount of investment that the already ailing economies are not able to conjure themselves, with a heavy pressure on their already pressurized natural resources. All this necessarily requires big foreign investors that are ready to invest in such businesses and this cannot be done without the collaboration of the private sector. Alternatively a mixed economy structure could be adopted with some sectors reserved for the government and some sectors reserved for the private sector with no or little intervention from the government. This could mean that the government could focus on addressing the most basic problems like developing infrastructure or producing more power while the Internet and telecommunication industries should be controlled wholly by the private sector with directions from the government on a priority basis. Government intervention is particularly needed for connecting rural and remote areas, which are usually left out by the private sector, and in areas related to education and legal and regulatory issues. An ICT strategy that combines public intervention with private-sector initiative in a mutually supportive manner is the only viable option.

CONCLUSION
The ICT sector in the developing countries has picked up pace in the last few years fuelled by the necessity to provide employment to the educated masses. This pool of cheap and skilled labor has proved to be a blessing in disguise for the developing nations and has provided a platform to compete against their more developed partners in the race to export more and better quality ICT goods and services. The total value of the ICT exports may be insignificant compared to the global parameters but the growth rates are outpacing the growth rates of the developed economies. Many improvements have emerged and many developments are continuously taking place. However, the battle of catching up or outpacing the leaders in the race to export more and better quality exports is unquestionably incomplete. So many obstacles still exist to be surmounted towards production and export of high quality ICT products in huge numbers. However with the growth rates spiraling more than ever before, the prospects of success towards a healthy ICT sector and a prosperous economy are numerous. No matter what the statistics show, the government and heads of states must take bold steps at the national and international level and engage the private sector in the race towards not only a prosperous ICT industry or a healthier economy, but also lessen up the digital divide and help build a truly global information society.

FUTURE SCOPE
Developing countries that are slow to act, or are not in a position to respond, are likely to find their position in the global economy and society diminished, thus exacerbating existing inequalities. However, If necessary steps to aid the growth of the nascent ICT sector, some of which amounting to chanellizing the cash flows originally meant to assist some other sector or curbing some important problems, are taken, and taken fast, the developing countries with their huge pool of educated, technically skilled, English speaking graduates coupled with their strong policies may eventually replace the existing screnios with the developing countries exporting to the developed nations thus not only embarking such economies on the road to prosperity, but also lessening the digital divide and help build a truly global information society.

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Chart 1.1
Share Of Different Economies in total Exports of computer and information services

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### Table 1.1

**Exports of computer and information services by level of development ($US Million)**

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<tbody>
<tr>
<td>Developed Economies</td>
<td>19,204,046,000</td>
<td>5.3</td>
<td>41,317,000,000</td>
<td>9.6</td>
<td>43,079,040,000</td>
<td>3.7</td>
<td>53,079,040,000</td>
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<td>Developing Economies</td>
<td>4,032,850,000</td>
<td>32.7</td>
<td>9,397,000,000</td>
<td>19.2</td>
<td>10,968,948,000</td>
<td>36.9</td>
<td>14,005,176,000</td>
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<tr>
<td>South East Europe and CIS</td>
<td>258,968,000</td>
<td>62.4</td>
<td>259,123,000</td>
<td>11.6</td>
<td>350,729,000</td>
<td>26.0</td>
<td>451,248,000</td>
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<td>World</td>
<td>24,533,048,000</td>
<td>11.1</td>
<td>43,022,493,000</td>
<td>11.3</td>
<td>56,887,928,000</td>
<td>25.3</td>
<td>71,135,408,000</td>
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### Table 2.1

**ICT enabled service exports by level of development ($US Million)**

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</thead>
<tbody>
<tr>
<td>Developed Economies</td>
<td>589,000</td>
<td>3.9</td>
<td>573,650</td>
<td>11.3</td>
<td>593,157</td>
<td>17.5</td>
<td>698,900</td>
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<td>Developing Economies</td>
<td>12,177,676</td>
<td>4.2</td>
<td>12,762,876</td>
<td>5.8</td>
<td>13,343,876</td>
<td>10</td>
<td>13,870,876</td>
</tr>
<tr>
<td>South East Europe and CIS</td>
<td>1,305,400</td>
<td>62.2</td>
<td>5,302,000</td>
<td>27.6</td>
<td>6,609,000</td>
<td>10.9</td>
<td>8,884,000</td>
</tr>
<tr>
<td>World</td>
<td>63,320,640</td>
<td>24</td>
<td>64,286,640</td>
<td>10.5</td>
<td>71,844,444</td>
<td>18</td>
<td>83,364,444</td>
</tr>
</tbody>
</table>

### Chart 2.2

**Share of Different Economies in total ICT enabled service exports**

- **Developed Economies**: 69%
- **South East Europe and CIS**: 1%
- **Developing Economies**: 40%

### Chart 2.3

**Growth Rates of ICT enabled service exports for year 2003**

- **Developing Countries**: [Chart 2.3] (Developing Countries 2000-2003)
- **Developed Countries**: [Chart 2.4] (Developed Countries 2000-2003)
- **World**: [Chart 2.5] (World 2000-2003)

### Chart 2.4

**Developed Countries**

- 2000: 5,302,000
- 2001: 6,609,000
- 2002: 7,502,000
- 2003: 8,752,000

### Chart 2.5

**World**

- 2000: 1,305,400
- 2001: 5,302,000
- 2002: 6,609,000
- 2003: 8,752,000

### Chart 2.6

**Developed, Developing and World**

- 2000: 63,620,640
- 2001: 64,286,640
- 2002: 71,844,444
- 2003: 83,364,444

### Chart 1.1

**Growth Rates Of Exports Of Computers and Information Services**

- **Developing Countries**: [Chart 1.2] (Developing Countries 2000-2003)
- **Developed Countries**: [Chart 1.3] (Developed Countries 2000-2003)

### Chart 1.2

**Developing Countries**

- 2000: 19,204,046,000
- 2001: 41,317,000,000
- 2002: 43,079,040,000
- 2003: 53,079,040,000

### Chart 1.3

**Developed Countries**

- 2000: 589,000
- 2001: 573,650
- 2002: 593,157
- 2003: 698,900

### Chart 1.4

**World**

- 2000: 24,533,048,000
- 2001: 43,022,493,000
- 2002: 56,887,928,000
- 2003: 71,135,408,000

### Chart 1.5

**Developed, Developing and World**

- 2000: 24,533,048,000
- 2001: 43,022,493,000
- 2002: 56,887,928,000
- 2003: 71,135,408,000