Software Industry: The Indian Example and The Possibility of Applying it in Palestine

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Abstract

In this paper we give a summary about the stages of software industry development in India, and the strategies that have been followed up to stand up with this industry. The software industry in India contributed mainly in enhancing the Indian economy, where the software exports is expected to reach 57 billion American dollars in the year 2008.

We try through this paper to duplicate the Indian experience in software industry considering strategies, approaches and mechanisms that have been adopted. We examine and investigate the possibility of utilizing the Indian experience on the Palestinian status taking into account the hardships and obstacles faced in Palestine.

This work has been done to be an initiative towards the development of the weak Palestinian economy with the easiest and less cost approaches.

1. Introduction

Some of the very important and main reasons for India to focus on software industry can be summarized as below :

- The increasing request for software products locally and globally.
- The availability of qualified experts in the field of software.
- The low cost of software industry comparable with other kinds of industries.
- The low cost of the qualified Indian manpower in software, makes the products of this industry very competitive.

The main adopted policies and approaches used to stand up with the software industry in India were based on the following ideas:

- Establishment of unambiguous policy to stand up with Information Technology (IT).
- Proposing mechanisms related to applying the proposed policies.
- Knowing the degree of flexibility in applying the proposed mechanisms to achieve the required policies.

It is to be noted that the software industry in India was below the required level at the beginning of 90s where the situation can be briefed as below :

- Low production in software industry.
- Weak communication and networking infrastructure.
- The foreign investment was minimal.
- Very few communities, associations, parks and advanced centers related to IT were existing.
- The IT affairs were related to the ministry of commerce (until 1991).
- The existence of many qualified graduates who have strong ties with IT.

The Indian government could develop and enhance the software and IT sector through a steady polices followed by the ministry of communication and information technology. The total Indian exports of software from India is growing steadily at a rate of about 30% and is expected to rise further [5] [12].

2. Some Facts and Figures about Indian Software Industry

In this section, we state some figures to show the development of Indian software industry and its impact on the Indian economy. Figure 1 shows the income percentage of software exports to the overall income of the total exports. The huge increase in the consecutive years has to be noticed. The software exports reached 21% in 2003 after it was less than 5% in 1997 [5].

Figure 2. illustrates more clearly the grow in software exports from 1995 to 2008 (expected), the exports in 1995 was less than $1 billion and in 2003 reached to $10.75 billion. Moreover, it is expected to reach 57 $billion in 2008.

Figure 3 shows the countries that import the Indian exports of software . It is clear that the largest importer is the USA with a percentage reaching to 60% followed by Europe with 23%. The huge income of software exports is backed by strong and steady Indian policies [5].

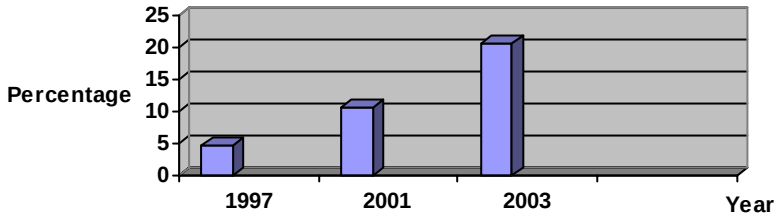

Figure 1. The percentage of software exports to the total income of exports.

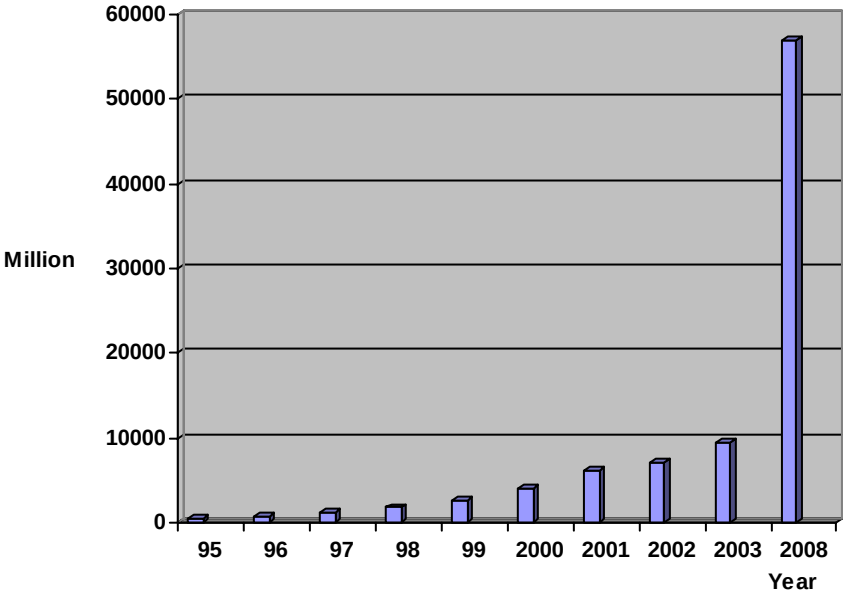

Figure 2. The growing of Indian Exports in Software Industry

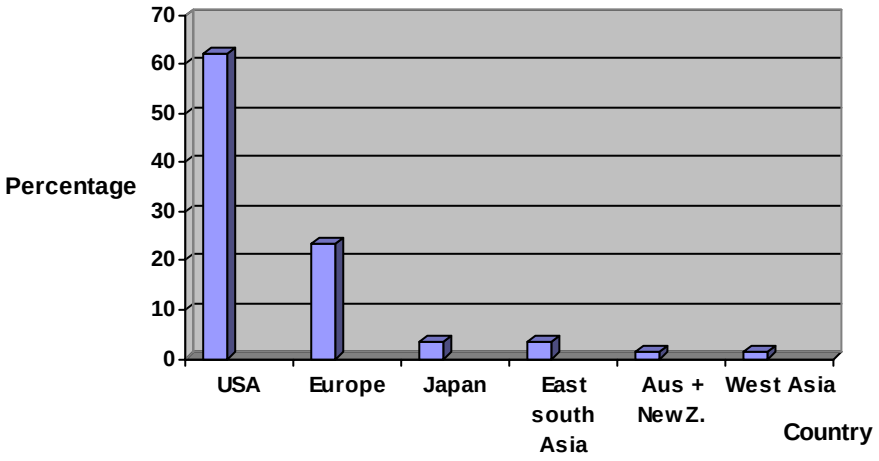

Figure 3. Software exports to the world

3. Indian Policies of Software Industry Sector

As mentioned before, the overall success in the IT sector in India was based on specific policies. At the same time, there were certain general reasons related to the Indian community facts, those facts are listed below:

- The low cost of manpower.
- The high qualifications of persons specialized in software development.
- The low price of the Indian Rupee to the American Dollar.
- The good management and administration based on the experience and concrete scientific approaches.
- The security and political stability.
- The Indians fluency in English.

The previous reasons gave many Indians the opportunities to work abroad. Those Indians get high experience in many IT related areas and can help in :

- Putting policies for software development and management in a very competitive way.
- How to be open to the world and establishment of companies work in outsourcing.
- How to invest money in software development.

As a conclusion, many international companies are motivated to establish offices in India.

The decision of the Indian minister of communication and information technology in 1998 to adopt a strategic policy to make India the largest software export in the next ten years was the starting point for the real software industry in India. A web site was created first to collect the opinions of the local and global experts, the opinions were modified and posted again on the site [12].

In the next subsections, we explain the adopted policies by the Indian government.

3.1. Development of the Communication Infrastructure

The infrastructure of the communications has been developed rapidly where each year the specified amount of money for this development is increased by 18% of that of the previous year. As a conclusion, India has now:

- Eight Satellite Intelsat.
- One satellite Inmarsat.
- More than 254 ground station.
- VSAT technology is used in remote and poor areas due to its less cost, to expedite the communication process.
- Four gateways for communication with the world.
- Four underwater lines, one of then is connecting to Sharjah.
- Fiber optics link around India.
- ERNET network connects more than 800 academic and research institutions. [12]

The main consequences of this development are :

- Availability of 28 million telephone lines.
- Availability of 3 million mobile lines.
- Availability of 7 million internet users (expected to reach 100 million by 2008).
- 63 internet providers.

All the above consequences had to make a direct impact on the development of software industry [12].

3.2. Establishment of Software Technology Parks (STP)

In 1991, a decision to establish STPs has been made. STPs are very well equipped buildings and centers, in addition to facilities related to IT. This is to motivate and facilitate software export and industry in India. STP might contain

- Advance labs.
- Library and e-library equipped with books and software.
- Offices for contributed companies
- Lecture and social halls
- Medical center
- Restaurant
- Sport center

The significance of STP is coming from its administration mechanism which is stated below:

- High level technicians are administrating the parks.
- The investment is decentralized.
- Most of the authority is given to the STP directors.

As a result for this flexible system, a decentralized single entry portal is emerged. The main functions that can be achieved by those parks are :

- Import without taxes.
- Foreign investment up to 100%.
- No income tax until 2010.
- Full authority in dealing with customers and issuing special export certificates for software, and ability to import necessary requirements.
- provide and help companies with consultancy and services.
- The available facilities are also for community service.

This flexibility and high level authority gave positive impact on establishment of many STPs. In India, there are currently more than 23 STPs. This establishment of STPs was one of the main key factor to increase the software industry and exports. This also opened a new job opportunities for those who are specialized in IT [5][6][9]. STPs also played a good role in making the Indian products confine with the international specifications.

3.3. Incubators

The software industry incubators were the outcome of the STPs, which contributed in establishment of the outsourcing stream and finding job opportunities to graduates. There are currently in India more than four incubators equipped with very good IT infrastructure and able to fund and market various

projects. Those incubators provide software developers with all the necessary facilities such as networking, library, training, funding and marketing [12].

3.4. Community Information Centers (CICs)

The main idea of establishing CICs was to stand up with the community to make it aware of the importance and significance of IT in developing the community and the whole society. The targeted people of CICs are ordinary people as well as institutions employers. This encourages people to learn how to use computers, there by, learn how to deal with e-government and e-commerce systems [8].

To develop fields such as e-government and e-commerce, preparing people who are capable of dealing with computers and internet is necessary. This area (e-commerce and e-government) opened a new era of software development in India. The Indian plan involves establishment of 300 CICs out of which 30 CICs are already established. The main reasons to establish CICs are :

- Support the applications of all the management business in government institutions.
- Facilitate electronic information exchange among the government institutions.
- Organizing computing awareness training in government institutions.
- Communication with academic institutions, research centers and government institutions.

The main results of CICs are :

- The significant income (in terms of money) from the e-commerce and commerce applications.
- The e-government has been highly developed, specially in state of Andrah Bradesh (muli language in India is one of the main obstacles).
- Development in news and media.
- Development in shares market.
- Development in health centers.
- Development in disaster warnings.
- It is expected to have 100 million internet users by 2008.
- Advance step a head in distance and electronic learning.
- Great awareness for the use of computers and its applications.
- Direct communication among the institutions.
- Information storage in a scientific way which helps in dealing and retrieving. [8]

3.5. Software Quality Assurance

The Indian software products became one of the most competitive products in the world. The Indian companies are among few international companies which care with producing their products in accordance with the international specifications. We state below some facts related to the serious care with software quality assurance by the government and private sector:

- There is a special department in the ministry of communication and IT concerned with quality assurance.
- The Indian companies are the most obligated companies with the necessary levels of quality assurance such as CMM, PCMM, ISO.
- More than half of the companies which have SEI CMM 5 level in the world are Indian companies located outside India (32 out of 58 in the world).
- More than 170 company out of 300 Indian pioneering company have ISO 900 certificate.

The result of quality assurance policy can be briefed as below:

- The software exports have increased exponentially.
- There are 185 out of 500 company work in outsourcing from India.
- International companies opened offices in India and the foreign investment is increased.
- The increase in job opportunity for those who are specialized in programming. It is expected that India might be in need of programmers and IT specialists in the coming future in spite of

graduating 35000 engineers each year and launching of 68000 professionals per annum. Moreover, it is to be noted that there are currently about 300000 professionals in India [5] [10] [12].

3.6. Copyright Regulations

The Indian government followed up the policy of copyright for press and publishing, specially which are related to software[12]. This made a big influence on software industry and competition among the companies. The main results of copyright policy is :

- The confidence for the international companies to open offices in India helped in opening job opportunities and foreign investment. This also helped in developing the Indian economy and be open to the world.
- The Indian companies can guarantee its rights as the foreign companies can do.

3.7. Council for IT Material Exports

In 1989, a council has been formed under the umbrella of the ministry of communication and IT specialized to make the world aware of the Indian IT products. It is to inform the world about the Indian qualifications in the field of IT. The foundation of this council has a great outcome:

- Achieve of exports of $200 million in its beginning of establishment.
- Achieve of exports of $10.75 billion in 2003.
- Expected to achieve $57 billion in 2008.
- Indian software exports reach 175 countries.
- Reaching new markets such as Japan and Latin America. [10] [12]

4. The IT Status in Palestine

In this section, we shall study the existing IT situation in Palestine to be able to investigate the possibility of applying the Indian experience on the Palestinian status. The infrastructure in Palestine for IT sector is generally considered to be acceptable. The main problem is with the policies and mechanisms to be followed that must cope with our circumstances.
Figure 4 illustrates the availability of some IT related tools in the Palestinian householder (computer, internet service, etc.) [1]. It important to notice that the availability of these tools is above of its average in the Arabic world in spite of the genocide and aggression policy adopted by the Israeli government against the Palestinian people. This gives a great indication about the determination of the Palestinian people towards the technology.

Figure 5 shows the nature of computer usage in the Palestinian houses. We notice that it is mostly used in children education and entertainment with a percentage of 38.2%. This is again a good indication to have educated and literate generation who are aware of the importance of IT and computer usage [1]. Another study pointed that 18.9% of the Palestinian families have both telephone and computer, and all of them use the internet, out of them 75.9% use the internet without subscription and their ages range from 10-25 [2]. We consider these numbers as good indicators in the sense that this generation will deal with the e-commerce and e-government and other related computerized business. This leads us to our main topic which makes the software industry (e-commerce, e-government, etc.) not only acceptable by the people, but also required.

4.1. The IT Infrastructure in Palestine

In this section, we shall give details about the infrastructure in Palestine which has relation with software industry

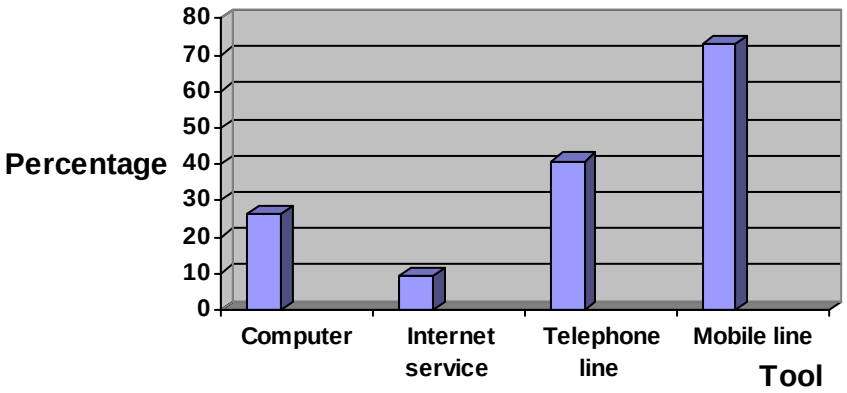

Figure 4. The Situation in Palestine. The Availability of Tools in Household

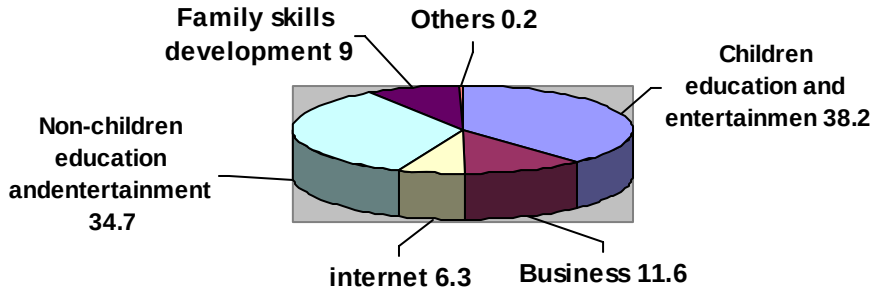

Figure 5. The Situation in Palestine. The Usage of Computer at Home.

4.1.1. Communication Networks

The situation of communication network in Palestine can be briefed as below[13]:

1. Existence of advanced communication network.
2. There is a good support for internet by the availability of Internet Service Providers (ISP) and companies with high speed and continuity reaches up to 99%.
3. The Palestinian communication company (Paltel) can provide the users with domain name.
4. The ISDN service started before two years(in 13 regions) despite it started in Lebanon before about 7 months.
5. The availability of leased lines.
6. Starting in establishment of the Palestinian education network through the Palestinian Education Initiative (PEI).

4.1.2. Academic Situation

Table 1 shows the number of programs in Palestine which offer various academic degrees related to IT. These degrees are diploma, BSc and MSc. The numbers in the table do not necessarily mean the

number of programs, it means the number of the institutions offering the program. This means one institution might offer diploma in more than one program related to IT [3].

Program	Gaza Strip	West Bank	Sum
Diplioma	6	8	14
B.Sc	5	5	10
MSc	-	2	2
Sum	11	15	26

Table 1. Academic institutions offering degrees related to IT in Palestine

The number of graduates from these programs is considered to be high. Many of those graduates do not find jobs, or work in areas not related to IT at all. The main problem is the followed policy which has deficiency in exploiting those graduates. In this context, we would like to clarify certain points :

- There is enough number of graduates, and many of them do not work.
- There are qualified graduates and others who have international experience, not being used to get advantage of their experience in software industry or software project management.
- If unsustainable and long term policy is considered, many youths will stop studying in IT related fields, thereby, losing a good opportunity to stand up with the Palestinian economy.
- The qualified manpower in software industry in Palestine is cheap.
- The Palestinian companies are mostly small companies require always highly qualified people (in many IT fields) with long experience, which makes it difficult for the new graduates to find jobs. This policy is not being used in India, specially at the beginning of software industry revolution.
- The public sector needs a comprehensive IT development. This will offer many jobs to graduates and help in developing software industry in Palestine.

4.1.3. Palestinian Companies

Figure 6 shows the number of the Palestinian companies registered in the Palestinian Information Technology Association for companies (PITA). The number of registered companies is very small, it is about 70 companies out of which 18 companies work in software industry [15]. These numbers show the weakness of software industry in Palestine. We state below the following points:

- 12 companies registered in PITA in 2005, out of which 2 companies work in software development.
- 8 Palestinian companies started since 2001 to enter the gulf market after presentation of 28 software in Gitex 2001.
- No Palestinian company has a quality assurance certificate.
- There are many small Palestinian companies not registered in PITA and mostly work in IT technical support.

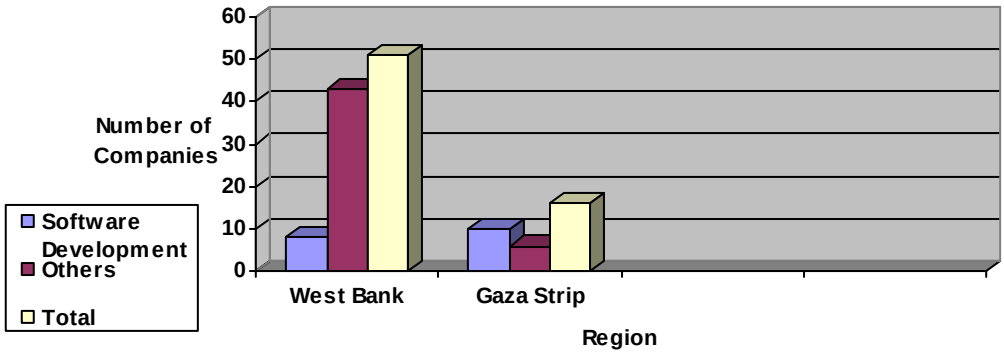

Figure 6. The Palestinian Companies Registered in PITA.

4.1.4. Associations and Centers

In addition to the ministry of Tel communication and information technology (MTIT), there are many centers and associations related to IT in Palestine. In this section, we shall state some of those well known centers.

4.1.4.1. Ministry of Tel communication and Information Technology

The ministry of Tel communication and information technology has considered many policies that can contribute in pushing up the IT sector in Palestine. Some of those policies are the initiative of the e-government, establishment of e-city and the PEI, but most of those are not completed or even in initial stages due to occupation situation or funding problems. It is to be stated that many policies are decided by the ministry without the working mechanism that can cope with the surrounding circumstances (this is one of the main problems) [4].

4.1.4.2. Internet Society (ISOC)

This society has been established to widen the usage of the internet in the Palestinian society and to increase the awareness of the Palestinian society with the importance of IT [11]. The result of this society is considered to be very poor because of the failure in the used mechanisms and disability to communicate with the whole parts of the community.

4.1.4.3. The Palestinian Information Technology Association (PITA) for Companies

PITA has been founded to draw a unified policy for all the Palestinian companies for the purpose of developing the information technology in Palestine, and reaching to the international market. PITA 's goal also is to tide the relation among private sector, public sector and academia [15].The main point that has been noted about the work of this association is that it does not have a specific policy or mechanism to achieve its goals, or even to stand up with the software industry through the Palestinian companies.

4.1.4.4. The Palestinian Incubator for IT

The Palestinian incubator has been founded to help graduates to find jobs by opening small companies or working in outsourcing field. The incubator funds and markets the projects [14]. The idea of establishing the incubator is considered to be a good idea, but due to lack of coordination between PITA and academia, the idea is scattered. The incubator has only one center in the west bank and most of the funded projects are also from the west bank. This is a negative indicator. We feel that the incubator should motivate Palestinian companies to obtain quality assurance certificates to ensure the ability to market the products of those companies. The incubator should not limit itself with dealing with newly small companies, but also with large companies.

5. The Proposed policies and working mechanisms

Because the situation in Palestine differ from any other region in the world, we must follow up policies and working mechanisms suitable with our situation. We recommend to adopt policies based on our existing situation, which can be enhanced when our situation is changing. We shall not recommend new mechanisms that might need extra funding due to our understanding of budget and occupation problems, but at the same time we should find out some ideas acquired from the Indian experience that can be suitable with our situation. Below is the list of the proposed policies and approaches that we recommend:

1. Continuing the e-government project which has been started by the ministry of communication and information technology (there is already a fund for the project).
2. Continuing the PEI project (there is already a fund for the project).

3. Continuing the e-city project (there is a part of the fund) and to consider a software park as a major part of it.
4. Working hard to make the society acquainted with the importance of computer usage through a cooperation and coordination between the MTIT and academic institutions. As Palestinians, we do not have enough fund to establish CICs as in India, but by this coordination, continuous education centers in the universities and the government computer center (related to MTIT) can play a good role that CICs can do.
5. A full coordination between PITA, the incubator, the MTIT, academic institutions and the public sector must be founded.
6. The MTIT through the Palestinian Parliament should try to issue regulations that permit exporting and importing without taxes for STPs or the companies that get quality assurance certificates in software industry.
7. The Palestinian government should try to make agreement with India to allow some qualified Palestinians to attend some workshops and training on marketing and project software management. This is again can be done using the existing agreements in case of difficulty to conduct new agreement. There is already an agreement between India and the Palestinian authority to offer ten scholarships for Palestinians every year to study in India in various levels and programs, an amended agreement can be done with cooperation with the Palestinian ministry of higher education, Indian ministry of higher education and MTIT to specify two of the ten scholars for the purpose mentioned above.
8. The Palestinian incubator should have at least two more branches, one in Gaza strip and the other in the west bank. To do this, the incubator can use the universities as incubator centers where all the necessary infrastructure is already existing (building, networking, library, training centers, etc.). This does not need extra fund, but only coordination with the universities and research centers.
9. The MTIT and PITA must try to convince international companies to open branches in Palestine. This can be done by informing those companies with the highly qualified graduates, cheap qualified manpower and the good communication infrastructure. One of the main problems is the insecure region, but still those companies can be convinced as what happened recently with the Islamic university of Gaza when Intel accepted to open a new training center in the university.
10. The Palestinian universities must not allow any IT graduate to get his/her certificate before obtaining at least 525 in the TOEAL exam, or the university should use some other approach which ensures that the graduate will be fluent in English. Fluency in English language is one of the main reasons for Indians to find jobs in IT field.
11. Trying to get employment projects for the IT graduates funded by international institutions. Such projects are periodically occur to overcome the problem of unemployment (short period jobs, say 6-9 months) in Palestine. The problem is that those people (IT graduates) are not used well and the process is done in an arbitrary way. Those people should be trained in a way that help improvement of software industry and opening new job opportunities, this should be done in accordance with a long term strategic plan.
12. The government institutions must be encouraged to ask local companies for their needs from software. This can be done by making the Palestinian authority institutions familiar with the Palestinian companies capabilities and their external contributions.
13. Working hard to make a network that links all the government institutions with each other.

6. Conclusions

In this paper, we studied the factors, policies and working mechanisms that led to immense development in Indian software industry, which therefore, gave a high impact on the Indian economy. We stated also the IT situation in Palestine and its infrastructure. Our objective of this study is to get advantage of the Indian experience and trying to apply its ideas on the Palestinian situation. Due to the main difference between the two cases in the geographical, political and security situation, we tried to use some of the Indian strategies that can be used in the Palestinian existing situation. We proposed

and recommended some policies and working mechanisms adopted from the Indian example, and can be applicable in our Palestinian situation in terms of funds. We strongly feel that standing up with the Palestinian software industry is possible, which therefore can have a good impact on the Palestinian economy.

The study shows that all the main success factors are available, but we miss the suitable working mechanisms to exploit those factors. We are sure that those working mechanism can be performed if we have good deeds.

References

1. Palestinian Central Bureau of Statistics (in Arabic), 2004.
2. Palestinian Central Bureau of Statistics (in Arabic), The press conference on the survey of internet usage without subscription, Ramallah, Palestine, 2005.
3. Accreditation and Quality Assurance Commission (in Arabic), Ministry of Higher Education, 2006.
4. The National Strategic Plan for Tel Communication and Information Technology (in Arabic), Ministry of Tel Communication and Information Technology, May 2005.
5. V. Kumar, " Evolution of Information Technology and its Emergence in India", Nistads News, Vol. 5, No. 2, October 2003.
6. www.chennai.stpi.in/aboutus.htm
7. www.cia.gov/cia/publication/factbook/geos/in.html#Econ.
8. www.cic.nic.in
9. www.hyd.stpi.in/scheme/scheme/scheme.html
10. www.indembassy.or.kr/technology/information-tech.htm.
11. www.isoc.ps
12. www.mit.gov.in/org.asp
13. www.padico.com/paltel.htm.
14. www.picti.org
15. www.pita-palestine.org