

Software industry in Jordan the Prospects and Hopes

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Abstract

This paper overviews the software aspects in Jordan to give an indication for the growing state of software industry in developing countries. Many aspects can be considered as vital points that should be highlighted such as factors of strength, weaknesses, the difficulties and challenges Jordanian companies suffered from. In addition, this study clarifies the "hopes" that Jordanian companies dream to achieve with comparison to their limited capability. A questionnaire was distributed to Jordanian companies and data was collected and analyzed.

Keywords: software industry, Jordan software, software outsourcing.

1. Literature review:

Jordan entered the World Trade Organization in 2000 and signed a free trade accord with the United States.

Int@j (The Information Technology Association of Jordan) claims that the information technology market in Jordan has been estimated at around \$60 million in 1999, with an annual growth rate of 15 - 30% in addition export sales have been estimated at \$7.5 million in 1998, with an annual growth rate of over 100%, so \$30 million is estimated in the year 2000, employing about 3,000 employees, In Addition to 400 - 500 software and hardware resellers, employing around 10,000 people [12]. The main Jordanian software development areas are banking, accounting packages, web-based applications, Arabization, system integration, health, insurance packages and software conversion from 3rd to 4th generation. These are mainly used in banks, hospitals, hotels, universities, communications, government and insurance companies [12].

For Jordan, this focus makes sense due to several reasons: In addition to the periodic reviews, a variety of other significant events have contributed to the growth and success of Jordan's Information and communication technology ((hereafter labeled ICT) sector. These events are listed below in chronological order [16].

Jun 1999 Concept paper presented to HM King Abdullah II
Aug 1999 Final strategy and action plan ready
Oct 1999 Final strategy adopted by HM and the government
Mar 2000 Jordan ICT Forum I, Dead Sea, Jordan
May 2000 int@j registered and commences operation
Jul 2000 First REACH review process launched
Sep 2000 REACH 2.0 presented to HM
Jun 2002 Second REACH review process launched
Sep 2002 REACH 3.0 presented to HM
Sep 2002 Jordan ICT Forum 2, Amman, Jordan
Oct 2003 Third REACH review process launched
Dec 2003 REACH 4.0 presented to HM

Since 2000, the number of Information and Computer Technology (ICT) related jobs has grown from 1,250 to 9,000; the sector has attracted more than \$79 million in cumulative foreign direct investment; and export values total more than \$47 million.

An association agreement was signed with the European Union in 2001, leading to increases in trade and foreign investment.

Since 2002, discussions focused on the core competence of Jordan's IT sector (i.e. outsourcing) and how to reach a "critical mass" and how to develop large companies that employ substantial numbers of technical employees[19], taking into consideration India case and other countries, who play fatal role global software outsourcing[2] and [4].

The 2002 Jordan ICT Forum attracted nearly 1,000 participants from more than 35 countries, including top U.S. and European executives, who praised Jordan's dynamic approach and strong public-private cooperation [14].

Software and IT services require skilled human capital. Jordan's relatively well-educated workforce stands as a comparative advantage for these activities: more than 1,500 students are graduated from Information Technology related fields each year, from universities, colleges, and technical institutes.

Six out of eight universities achieved excellence in Jordan according to the British Evaluation System [19]. Moreover, in the coming years this figure is expected to increase significantly as eleven universities in Jordan offer degrees in different engineering fields and 17 universities offer degrees in computer science, computer engineering, and telecommunications. Community colleges and vocational training institutes contribute to the mid-level workforce in similar fields. The student population in IT fields totals 8,000 at university level and 5,300 at college level [18] and [19].

Eighty-three percent (83%) of the workforce is employed in the services industry, and approximately 212,000 of the country's population of 5.5 million have regular Internet access [7].

Int@j states that Jordanian Information technology (IT) firms already possess sufficient conditions for a competitive outsourcing industry for software development, especially in the areas of coding and testing [11]. These claims are supported by two studies [2] and [4], which demand to emulate the Indian case.

21% of the local IT firms in Jordan are engaged in outsourcing activity in the year 2000, with contract values ranging from \$14,000 to \$213,000 per year [10].

Int@j shows that Jordanian IT firms have the potential for meeting the coding and testing needs of the global outsourcing trend. These firms have exhibited strong capabilities in the areas of implementation, maintenance, customization and Arabization, analysis/functional specifications, and design [11].

The IT industry in Jordan has grown dramatically in the last 6 years [1] [2], currently employing approximately 10,000 people and generating US\$167 million in annual revenue [8]. Jordan market needs more software solution companies since it is growing day by day and the resultant growth should yield acceptable competition [2].

The main regional concentration is directed towards the Gulf market with some outsourced work being done for the US and the global market [2], [4] and [12].

Unlike manufacturing and tourism that are affected by transportation mechanisms, software services are a "distance-less" industry. Its inputs and outputs are transmitted electronically [15]. Moreover low start-up capital requirements which makes it easier and less risky for market entry by Jordanian firms, even small outfits formed by individuals [16].

Jordan has a number of US company representatives including IBM, Microsoft, Dell, Compaq, HP, US Robotics and Apple. Jordan has ten operating ISP's, with another eight scheduled to become operational next year. These provide services to about 25,000 local subscribers and 100,000 users (excluding internet café users, which are hard to pinpoint in numbers) [12].

Industry leaders must continuously put strategies and tracking applying these strategies to support the industry, and monitor the effectiveness of the strategies implemented [20].

Active and continued support of the Government is also a key prerequisite for success. None of the other leading offshore software locations such as India and Ireland would have succeeded without this role. Throughout the world, ICT initiatives have succeeded because they were led by the private sector, but had high-level support and positive actions from Governments [20].

2. Software Piracy in Jordan

To take advantage of the opportunities offered by new trade agreements, Jordan would need a more efficient, market-oriented customs regime in compliance with world trade organization (WTO) requirements, capable of handling increased traffic at the borders while at the same time preventing the entry of pirated software [13].

In 1999, Jordan's parliament amended the country's 1992 Copyright Law and passed various regulations to better protect intellectual properties [1][3]. Two years later, King Abdullah received a special award from the Business Software Alliance (BSA) for his efforts to enforce the country's copyright and trademark laws. Largely due to these efforts, software piracy in Jordan has seen a steady decline since 1994, when rates reached 87%. By 2002, piracy rates had dropped to 64%, although the total losses of the software industry had risen, from US\$2.2 million in 1994 to US\$3.5 million in 2002 [9].

EL-Sheikh, Rashed and Peace [1] had studied the software piracy in Jordan. They discussed the software piracy's causes and suggested some cures such as undertaking a study of piracy behavior in Jordan. Their paper provides an overview of the topic of software piracy, including the results of a study of illegal software copying in the Jordan. However Rashed [21] carried out another study discussing the level of understanding of the meaning of software piracy and convince to pay software against practice.

His results recommend fighting this phenomenon by increasing the level of awareness about software disadvantages.

El-Sheikh, Rashed and Bal Beed [3], studied the role of law and legislation in reducing the software piracy in Jordan. Their study shows that Jordan government activates the law and legislation that reduce the software piracy phenomena. Their result focuses on the importance of applying the laws and legislations to protect the intellectual property taking into consideration awareness factor through the media. Moreover they claim that Jordanian companies should produce suitable software with low prices that fit the individual's ability of purchasing software. In addition, they suggest establishing software department that would monitor the applying of intellectual property (IP) laws, software quality and society aware of software piracy disadvantages.

Al-Sheikh, Rashed, Peace, and Qudah [5] studied and evaluated the role of concerned parties in media awareness against software piracy as case study of Jordan. They found that results SW piracy is a crime in spite of considering it as an ethical, economical or legal crime. Moreover results show the importance of concentration on the ethical side of this problem, stressing on the intense and diversity in media awareness. However efforts of all parties should be coordinated so that each party should play an active role in fighting this phenomenon using the media to aware the target people, as it is an effective tool.

3. Can Jordan Companies Compete International Companies?

As a result of increasing the number of companies that invest in the software development sector, an amendment to the Copyright Law was introduced to acknowledge that copyright ownership of all works created by employees shall rest with the employer provided that such works are related to the business of the employer and provided that employees are utilizing the knowledge, tools, and resources made available by the employer [17].

El-Sheikh and Rashed's study [2] is being one of the earliest studies that focus on studying global software outsourcing (GSO) in Jordan, concentrates on Jordan companies' capabilities to get engaged in outsourcing relationships. Their paper also explains how such companies can compete in this field. They clarify the lessons learnt from the Indian and other countries experiences in this field.

Depending on the barriers and challenges that face Jordan outsourcing companies, they tried to prove that Jordanian companies possess factors and characteristics that make them qualified to compete in this area. Their research also raises an important research question regarding the effects of GSO on Arab countries for future research.

El-Sheikh, Rashed and Smaha [4] studied the GSO factors, possible outsourcing partner and shed the light on the Indian (Shiva), British (Sierra) and experiences. They studied this factor considering what Arab companies have to deduce to overcome the barriers and compete the international companies exploiting their compete advantages.

Al-Sheikh, Rashed and Byan [6] studied the international quality standards in Jordan software industry such as Capability Maturity Model (CMM) and ISO. They found that most of Jordanian companies do not apply international quality standards in all software phases. The results show that the population believes that the international quality standards will increase the competition level of the Jordanian companies and reflect the desire to compete. Their recommendations focus on the importance of applying international quality standards in Jordan software industry and the role of awareness factor for the companies' employees.

In order to increase the level of Jordanian SW ability in international competition, El-Sheikh and Rashed [2] suggest the following points:

- Although the legal system is acceptable it should be improved.
- The education system must produce better prepared students and the IT infrastructure should be periodically upgraded so that the high rate of programmers as an output of the education, leads local companies to pay less than other companies in the world.
- Immature international experiences for the Jordanian IT companies. The government trends to improve the IT sector as a major condition to increase the ability in competing but still they should speed up the support and transition for GSO such as exempting the IT sector from duties & taxes. Also they should accelerate the promotion of the Jordanian IT sector heavily abroad.
- A study should be done to utilize other developing countries experience in GSO, such as the Indian model.
- Suitable conditions for the employees should be ensured to stop the brain draining to other countries. Moreover, the Jordanian community abroad can be a significant asset to Jordanian companies.

○ It is better for Jordanian companies to establish vertical domain expertise and have cutting edge solutions or 80% complete products (which require high quality specs) that can be customized to the needs of client in minimal time.

○ Targeting the Arab/ regional markets benefiting from localization expertise is an advantage over global companies who have other costs/ barriers which prevent them from targeting our countries/ regions. Focusing on preparing resources for the software industry should start from high school based on career orientation sessions.

○ Companies can really benefit from GSO through establishing clear service level agreements, building a healthy relationship with the vendor that can last for years, clearly identifying the project scope, identifying roles and responsibilities and developing a quality assurance model.

○ Needs Analysis (hire GSO to perform needs and Statement of Work SOW); or perform in-house and then validate with consultant you trust.

Based on needs, develop HR specification of persons who will be able to perform SOW.

- Oracle DBA
- JAVA Developer
- Linux Expert
- Etc.

Based on needs analysis/SOW and developers; one would estimate how long the project will take and begin hiring phase in Jordan to see who is most qualified to bring results. Client is likely to obtain the BEST developers well trained from the best firms in Jordan. Interview them... and see if it is worth while to pursue in-house development. Even on a contractual basis.

○ Based on SOW and information above, client would then pursue RFP (request for proposals) from several local firms to determine pricing, time for delivery etc.

○ Client would ensure that developer had enough CHECKS & BALANCES (i.e. validation) during the phases of the project so that he/she does not get stuck with a system that will fail in 18 months.

If client went to a local vendor, he/she should only allow FIXED-BIDS (or Lump Sum) contracts based on SOW. Change Requests would have to be determined and the company must be aware of CRs related to standard ISO 15000 ITIL/CMM etc. in order to control costs.

Al-Sheikh, Rashed and Balbeed [3] recommend decreasing the price of the Jordanian software with taking into consideration the international quality standards.

4. Jordanian Software Companies:

Studies [2][4] show that Jordan companies can exploit their strong areas such as fast and cheap internet, pool of professional employees, with lower cost. However the same studies determine the difficulties and challenges that face the Jordanian companies in difficulties to compete international companies in price especially Indian companies.

5. Research Methodology

A questionnaire is distributed to Jordanian IT companies and analyzed.

5.1 The Community of the study

The study is carried out on Jordanian companies and the survey includes the following point:

- Software quality concepts: which include software quality, user, product and Methodology .
- Current situation.
- Desired situation.

5.1.2 Sample characteristics:

We distributed the questionnaire to Jordan IT companies by hand and email and the response was 40%.

5.2 Results

5.2.1 Software Quality Concepts:

Software quality:

- All respondents agree that it is necessary to apply quality standards to the software industry in Jordan. In addition, they think that applying quality standards yield quality assurance in software industry, this result emphasizes the results in paper [7].
- 44.4% of the sample agrees that qualified people may be the solution when the company growth rate is high enough that is no way to apply the quality assurances. However other suggest training the exist team.

User

- All respondents confirm that the benefit based on software development could be exploited by the user and it is preferable.
- 78% agree that user requirements may result in modifying software. Moreover they think unclear requirements could be big problem in software development.

However others focus on the lack of systematic development.

Product

- All respondents think that there must be clear, practical vision in the software industry.
- 89% of the respondents believe that simple design that covers development idea may be most acceptable for the user. Moreover they think software design that achieves the user goals for longest possible period is most successful, so it should be maintained and revised continuously and reusability should be used. Moreover they think that the development process should be handled carefully and they believe that each sub-phase should be tested.
- 67% of the respondents believe that the main reasons for software industry failure is the lack of produced software good testing. Furthermore they think the lack of forecasting may be the reason.

Methodology

- All respondents prefer to follow up the standards in developing life cycle and studying the risks that might be produced in software development following scientific sequential systematic methodology.

5.2.2 Current Situation

- All respondents mentioned that they communicate with their customers and they have evaluation records for their products. However they suggest funding software industry by the government.
- 78% of the respondents use main criteria to evaluate their software product success.
- 66% of the respondents always participate in software industry conferences. Moreover they use standard documentation tools in their work. However they do not use both user expectation management and risk analysis standards especially when there is no enough time.
- 56% of the respondents think that the investment cost in the software industry is still high.
- 89% of the respondents think that an employee who is specialist in testing software products before delivering it to the end user should be qualified. On the other hand, they believe that public sector do not help private sector to develop software industry. Moreover they think that the copyrights law is not sufficient to protect the software industry.

Desired situation

- All respondents believe that Jordanian software needs more studies and the Market needs analysis to predict the software industry.
- 78% of the respondents claim that the education system should be updated to make the students qualified enough and armed with strong skills and knowledge. They confirm that Arab market is their target to whom they export their product.
- 66% of the respondents think that software companies should be enforced to follow up the international standards in developing software. However they think that the leadership in this field should be to the private sector.
- 89% of the respondents believe that human factor is the major role in software industry, rather than the industry itself. In addition, they think that the international vendors in Jordan will support this industry due to their investment so they expect increasing of the growth rate, hiring chances in software industry.
- 56% of the respondents think that the Arab market is the most expected revenue and suggest concentrating on this market. in addition they think services sector in Jordan will attract the software companies and they claim for an independent governmental responsible department to carry out the forecasting process and market analysis. However 46% of the respondents believe that the companies themselves have to do that by themselves.

Conclusion

It is necessary for Jordanian companies to apply the international standards to improve software industry in Jordan and get the desired situation. Human factor is important as qualified employee would be able to work with unclear requirement, using the scientific approaches and international standards to achieve the user goals and desire, preventing systems from failure. As it is important to communicate with the customer during the developing phases and the target should be the Gulf and Arab area.. Education system should re-structure to produce qualified output and government support should be directed to encourage the investment in IT sector by attracting the Arab and international companies. Moreover cooperation between public and private sector should come to the light. The result shows the importance of studies that are dedicated Jordanian software.

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