Rapid Market System Analysis
Quality of Engineers for Multinational Enterprises (MNE's)

Skills Gap between recent graduate and MNE Outsourcing Job Market Needs

Executive Summary

December 2015

Several studies have highlighted the strong potential growth of Information and Communications Technology (ICT) sector in the occupied Palestinian territories (oPt), mainly because of the fact that it is less dependent on cross border movement restrictions. In 2013, the gross revenues for the sector were estimated at around $637 million[1], making it a significant part of the Palestinian economy (6% of GDP). There are around 250 local ICT company in the ICT sector employs directly about 5,000 people and creates additional 2-3 indirect jobs for each direct job, so it also has a significant employment potential growth. It is estimated[2] that 5-10% of the total local workforce are females, while the workforce is highly educated with literacy rates exceeding 90%.

The ICT sector activities are partially impeded by a number of external constraints (mainly the Israeli-imposed constraints on ICT infrastructure and connectivity, and also the higher risk factors that the occupation presents on doing business in the oPt). However, ICT sector is also constrained by internal gaps, such as underdevelopment of supporting echo system, supporting functions, policies, standards, and legislation as well as the lack of quality of the education system amongst other factors which have negative impact on the availability of quality of engineers graduates, the ability of the outsourcing, and software development companies to be able to scale. The sector's development and operations are further constrained by low levels of capital investment and short supply of appropriate and innovative financing instruments. Innovation in the oPt also suffers from a lack of research and development (R&D) and a poorly developed information society. Finally, legal and administrative hurdles to foreign direct investment (FDI) in the oPt minimizes the number of investment opportunities. The same situation applies for Gaza strip[3] as well, while the big difference between Gaza and West Bank contributions to GDP is mainly related to Gaza's small market size in addition to the closure imposed on the Gaza Strip and the limited chances for outsourcing.

This report is intended to be a brief analysis on the failure to graduate quality software engineers, which have a direct impact on scaling the software outsourcing as well as attract more Diaspora offshoring investment models. The report compliments the analysis conducted in 2014 by the PMDP on the "Multinational Enterprises (MNEs) outsourcing to Palestinians[4]" market system analysis. The desk research conducted has highlighted that the available software development engineers are neither sufficient nor adequate, and are a main constraint in the value chain of the software outsourcing industry.This report subsequently provides analysis on the core relationship between the universities as suppliers of graduates in information technology related academic programs, the software development industry as buyers and recruiters for such talent to support their software outsourcing and software offshoring operations.

This report provides analysis on the supporting functions and rules related to the supply and demand, largely based on literature desk research and review of several previous studies that have highlighted the lack of quality of engineers in the software outsourcing sector.

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[1] Economic Initiative for Palestine – OQR: http://www.quartetrep.org/quartet/news-entry/ipe-overview/
[2] According to information collected from PITA management
[3] Palestinian ICT Labor Market Gap Analysis : http://pita.ps/studies
[4] http://www.pmdp.ps/page.php?id=aae2y43746Yaae2

It is very important to differentiate between the skills gap according to the different segments. For example, the skills needed for top tier R&D outsourcing to MNE differs from skills needed for lower tier software development outsourcing. Likewise, skills that are needed for the captive outsourcing "offshoring" require much higher skills than those needed for the ready-made application or custom software development made for the local market. None of the studies that were previously conducted in the past five years had addressed this issue and considered the same skills gaps in all of the sub-segments of the ICT sector.

Accordingly, this document attempts to collect additional related information, to prioritize the previously mentioned activities and suggest relevant recommendation, guidance and facilitation to address the failures related to skills gap between recent graduates and MNE job market needs, and on the long term to be able to scale it, therefore it analyze the demand and supply side:

1. **Problems on Core Functions**: Skills (technical and soft) gap between the recent graduates and the job market needs on both, short and the long terms. Many constraints were highlighted as the lack of the industry Job Classification to translate the skill profiles needed by the private sector as an input for consideration while developing and updating the curriculum by the universities. Although there was a slight improvement in soft skills development lately at the universities, however, it is still far from the international accepted standards such as multinational enterprises. The recent graduates are suffering from the lack of practical training, poor soft skills, creative thinking skills and other related skills. This influx of graduates with poor soft skills limits the ability by the outsourcing companies to scale the volume of outsourcing contracts due to the limited availability of qualified engineers to the level of demand side expectation from the multinationals. Local universities don't have a clear and robust national plan for introducing better quality practical training toward ICT students and graduates, additionally there is no unified national strategy to group all local universities to collectively and jointly upgrade the curriculum and address the gap on national basis. It also indirectly results in high staff attrition within the same pool of talented engineers who continue to search for better paying salaries in Palestine, causing mobility of engineers amongst the outsourcing companies.

2. **Problems on Supporting Functions**: An information dissemination gap was identified between the private sector and the academia from one side, and between and among the universities. A significant part of the students don't know the potential career opportunities post-graduation as a national or industry recognized online job vacancy boards do not exist nor do information about the skills needed by the private sector is available to aspiring students. The university's department of education, skills and the center of excellence and innovation in liaison with the private sector needs to ensure that the opportunities available within the private sector are being communicated effectively to universities, teachers, and students. This career awareness must have an input from the industry as this will best communicate the skills required by a constantly evolving technology sector. Also, in the absence of a national strategic vision there is a mismatch in curriculum being taught at the local universities level, since the curriculum development is done differently from one university to another. Some of the issues that recent graduates have, are related to poor analytical and problem solving technical skills, with mostly theoretical knowledge without practical experience and lack of knowledge in new technologies that are been demanded by the MNE and international clients. Finally, there are nascent employment support services by the both

sides: academia and private sector on several important type of activities such as: quality internship programs, industry orientation programs, transparent student career path, salary guides and job classification that also detail needed skills and profiles as mentioned earlier.

In addition, students have limited access to labs and equipment, and the curriculum is not balanced with activities on recent technology trends and soft skills competencies e.g. critical thinking and English. There is a lack of R&D Funds, which is not helping in bridging the gap between industry and universities. The best qualified university teachers are usually the ones implementing the best teaching methods, with on-hands research tools, market related methodologies as well as technologies attributed to their work on research projects in cooperation with the industry. Finally, both sides usually target donors to initiate projects that are bound to address market failures.

3. **Problems on the Rules and Enabling Environment**: On the governmental level, there is a lack of support from the ministry of education and higher education (MoEHE), and other government input to ensure the policy structure and economic conditions are favorable for employment opportunities in the ICT industry and to invest in serious reforms in the ICT education. Taking other countries experience into consideration, such as the case of Ireland who were able to become an outsourcing destination for multinationals in Europe by differentiating their value proposition based on quality of IT graduates and more competitive pricing relevant to European continent. Finally, the student acceptance and graduation criteria should be revised to reflect the good international practices of not passing students who do not meet a minimum requirement in core courses.

The skills gap and its constraints in the value chain were validated from different sources and by different stakeholders. Validation of the analysis included desk research, interviews during the Quality of engineer 1st sub-group meeting that was held on march 11th 2015 at the Palestinian Information Technology Association (PITA) office and that was attended the major stakeholder (Donors community, local ICT companies, the Ministry of Telecommunication and IT (MTIT) and four local universities), whereby the PMDP presented and validated the summary of supply and demand constraints[5] of this study and previously conducted studies. Later on, and based on this validation, PMDP have developed the proposed impact framework for the Quality of Engineers, which aims to organize the efforts and the required activities, and to improve the sector coordination in order to achieve the required system level change that will impact positively on improving the skills and training/education market. Such change is expected to result in positive change at the business level in order to achieve the goal of introducing new products and functions in the value chain that will ultimately lead to increase value of exports to MNE and investment in Diaspora offshore. Accordingly, it will impact increasing the employment and incomes in this value chain.

Finally, the report highlights the recommendations that can be implemented by the stakeholders, to address these gaps as follows on both sides as below:

On the supply side (Universities and Training Centers)

Ideally, a large-scale coordination engagement between industry and educational institutions to discuss many elements in the education system should take place such as: curriculum development

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[5] The Market System Chart / Figure 2 in this document that was developed by PMDP as part of the QoE for MNE's

based on industry needs and internship programs that facilitate transitioning students from theory-to-practice. Coordination efforts should take into consideration improving the teaching methods and techniques such as inclusion of seminars lead by market experts. Additionally, universities shall assign instructors from industry to teach some courses to share knowledge knowhow and latest trends.

Information dissemination and exchange between and among universities and with industry requires further development. One way of doing that is to develop friction free internal policies at universities to allow the lecturers to interact and work at the industry on part time basis and not just for students to have internship programs with the industry.

On the demand side (Palestinian Outsourcing and Offshoring companies)

Coordination and change of behavior on the demand side is needed for the companies to be active participants in the implementation of a quality graduate internship program and engage in curriculum development based on research of their skills needs. In short, the private sector has to seek more cooperation such as employment support services such as orientation programs and salary guides as well as detailing career path for students. Industry is part and parcel of the solution through information dissemination and engagement with local universities.

Regulatory

Government can assist in growing the sector through the development of supporting laws and legislation that would enable a flexible labour market and to introduce policies that would incentivize and facilitate for industry-university cooperation and improve the employment market including gender employment. A better protection regime for intellectual property can attract foreign direct investment[6] and it also will improve the innovation sector in Palestine.

It can also provide incentive schemes[7] to initiate industry-university projects that would support the development of the university teachers and lecturers to become knowledgeable on technology tools, methodologies and standards that would complement the theory taught in the classrooms. This also includes having the opportunity for the faculty to be up-to-date on latest technologies, its trend and practical teaching techniques through research and development (R&D) funds and schemes.

Government leadership can also be a catalyst for many projects such as cooperating with the industry in developing and providing market information and statistics on the actual market needs.

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[6] As per the (MNEs) outsourcing to Palestinians study recommendations, the list of policy and business enabling environment constraints needs to be considered, including: 1) Policies and IPR need to be in place and/or activated in order to protect the interest of the demand side and attract investment. This step entails a review and assessment (including impact assessment) of existing draft legislation on industrial property, copyright, and related rights and a review of previous analyses conducted under multiple projects, in order to promote the development, adoption, and awareness of the World Trade Organization's (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS); 2) Developing and implementing standardization of, and certification for, methodologies, processes, and products in order to increase the level of trust in the Palestinian ICT product offering; 3) Upgrading the Investment Law by PIPA, including a tax break for ICT companies in addition to promote the development, adoption and awareness of, WTO TRIPS-aligning laws in view of the need of the ICT industry to improve the level of trust among foreign investors, including MNEs; and 4) Advocating for and improving (at the policy/legislative level) the possibilities for foreign ownership generally or specifically in the area of ICT in order to increase Diaspora's foreign investors' participation in company establishment and growth, ..etc

[7] As to: develop a national incentive scheme to encourage cooperation between universities and companies by creating R&D funds or joint projects, and other initiatives.