



Knowledge Based Transformation Programs

Funded by
the UK Government's Middle East & North Africa (MENA) Conflict Prevention Programme
and the European Union (EU)



ICT BUSINESS DEVELOPMENT

Market Mapping of the Palestinian ICT Sector
and the Opportunities for Partnerships in the Region

2nd Edition

by **Nicholas White**

Consulting & Interim Management Solutions Ltd



Mercy Corps

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March, 2010

Programme Partners

Mercy Corps - An international aid organization which works amid disasters, conflicts, chronic poverty and instability to unleash the potential of people who can win against nearly impossible odds. Since 1979, Mercy Corps has provided \$1.3 billion in assistance to people in 100 nations. Supported by headquarters in North America, Europe, and Asia, the agency's global programs employ 3,400 staff worldwide and reach more than 14.4 million people in more than 35 countries. Over the past five years, more than 90 percent of the agency's resources have been allocated directly to programs that help people in need. For more information, visit www.mercycorps.org.

PITA – The Palestinian Information Technology Association of companies, a private sector body set-up to support and communicate the benefits of the Palestinian ICT industry. “PITA” was founded in 1999 by a group of Palestinian entrepreneurs who wanted to create a non-government body to defend the interests of the ICT sector. PITA has evolved as a strong organization that represents more than 80 major companies from various ICT sub-sectors including hardware distributors, software development firms, office automation vendors, internet service providers, telecommunications, IT consulting, IT training and related businesses. PITA has become the basic pillar in defending the interests of the ICT sector and the main reference on the ICT sector in Palestine.

IAESI – Israel Association of Electronics and Software Industries, a trade body set-up to represent the Israeli software and electronics industry. The Association is comprised of about 300 companies in the fields of electronics, telecommunications, semiconductors, medical devices, IT and software. Membership in the Association is open to any company dealing with design of electronics and software products having a minimum added value of 45%. Members of the Association include private, public, government-owned and multi-national companies. IAESI strives to maintain the competitive advantage of Israel's electronics and IT sector in the face of increasing competition from India, China and the countries of the Former Soviet Union. The Association has set itself a target of increasing annual sales to \$35 billion, most of which will be export oriented, by 2013-2015.

Intellect – The UK trade association for ICT and consumer electronics. Intellect provides a collective voice for its members and drives connections with government and business to create a commercial environment in which they can thrive. Intellect represents over 750 companies ranging from SMEs to multinationals. As the hub for this community, Intellect is able to draw upon a wealth of experience and expertise to ensure that members are best placed to tackle challenges now and in the future.

Table of Contents

Terminology	6
Executive Summary	8
1.0 Purpose of Report	11
1.1 Background	11
1.2 Overview	11
2.0 Methodology.....	15
2.1 Overview	15
2.2 Market Data	15
2.3 Custom Research	15
2.3 Recommendations and Conclusions	16
3.0 ICT Market Overview	17
3.1 Background	17
3.2 Market Performance.....	18
3.3 Developments in the Market	19
3.3.1 IT Equipment Market	19
3.3.2 Software Market	20
3.3.3 IT Services	20
3.3.4 Outsourcing.....	21
3.3.5 Telecommunications.....	22
3.3.6 Mobile Telecoms.....	22
3.4 Major Market Trends	23
4.0 IT Outsourcing/Business Process Outsourcing	24
4.1 Overview of Outsourcing	24
4.2 Information Technology Outsourcing	24
4.3 Software Development and Management Outsourcing.....	24
4.4 Business Process and Knowledge Process Outsourcing.....	25
4.5 Drivers for Outsourcing.....	26
5.0 Regional Reviews	27
5.1 Regional Review – Europe.....	27
5.2 North America	29
5.2.1 Information Technology.....	29

5.2.2 Software	29
5.2.3 Services	30
5.2.4 Communications	30
5.3 Regional Review - Middle East and North Africa (MENA).....	31
6.0 Palestinian ICT Sector Findings and Capabilities.....	32
6.1 Palestinian Market	32
6.1.1 Market Overview	32
6.1.2 Palestine Cost Advantage	34
6.2 Palestinian Primary Research Results	35
6.2.1 Respondents	35
6.2.2 Skills and Resources	36
6.2.3 Technology Capabilities	36
Software Platforms	38
Software Languages.....	38
Mobile Platforms	39
6.2.4 Day Rate Profile.....	41
6.2.5 Relationships Outside of Palestine	42
6.2.6 Working Outside of Palestine	42
6.2.7 Conclusions	45
6.3 Palestinian Outsourcing SWOT Analysis	46
6.3.1 Strengths	46
6.3.2 Weaknesses	47
6.3.3 Opportunities	48
6.3.4 Threats	49
7.1 The Israeli Market	50
7.1.1 Market Overview	50
7.1.2 The Competitive Landscape	51
7.1.3 Conclusions	51
7.2 Israeli Primary Research Results	51
7.2.1 Background	51
7.2.2 Respondents	52
7.2.3 Technology.....	52
7.2.5 Views on Outsourcing	55
7.2.6 Quality and Technical Requirements	57

7.2.7 Existing Relationships with Palestinian Companies	57
7.2.8 Supplementary Research	57
7.2.9 Conclusions from the Israeli Research	59
8.0 Conclusions and Recommendations	61
8.1 Opportunities for Palestinian ICT	61
8.1.2 Services that can be outsourced to Palestine	61
9.0 Recommendations	66
9.1 Regional Outsourcing Strategy.....	66
9.2 Developing Strategies through Market Segmentation	67
9.3 Supporting Change in the Palestinian ICT Market	68
9.4 Centralised Support	68
9.5 Palestine Market Development Map.....	69
9.6 Building Future Resources	72
9.7 Develop International Business Strategies	72
9.8 Marketing Operations	73
9.9 Sales Operations	73
9.10 Recommended Follow-up Activity	73
9.11 Using This Report	74
AppendicesAppendix I	75
Appendix I	76
Market Drivers	76
Drivers for IT Spending.....	76
Business.....	76
Public Sector	76
Consumer	77
Appendix II	78
Asia.....	78
Appendix III	79
Palestinian Market FBI Analysis	79
Appendix IV	82
Case Studies	82
Appendix V	86
Bibliography	86

Terminology

Set out below are references to the main terms used in this report:

ADSL – Asymmetric Digital Subscriber Line, it is a type of broadband that uses copper in the network, (as opposed to Cable, which used fibre optic cables). ADSL is usually linked to the traditional telephone network and the copper cable run into properties by the telephone companies. ⁽¹⁾

Broadband – A data signalling method that carries a wide range of frequencies along a single medium (wire). It is often used to describe the way the Internet is delivered to users, usually consumers or small businesses. Larger organisations will tend to have their own private network connections. Broadband delivery can be by copper fixed line, optical cable or wireless and has varying data speeds dependent upon the available technology. ⁽¹⁾

Business to Business (B2B) – Commercial transactions carried out between businesses.

Business to Consumer (B2C) – Commercial transactions carried out between businesses and consumers.

Business Process Outsourcing (BPO)– Outsourcing of specific business process such as payroll, accounts payable/receivable, and more complex areas such as human resources or industry specific processes. In the context of ICT, it is usually used to describe the outsourcing of processes where electronic communications methods are an fundamental element.

Cloud Computing – A type of computing, comparable to grid computing, that relies on sharing computing resources rather than having local servers or personal devices to deliver the “system”. ⁽¹⁾

End User – The final or ultimate user of a computer system. The end user is the individual who uses the product after it has been fully developed and marketed. The term can refer to an individual person or an organisation.

ERP Systems – Enterprise Resource Planning, it refers to a business management system that integrates all facets of the business, including planning, finance, manufacturing, sales, and marketing. As the ERP methodology has become more popular, software applications have emerged to help business managers implement ERP in business activities such as inventory control, order tracking, customer service, finance and human resources. ⁽¹⁾

ICT –Information and Communications Technology, is the study or business of developing and using technology to process information and aid communications. It encompasses computer hardware and software, computer services, network equipment and services, public and private fixed and mobile telecommunications and appropriate equipment and many aspects of semiconductor design and manufacture ⁽¹⁾

ICT Security –Refers to the protection of information and property from theft, corruption, or natural disaster, while allowing the information and property to remain accessible and productive to its intended users. It addresses the processes and methods used to protect valuable information from unauthorised publication, tampering or damage by unexpected events or actions by unauthorized activities or dishonest individuals.

IP – Intellectual Property, it is the “soft” property of organisations that is owned by them and over which they have property rights. Examples include software code, blue prints, processes, circuit designs.

IP Protocols – The network framework used to deliver Internet services.

Legacy Systems – In computing terms, the word legacy is used to describe outdated or obsolete technology. Legacy Systems are any system that is out of date but continues to be used, typically because it still functions for the users' needs, and is difficult or costly to replace.

Off-shoring – A term used when outsourcing is undertaken in a different country to that where the customer is located.

Open Systems – Generally considered to be technology that can be used interchangeably thus reducing the amount of technology lock-in to a particular supplier. Open systems usually are technically specified by a working group of companies or a body. As they are commonly owned they should be easier to integrate and lower cost than proprietary products.

Outsourcing – Refers to the seeking of resources outside of an organisational structure to complete a function necessary for some aspect of that business. It is usually undertaken to save money and/or exploit the skills of another entity. Typically used in terms of the business world, outsourcing often entails an enterprise using another company, such as a consultancy or application service provider, to provide a service that the enterprise can provide for itself, but which is cheaper or more effective if carried out by a third-party's resources. The term covers a wide range of services across the ICT industry, including Business Process Outsourcing (BPO). Examples include third party developing software, providing help desk support, hosting computer applications and data, developing applications, undertaking testing, and providing quality control.

Public Sector – Part of the state (government) that deals with the delivery of goods and services by and for the government, whether national, regional or local/municipal.

SaaS – Refers to the term Software as a Service and is where software is provided on a service basis, such as pay for use, rather than sold as a licence. SaaS is an industry trend as software providers look to add services. It is closely related to Cloud Computing as the network is used as the delivery mechanism.

Thin Client – A user device, usually a terminal or a pc, where the operating resources, such as memory, storage and processing, sit on the network rather than in the machine.

Web 3.0 – Sometime referred to as the Semantic Web, Web 3.0 is an evolving development of the World Wide Web in which the meaning (semantics) of information and services on the web is defined, making it possible for the web to understand and satisfy the requests of people and machines to use the web content. It derives from World Wide Web Consortium director Sir Tim Berners-Lee's vision of the Web as a universal medium for data, information, and knowledge exchange. It potentially unlocks a massive amount of information through the use of complex search requests: ⁽¹⁾

Main terminology sources from Wikipedia and Webopedia.

Executive Summary

This report aims to highlight opportunities for increased international business for Palestinian ICT companies based on the results of research carried out by Intellect, with support from Mercy Corps, PITA and IAESI, in addition to participation of nearly 200 Palestinian and Israeli companies. The research examines the intersection of Palestinian Information and Communication Technology (ICT) sector capabilities with demands for software outsourcing support by technology companies in the Middle East and North Africa (MENA) region. A specific focus is on outsourcing opportunities to Israel; more broadly the aim is to identify means for expanding the Palestinian ICT services export market to Europe and the US. The report includes recommendations on implementing this expansion, while bearing in mind the state of the world ICT marketplace, as well as the very real obstacles and challenges of the regional political situation which constrain or limit both the Palestinian and Israeli ability to establish business partnerships.

The research demonstrates that opportunity exists for Palestine to expand its ICT outsourcing services significantly through increased deal-flow from Israel and other countries around the world. Already, there are significant developments which are starting to overcome some of the key barriers to partnerships with Palestinian companies. These include initiatives by Intel, Cisco and others that are undertaking development projects in Palestine, managed by their Israel-based offices, as well as a number of Palestinian companies already working for customers in MENA, Europe and North America. A synopsis of some of these examples is provided in Appendix IV.

This report, and the programme of which it is a part, are components of Mercy Corps' knowledge-based economic development programme, which aims to promote focus within the Palestinian economy on technology and service sector expansion and employment. This focus is presented as an alternative to conventional thinking about Palestinian economic growth models that place more emphasis on agriculture, light manufacturing, textiles and other low skill sectors. The programme's assumption is that through growth of the ICT sector, with an emphasis on software and business process outsourcing, the overall Palestinian economy will become more insulated against often dramatic shocks that result from regional geopolitical instability.

The analysis from the research indicates some very positive areas that make Palestine a potentially strong outsourcing location: The reasons for this are:

- Labour costs in Palestine are extremely competitive against both the West and competitive with India and China;
- Software, ITO and BPO services are delivered through electronic communication, providing a borderless environment;
- Many Israeli companies are positive about outsourcing;
- Common technologies are used in both Palestine and Israel; and
- Location, language skills and cultural awareness of Israel, Europe, MENA and North America, is good compared to some competition.

There are also constraints that need to be recognised:

- The perception of chronic insecurity and instability of the West Bank and Gaza is the major constraint;
- The relative isolation of Palestinian companies has led to the industry needing to understand the up to date competitive climate;
- International standards are lacking, especially around process and quality management; and
- Structural issues are inhibiting growth:
 - Lack of capital to drive investment;
 - Limited commercial training and development of new employees; and
 - Lack of exposure and contacts in the world markets.

In order to exploit these opportunities, manage the constraints and to catalyze new business partnerships with international companies, the programme partners have generated the following recommendations for the Palestinian ICT industry:

1. Palestinian ICT companies, through organisations like the Palestinian Information Technology Association (PITA), need to clearly position themselves in the international market to leverage their relative cost advantages, technological capabilities, and other positive attributes. Marketing messages should be communicated at an industry level, and the Palestinian Outsourcing Website is a first stage in this process. Individual companies must do the same.
2. International commercial skills must be further developed within Palestinian companies, with a particular focus on marketing and sales. This not only involves training but close examination of market trends from which services can be developed and targeted at identified prospects.
3. The market mapping exercise completed as part of this project should be used to connect specific Israeli companies, which are predisposed to partnering with and outsourcing, to Palestinian counterparts.
4. Further development and improvement of technical quality and process accreditations must be undertaken, along the lines of the Palestine Enterprise Development assessment undertaken by David Ross in 2008. This will increase the attractiveness of companies to potential international customers.⁽³⁾
5. Palestinian ICT companies must leverage existing international projects through the publication of case studies and reference accounts in order to create a dialogue with management of prospective customers and partners. This includes “educating” prospects on the benefits of working with Palestinian companies through sales and marketing techniques.
6. Additionally, Palestinian companies should explore the opportunities of partnering with or sub-contracting to existing global outsourcing companies. This would be attractive to these

organisations as they can sub-contract appropriate activities, leaving them the opportunity to move up the value chain. Such opportunities would provide Palestinian companies with increased business and broader exposure to international quality standards and best practice business processes of these large organisations.

7. Palestinian companies must explore the opportunity of establishing sales and support centres in major international ICT development locations, supported by marketing and sales programmes. These may be shared centres, promoting the region and the opportunity for partnership with Palestinian companies, but more importantly, they would provide a channel to market for companies.
8. Palestinian ICT companies must support the development of the industry as whole and aid its evolution through appropriate support for a Palestinian ICT marketing initiative.
9. To support the expansion of Palestinian businesses, venture capital and funding mechanisms must be set-up with the aid of NGO's, banks, existing venture capital organisations and individuals.
10. The Palestinian Authority and companies need to ensure the education system addresses the technical needs of companies when educating engineering students as well as giving them a level of business understanding.
11. The Palestinian Authority needs to ensure the appropriate infrastructure is in place to support business growth. This includes issues such as telecommunications competition and legal frameworks.
12. Lastly, further work needs to be undertaken to identify the best market opportunities in the broader international markets and to develop plans to enable Palestinian companies to access these markets. The initial findings indicate that MENA, Western Europe and North America offer significant opportunities. These opportunities include Web development, mobile applications development, various aspects of ITO and BPO.

Overall, the successful development of Palestinian outsourcing business, enabled by working more closely with Israeli companies and developing broader geographical business, will be a significant benefit to the Palestinian economy. The foundation provided by outsourcing and the enactment of the recommendations described above will change the current shape of the Palestinian ICT industry by enabling the augmentation and evolution of larger companies. In addition, scaling-up will enable Palestinian companies to manage their way up the value chain over time.

A detailed view of the activities that need to take place is provided in figure 28.

1.0 Purpose of Report

1.1 Background

Mercy Corps was awarded a grant by the European Union in 2008 to implement an Information and Communications Technology Business Development Project (ICT BDP) through the Partnership for Peace funding instrument. The European Union investment in this project was supplemented by a project grant from the British Government Global Conflict Prevention Pool (GCPP) entitled, *Investing in Peace through ICT Business Cooperation and Capacity Building*. These two projects form the foundation for Mercy Corps' ICT BDP, which aims to catalyze the expansion of the Palestinian knowledge economy through strategic investment in the ICT sector.

Mercy Corps' Business Development Programme, of which this report is a part, has two primary aims: 1) to solidify market linkages between Palestinian, Israeli and European ICT businesses; and 2) to facilitate concrete business partnerships and technical capacity transfer from Israel and Europe to Palestinian ICT professionals and companies in support of the economic development in the West Bank and Gaza as a means for supporting future prospects for peace. Mercy Corps works with a broad base of local and international partners in the ICT BDP toward achievement of these objectives. Partner organizations include: the Palestinian Information Technology Association of Companies (PITA), the Israel Association of Electronics and Software Industries (IAESI), Intellect, and the Palestinian Information Communication Technology Incubator (PICTI).

Mercy Corps' ICT BD Programme aims at achieving the following specific results:

- Palestinian and Israeli ICT business partnerships, niche areas of cooperation and third party investment prospects are identified, promoted, and developed;
- Joint business opportunities highlight Palestinian-Israeli cross-border cooperation through linkages with private sector counterparts; and
- Opportunities for Palestinian business co-operation with other regions of the world, specifically MENA, Europe and North America, are explored.

This report provides data and analysis to contribute to those results. The main focus of the report is Palestinian companies in the West Bank companies, primarily because the security situation in Gaza remains serious and therefore not practical for business expansion. However ICT business does continue in Gaza, and a small number of Palestinian respondents to the market research came from that area.

1.2 Overview

The private sector remains one of the few venues where dialogue and cooperation between Israeli and Palestinian institutions is currently feasible. Despite complementary capacities, Palestinian and Israeli ICT companies lack sufficient data and facilitated networking opportunities to support initiation of profitable partnerships. In preparation for the full market mapping assessment, Mercy Corps spoke at length with both PITA and IAESI representatives about the challenges to cross border cooperation and with PITA about barriers for its members' full participation in the global ICT market. Both groups reported low levels of information about one another's markets and offerings. PITA reported that Israeli companies are not aware of the capacities of the Palestinian ICT sector, and Palestinian businesses are not aware of how to be responsive to the Israeli market in concrete terms.

Numerous policymakers and civil society actors worldwide have agreed that sustained Palestinian economic growth will be a critical prerequisite for any sustained push for peace between Israelis and Palestinians. The outsourcing market is not only interesting in its opportunities for cooperation between Palestinian and Israeli markets, but also to take advantage of a dynamic growing market worldwide. The ICT outsourcing sector showed robustness during the recession and is forecast to grow strongly in the future. For example, the European Information Technology Observatory (EITO) 2009 forecast for ICT services market worldwide is €485bn with a growth rate, even during the recession, of about 3%.⁽²⁾

Mercy Corps spoke with a number of Palestinian technology professionals representing ICT companies, and they reported three key factors that inhibit their ability to enter mutually beneficial partnerships with Israeli ICT companies:

- Limited data about complementary, niche ICT sub-sectors in Israel and direct relationships with Israeli corporations to facilitate partnership discussions;
- Limited ability to successfully package and market Palestinian ICT products and services through marketing strategies; and
- Limited opportunities for advanced technical and entrepreneurial skills training for young ICT professionals in addition to quality certification for Palestinian ICT companies.

The Israeli ICT sector is amongst the strongest in the world, but it has thus far only begun to take advantage of the potential opportunities for ICT business partnerships with Palestinian companies. These opportunities include the availability of proximate, low-cost, skilled labour, low employee attrition rates, as well as relative cultural similarity between Israelis and Palestinians. In addition to political and trade challenges stemming from security concerns, Israeli ICT leaders cite the following reasons for the low level of Israeli interest in ICT partnership with Palestinian companies:

- The view that previous partnership attempts failed due to gaps in advanced ICT and management skills among Palestinian companies;
- The insecurity in the West Bank and Gaza, concerns over confidence of Palestinian programmers in relation to security-sensitive content, and overall perceived risks of investing in Palestine under tense security conditions; and
- Lack of information about the strengths and capabilities offered by the Palestinian ICT sector, and the opportunity that it represents;

While the obstacles to bringing Palestinian and Israeli institutions together are admittedly great, Mercy Corps' research with its partners has highlighted a general predisposition of many companies on both sides to the establishment of cross-border partnerships, and has identified numerous possibilities for cooperation, which, if capitalized upon, will promote greater economic stability in Palestine and thus increase prospects for peace. For instance, while the West Bank may lack some comparative advantages in the ICT sector, it does share the same time zone, tax laws and internet providers with Israel, thus making it more competitive in these ways than more distant and more costly labour and knowledge pools such as India. The West Bank has a large number of unemployed ICT sector engineers, with, on average, 2,000 graduating annually, while the Israeli market has a

significant demand for skilled engineers. Moreover, the two societies have a history of continuing trade even during the most politically unstable times.

Within the overall ICT sector, the outsourcing market is divided into three areas: Information Technology Outsourcing (ITO), focussing on services that otherwise would be performed by an ICT unit of an organisation; Software Development and Management, the development or management of different aspects of software for another organisation; Business Process Outsourcing, (BPO), the outsourcing of an organisation's business processes encompassing Knowledge Process Outsourcing, outsourcing processes that require a higher level set of skills.

Analysing the overall market opportunities and findings from the research, the report concludes that software outsourcing and elements of the ITO and BPO markets are of specific interest for Palestinian ICT actors when considering commercial partnerships. The reasons for this are:

- Labour costs in Palestine are extremely competitive against Israeli (about 70% lower) and Western European and USA rates (about 75% lower) and competitive with labour costs from the traditional outsourcing countries such as India (about 25% lower) and China (similar costs);
- Software, ITO and BPO services are delivered through electronic communication, thus providing a borderless environment for the work to take place, and are not inhibited by restrictions on movement and access for people or physical products. Projects and interactions can be managed using electronic communications, thereby reducing the need for travel;
- Israeli companies show a high propensity to outsource elements of their software activities;
- The technology matching between Palestine and Israel is close, with development work taking place on similar software platforms using the same software languages; and
- Palestinian companies have the advantage of location, language skills and cultural awareness of Israel, Europe, MENA and North America, when compared with India and other parts of Asia. In particular, the proximity with Israel provides the added advantage of being able to meet and integrate with existing development teams, receiving firsthand training, and ensuring common working practices.

Partnership and outsourcing also faces some constraints that require mitigation, whether in terms of business partnerships with companies in Israel or other countries:

- The primary constraint is the perception of chronic insecurity and instability of the West Bank and Gaza. The recent conflict in Gaza has exacerbated the problem despite on-going stability of the West Bank;
- The relative isolation of Palestinians living in the West Bank and Gaza results in limited exposure to the competitive pressures of the rest of the world. This has left a legacy of companies not accustomed to high levels of competition that lack experienced people to sell outsourcing services on the world market and that lack contacts to build such business;

- The isolation has also meant that companies have lagged behind in meeting international standards and process accreditations, often required before a company will be considered for a contract; and
- Certain structural issues are limiting growth opportunities:
 - Lack of capital to drive investment into business development, sales and marketing, and communications, especially in developing and educating customers in the target markets, (Israel, Europe, MENA and North America);
 - Lack of capital to fund growth and the training and development of new employees to bring them up to revenue earning skill levels;
 - Lack of investment monies for equipment and for developing skills in emerging high value software skills;
 - Limited channels to market and sales capabilities in local export markets, including Israel, Europe MENA and West Coast USA.

The report explores these constraints, as well as the reasoning behind its recommendation that despite the challenges, partnership is still worth working toward and offers the potential for great rewards on all sides.

2.0 Methodology

2.1 Overview

This report is divided into four sections: Market Overview, Custom Research Results, Conclusions and Recommendations. Additionally, there is a mapping exercise that seeks to match Palestinian and Israeli ICT companies with one another based upon technical similarities; this exercise is not included in the report, but the relevant data is included in the research results.

The preparation of this report involved three phases of work that were linked closely to the overall mapping exercise. The first was the collection and analysis of published market data that was used to provide the market backdrop and insights into the three ICT market regions (MENA, Europe and North America). The second was the primary research stage, which included a number of sub-phases of qualitative research and web-based quantitative research in each country. The information was analysed and is included in the report. The resulting data was entered into a spreadsheet database to form the actual mapping information. The last stage comprised the analysis of all the available information and the formulation of conclusions and recommendations. Throughout the research and analysis periods, the market knowledge of both Intellect and Consulting and Interim Management Solutions, Ltd. (CIMS) were used to draw informed conclusions that would serve the overall aims of the project.

2.2 Market Data

The main source of market data and information for this report is the European Information Technology Observatory (EITO). In July 2009, EITO produced a detailed report⁽²⁾ which provides a view on the recession's impact on the global ICT market. Intellect is a preferred partner organisation of EITO, and in most cases the ICT market forecasts in this report have been extracted from that 2009 report, thus providing continuity throughout the document in terms of type and presentation of data. Where pertinent forecasts were not available for this report, and where additional information or market views were required, other data and information sources were used. Other sources include: AT Kearny, PITA, PICTI, Gartner, RNOS Industry Research Solutions, Business Monitor International, and KPMG.

The geographical regions investigated are MENA (with detailed analysis of Palestine and Israel), Europe and North America. These regions were selected in line with the objectives of the project and based on discussion with the Palestinian companies that identified these as markets with the highest potential. Subsequent research by CIMS confirmed this.

2.3 Custom Research

Consulting & Interim Management Solutions Ltd (CIMS) carried out the enclosed research on behalf of Intellect, the UK trade association for ICT and consumer electronics. CIMS conducted the research in two phases:

- *Phase one* looked at the Palestinian market with data collected from a quantitative study of companies operating in the ICT market and qualitative research undertaken during one-to-one meetings with senior management of 15 Palestinian companies. Additional meetings were held with PITA and PICTI personnel. The quantitative research utilized a web-based survey of PITA member ICT companies in both the West Bank and Gaza and yielded 45

complete responses. Qualitative research meetings were held in the West Bank between CIMS and senior management of major ICT organisations, along with video conferences with five Gaza-based companies. Additionally, CIMS held meetings with the Palestinian Authority minister responsible for the technology sector and business people of influence in both London and in Ramallah;

- *Phase two* was conducted primarily through a web-based survey of Israeli ICT companies. The company sample was provided by IAESI and supplemented by a number of Israeli companies outside of the IAESI sample. CIMS received and analysed 146 responses. Prior to the quantitative study a number of qualitative meetings were held to get a range of views on the industry and on prospects for Israeli-Palestinian business cooperation. These were conducted with industry experts, venture capitalists and other sector stakeholders.

2.3 Recommendations and Conclusions

CIMS analysed information gathered from multiple sources in consultation with Intellect and Mercy Corps. A SWOT analysis, (Strengths, Weaknesses, Opportunities and Threats) was applied to help draw conclusions on the following:

- The current state of the ICT market worldwide and the key trends which will influence outsourcing over the short to medium term;
- The current position of the Palestinian ICT market and the strengths and weaknesses of the industry to supply technology outsourcing services;
- The needs and opportunities presented by the Israeli ICT market for outsourcing in general and outsourcing to Palestine specifically; the activities that need to be undertaken to stimulate cooperation and mutually beneficial partnerships between Palestinian ICT organisations and their counterparts in Israel and abroad.

CIMS and Intellect then developed the recommendations by matching the current position of the Palestinian outsourcing capabilities to the goal of increased business with Israel, MENA, and Europe. The outputs of the SWOT were used to develop a set of recommendations for increasing cross-border partnerships and stimulating the growth of the Palestinian ICT sector.

Recommendations are directed toward various ICT sector stakeholders, including:

- Palestinian companies wishing to gain international business;
- Israeli and international organisations looking to outsource services;
- The Palestinian ICT industry representatives;
- The Palestinian National Authority; and
- Donors and Mercy Corps.

3.0 ICT Market Overview

3.1 Background

In today's ICT market, traditional sectors are blurring and becoming increasingly inter-dependent, impacting on nearly every area of the market. For instance, the growth of the Internet and IP networks is changing voice and data communications, delivery of software applications, sales and distribution channels and the provision of social networking tools. These changes are not only impacting on the technology itself, but on the way it is used and the reasons for its use.

These developments can move rapidly, creating social fashions that also transform business and marketing; Facebook and Twitter are two examples. Other, more complex and costly developments tend to take several years to become mainstream; "Cloud Computing" is likely to be a good example. It will take both the ICT industry and end users time to assimilate this model.

Given the significance of the Cloud Computing model for the use and delivery of ICT, more detail is provided below on this concept. Cloud Computing is the term given to a fundamental change in the way computing resources, applications and data will be accessed. A definition provided by National Institute of Standards and Technology (NIST) is: ⁽⁴⁾

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of seven essential characteristics, three delivery models, and four deployment models.

- **Delivery Models**
 - Software as a Service (SaaS)
 - Platform as a Service (PaaS)
 - Infrastructure as a Service (IaaS)
- **Deployment Models**
 - Private Cloud
 - Community Cloud
 - Public Cloud
 - Hybrid Cloud

In summary, Cloud Computing will result in resources residing on the network, whether hardware, software or services, with end users able to call on these resources as required on a pay-for-use basis. This has the potential to simplify many aspects of organisations' ICT systems, and to lower expenditure whilst changing the way ICT functions. These changes will lead to lower computing resources, new methods for paying for software and, potentially, an improved business focus to the provision of ICT.

Cloud computing is just one example of the constant changes in the ICT market that affect every aspect of use and production. These changes are contrasted by more established areas of the industry which are based on existing ICT systems and communications built around established

technologies and previous major investments. These tend to take a long time to change due to cost and need for business process change. Examples are traditional telephony, major Enterprise Resource Planning (ERP) systems and vertical specific applications; all have involved considerable sums of money having been spent on implementation. However, even these established areas need resources, management, development, and increasingly, integration with other newer areas of technology, all providing product and service opportunities that are mostly software based.

In summary, the ICT market continues to evolve and change, driven by factors such as technology development, the creation of new delivery models and changing needs of end user organisations. This creates continuing opportunities for companies in the market, driving new development requirements and therefore opportunities for outsourced services over the medium to long-term.

The next sections provide an overview of the ICT market world-wide and by key regions, and set out some of the major trends and developments that are expected in the medium term. This forms the basis from which business decisions can be made as to the market “sweet spots” and hence where investment is most likely to deliver the best returns. In particular, this information and analysis provides the Palestinian ICT industry with the information from which the individual companies can start to plan their focus and identifies potential opportunities for new companies to be created.

3.2 Market Performance

Overall, the worldwide ICT market has continued to show significant growth over the period 2002 to 2007. Since then, the 2008/9 global economic turmoil has clouded the picture and considerable changes in focus have taken place. Much of the change has been end user focus on cost reduction resulting in lower sales of equipment, cost pressure on software services and an overall reduction in project activity. However, forecasts for 2009 still show growth, if somewhat subdued.⁽²⁾

Table 1: World-wide ICT Market Size (€bn)

ICT Market World	2006	2007	2008	2009 Forecast	06/07	07/08	08/09 Forecast
Total ICT	2102.7	2244.5	2353.1	2437.1	6.7%	4.8%	3.6%
Total IT	862.1	918.1	960.2	984.3	6.5%	4.6%	2.5%
IT Equipment	281.0	295.6	306.0	310.5	5.2%	3.5%	1.5%
Software	160.7	172.9	182.8	189.0	7.6%	5.7%	3.4%
IT Services	420.5	449.6	471.4	484.7	6.9%	4.9%	2.8%
Total Telecom	1240.6	1326.4	1392.9	1452.8	6.9%	5.0%	4.7%
Telecom End User Equip	117.1	130.1	137.3	145.1	11.1%	5.5%	5.9%
Network Equip	121.4	127.2	132.5	135.3	4.8%	4.2%	2.0%
Carrier Services	1002.1	1069.0	1123.1	1172.4	6.7%	5.1%	4.4%

Figures shown here are in billions of Euros. (Source: EITO July 2009)

Overall, the market worldwide is forecast to grow by 3.6% from 2008 to 2009, but the individual growth rates across the major sectors differ. Telecommunications are holding up the best, driven by carrier services, which includes broadband and wireless services. Growth in both software and

services is forecast to slow, but still shows reasonable increases. Hidden in the figures are elements of regional shifting, with emerging markets growing faster, albeit from a lower base.

The relative market sizes of the main geographical regions are:

Table 2: Regional ICT Market Sizes (€bn)

	2008 Value	2008 % Split	Trend
Europe	748.5	31%	>
US	744.9	32%	>
Rest of world	859.7	37%	>>

Figures shown are in billions of Euros. (Source: EITO July 2009)

Europe holds the largest portion of the market for the sector, followed by the United States and then the rest of the world combined. This situation will change with the continued growth of China and India, which are included in the “rest of the world”.

The implications of this regional shift are that ICT companies will be:

- Looking for growth in these emerging areas, which includes MENA, opening up opportunities for services and software development;
- Exploiting the new technologies in established markets by attempting to move existing customers to new ICT technologies and business models, driving up the requirement for development and integration services and tools; and
- Seeking to reduce cost on both new developments and in the management of existing ones to try to protect margins and get the best returns on investments.

Overall, this means the software development market is set to continue to grow. Given the focus of most organisations on costs, delivery time and quality, it is highly likely the outsourcing element will also grow. With companies seeking to develop new products for mature markets and gain market share in growing ones, Palestine should be able to exploit this growth if it develops quickly and in the right direction.

3.3 Developments in the Market

Each of the market sectors has its own drivers for change, including sales demand, new and developing technologies, intermediation of technologies (such as the replacement of traditional land line calls with mobile and IP network calls) and the increasing demand for information. Each of these areas of growth presents market opportunities that should be closely observed by Palestinian ICT actors to guide skills training and positioning for outsourcing and capacity.

3.3.1 IT Equipment Market

Overall, the ICT equipment is a sector under pressure with the drive for cost reductions, which is creating the following changes:

- *Servers:* There is a current trend toward server consolidation, whereby increased server utilisation is reducing overall demand for new units. This trend is driven by cost savings and environmental issues, including the need to reduce power consumption and usage of space by increasing the utilisation of existing resources. New products are being introduced which

both aid consolidation and reduce energy usage to try to stimulate the market, such as virtualisation tools.

- *PCs and Laptops*: The recession has led to many organisations halting planned upgrade programs, making existing machines run for longer periods. This trend will diminish at some point, as organisations are forced into a new replacement cycle. Laptops have been under price pressure, especially in the consumer sector, and the previous premiums enjoyed may not return.
- *Data Storage*: This is the major growth area in equipment, driven by the relentless demand for more storage from both the business and consumer sectors on the back of increased business regulation and the expansion of the internet.

3.3.2 Software Market

The software market is undergoing a significant change, stimulated by factors including Internet Protocol, IP networks, Open Systems, SaaS delivery models and demand for business/ICT alignment, whereby ICT is targeted with supporting business improvement. The key trends are:

- *Commoditization*: Software markets are increasingly driven by Open Systems and the Internet. Taken together, these two commodities provide users with a lower cost base driven by both lower purchase costs and easier integration than in typical proprietary systems. This trend is driving new, low-cost providers into the market;
- *Intermediation*: Software is increasing its independence from hardware and software platforms resulting in increased interoperability, whereby systems can be integrated more easily to create more appropriate applications that replace the existing ones. This reduces costs, reduces the time to build or add to systems and makes applications more business friendly, it also creates opportunities for new services and software companies;
- *Collaboration and Mutualisation*: ICT is increasingly shared, whether from hosting and virtualisation services or through modularisation of software to create re-use. This reduces wastage in resources and makes software development quicker and cheaper as modules can be re-used many times. In the longer term, this trend should make software less costly, but in the medium term it is spawning new products and services that can deliver the collaboration and mutualisation;
- *Business Process Support*: One of the major challenges over the years has been to achieve alignment of IT systems with business needs. For instance, many organisations have a number of databases which, in an ideal world, would be integrated to provide a “one view” approach. End user organisations are continuing to demand that IT supports the business and the business processes, opening up opportunities for business process and integration services as well as business friendly applications; and
- *Internet-based Interfaces*: Software applications and even operating systems are increasingly provided through the Internet. Cloud Computing refers to this: the applications exist in the network, not on each computer as happens today. Another common term is Software as a Service (SaaS), where the software owner supplies the application through the network, usually the web, with a license that is “on demand”. This method of delivery will fundamentally change the way traditional software companies operate and will radically change their existing business models. One of the most well known companies operating in this way is Salesforce.com, delivering a full Customer Relationship Management (CRM) system on demand that is accessible at any approved computer. Once again, this provides opportunities in the area of new software and systems that will require development.

3.3.3 IT Services

IT Services are under pressure, though the market has grown consistently for many years. Services are often locked in and any changes take time to filter through the system. As they do, suppliers’

margins are likely to be put severely under pressure. These would include hardware maintenance, applications support, some elements of hosting and some elements of Help Desk.

However, many vendor companies seek to add services to their traditional businesses as these continue to commoditise. They see services as a way of retaining customers and increasing revenues. This move is underlined by some large acquisitions recently, such as the HP purchase of EDS Corporation and Dell's purchase of Perot Systems Corporation.

The main trends in services are:

- Continued pressure on supplier prices and margins, with the most pressure on the lower level services;
- Suppliers seeking to move up the value chain to supply higher value and margin services;
- Increased use of multi-contract services, choosing Best of Breed supply either by end users directly or by service providers;
- Further consolidation in the market; and
- Pressure on Business Process Outsourcing suppliers who face low prices, changes caused by innovation and lack of growth. Gartner, the analyst firm, expects one in four BPO suppliers to disappear by 2012.

Overall, these changes should be positive for Palestine as a low-cost delivery region, providing opportunities to work with both companies which are expanding their services coverage as well as those who are providing high quality, good value services to the traditional services companies.

3.3.4 Outsourcing

India remains the number one outsourcing location for ICT products and services, though outsourcing is undertaken in an ever increasing number of locations; a recent AT Kearny ranking of the top destinations for outsourcing puts the top three as India, China and Malaysia for outsourcing from elsewhere the world; the source of which are mainly US and Europe as these are the main areas outsourcing. ⁽⁵⁾

However, the A T Kearny index has identified recent changes. The economic crisis and the weakening of the US dollar have negatively impacted Central and Eastern European outsourcing, which were positioned as Western European outsourcing hubs. The joint impact of increasing local costs and strong currencies in these countries has caused them to have fallen off the index, underlining the fact that cost is still a huge factor. Southeast Asia scored well on the index as ideal outsourcing locations, as did MENA, with Egypt and Jordan making it into the top ten for the first time. Tunisia and Morocco also improved their position, built upon their large, well educated population in close proximity to Europe.

The A T Kearny report also points out that India is not only a competitor but also an enabler to industry growth in other regions as Indian companies increase their global footprint and help clients get multi-region support. As would be expected, Palestine does not feature in the A T Kearny index.

3.3.5 Telecommunications

Changes in telecommunications are being driven by the Internet and IP protocols. Traditional communications were based upon voice and data networks dominated by large companies, often in the public sector and built around large networks. IP networks have changed this by providing voice and data communications at a much lower cost especially where heavy security is not a fundamental issue.

3.3.6 Mobile Telecoms

The mobile phone market has changed over the last few years, handsets have developed and functionality added, perhaps most notably cameras. In the background, the Smartphone market has been emerging, bringing sophisticated data services and applications to the mobile handset. RIM Inc., with the Blackberry and Nokia, has been at the forefront. More recently, the market has been developing and broadening, especially to the consumer where the iPhone from Apple Inc. has gained a significant market share. New offerings are coming to market from Google, in the form of the Nexus phone, as well as from the traditional handset manufacturers who are seeking to re-gain market share in this lucrative space; these include Nokia, Sony Ericsson and Motorola.

Whilst the overall mobile phone handset market has shown its first decline ever during 2009, the Smartphone segment grew by 27% in the second quarter of 2009. Whilst the Smartphone represents a small overall share of the market, it is where important growth is being seen.⁽⁶⁾ For 2009 it is expected that Smartphone will account for about 12% market share. The market is expected to continue to grow, driven by both demand and more and more smart devices coming to market. A good case in point is the Apple iPhone which is now the number three brand in the market. Gartner are forecasting that Smartphone will account for 38% of the market by 2013.⁽⁷⁾

The Smartphone is significant in relation to the applications that it uses, and therefore the opportunities to develop these applications either as products or as part of an outsourcing strategy. Many applications are small and highly tailored to local market needs, offering opportunities at both the international and local levels. They sit on the handsets themselves or are accessed by the network or wireless broadband capabilities of the phone. In the emerging markets, simple handsets will continue to dominate as these markets continue to grow.

Details of the general market drivers in the ICT Industry are provided in Appendix 1.

3.4 Major Market Trends

Major market trends which will impact on the market for software and services are detailed in Figure 1 below.

Figure 1: Major Market Trends

Trend	Description
Trend 1	Software as a Service and Cloud Computing are forcing software providers into changing their business models. Revenues for these services come from usage and therefore the income profile moves from upfront licensing and yearly maintenance to a more irregular pay-for-use model. This will challenge software providers in many ways: new billing models, new support models, new R&D models, new upgrade and version control models.
Trend 2	The continued growth of the Internet in terms of its coverage, speed and sophistication. Broadband coverage is growing based on fixed line, cable and broadband wireless communications; speed is increasing leading to new services becoming viable and Web 2.0 has transformed the applications and services (transactional, social media, entertainment services, etc.); Web 3.0 could well do the same for information access.
Trend 3	End users drive to reduce cost of their ICT systems. The trend is a result of pressure on costs both in terms of cost reductions on existing process and ICT infrastructure as well as for new ICT investments.
Trend 4	New business models build around developing technology. These are impacting on both applications and delivery mechanisms. For instance, smart phones will continue to encroach on the PC space and thin clients will become more practical through web services. Google is a good example: Google has created a business out of other peoples' information and changed the media world in the process.
Trend 5	The public sector is looking to reduce cost or streamline services in order to save money as pressure rises on public sector borrowing, especially in the UK and USA. One way of doing this is to create more "joined up" systems, creating opportunities for new applications and services, whereby different elements of government are linked through ICT.
Trend 6	Growth in regulatory requirements is being driven by the current financial crisis, environmental regulations, legal changes, health and safety, employment law and other privacy and public interest considerations. ICT solutions are being used to manage these, driving systems and services.
Trend 7	There is an increased need for security of systems, both physical and electronic, protecting from physical harm, such as flood or acts of war, as well as information security to protect from viruses, fraud or IP theft.
Trend 8	Server consolidation and virtualisation, whereby organisations are reducing the number of servers and consolidating applications to increase utilisation of existing resources. Virtualisation covers a number of areas and essentially allows resources in the network to be used as a virtual form. For instance, memory does not need to sit on one server if it can be accessed from the network. This is both a cost saving method and very much a Green Initiative, utilising resources which are currently redundant.
Trend 9	Data Storage growth is driven by the increased need to analyse and keep data, advanced by regulation and expanded use of data analysis, as well as Internet applications driving more storage requirements.
Trend 10	Telecommunication is characterised by fixed line price reductions driven by competition and regulation. Operators therefore need to increase usage and compete against mobile operators.
Trend 11	Increase in the use of mobile applications and data across the wireless network driven by the growth of wireless broadband and Smartphone. This is being seen as a mix of applications for the Smartphone's as well as web applications built or modified for access on the Smartphone over broadband services. This trend could start to include mobile laptop applications as the growth of broadband wireless enabled products and appropriate charging mechanisms are developed.
Trend 12	Global sourcing growth, as the Indian outsourcing model has been emulated in many countries, creating both increased competition as well as new services. Two major services are: "Follow the Sun" services, where 24 hour development work is carried out in multiple locations around the globe; and right sourcing, the use of a network of outsourcing partners each having a particular required skill set.

4.0 IT Outsourcing/Business Process Outsourcing

4.1 Overview of Outsourcing

Outsourcing refers to organisations subcontracting certain service activities to a third-party company, something that companies have been doing for decades. ICT outsourcing is a term that appeared in the 1980's and over the last 20 years has grown into a massive market, dictated by organisations' commercial needs and fuelled by vastly improved methods of electronic communications allowing ICT services to be carried anywhere with network access.

The decision of whether to outsource or undertake a task in-house is often based upon a combination of considerations: achieving a lower production cost, making better use of available resources, focusing energy on an organisation's core competencies, or simply making more efficient use of labour, capital, information technology or land resources.

There are four basic types of technology for offshore outsourcing:⁽⁴⁾

- *ITO - Information Technology Outsourcing*: The hire of the services of another company to manage all or parts of the services that otherwise would be performed by an IT unit of the organisation.
- *SDM - Software Development and Management*: Commissioning the development or management of a software application to another organisation, usually a company that specializes in the development of this type of application.
- *BPO - Business Process Outsourcing*: The outsourcing of an organisation's business processes, which includes activities such as running call centres, processing insurance claims and human resources management. It uses ICT to enable the service in terms of applications, communication and information sharing.
- *KPO - Knowledge Process Outsourcing*: Outsourcing processes that require a higher specialised skill set such as reading X-Rays or performing investment research on stocks and bonds. KPO tends to be an extension of BPO and is the objective of many outsourcing suppliers as it provides more added value, therefore attracting better margins.

It should be noted that to some extent these terms are interchangeable depending upon the source.

4.2 Information Technology Outsourcing

ITO refers to circumstances in which an organisation buys in the services of a third party to manage all or parts of the functions usually rendered by the IT department of the company. This covers a wide range of services including:

- Server management and resourcing;
- Data management and security services;
- Network management;
- Desktop support and management; and
- Help desk services.

4.3 Software Development and Management Outsourcing

Software firms face competitive pressures to bring out new applications and services, to continually improve existing products and to reduce the cost of product management. As such, the pressures on software development departments are increasing. In order to alleviate the pressure, firms have to

either increase budgets or find ways to utilise the resources in a more productive way. Many organisations view outsourcing as a solution to increasing software development productivity and lowering the cost of software management.

The key drivers for outsourcing are emerging mass markets and availability of expertise in the field. In this context, the two most populous countries in the world, China and India, provide huge talent pools. Both countries produce over 200,000 engineers and science graduates each year. Moreover, both countries are low cost sourcing countries. Many other countries view the provisions of outsourcing services as a commercial proposition and are competing or trying to compete in the outsourcing market.

An important aspect of software development and management is software testing. Outsourcing this process allows software testing to be carried out by a separate group of people independent of the development group, thus gaining an unbiased view of functionality and robustness of a product.

Software testing is an essential phase of software development, but is definitely not the core activity of most companies. Outsourcing enables the company to concentrate on its core activities while external software testing experts handle the independent validation work. This offers many tangible business benefits, including: independent assessment leading to enhanced delivery confidence; reduced time to market; lower infrastructure investment; predictable software quality; de-risking of deadlines and increased time to focus on designing better solutions. Stress, performance and security testing are currently the most demanded types of software testing outsourcing.

4.4 Business Process and Knowledge Process Outsourcing

Business Process Outsourcing (BPO) is a form of outsourcing involving the contracting of the operations and responsibilities of specific business functions (or processes) to a third-party service provider. Originally, this was associated with manufacturing firms, such as Coca Cola, which outsourced large segments of its supply chain. In the contemporary context, it is primarily used to refer to the outsourcing of IT services.

BPO is typically broken down into two categories: 1) back office outsourcing, which includes internal business functions such as human resources or finance and accounting, and 2) front office outsourcing, which includes customer-related services such as contact centre services.

Offshore outsourcing refers to BPO that is contracted outside a company's country. BPO that is contracted to a company's neighbouring (or nearby) country is called near-shore outsourcing.

These outsourcing deals frequently involve multi-year contracts that can run into hundreds of millions of dollars. Often, the people performing the work internally for the client firm are transferred and become employees for the service provider. Dominant outsourcing service providers in the BPO fields (some of which also dominate the ICT outsourcing business) include US companies IBM, Accenture, and Hewitt Associates, as well as European and Asian companies Capgemini, Genpact, TCS, Wipro and Infosys.

Given the proximity of BPO to the information technology industry, it is also categorised as an information technology enabled service or ITES. Knowledge process outsourcing (KPO) and legal process outsourcing (LPO) are some of the sub-segments of the business process outsourcing industry.

4.5 Drivers for Outsourcing

When looking at determining whether to develop outsourcing services, companies need to identify customer motivations for seeking such services. The list below details the primary motivations, though each customer is likely to have a different set of motivations, and therefore selling such services requires a consultative approach and very detailed project management. Primary drivers for outsourcing include:⁽⁵⁾

- *Cost saving*: The lowering of the overall cost of the service to the business by accessing lower cost economies through outsourcing;
- *Focus on core business*: Using outsourcing of non-strategic functions of the business in order to put resources around the strategic parts;
- *Cost restructuring*: Balancing costs and expenditures, often moving fixed costs to variable ones;
- *Improve quality*: Achieve a step change in quality by contracting out the service with a new service level agreement;
- *Knowledge Access*: Access to intellectual property and wider experience and knowledge;
- *Access to expertise*: Access to a larger and a sustainable source of skills;
- *Capacity management*: Using the resources of an outsourcing organisation to manage capacity; and
- *Reduced time to market*: The acceleration of the development or production of a product through the additional capability brought by the supplier.

Therefore, it seems the drivers are in place for the growth of software development and management outsourcing. The main questions now are: which regions will be prominent in outsourcing, which regions are best placed to take up this demand and, importantly, what opportunities does this create for Palestine? The next section looks at the regions and draws conclusion on their direction, growth and trends.

5.0 Regional Reviews

The regional reviews focus on geographies that would seem to offer the best opportunities for the development of the Palestinian outsourcing services, namely MENA, (with a focus on Israel), Europe and North America.⁽²⁾

5.1 Regional Review – Europe

Europe is a large opportunity area for Palestine, given the cultural and physical proximity as well as the language skills available in Palestine. However, it is a fragmented market made up of countries that show significant differences, including:

- Well-established, mature countries in the West and fast developing countries in the East;
- Differing economics capacities, again along broadly west and east lines;
- Differing attitudes toward business and employment, impacting on the likelihood of outsourcing. For instance, the UK, Holland and Scandinavia are mature markets, whereas Germany and France are just emerging in terms of outsourcing and off-shoring; and
- The cost structure in Western Europe only allows for high value outsourcing to be carried out in country.

The market is large, but growth is slowing in the European Union countries, in contrast to the smaller but faster growing non-EU countries.

Table 3: European ICT Market Size (€bn)

	2006	2007	2008	2009	2010
EU					
ICT	629.4	651.2	665.2	658.1	663.0
IT	280.3	293.1	302.8	296.0	297.9
Telecom	349.1	358.4	362.0	362.0	365.6
Non EU					
ICT	69.9	75.8	86.4	93.3	98.2
IT	24.6	28.0	30.6	33.1	34.3
Telecom	32.1	36.1	42.5	46.9	50.5

Figures are shown in billions Euros (Source: EITO, July 2009)

The European IT market trends since the start of the recession in mid 2008, have been mixed, and include the following:

- Business to Business (B2B) equipment sales fell as organisations postponed new projects and planned upgrades, impacting on PC, computers and displays;
- Prices fell as manufactures needed to clear inventory and stimulate demand;
- Data Storage device sales have increased, in part driven by the demand for increased data storage capacity driven by regulatory requirements and by the continued growth of the Internet and its applications;

- Software is driving many aspects of IT systems in Europe, and virtualisation has been growing as organisations strive to reduce IT costs. Cloud Computing is becoming established in some sectors;
- The security market has remained strong as the numbers and types of threats increase and more confidential data is shared across networks: and
- The software tools market is likely to decline in the short-term, but will remain important in the medium term.

Areas of particular interest for Palestinian companies are:

- *Collaboration tools*: a fast-changing area with the application of Web 2.0, offering cost-effective alternatives to traditional software delivery models;
- *Data management*: growing as structured and unstructured data is merging in organisations to provide more detailed information;
- *Intelligence solutions*: providing a unified view of information, offering big benefits for customer organisations; and
- *Development tools*: strongly impacted by the Internet and open source models, especially in the Java world where the market is concentrating on Eclipse, the open source framework. In development environments, model-driven approaches still offer value and should generate growth.

The service sector divides into three areas, each with a different position:

1. *Hardware Maintenance*: In Western Europe this is generally under pressure as hardware becomes more reliable, outsourcing grows to reduce costs and virtualisation is implemented to reduce the number of computers. In Eastern Europe there is some growth driven by a still expanding hardware base;
2. *Project Services*: These have been severely negatively impacted by the recession, with many projects curtailed or postponed. New ERP roll-outs have been impacted, but consolidation of existing systems less so. Custom software is driven by maintenance and evolution, and integration projects are continuing, as they tend to deal with efficiency.

There are application areas that are still performing, such as Controlling/ Risk Management/ Performance Management/ BI (Business Intelligence), CRM (Customer Relationship Management) or Compliance, and a few topics like Consolidation even seem to take advantage of the crisis; and

3. *Outsourcing*: This is a growth area driven by cost reduction. Here existing contracts are being reviewed and re-negotiated to further reduce costs. New contracts take a minimum of six months to start to deliver results, and margins will undoubtedly be under pressure.

The ICT services market is somewhat fragmented, with the UK, Scandinavians and the Netherlands being the most mature. Both France and Germany are growing; France is mature in applications management, but not in traditional services outsourcing, whilst Germany is ahead on management services and out-tasking and well ahead of France on BPO. One of the main drivers is the strong Euro, which pushes the need to reduce costs to stay competitive.⁽¹⁰⁾

5.2 North America

North America is showing a lower rate of growth into 2009/10, compared to previous years, with IT spending slowing rapidly but telecommunications maintaining healthy growth. ^{(2) (11)}

Table 4: North American ICT Market Size (€bn)

	2006	2007	2008	2009	2010
ICT	651.1	681.7	713.3	744.9	766.3
IT	322.3	340.9	359.6	371.2	374.4
Telecom	328.7	341.8	353.6	373.7	391.8

Figures shown in billions Euros (Source: EITO, July 2009)

The US market is being shaped by a continued technology convergence and the commoditisation of products and services. ICT players are seeking greater scale and market coverage whilst looking to develop new business models for growth. Consolidation is highly likely across sectors, supporting the development of new business practices. Growth is forecast to take place, but the market maturity is dictating that the high margins of new technology products are increasingly harder to achieve. Scale is becoming more important, driving market share and growth. This includes acquisitions, though these are being curtailed by the current economic downturn. ⁽⁶⁾

The new disruptive technologies are emerging, such as Cloud Computing, helping new competitors into the markets and providing opportunities for disintermediation of existing technologies, whereby they are replaced by the new technologies. This is both allowing small companies to create niches and providing larger companies with the chance to dominate in new areas, such as Google attempting to do with its network-based operating system Chrome.

5.2.1 Information Technology

Consolidation continues in the US as margins continue to face pressure, a trend that has been present for some time and can be seen clearly in the PC industry. These margin pressures have resulted in some players moving out of markets, like IBM's sale of its troublesome PC business to China's Lenovo. This trend will impact on servers, particularly through the virtualisation drive.

Data storage will continue to grow in capacity terms, but evolving technology will keep prices and margins under pressure.

5.2.2 Software

In software, the US industry giants are seeking to expand, acquire and secure their customer bases as the industry business model starts to transform. Companies are looking to deepen the relationship with customers by providing vertical solutions to integrate through the business. These vertical solutions will help customers consolidate views of their business across the organisation; such solutions are in demand as business regulations, such as Sarbanes Oxley, take effect. This solution also helps lock customers into the supplier.

Convergence and consolidation are creating a major shift away from large-scale software solutions supported by high-margin integration and maintenance services to on-going maintenance and rationalisation of systems. Ultimately this will move to the SaaS model, giving customers more freedom to choose suppliers based on cost and usability.

5.2.3 Services

The service sector in the US remains an important area and one that players in the commoditised sectors of the market are looking to enter. The reasoning behind this is twofold: first, by being in a position to supply products and then provide the services as well, the customer is more locked in to the supplier, and the perceived wisdom is that the customer is more likely to buy again; second, it provides a new revenue stream and allows a supplier to increase its share of existing customer budgets whilst being in a position to offer service-only customers a wider portfolio of goods and services. However, service margins will remain under pressure in the US and commoditisation has long been in existence, especially at the lower end of the value chain.

5.2.4 Communications

Over the last 20 years there has been a communications revolution in the US. In the past, most electronic communications, be it voice or data, were made over fixed copper wires. Technology has developed rapidly, and now there are many methods of electronic communications. The fixed copper line is still important, but is being surpassed by fibre optic cable, IP technology, wireless network and satellite. These newer technologies tend to carry more data faster, and since communication is an enabler, this upgrade in speed has opened up opportunities for new services.

In the US market, fixed and mobile carriers are seeking scale in this fragmented market in order to cover next generation network investments and to benefit from fixed line and mobile service convergence. Scale is being sought by horizontal product and service portfolio enhancements; an example is the acquisition by Cisco of Tanberg, an electronic conferencing company. The increased use of Voice over IP (VOIP), along with the emergence of IPTV, will provide wire line operators an opportunity to gain ground against cable companies for the digital home. Mobile operators are evolving quickly as service adoption accelerates and the larger operators gain scale through acquisition. Voice is still the main driver of growth, though increased sophistication is driving growth in camera and Smartphones. These will provide opportunities for both application development and increased network usage.

5.3 Regional Review - Middle East and North Africa (MENA)

Increasingly the governments in the MENA region are supporting commercial development as part of their strategies to realign their economies away from oil dependence. For ICT the opening of telecommunications through privatisation and competition is having a positive effect. In the future, driving new businesses will create demand for most other areas of ICT, with significant growth expected around Internet and mobile communications penetration. The region is seen as a significant emerging growth area, making it attractive for new competition. An area of note is the growth of outsourcing services targeted primarily on Europe.

Many governments in the MENA region are positively influencing market reforms, with the main focus on liberalisation of the telecommunications network through privatisation and issuing licences for new providers, especially in the mobile and broadband spaces. These are impacting on the Internet as well as competitiveness in the mobile communications sector. Qatar, Egypt and Saudi Arabia are all examples of actual or planned liberalisation.

Personal computer penetration across the region on average is 5.95%, therefore providing significant opportunities for growth, though 2009 is likely to be subdued due to the slow economy. Growth will be driven by increased use of the Internet, which has increased to 57.4million users, a 28.3% penetration in 2009. ⁽¹⁴⁾

The expected growth in the region has raised the interest of the global ICT players. An example is SAP taking ownership of sales channels in the region, indicating the importance of the area for them as other markets mature. Indeed, many mainstream companies such as Cisco and Microsoft are moving into the region, but potentially facing some cultural and language issues.

Mobile phone usage has increased from 44 million in 2002 to 110 million in 2008. In some countries, penetration is already above 100%. ⁽⁷⁾ The growth of mobiles and the pressure on network prices, driven by increased competition, will lead to operators providing more data services, much like in the mature Western and Asian markets. These will require tailoring to the region driving new application development that reflects local language and culture.

6.0 Palestinian ICT Sector Findings and Capabilities

6.1 Palestinian Market

6.1.1 Market Overview

In the context of major markets, the Palestinian ICT sector is small, valued at about \$280m and accounting for about 5% of the Palestinian GDP. The forecast is for growth to \$307m by 2010. As of 2008, estimates of ICT exports were thought to account for about \$15m.⁽⁸⁾

The Palestinian political and security challenges have perpetuated a level of uncertainty despite ongoing efforts to facilitate a peace process. However, the West Bank is far more stable than Gaza and has provided the platform for a number of ICT companies that are doing well in the home market and expanding their export business.

The GDP per capita of Palestine is low in comparison to the rest of the Middle East, at \$1,289 per person, compared to Jordan at \$3,421 and Israel at \$28,365.⁽¹⁶⁾ Growth in the ICT sector could strongly affect an improvement and thus should be a priority for all parties interested in developing Palestine.

Despite the relatively small size of the industry, ICT is important within the Palestinian economy. The output value of a worker in ICT is an estimated at \$40k, against an average of \$17k. It is also estimated that the multiplier ratio is about 1 to 3, meaning that one new ICT job creates up to three other jobs in other sectors.⁽⁸⁾

Palestine is well ranked in ICT penetration in MENA: some 49% of households own a computer, 28.5% are connected to the Internet and 47.5% have a phone line. Internet usage is broad based with knowledge acquisition, education, communication and entertainment being the main uses.⁽⁹⁾ Home internet access is slightly more common in Gaza, with 31% of households having access compared to 27% in the West Bank.⁽¹⁰⁾

Mobile penetration is at 92.4% of households, meaning individual penetration will be lower, and therefore offering a market opportunity. When comparing West Bank and Gaza the penetration levels are very similar, with the West Bank a little higher on all counts.⁽⁹⁾ Increasing competition in the mobile network markets should help drive this number up, though low incomes will limit some peoples' ability to get access to the technology.

The telecommunications market has been opened through the privatisation of PalTel in 1996, though the organisation still has dominance over the market as the incumbent service provider. Several licences for new mobile phone networks have been issued. The first of these, Wataniya, launched its service on the 1st November 2009, much later than planned and with a lower bandwidth than agreed in the licence, due to limitations put in place by the Israeli military. If this issue with Israeli military communications can be resolved, the bandwidth should increase. A proviso on all Palestinian telecommunications is that much of the network infrastructure is largely reliant upon the Israelis.

There are an estimated 270 ICT companies present in Palestine covering all sectors of the ICT market. ⁽⁸⁾ This is quite a small number, reflecting the domestic nature of the market. These companies have been working largely in their home market, which has been led by public sector spending. This heavy public sector subsidy, coupled with the relative isolation of the West Bank and Gaza from trade opportunities, means that many of these companies are not accustomed to international competition. The major international players see MENA as a growth opportunity and competition will increase, although Palestine is unlikely to become a focal point in the short- to medium-term.

The Palestinian government has invested in education, both technical and in languages. There are 11 accredited universities teaching IT and delivering some 2,000 new ICT graduates to the market each year. This is more than the current market requires, resulting in both unemployment and a brain drain for the best candidates, but providing the potential for growth.

The pressure on employment does mean people tend to stay loyal to employers, and staff turnover is very low, with stiff competition for jobs in the best companies. This reliability gives companies continuity and allows the provision of consistent services without the massive training cost seen in some other outsourcing countries where staff turnover is higher.

The language skills and cultural position of Palestine means that Palestinian companies can easily look at Israel, MENA and Europe as potential markets, as well as North America.

6.1.2 Palestine Cost Advantage

A significant factor that makes Palestine attractive to potential partners outside of the region is cost. A typical senior software engineer in Palestine is charged out at between \$80-300 per day, with an average of \$172, according to this research. Using published data, the following cost comparisons can be made¹:

**Figure 2: International Cost Comparisons
(Based upon a software developer daily charge out rates)**

Country	Average Day Rate	Estimated Range
Palestine	\$172	\$80 - \$300
Israel	\$750	\$600 - \$1000
Jordan	\$167	
India	\$300	\$210 - \$420
China	\$180	\$100 - \$200
USA	\$850	\$700 - \$1000
South Africa	\$450	\$250 - \$600
United Kingdom	\$720	\$500- \$900
Ukraine	\$230	\$125 - \$280
Poland	\$260	\$170 - \$390

Based on comparative charge out rates, Palestinian companies offer a beneficial cost structure and with the good technical expertise very good value for money.

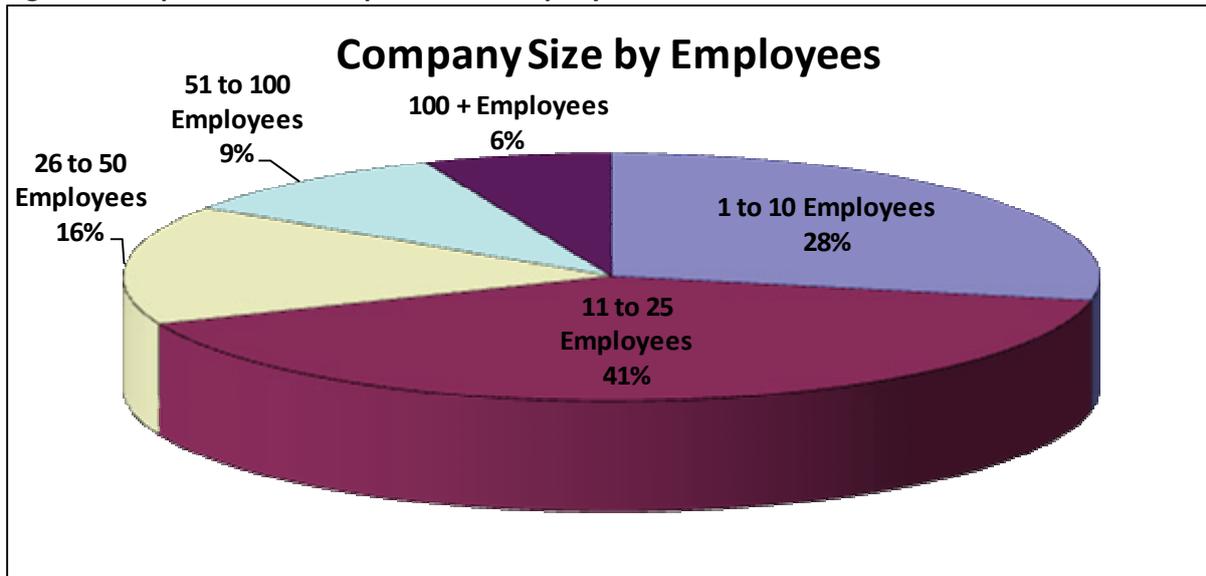
¹ Figures are estimates of day rates based upon primary research, information from government sources and salary information from www.payscale.com. Where average salaries were used they were multiplied by three to allow for employment costs and margin. Average working days a year were set at 215 for western countries and 240 for emerging countries.

6.2 Palestinian Primary Research Results

The research on the Palestinian ICT sector was carried out in the early part of 2009 using an on-line survey tool. Overall, 46 companies responded from both Gaza and the West Bank, the majority being from the latter location. This accounts for about 20% of companies in Palestine and a higher proportion of those in the West Bank; it also represents many of the larger organisations.

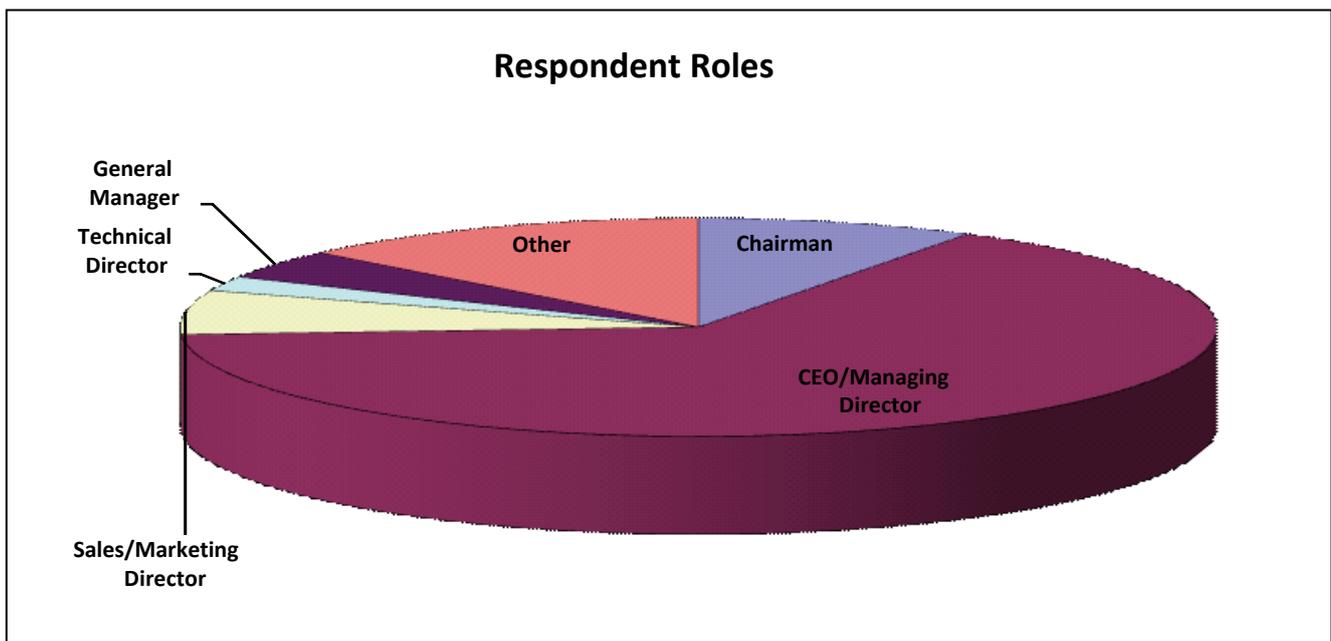
6.2.1 Respondents

Figure 3: Respondent make-up – size of company



The companies in question were mainly Small and Medium Enterprises (SME) with turnover of \$5m or less and employing no more than 25 people. A few larger organisations also participated.

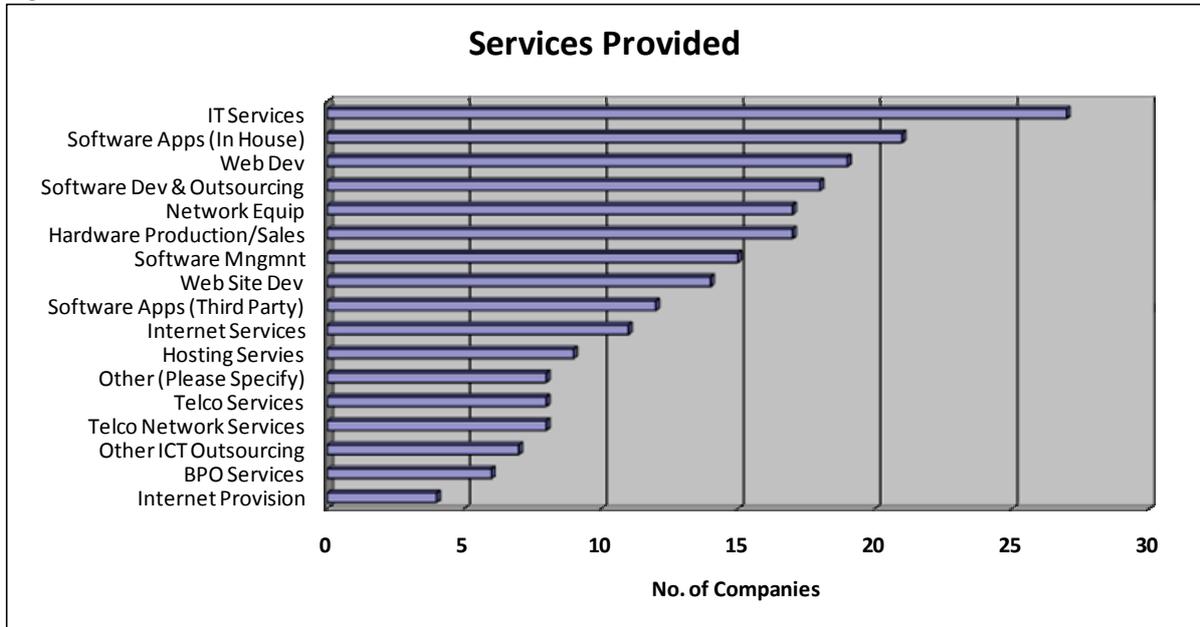
Figure 4: Respondent Roles



The majority of respondents were senior managers and thus reflect the views of people running the company. The companies worked primarily in Palestine and covered a wide range of vertical markets.

6.2.2 Skills and Resources

Figure 5: Services Undertaken



Most sectors of the ICT market were covered by existing Palestinian companies, with software applications and services by far the dominant areas. This is an important strength for Palestine, as software services are in demand and do not require the physical handling of goods, making border controls less intrusive to conducting business.

Key areas relating to outsourcing are well represented with services, software applications, software development and web development featuring strongly. Hardware experience would seem to refer mainly to distributorships, although there is a small amount of hardware development taking place in Palestine, mainly around semiconductor chip design and testing.

On the whole, telecommunication services did not feature strongly in the Palestinian market, possibly mirroring the structure of the overall market and the dominance of the PaTel Group. The market was only recently privatised and the incumbent supplier is still dominant and likely to remain so for some time. The mobile market is opening up slowly with the second operator coming on stream from the 1st November 2009 with an initial 40,000 subscribers.

6.2.3 Technology Capabilities

The Tiobe Company, a Swiss organisation specialising in measuring the quality of software publishes a monthly list of the most popular software languages used around the world. This provides a good base to understand how well the Palestinian software capabilities fits into the worldwide markets.⁽¹¹⁾

Comparing the top ten software language skills from the Tiobe list with those available in Palestine, (see Figures 6 & 7), the top 10 present a very close match, reflecting appropriate development of languages in Palestine. The only language not mentioned in the research is PHP, but this could be an oversight in the research list provided.

Figure 6: Tiobe List of Most Popular Software Used

Position Dec 2009	Position Dec 2008	Programming Language	Ratings Dec 2009	Delta Dec 2008
1	1	Java	17.061%	-2.31%
2	2	C	16.285%	+0.12%
3	4	PHP	9.770%	+0.29%
4	3	C++	9.175%	-1.72%
5	5	(Visual) Basic	7.778%	-1.70%
6	6	C#	6.258%	+1.61%
7	7	Python	5.185%	+0.62%
8	9	JavaScript	3.515%	+0.45%
9	8	Perl	2.692%	-0.91%
10	11	Ruby	2.653%	+0.34%
11	10	Delphi	2.301%	-0.75%
12	13	PL/SQL	1.494%	+0.35%
13	35	Objective-C	1.159%	+1.00%
14	14	SAS	0.911%	+0.07%
15	19	Lisp/Scheme	0.881%	+0.37%

Tiobe software Community Index December 2009 ²

The research conducted for this paper identified the key technology capabilities present in Palestinian companies and therefore available to the outsourcing market. The results showed that the most popular technologies were present in a wide range of organisations.

² ¹The ratings are calculated by counting hits of the most popular search engines. The search query that is used is "+<language> programming"

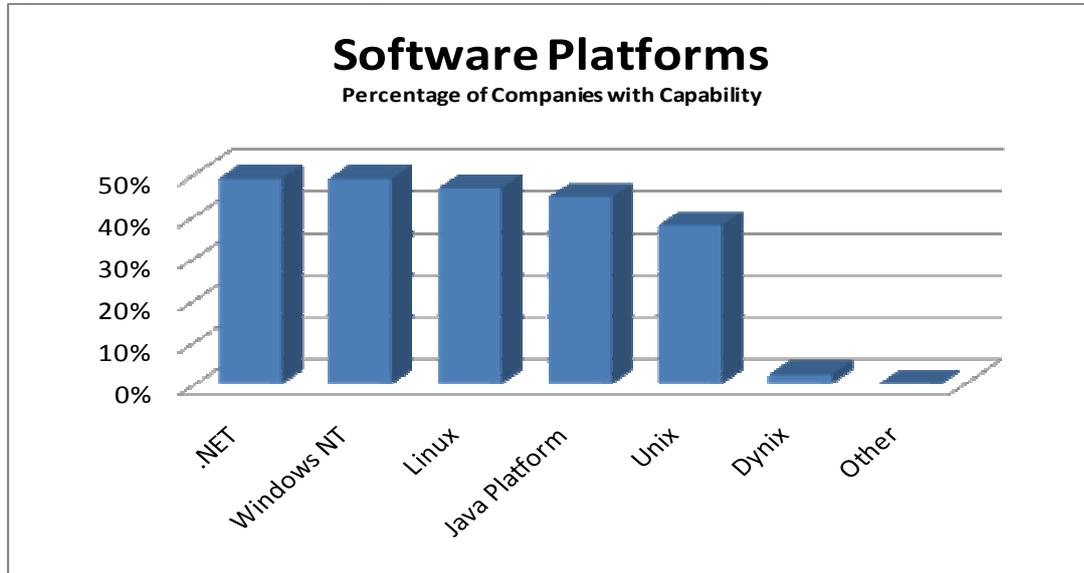
The search query is executed for the regular Google, Google Blogs, MSN, Yahoo!, Wikipedia and YouTube web search for the last 12 months. The web site Alexa.com has been used to determine the most popular search engines.

The number of hits determines the ratings of a language. The counted hits are normalized for each search engine for the first 50 languages. In other words, the first 50 languages together have a score of 100%. Let's define "hits50(SE)" as the sum of the number of hits for the first 50 languages for search engine SE and "hits(PL,SE)" as the number of hits for programming language PL for search engine SE. Possible false positives for a query are already filtered out in the definition of "hits(PL,SE)". This is done by using a manually determined confidence factor per query. A query such as "Basic programming" also returns pages that contain "Improve your basic programming skills in Java". The first 100 pages per search engine are checked for possible false positives and this is used to define the confidence factor. If this factor is 90%, then only 90% of the hits are used for "hits(PL,SE)". An overview of the confidence factor can be found in the groupings table below.

The ratings are calculated with the following formula: $((\text{hits(PL,SE1)}/\text{hits50(SE1)} + \dots + \text{hits(PL,SEn)}/\text{hits50(SEn)})/n$ where n is the number of search engines used. YouTube only counts for 7%, the other search engines 23% for each

Software Platforms

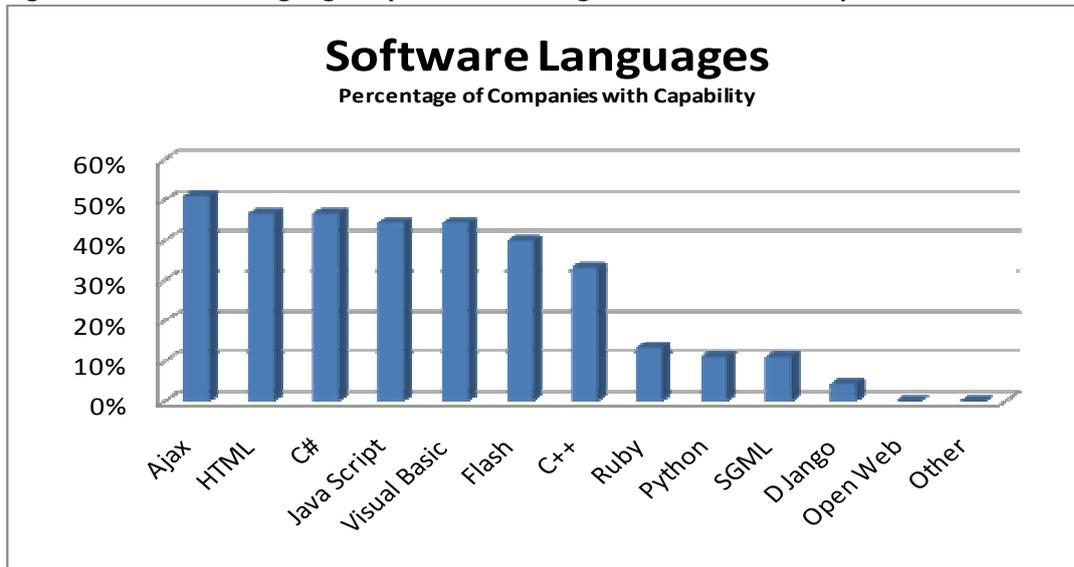
Figure 7: Software Platform Capabilities in Palestinian ICT Companies



The most prevalent platforms among Palestinian ICT companies were MS based, but both Java and Unix and Linux were well represented.

Software Languages

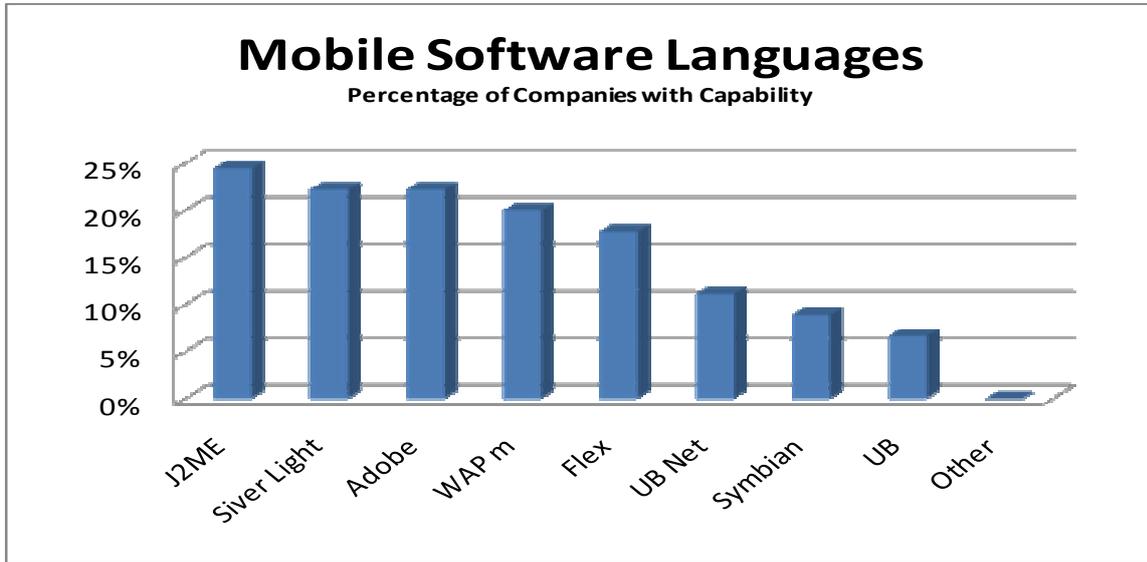
Figure 8: Software Language Capabilities among Palestinian ICT Companies



A wide range of software platforms were also present among Palestinian companies, again with a focus on Internet as well as other programming environments.

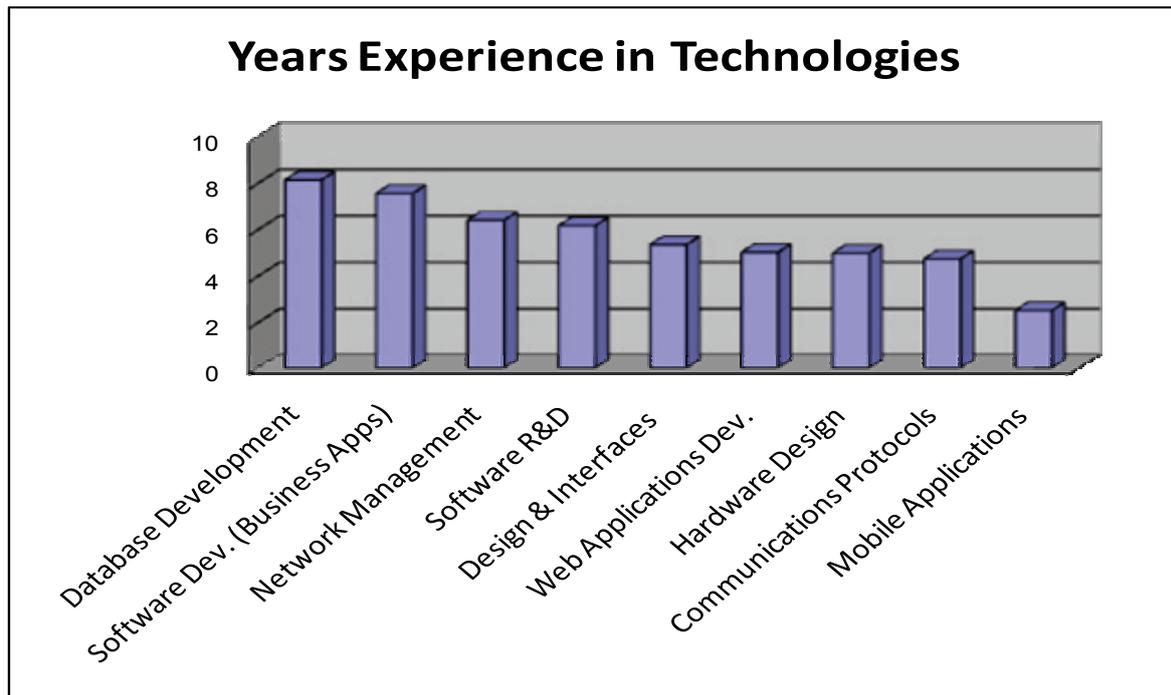
Mobile Platforms

Figure 9: Mobile Software Language Capabilities among Palestinian ICT Companies



The mobile phone languages and platforms present in Palestinian ICT companies are more fragmented, with the market still in relatively early stages of development (as compared to the Internet languages). Additionally, with the growth of Smartphones, traditionally web-based software development tools are becoming even stronger in the mobile phone space. Although not as well represented, there are considerable skills in the mobile area in Palestine.

Java, in the form of J2ME, is an important language in this area, and open systems in the form of Android are developing; based upon Linux, this operating system uses Java. Windows Mobile, Palm OS, Symbian OS and iPhone OS are other operating systems that support mobile application development.

Figure 10: Years of Experience in Technologies among Staff of Palestinian ICT Companies

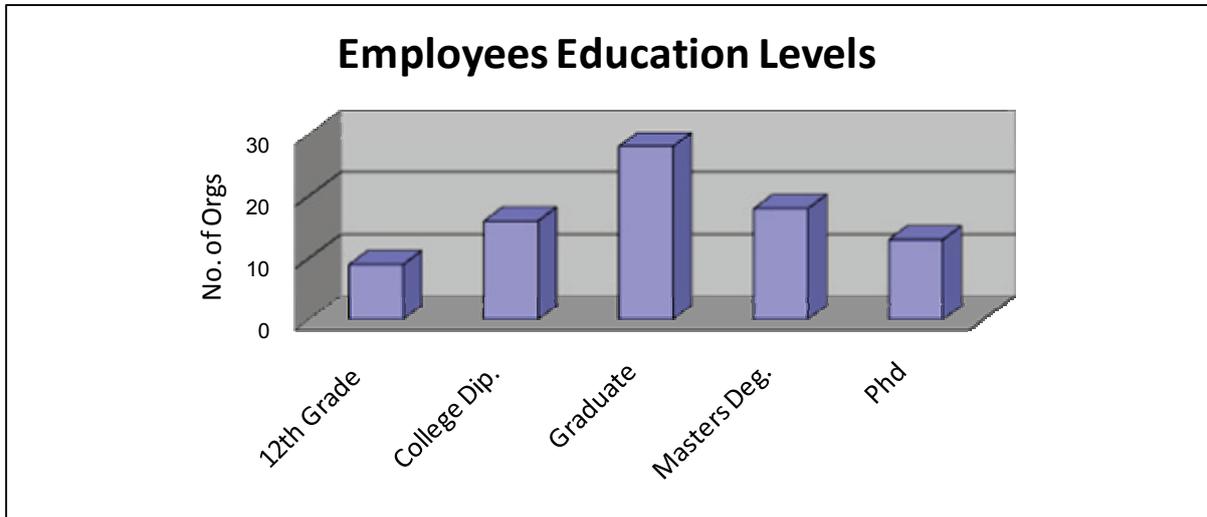
Many Palestinian companies that responded to the survey questions had years of experience in using the relevant technologies as well as demonstrating experience of the newer ones such as mobile applications.

An important element of remaining viable as a location for outsourcing is to ensure that the engineers keep up to date with new technologies. Palestinian companies that participated in the research reported the following expectations for skills trends:

- Software Development, Web Application Development and Network Services would remain important over the next few years;
- Managed Services, Mobile Applications and VOIP are expected to become more important over the next few years;
- Software support, database development and hardware technical support are expected to become less important.

Overall, these responses reflected recognition of changes in the market and a need to skill-up in these areas to meet market changes and develop opportunities for higher value service offerings.

Figure 11: Education Level of Employees in Palestinian ICT Companies

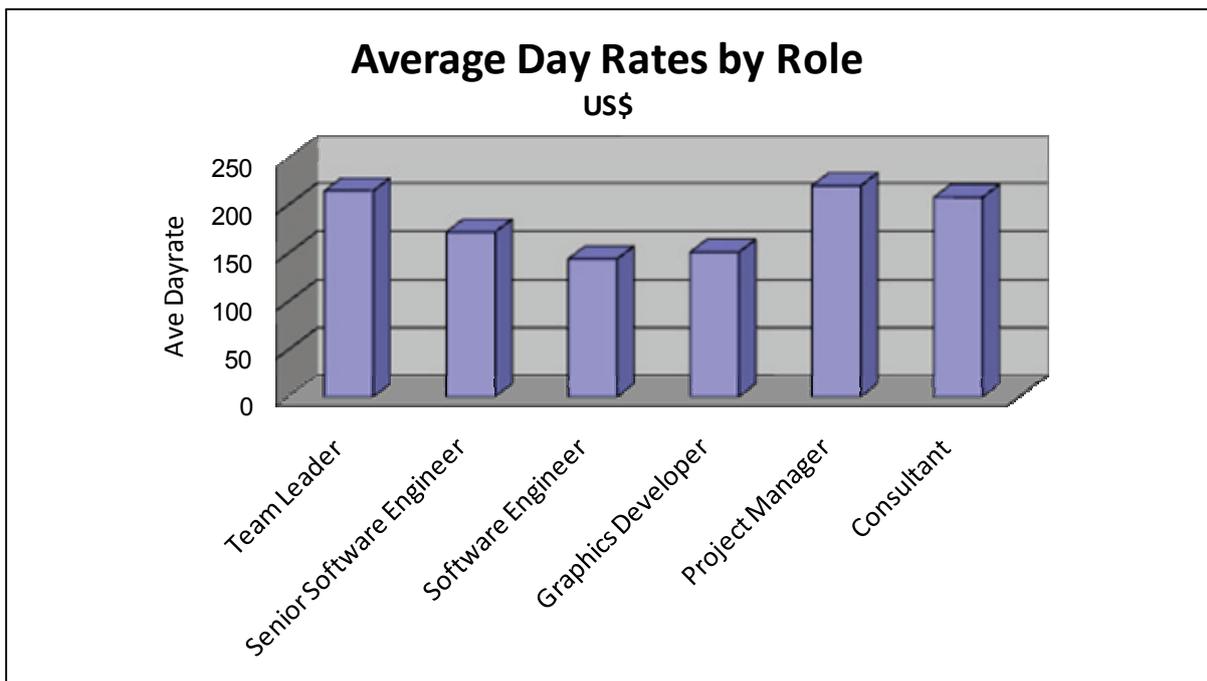


The educational level of staff is also important in an outsourcing environment. The research showed that staff composition in Palestinian companies reflects adequate education levels to meet the needs of this market.

Additionally, many of the senior managers have experience outside of Palestine, many in the USA, bringing important skills to their companies. As the industry grows, more home grown managers will be required.

6.2.4 Day Rate Profile

Figure 12: Average Day Rates by Operational Role in Palestinian ICT Companies



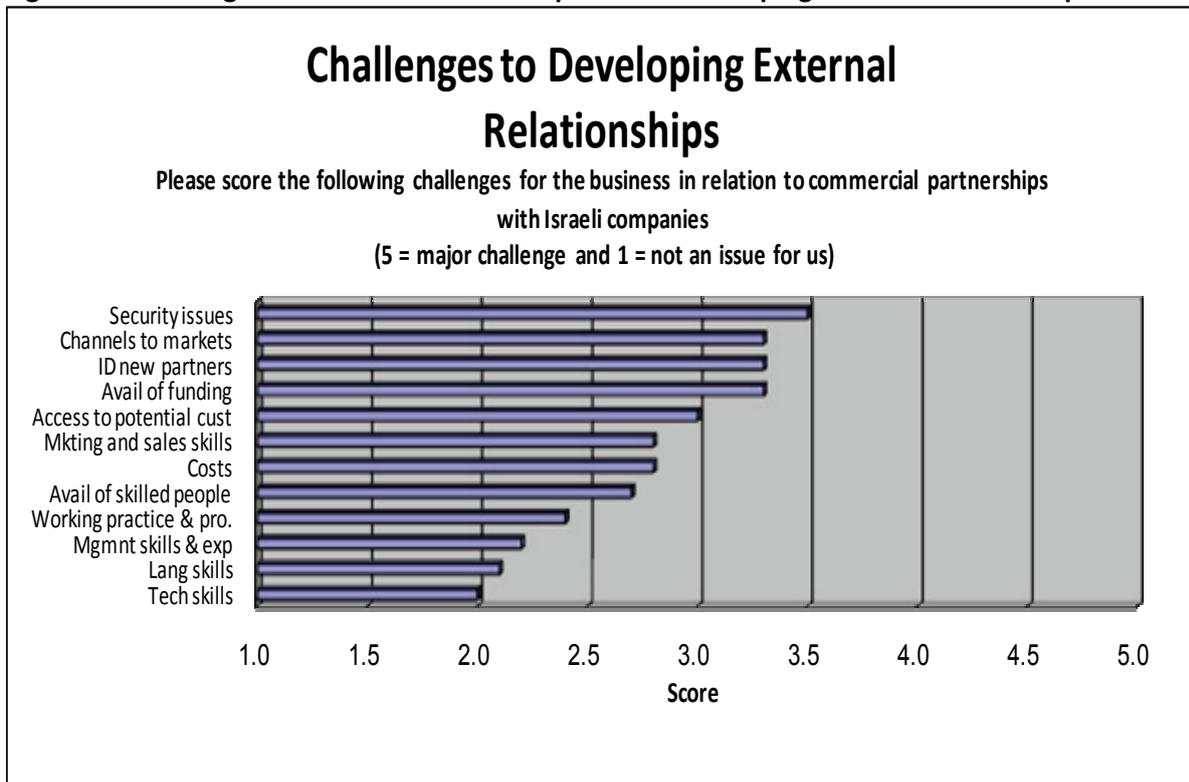
One of the key advantages for Palestine is the low cost environment. Individual company day rates ranged quite widely, but the averages indicate a strong competitive position. This is an attribute that Palestine needs to sell hard. However, Palestinian companies also needs to recognise that technical, business and project management skills will be the most important factor in customers’ final buying decisions, out-stripping the importance of low cost.

6.2.5 Relationships Outside of Palestine

A number of Palestinian companies have existing relationships outside of Palestine: some 32% are working with Israeli companies in a number of ways, and 50% have external relationships outside of Israel/Palestine. These include a variety of business relationships ranging from sales and installation of applications to service provision and distributorships. Palestinian companies must leverage these relationships and use them to build not only the individual businesses, but also to promote the Palestinian ICT industry.

6.2.6 Working Outside of Palestine

Figure 13: Challenges for Palestinian ICT Companies to Developing External Relationships



The research also set out to understand more about how the companies felt they were positioned to exploit opportunities outside of Palestine. Most recognised the challenges of providing “offshore” services, with the main concerns falling into three areas:

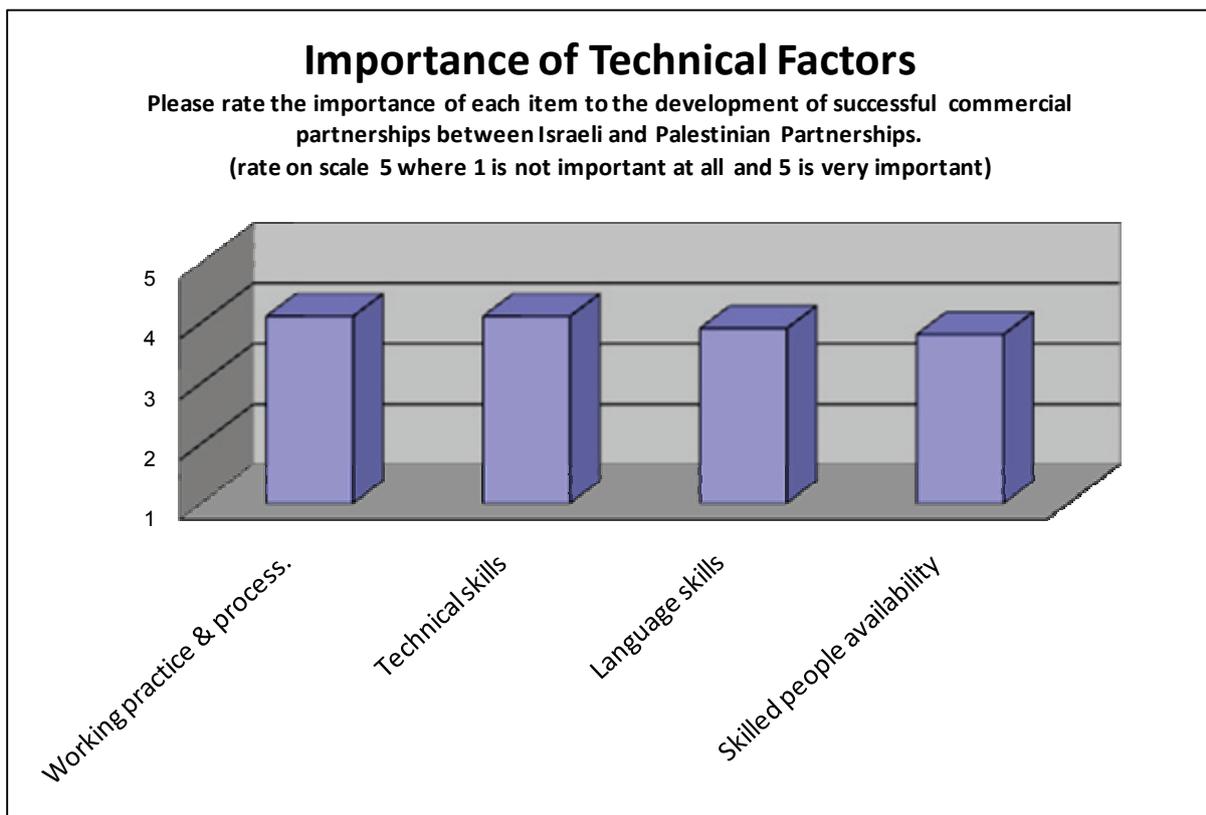
- *Security issues*: these relate to a number of factors, the first being the political situation in the region which gives cause for concern and could be seen to impact on continuity and security of services and data. The data and server security issue can be resolved by off-shoring the data storage and servers, if required. Additionally, there were concerns about the security situation making travel difficult, therefore impacting on business development.

- *Commercial issues:* The relative isolation of Palestine presents challenges in finding external partners or customers. Many of the successful companies that sell externally have built contacts whilst their management were located in other countries or have sales people who can travel easily. In addition, due to the nature of the Palestinian market, limited sales and marketing resources have been needed. Much of the business comes from the public sector where relationships and networks are most important.
- *Financial issues:* concern was expressed about the availability of risk and venture investment and working capital as Palestinian companies seek to grow.

Generally, the respondents were confident in the ability of their companies to meet these challenges.

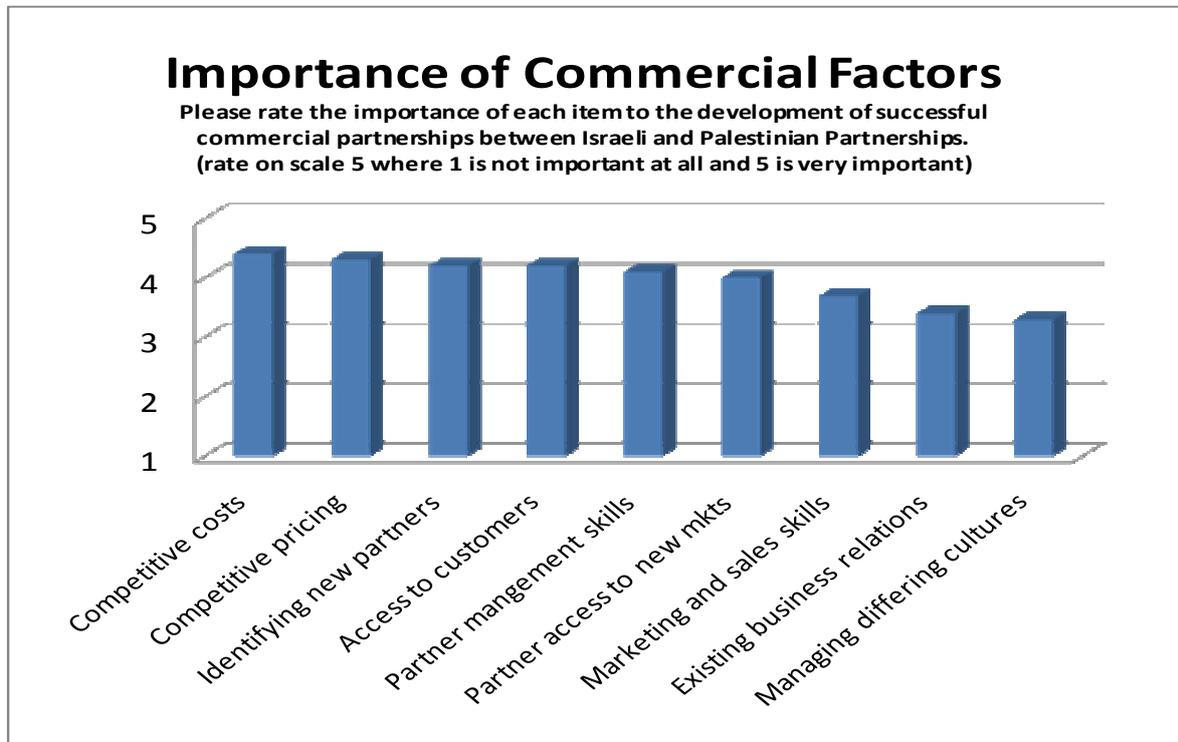
The research sought respondents’ opinions on the most important factors for developing relationships between Palestinian and Israeli companies. These were divided into three areas: technical factors, commercial factors, and infrastructure factors, as represented below.

Figure 14: Ranking - Technical Factors Influencing Palestinian-Israeli ICT Partnerships



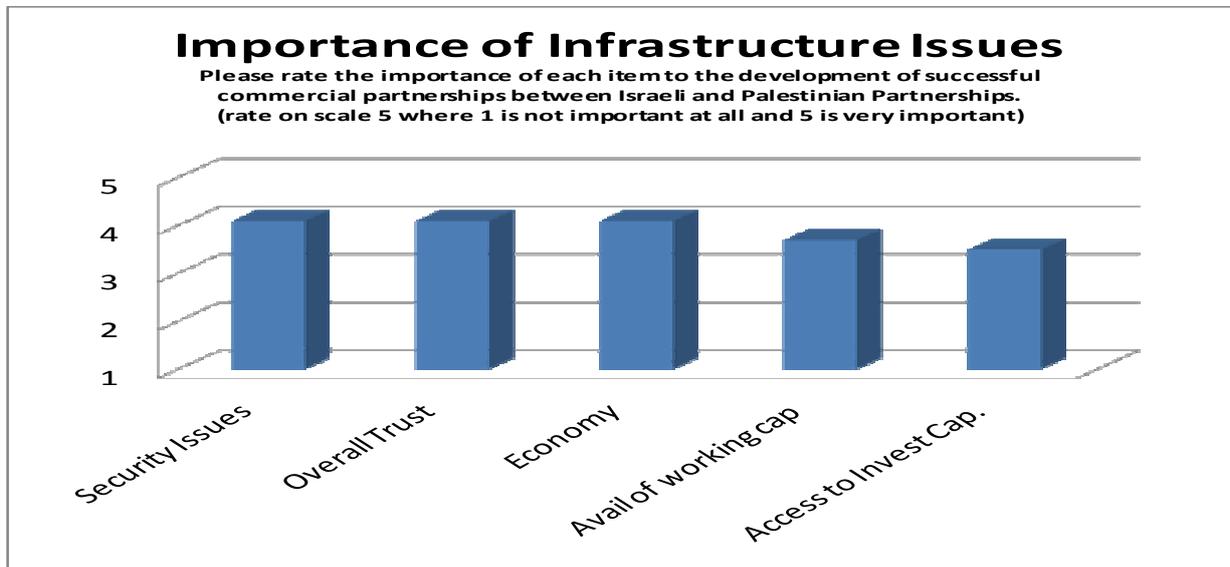
Technical: Working practices, availability of skilled people, technical skills and language skills all rated well above average in terms of importance to the development of commercial partnerships between Palestinian and Israeli companies. However the working practices, technical skills and the instances of quality processes was found by the Palestine Enterprise Development Project (David Ross May 2008) to need attention if the region was to meet its potential in the outsourcing market. Comments by Israeli companies, working with some Palestinian companies, indicated they had found a need for additional training to bring the existing technical knowledge up to the required standard.

Figure 15: Ranking - Commercial Factors Influencing Palestinian-Israeli ICT Partnerships



Commercial: Costs and pricing were seen as the most important, followed by access to customers, management skills and access to partners. These would seem to reflect a fair view of the issues and reflects an area where considerable work is required to further develop marketing, sales and commercial skills.

Figure 16: Ranking - Infrastructure Factors Influencing Palestinian-Israeli ICT Partnerships



Infrastructure: Security, trust and the strength of the overall economy rated well above average. These factors are not readily influenced by the industry, but work needs to take place with the Palestinian Authority government and the banks in Palestine to ensure the financial and legal infrastructure is in place for investment and growth.

6.2.7 Conclusions

Overall the research results were very positive for the Palestinian ICT market, demonstrating good coverage of software technology, supported by qualified employees and an education system designed to produce properly trained ICT personnel. Costs were confirmed as being competitive and management showed a sound understanding of the issues they face in trying to build business with Israel and other locations. Additionally, some companies were working for customers outside of Palestine and the qualitative research revealed some good examples. Some of these have been developed into short case studies and are detailed in Appendix IV.

6.3 Palestinian Outsourcing SWOT Analysis

The Palestinian ICT outsourcing SWOT analysis takes into account the overall issues raised by actors in the market, the research and overall market knowledge. The summary grid below is followed by a detailed discussion of the key SWOT factors.

Figure 17: Palestinian SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • Low cost base; • Wide range of software skills; • Cultural proximity to major markets for outsourcing; • Language skills; • Sector experience (especially for the MENA region); • Organisation stability; • Advanced education system; • Intellectual Property security. 	<ul style="list-style-type: none"> • Political situation in the region and the perceptions it produces; • Limited commercial experience and contacts in the international markets; • High infrastructure costs; • Limited scale of organisations; • Lack of sales channels; • Limited access to development capital; • Lack of investment into the market; • Lack of formal quality and project management processes; • Limited available skill range, e.g. limited numbers of project managers, team leaders; etc. • Lack of clear legal infrastructure with elements of international law as it relates to Palestine as yet needing further definition.
Opportunities	Threats
<ul style="list-style-type: none"> • The current economic climate, meaning organisations will look to find ways of reducing costs; • Developing experience in leading edge software technology; • Developing business in Israel; • Developing business in other locations; • Building partnerships and larger organisations; • Gaining technical and quality accreditations. 	<ul style="list-style-type: none"> • The economic climate in so far as it might be politically difficult to move work to lower cost areas; • Deteriorating political situation; • Competition from other regions; • Lack of support for required infrastructure developments; • Departure of critical skill sets due to greater opportunity elsewhere (i.e., “brain drain”).

6.3.1 Strengths

The ICT Service strengths are seen as follows:

- *Low cost base*: The low cost base is one of the major strengths that must be highlighted in order to position Palestine internationally, whilst also ensuring good margins and adequate surpluses to re-invest into the businesses. However, cost alone will not ensure the

development of the Palestinian ICT outsourcing industry; value for money is the overall requirement, which means that the expertise and quality issues have to support the low cost base;

- *Wide range of software skills:* The range of necessary software skills includes both existing, popular languages along with evidence of development into emerging areas. The skills base and education programme is building a potentially strong workforce, but practical real experience will be important to international credibility;
- *Cultural proximity to Western Europe, Middle East and North America:* This potentially reduces management costs for customers. Proximity in this sense includes location, language and cultural understanding; these are advantages that some other, better known outsourcing regions do not always deliver;
- *Language skills:* Palestinian companies have a number of options on the markets as a result of their range of language skills in Arabic, Hebrew and English. These can be used to work directly in Europe and the US, or to interface between Western and Middle East countries, particularly in localisation services;
- *Sector expertise:* Though much of the available sector expertise is related to the Palestinian market, this is useful experience and could be valuable when working in other MENA countries, especially where it addresses Arabic culture and law;
- *Organisational stability:* Stability, which refers primarily to low rates of staff turnover, is highly important to outsourcing customers. This factor reduces the amount of management resources required and keeps costs low due to limited re-training and re-orientation costs. This is an important advantage for companies to exploit;
- *Advanced education system:* The Palestinian education system is providing a reasonable flow of new graduates of a good standard, which is important as companies need to scale-up the size of their businesses. With continued business success, this flow will need to increase;
- *Intellectual Property security:* This type of security is a major consideration for many companies outsourcing to India, China and other locations. A service that minimises the risk will be well received in the market, especially on R&D projects. The culture and staff continuity present in Palestine supports this position.

6.3.2 Weaknesses

The ICT Service weaknesses in Palestine are:

- *Political challenges:* The recent history has created a poor perception of the region, and hence at best it is seen by much of the world as medium- to high-risk. This has left the West Bank and Gaza isolated and unattractive to outside companies, and has also allowed the local businesses to enjoy a market that has not been subjected to the commercial challenges of international competition. An example would be the use of proprietary software applications: in other countries, local applications have been surpassed by major international software brands like Oracle and SAP. Palestinian companies need to understand the international markets and build their commercial strength as well as ensuring they meet international standards for quality and

process. They must also work together to dispel the views that Palestine is not a stable or reliable business environment;

- *Infrastructure issues:* These include the cost of telecommunications, the opening up of the telecommunications market and the sensible easing of the financial system to make it easier to obtain venture capital, investment loans and overdrafts for working capital. The Palestinian Authority needs to consider setting up political initiatives to aid structural development of the ICT sector, while also working with the banks to build a climate that is both sensible and encourages business growth and investment;
- *Organisational scale:* The number of people employed in many companies is small, dictating the types of projects for which they can compete. To compete for larger projects, Palestinian companies will need to increase in scale. The limited scale of the overall population is also likely to inhibit the development of BPO in the short term. This is a function of the size of the local population related to need for manpower in typical low value-add BPO services. Specialisation in a few value-add areas of BPO would make it easier for Palestinian companies to build an international reputation and scale. Additionally, encouraging companies to co-operate and run joint projects will help deliver scale to prospective customers;
- *Investment:* The Palestinians have not had the investment required for market development and business development to be considered as a recognised outsourcing location. A mixture of good marketing, strong sales and demonstrable experience must be developed and communicated to the market;
- *Sales channels:* These channels are currently limited, and the successful firms often have management with good connections rather than formal sales strategies. Palestinian companies need to work together to develop formal channels to their chosen target markets;
- *Formal quality and project management processes:* As originally noted in 2008 by the PED Project (David Ross), these processes are lacking. To be credible in the medium-term, Palestinian companies must address this issue. Certain skill sets need development, mainly relating to people and project management, and will need to be attended to if serious growth is to be achieved. Typically these have to be addressed by individual companies, though the education system could provide some useful knowledge to students which would help the companies implement; and
- *Financial and Legal Infrastructure:* The banking system in Palestine is not set-up to support growth in companies. The legal structure of the West Bank (and Gaza) must be brought up to international standards to help enable trade and reduce risk for customers, an issue being addressed by the National Economic Dialogue Program NEDP III since 2008 (www.nedp.ps), a Palestinian programme.

6.3.3 Opportunities

The factors that are creating opportunities for growth in the Palestinian ICT market are widespread and include:

- *Economic climate:* With organisations looking to reduce costs but minimise impact on on-going business and development projects, low cost outsourcing is likely to prove attractive. With the current cost structure, Palestine is well placed to exploit this demand;

- *Leading edge of software development:* Organisations should consider developing sound technical skills in emerging technologies where resources are sought after. This has implications for the education system, job experience and training for new graduates;
- *Working with Israeli companies:* the research has indicated a strong propensity for numerous Israeli ICT companies to outsource various elements of their development, product testing and services to an outside provider. Palestine needs to communicate the capabilities and benefits to Israeli companies.

From a technical viewpoint, there is significant common ground in terms of technologies used in Israel and the Palestinian capabilities. Various meetings with Israeli companies who were partnering with Palestinian companies indicated that the ramp-up process was the same as any other outsourcing deal, but there was also an underlying motivation to make the relationship work, primarily for business reasons but also social ones.

As with all business relationships, partnerships between Israeli and Palestinian companies must make commercial sense and provide a sound return on investment, or they will not be sustainable. As an industry, the service sector of the Palestinian ICT market will need further development, building on existing experience. There are good companies that are very capable of competing on the international stage, but building scale will be important in order for the region to be recognised for outsourcing;

- *Building business in other geographies:* Palestine needs to look outside Israel to build its market presence and take potential opportunities in other geographies. The growth of the MENA region provides a major opportunity, both in localisation services and development/management services. European outsourcing demand will grow for specialist services, and Palestine should be well placed to respond to demand. Partnering with larger outsourcing companies would be a good route to gaining experience and getting access to markets; and
- *Build company scale:* To allow Palestine to address larger opportunities there is an opportunity to create larger organisations that enjoy the benefit of scale and can take on large scale projects.

6.3.4 Threats

Although limited in number, the threats to Palestinian ICT market growth are significant:

- *The current economic climate:* despite the need to find external resources, some companies that are reducing their headcount may find it difficult to immediately hire outsourced people, even on a project basis. There is pressure on budgets, leaving fewer opportunities in the market and fierce competition;
- *Slow peace process:* should the peace process continue to move slowly, or the political situation in Palestine or its immediate neighbours deteriorate, it will be more difficult to convince companies to risk putting projects in the region; and
- *Competition:* other countries have a head start in providing software outsourcing services and will fight to maintain their positions in the market. The positive, however, is that Palestine will be of little threat to the big market players and with effort could become an ally.

7.1 The Israeli Market

7.1.1 Market Overview

Table 5: Israeli ICT Market Size (US \$m)

	2007	2008	2013	GAGR
IT Hardware	1,680	1,850	2,500	6%
Software	255	309	433	7%
IT Services	1,400	1,540	2,340	8.6%

Business Monitor 2008/2009 Regional Reports \$millions

Within the MENA region, Israel is the most developed ICT market. It has suffered a slowdown during 2008/9, driven by rising unemployment and lower consumer and enterprise confidence, but is forecast to recover reasonably quickly. Venture capital investments are down, as are technology company mergers and initial public offerings (IPOs). Typically these are buoyant in the Israeli ICT market, driven by the leading edge technology approach taken in the country. Between the years 2006 – 2008, there was an annual average of 86 mergers, acquisitions or IPOs relating to Israeli companies, rating as one of the largest in the world. The market is estimated to grow to \$5.4bn by 2013, a Compound Average Growth Rate (CAGR) of 6%.⁽¹²⁾

There are a number of fundamentals which support the Israeli market:⁽¹³⁾

- *Low PC penetration in relation to other Western countries*, running at about 30% currently, offering opportunities for growth. The Israeli government is looking to stimulate this area as part of its socio-economic policy;
- *High Internet penetration relative to the rest of the region*. In 2007, Israel was estimated to have about 59% penetration of Internet users (about 4.3m), broadband was around 20.8% (1.5m accounts). The government has announced its intention to grow this significantly, especially to the poorer social groups where penetration is much lower. This increase is driving the retail sector and interest in multimedia and mobile computing services;
- *The size and strength of the government sector*. Some 50% of Israeli IT spending is accounted for by government and defence spending. This includes a number of e-government initiatives, including healthcare systems, court systems, ERP systems and identity cards.

Despite a number of large ICT organisations, the market is predominantly made up of Small and Medium Enterprises (SMEs) where software spending is increasing. Spending on enterprise solutions has grown since 2007, particularly around security, CRM and business intelligence.

The fastest growing sector is IT services. Whilst this sector is expected to have slowed in 2009, government and defence spending is expected to soften the impact. Additionally, Israel is developing as an IT outsourcing location with its strong technology skills, linguistic skills and lower labour costs compared to Western countries.

The telecommunications market is well positioned for expansion. Internet and broadband are well developed, but there is still room for growth, while the Israeli telecommunications infrastructure is liberal, comprising four operators. The wireless telephone market is mature, with a strong adoption

of value-added and 3G services. Mobile penetration is high, at over 120%, so growth is limited but provides opportunities for mobile applications.

There are number of factors that could impact on the future, especially in the mobile market. The negatives include issues such as interconnection tariffs, number portability and an overall hostility to Mobile Virtual Network Operators (MVNOs). The positives include the impact of the privatisation of Bezeq in 2005, which has opened up the market, creating a strong competitive environment. Several companies now have the opportunity to provide triple play offerings, (Voice/Internet/Entertainment services), leveraging the high Internet penetration.

7.1.2 The Competitive Landscape

Israel's leading IT services reported continued growth in 2008; Ness recorded a top-line growth of 18.7%, to revenues of US\$664.8m; Matrix had a good year and recorded revenues in excess of ILS1.3bn. (About 1/2 billion US\$), as reported by each company's annual accounts.

In 2008, SAP bought out its sales and distribution channel from Ness Corporation, as it has with Arabia's software licenses in an attempt to get closer to its customer in the region and expand its market share. IBM Global Services announced in 2008 that it was establishing a new systems and technology group in Israel, whilst Dell Corporation is setting up a new Research and Development and Business Centre in Jerusalem. CISCO Corporation and Intel Corporation also have development operations in the country.

7.1.3 Conclusions

The Israeli market is competitive and therefore will need to continue to drive costs down, especially telecoms and services sectors. Companies will also need to keep offering new applications and services quickly to remain competitive, though innovation and leading edge technology are already strengths of the Israeli ICT industry. Large international players are influencing the software market, as they are in the rest of MENA. This influence is expected to impact on local software providers over time, especially those in the legacy space. Currently IT services growth is coming from outside of the region, mainly from Europe and North America.

7.2 Israeli Primary Research Results

7.2.1 Background

During the spring/summer of 2009, CIMS undertook a study of the software usage and requirements of Israeli companies using an on-line research methodology. The master list of respondents was compiled from a number of sources including IAESI members, contacts in venture capital companies and contacts made in the region by Mercy Corps. A total of 146 replies were received, with 126 fully usable responses.

Specifically, the research set-out to achieve the following objectives:

- To understand the key software technologies being used in Israeli software and service companies;
- To gain an understanding of companies' propensity to outsource elements of their software development;

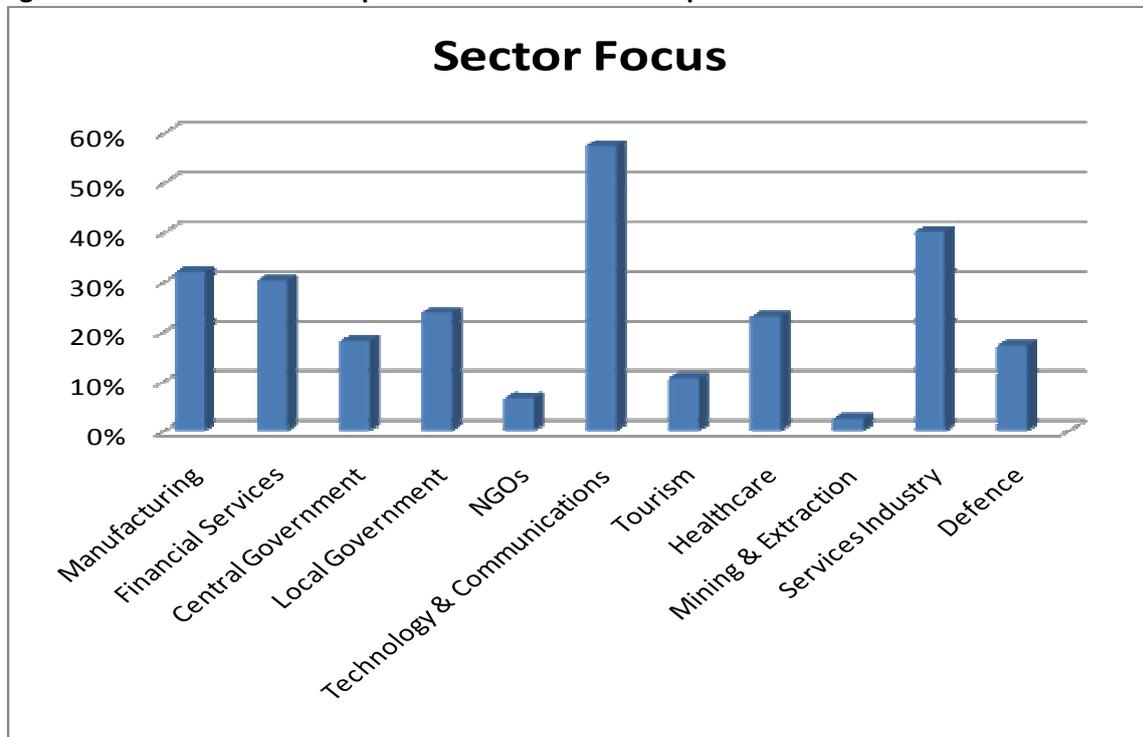
- To gain an understanding of the required attributes of potential outsource supplier;
- To gain an understanding of their experience and views of outsourcing to Palestine.

7.2.2 Respondents

Respondents came primarily from small to mid-sized companies; 75% came from organisations with 25 employees or less, with companies with over 100 employees represented by 11% of the sample. This mix reflects the source of the sample and the general make-up of the Israeli ICT sector demographics.

The managerial level of respondents was excellent, with 80% being Chairman or CEOs, followed by sales and marketing directors at 9%. This level of respondent supports confidence that the research results reflect senior management opinion.

Figure 18: Sector Focus of Respondents from Israeli Companies



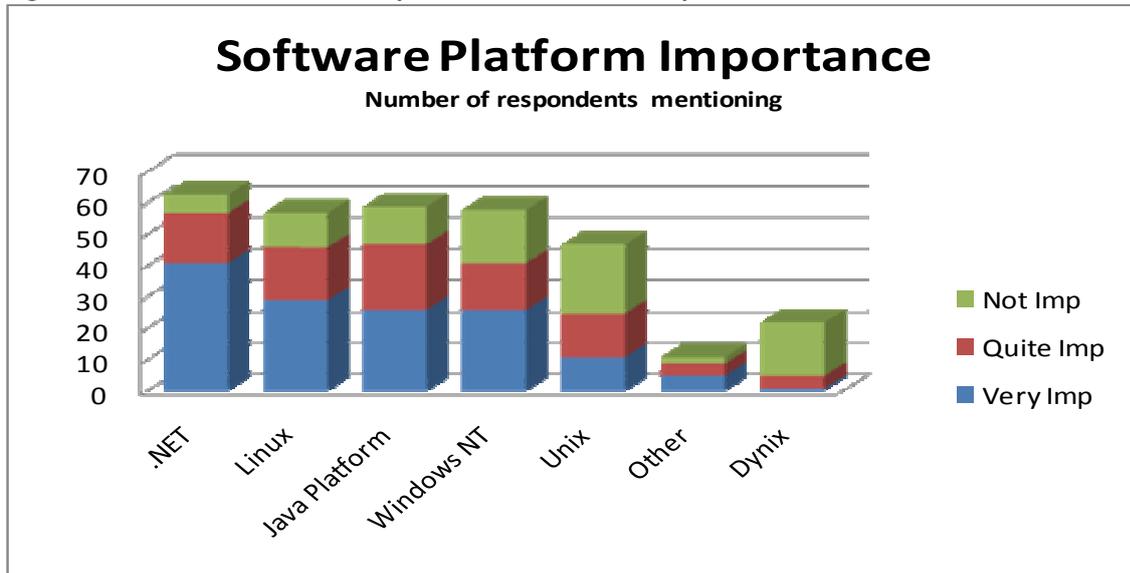
The respondents represented a wide range of business sectors (see Figure 18), with the highest in the ICT sector, reflecting the structure of the sample. Although defence is a large sector in the region, it accounted for only less than 20% of respondents. It is suspected that some of the ICT products and services ended up in the defence industry higher up in the supply chain, in other words embedded into defence products by other companies.

7.2.3 Technology

The research included three broad groupings for software: platforms, languages for computing, and web development and languages for mobile devices. However, it must be noted that although platforms and languages tend to be focussed on specific areas, many are now transgressing boundaries, such as the use of Linux on laptops. Additionally, several companies were using specialist programming tools for electronics and silicon chip design.

Computer Software Platforms

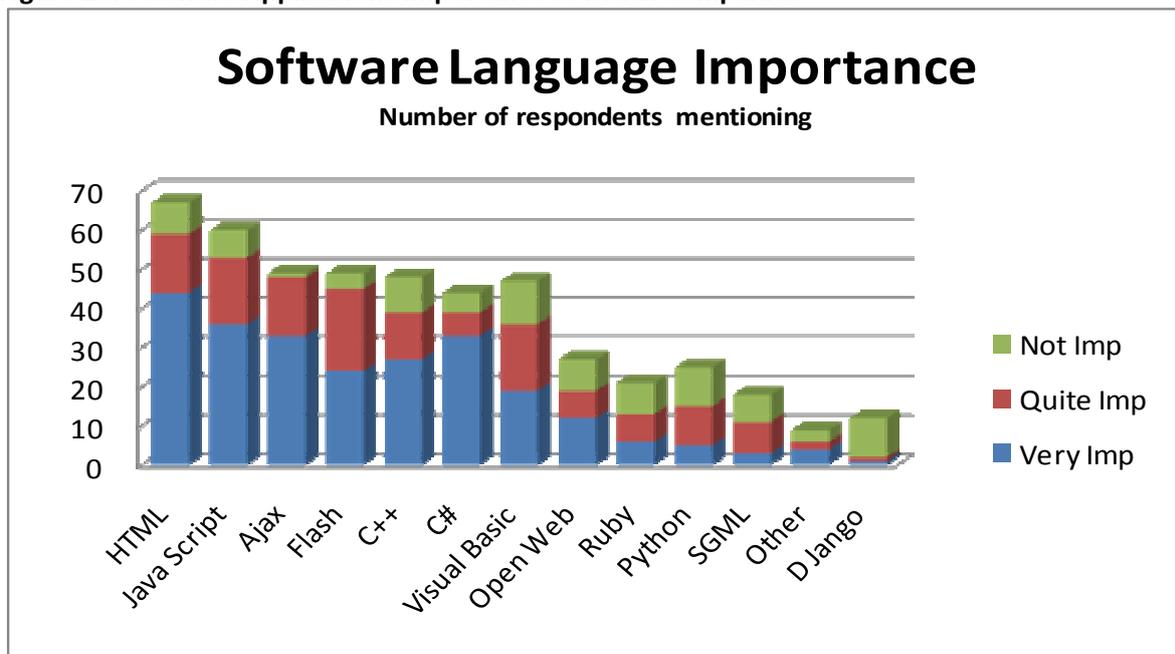
Figure 19: Software Platform Importance to Israeli Companies



It is critical to the project to understand which software platforms were seen as being important to the respondents companies (see Figure 19). Overall Web-based platforms came out as most important, particularly .NET, Java and Windows NT. This reflects the types of applications currently being developed and maintained in Israel at the moment. Linux was also important and may become more so as this operating system is extending to other hardware platforms due to some of the functionality and boot-up capabilities

Application Languages

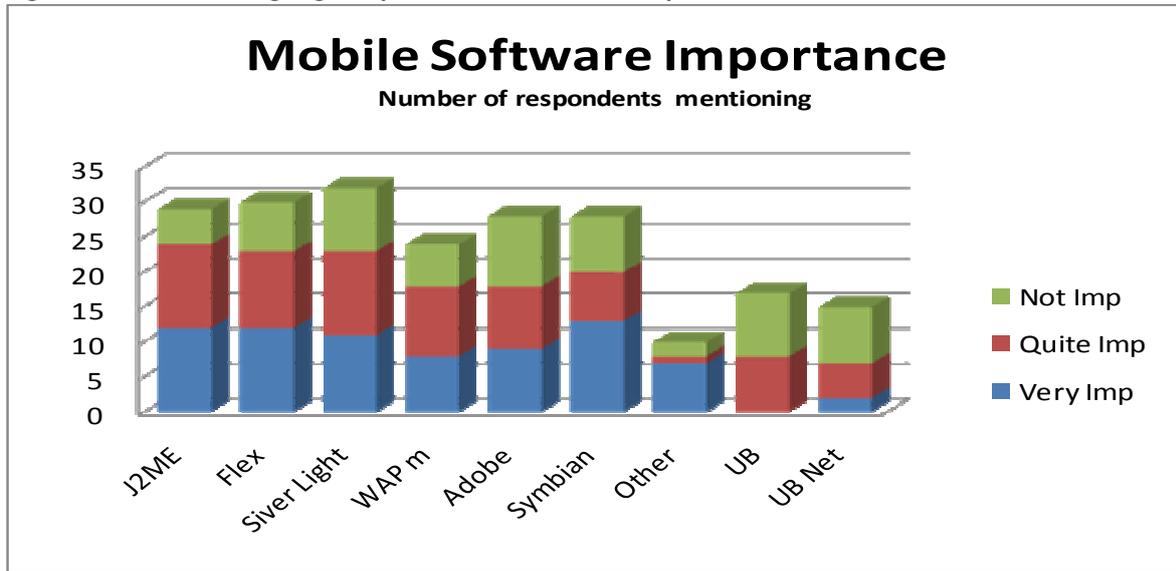
Figure 20: Software Applications Importance to Israeli Companies



Software applications languages ranking (Figure 20) showed a focus on Web-based and Web-enabled applications; HTML, Java, Flash C++ and Visual Basic are all important.

Mobile Languages

Figure 21: Mobile Language Importance to Israeli Companies



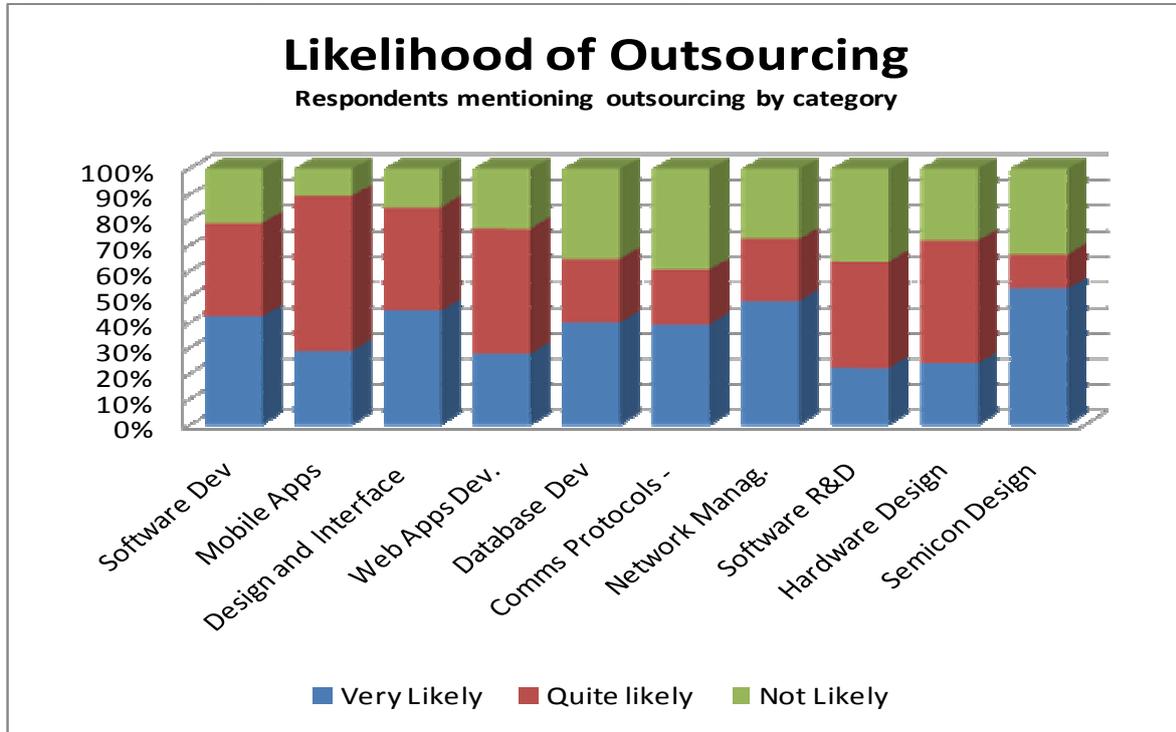
The demand for mobile applications could well be driven by the rise in the number of Smartphones and the network operators need to expand network usage to drive revenues. Applications might be simple ones such as games, fairly complex applications built into the handset, Web-based applications and specially adapted websites. In the Middle East this is likely to be a growth area given the penetration of mobile phone and the logical move to higher value higher margin networks.

Mentioned by far fewer respondents than traditional computer technologies, the mobile programming languages were still important when considering the technologies used by Israeli companies.

7.2.5 Views on Outsourcing

Likelihood of Outsourcing

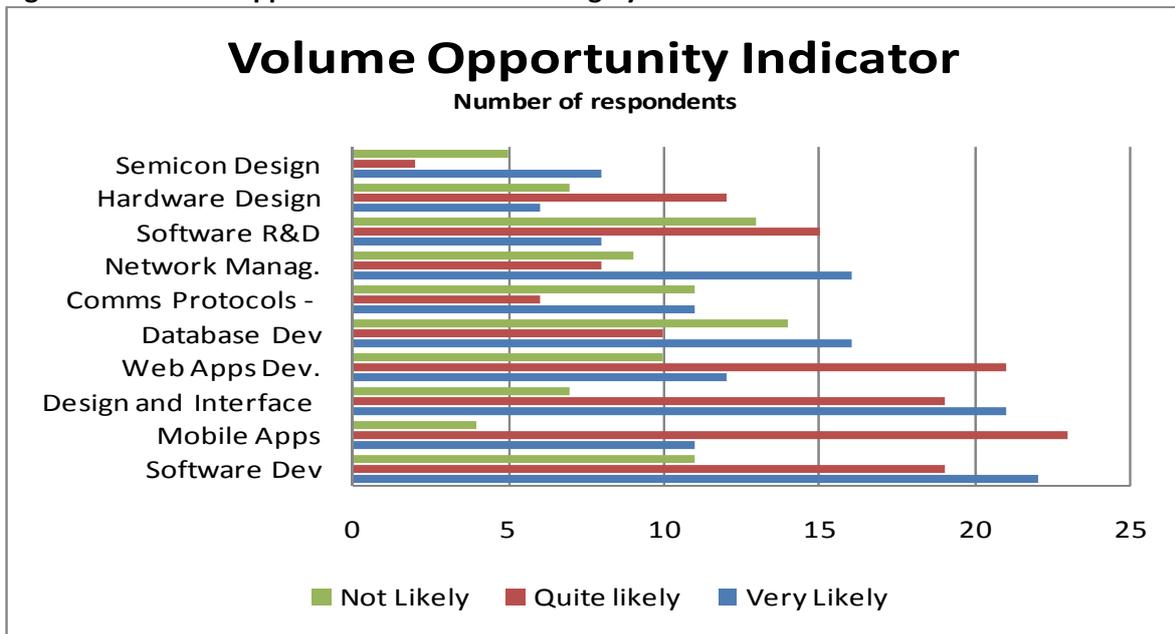
Figure 22: Israeli Respondents Likelihood of Outsourcing



The research explored the likelihood of the respondent companies outsourcing some of their existing software workload. Overall the views on outsourcing were very positive, 72% of respondents said that their organisation was very likely or quite likely to outsource some aspect of their software management or development. Figure 22 shows the propensity to outsource by technology type.

Areas of particular interest to the Palestinian market are: software applications, mobile applications, design and interface, web applications development and semiconductor design, all of which show positive outsourcing opportunities.

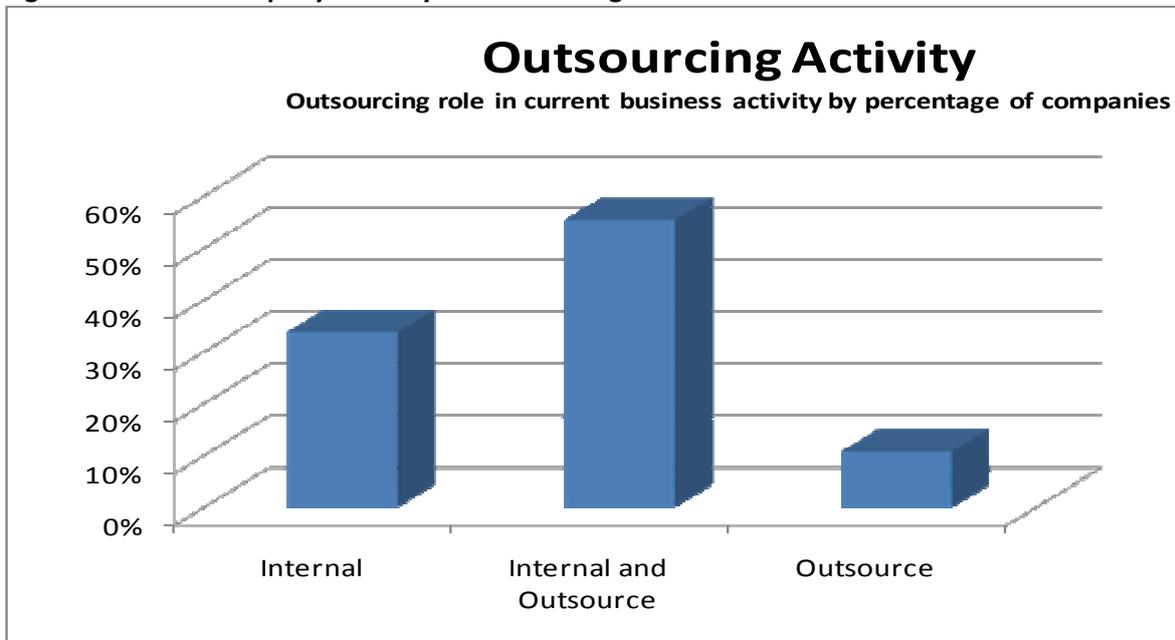
Figure 23: Volume Opportunities for Outsourcing by Service



If viewed from a numbers basis, the volume opportunities for outsourcing from the Israeli market lie in applications development: both software and mobile, design and interface, and web applications. (See Figure 23)

The Role of Outsourcing in Respondents Business

Figure 24: Israeli Company Delivery of Outsourcing



The research sought to understand to what extent outsourcing was an element of the Israeli respondents' existing business (see Figure 24). The majority were using outsourcing for their own internal development as well as providing some outsourced services themselves; about 40% were using outsourcing for internal use only; a few were solely supplying outsourced services. This

distinction is important as potential suppliers need to recognise that the closer the outsourced service they supply is to their client's own customer, the more pressure there is on quality and timeliness.

7.2.6 Quality and Technical Requirements

The Israeli companies' requirement for technical and quality accreditations among those to whom they outsource was only of limited importance. The key qualifications mentioned were various Microsoft Accreditations, with Microsoft Partner being the main one. From a quality viewpoint, 16% of respondents wanted a quality accreditation; ISO standards were mentioned most, with a few respondents desiring CMMi accreditations. A significant number of respondents mentioned project management skills, and many wanted demonstrable experience in order to agree to outsourcing.

7.2.7 Existing Relationships with Palestinian Companies

Some 10% of the Israeli organisations among the sample had some form of business relationship with Palestinian companies. Many of these relationships relate to distribution, and a small number pertain to software outsourcing or joint ventures; 56% of Israeli organisations among the sample said they did not have a relationship with any Palestinian company, and the remaining 34% declined to answer the question.

There was some reluctance among Israeli respondents to answer additional questions about their views on working with Palestinian companies; the number of responses was insufficient to support any analysis. This reluctance can be interpreted in a number of ways: reluctance to work together, but possibly a simple lack of knowledge of Palestinian capabilities. In general, those who did answer these questions reported that they had experience working with Palestinian companies.

During the qualitative stage of the research, many examples of Palestinian companies working with Israeli and with other countries were identified. Several of these were with the Israeli offices of multinational ICT companies. For example, Cisco has recently contracted three Palestinian organisations to undertake various development projects; Intel is using resources in Palestine, as is Novoton, the semiconductor chip designer, which has an important design project underway.

7.2.8 Supplementary Research

Further research with Israeli companies was carried out at the Investing in Peace through ICT Business Development launch event in Tel Aviv in November 2009. The conference was a key element of this project and included both Israeli and Palestinian businesses. This provided some qualitative insight on Israeli views on working with Palestinian companies. It should be noted that the sample might be skewed towards those who are more open to partnerships, given the nature of the event. Regardless, the results are worth considering.

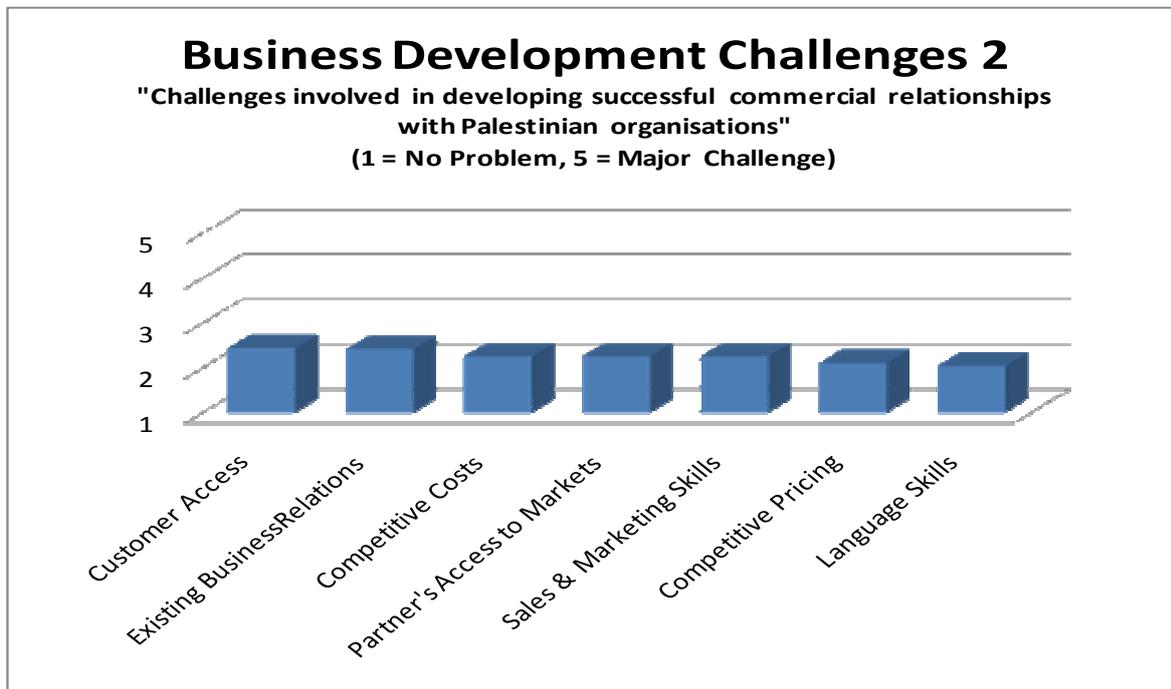
In all, 23 people responded, representing about 65% of the Israeli audience; of those, six already had relationships with Palestinian companies, of which three were buying outsourcing services. When asked if their company would continue or would consider working with a Palestinian software outsourcer, 18 answered positively and six said it was irrelevant for them.

The questionnaire then went on to explore the challenges these respondents saw involved in developing successful commercial relationships with Palestinian organisations. The results are shown in Figure 25.

Figure 25: Israeli Views of Principal Business Development Challenges for Israeli-Palestinian Partnerships



Figure 25a: Israeli Views of Secondary Business Development Challenges for Israeli-Palestinian Partnerships



Figures 25 and 25a provide insight into the relative concerns of Israeli companies regarding the development of business relationships with Palestinian organisations. The immediate point to note is a lack of issues that cause a “major challenge,” i.e., those that merit a score of four or more. Any score at around 2.5 or above certainly needs consideration, and those above 3 need to be addressed specifically.

Of the issues rated above three, Security and the Economy are beyond the direct control of either party. Security can be partially addressed by highlighting the positive partnerships that have existed despite security concerns, but the issue of security may remain an on-going concern for quite some time. The other issues of primary concern for Israeli companies can be divided into those relating to technical skills and those relating to management skills. These can be addressed by both individual Palestinian companies, as well as by ICT associations and the Palestinian government to ensure that the education process, qualifications and work experience meet the needs of international markets. Additionally, management skills can be enhanced by the direct or indirect hiring of experienced managers who can help develop the required skills. These may come from the Palestinian Diaspora, or could be interim type positions, using people from other regions to help in this development.

7.2.9 Conclusions from the Israeli Research

Overall, Israeli respondents showed a positive attitude to outsourcing elements of their software development and management, which could indicate both a need to reduce costs and/or to have access to people with the specific skills demanded by their core business. The technologies required offered no real surprises, and will be available in many locations around the world.

The technologies sought by Israeli companies relate well to Palestinian capabilities, and Palestinian actors must communicate their capabilities in these areas. The follow-up work of Market Mapping and facilitating meetings between interested organisations will be vital in achieving more

commercial cooperation and understanding of needs and capabilities between the two markets. These activities, along with marketing efforts will be aimed at developing an understanding of each other's needs and capabilities and to actively seek ways of encouraging the development of business relationships. This work should be carried out by the appropriate development agencies, trade associations and the companies themselves. The principals of this activity can then be expanded to other geographical regions.

8.0 Conclusions and Recommendations

Conclusions and recommendations relate primarily to actions that should be taken by Palestinian companies operating out of the West Bank. Whilst several companies in Gaza are included in the research, working arrangements with these organisations is outside the scope of this report.

8.1 Opportunities for Palestinian ICT

The IT services market is set to continue its growth. The main drivers of that growth are likely to be:

- *Continued cost reduction over the next two years:* Countries and industry sectors that traditionally do not outsource their ICT will start to do so;
- *Capacity supplementation:* as the recession recedes and business activity increases, previous cuts in programmes and people in the global ICT market are likely to result in a requirement for additional resources to bring projects and products to market;
- *Skills requirements:* in a recession, training and human resource development is typically put on hold, and the need to access skills in a short time frame forces organisations to seek external help;
- *Technology updates and development:* on-going changes in technology are affecting business processes and support, creating demand for resources to bring these new methods to market and implement them. Two specific areas to consider will be Cloud Computing and data applications on mobile phones and smart devices.

The software outsourcing market therefore represents a significant opportunity for Palestinian ICT companies. It builds upon the strengths of the region and circumvents some of the movement restrictions that Palestinians face. Forecasts indicate that most aspects of outsourcing will grow, and by specialising in software-related services the region can exploit existing resources and more easily build value services. Additionally, the ITO market also presents opportunities in services that can be delivered remotely, such as Help Desk. Specific opportunities are detailed in Figure 26 below, but broadly these can be divided as follows.

8.1.2 Services that can be outsourced to Palestine

Applications:

- Business applications, either development of bespoke applications or more likely as an outsource provider;
- Web development as a primary developer or for outsourcing services;
- Mobile applications development, either for local bespoke applications or as an outsource provider, and
- Electronics development, mainly circuitry-type services and as an outsourcer.

Services:

- Applications management;
- Applications development;
- Mobile applications development;
- Web development;
- Software design and testing; and
- Help desk and call centre services.

Business Process Outsourcing also provides an opportunity, but should be restricted to specialised, lower volume services as the overall population of the region will not support high volume services as delivered in India and China. Arabic call centres would be a good example of possible BPO for the region, or outsourcing of those offering specialised legal or human resource services to Middle Eastern companies.

The Israeli research indicated a considerable outsourcing demand in the areas noted above. The technologies used are complimentary, and therefore Palestine is in a good position to develop as an important supplier.

Additionally, there are significant opportunities in other Geographies, such as MENA, Europe and North America, which Palestinian companies should also pursue. To compete in these markets, Palestinian companies will need more support to identify opportunities and to find ways to sell into them. This work will require resources from investment, venture capital, banks and external agencies, to challenge and develop the current capabilities of smaller organisations in the sales, marketing and bidding processes.

Figure 26: Potential Market Opportunities for Palestinian Companies

Trend	Description	Opportunity
Trend 1	SaaS and Cloud Computing are forcing software providers to change their business models. Revenues for these services come from usage, and therefore the income profile moves from upfront licensing and yearly maintenance to a more irregular pay-for-use model. This will challenge the ways software providers operate in many ways: new billing models, new support models, new R&D models, and new upgrade and version control models.	Software providers will need to make changes to software, integrate billing systems, and develop low cost support models for new SaaS versions of their products. For new applications, the SaaS billing and management model will need to be integrated. Additionally, providers will need to manage existing customers and the traditional delivery model in parallel. This result will be opportunities for outsourcing to supply people, skills, resources, cost controls.
Trend 2	Continued growth of the Internet, both in terms of its coverage, speed and sophistication. Broadband coverage is growing based on fixed line, cable and broadband wireless communications. Speed is increasing, making new services viable. Web 2.0 has transformed the applications and services (transactional, social media, entertainment services, etc.), and Web 3.0 could well do the same for information access.	These developments drive several opportunities: <ul style="list-style-type: none"> • New websites in growing coverage areas, built to fit the local cultural needs, • Increased sophistication of existing sites to incorporate Web 2.0 type services, • Range of new applications to run within existing websites, requiring integration and support, often Mobile based, and • Potential for Web 3.0 application functionality in the future. The specifics are yet to unfold but developments should be monitored.

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Trend 3	End user cost reduction. The industry continues to feel pressure to reduce costs, both in terms of existing process and ICT infrastructure as well as for new ICT developments.	<p>This trend results in many opportunities with organisations seeking cost reductions:</p> <ul style="list-style-type: none"> • Outsourcing services to lower cost of existing ICT, • Installing new applications that are less expensive to run (e.g. HR systems, buying systems), including Open Systems, • SaaS/Cloud amendments to existing applications, • SaaS/Cloud based support services, and • Web driven applications to reduce cost e.g. on-line tax returns, on-line purchasing.
Trend 4	Development of new business models based on developing technology is impacting on both software applications and their delivery mechanisms. For instance, Smartphones will continue to encroach on the PC space, and thin clients will become more practical through web services.	<p>These new business models will create the following business needs, which will result in outsourcing opportunities:</p> <ul style="list-style-type: none"> • Expansion of existing applications to work with new channels including fixed or wireless Internet, • Development of new services to meet or create new demand using new delivery models, such as iPhone applications, and • Development of applications to leverage new models and availability of new information.
Trend 5	The public sector is looking to reduce cost or streamline services in order to save money as pressure rises on public sector borrowing, especially in the UK and USA. One way of doing this is to create more “joined up systems,” creating opportunities for new applications and services.	<p>Outsourcing opportunities will emerge from this trend, particularly for companies that supply assist the public sector to:</p> <ul style="list-style-type: none"> • Lower cost of processes, • Deliver integrated transformational government, • Streamline and integrate existing process, and • Deliver infrastructure projects.
Trend 6	Growth in regulatory requirements, driven by: current financial crisis, green regulations, legal changes, health and safety, employment law, etc.	<p>Outsourcing opportunities will be available to companies that supply applications, middleware or services to support their customers meeting the continued expansion of regulations in the areas such as:</p> <ul style="list-style-type: none"> • Financial, • Health, • Employment, • Legal, and • Green issues.
Trend 7	Increased need for security of systems, both physical and electronic. This includes protection from physical harm	<p>Companies developing or managing security of computer systems, primarily for software or networks, will have greater outsourcing</p>

ICT Business Development Project

	such as flood or acts of war, as well as protection from viruses, fraud or IP theft in the realm of information security.	opportunities.
Trend 8	Server consolidation and virtualisation, whereby organisations are reducing the number of servers and consolidating applications to increase utilisation of existing resources. Virtualisation covers a number of areas and essentially allows resources in the network to be used in virtual form. This is both a cost saving method and an environmental initiative, utilising resources which currently redundant.	Outsourcing opportunities will be available for companies providing virtualisation software products and services to aid consolidation across hardware and networks. Companies should be prepared for outsourcing needs in the area of management software, where communications networks will be worth specific examination.
Trend 9	Data storage growth, driven by increased need to analyse and keep data. This growth is driven by regulation and expanded use of data analysis, as well as Internet applications that demand greater storage.	Companies developing data storage software products and services will have outsourcing opportunities as a result of this trend. These might include: <ul style="list-style-type: none"> • Virtual storage management, • Analysis/search software.
Trend 10	Telecommunications fixed line price reductions driven by competition and regulation. Operators will need to increase usage and compete against the mobile operators.	Outsourcing will increase for telecommunications companies and suppliers that are developing new services to increase bandwidth and network usage, such as: <ul style="list-style-type: none"> • Entertainment services, • IP telephony, and • Website functionality and interactivity.
Trend 11	Increases in the use of mobile applications and data across the wireless network driven by the growth of wireless broadband and Smartphone usage. This increased use will be seen in a mix of applications for the Smartphones, as well as web applications built or modified for access on the Smartphone over broadband services. This trend could start to include mobile laptop applications as the growth of broadband wireless enabled products and appropriate charging mechanisms are developed.	Companies working in the mobile space will have greater outsourcing opportunities, specifically those developing: <ul style="list-style-type: none"> • Web functionality for existing fixed line websites, • Web development for mobile specific applications, • New Smartphone applications and services, such as iPhone and other emerging Smartphones, and • New social media applications developed for Smartphones.
Trend 12	Global sourcing, whereby the Indian outsourcing model has been emulated in many countries, creating both increased competition as well as new services. Two major services are: "Follow the Sun" services, whereby 24 hour development work is carried out in multiple locations around the globe; and right sourcing, the use of a network of outsourcing partners, each having a particular required skill set.	Palestine can leverage this trend through partnerships with larger, global outsourcing companies, providing a number of potential skills. These include technology expertise, languages and location.

Despite this wide range of outsourcing opportunities, there are a number of barriers that need to be overcome to develop commercial cooperation. Most significant will be trust and the willingness of individuals and organisations to commit in an area of perceived risk. It is therefore important that the risks are seen to be managed and the perceptions changed through proof of sound services and good relationships in existing projects.

Companies will need to address the weaknesses identified in the SWOT, (see figure 17), which will require action from the Palestinian Authority, ICT trade bodies and their supporters and individual companies all working together.

9.0 Recommendations

9.1 Regional Outsourcing Strategy

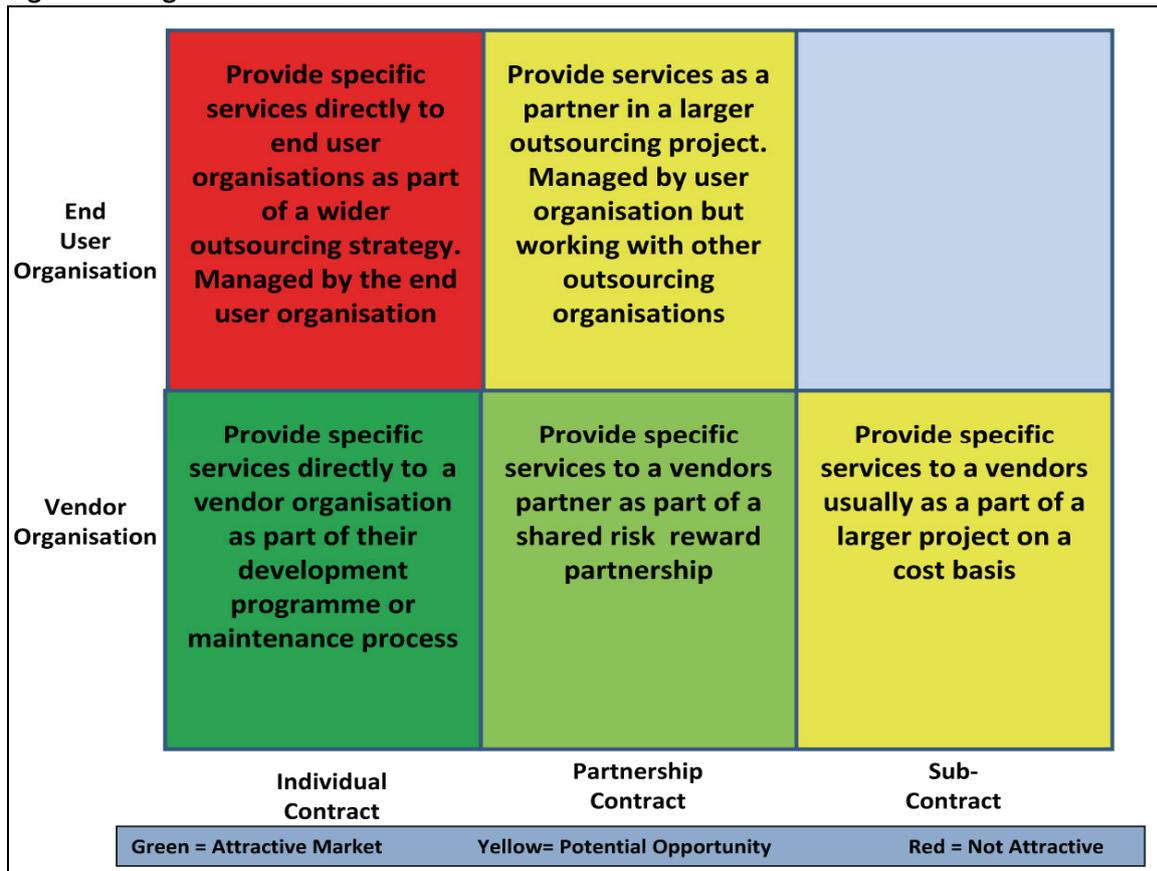
In order to succeed, the Palestinian ICT sector generally, and the software segment in particular, has to position itself in the wider world market and be recognised as an outsourcing region. Companies then need to support this positioning whilst still retaining their own independence.

Therefore, Palestine software outsourcing needs to be clear about the market segments in which it operates and for what reason. Whilst the individual companies are responsible for their own strategies, the findings of this report suggest that an umbrella positioning should be built around software-based services targeted at software, electronics and outsourcing companies in specific geographies: Israel, MENA, Europe and North America. This positioning would involve marketing Palestine as a “best of breed” area for software outsourcing through a wide range of communication routes. Individual companies would need to support this positioning and in return be able to leverage the overall activity. This activity would include communications, and could include the development of Palestinian software outsourcing sales and services offices in other geographical regions to promote and to seek business for the Palestinian companies. The umbrella positioning needs to be communicated to the target markets and will require the industry and the individual companies to prove that they are equipped to operate in those sectors, detailing the benefits they bring to potential customers. A detailed features benefits and interest analysis is provided in Appendix 2 which can be used to help develop these justifications.

9.2 Developing Strategies through Market Segmentation

In order to establish a strategy for Palestinian business development in the ICT sector, the key actors must identify which markets are likely to be the most lucrative and potentially accessible for Palestine at this stage of its business development. Figure 27 provides a segmentation model which can help to reach these decisions and identify appropriate segments on the basis of attractiveness to Palestinian companies.

Figure 27: Segmentation Model



The axes of the segmentation model are defined as:

- *End User Organisation*: an organisation that applies ICT technology to its business, usually commercial or public sector organisations;
- *Vendor Organisation*: a company that sells ICT products and services to end user organisations;
- *Individual Contract*: a specific contract to provide services to a customer that does not include involvement of any other service providers;
- *Partnership Contract*: a contract that involves two or more service providers partnering to deliver a project;
- *Sub-Contract*: A contract in which the supplier is contracted by another vendor to undertake an element of a larger, overall project. The sub-contractor may or may not be visible to the customer.

This model seeks to help organisations think about where they are going to source business. Each segment requires differing sales and marketing strategies and the choice will depend upon the company's service offerings, technical skills and ambitions.

9.3 Supporting Change in the Palestinian ICT Market

There will need to be change if Palestine is to gain a meaningful share of the software outsourcing market. Infrastructure has to be supportive of start-up organisations formed to meet these new opportunities and of companies that are looking to grow. Additionally support needs to extend to commercial skills development, market development skills, market access and a financial infrastructure, including support from banks and venture capital companies.

An area of change that will need to be supported will be industry consolidation. To be successful, organisation will need to achieve scale and to broaden and increase skills and capabilities. This increase in capacity will drive partnerships at a minimum, and will likely result in mergers and acquisitions. As with start-up, skill building and consolidation will require the availability of finance and venture capital.

The specific activities required will depend upon companies' own strategies, and the road map in the next section provides some thoughts on where organisations should direct their development, and the actions that need to be taken to get there.

9.4 Centralised Support

With the relatively small size of most of the Palestinian companies in international terms, those companies must create scale in order to operate outside of Palestine. Consideration should therefore be given to developing the following:

- Centralised marketing campaigns to promote Palestinian outsourcing to target markets. These could incorporate a Palestinian outsourcing website, but it should be part of a co-ordinated plan which incorporates all aspects of marketing communications. The campaign should be useable by individual companies as well as the industry as a whole.
- A sales and support operation that is located outside of Palestine, in target regions, which will act as a sales arm and then can support projects in terms of technical help and project management.
- Venture capital type operations to generate investment in start-ups, acquisitions and mergers. Such partnerships with venture capital would also provide the added benefit of bringing expertise to Palestine.
- Develop a bank of expertise that companies can call on to support in areas such as process development, quality standards, project management, business and marketing planning. This could be delivered in a number of ways, including; training of local personnel through the education system or using external courses, external experts called in as required or by building relationships with other outsourcing companies who would need to train local personnel in these skills and knowledge.

9.5 Palestine Market Development Map

The following provides a high level development map which identifies existing issues that need to be addressed and defines the ideal outcomes that will allow the Palestinian ICT outsourcing sector to develop. It details the existing position of ICT market actors in Palestine, describes the desired position and details a list of actions that need to be undertaken to achieve this potential. The responsibility for these does not rest solely on the software companies in Palestine, but also with the Palestinian Authority, telecommunications authority, banks, NGOs and donors working in the ICT space.

Figure 28: Development Map

Existing Position	Desired Position	Roadmap
Infrastructure		
Region seen as posing business risks	Confidence in placing business in the region	<ul style="list-style-type: none"> • Communicate all successful business contracts with customers from outside the region – case studies, outsourcing website, company promotional materials. • Arrange for visits from foreign delegations to see the West Bank and visit companies, particularly with people who will help build a positive image for the region. • Develop skills demanded in the market that are in short supply. <p>These should be the responsibility of companies in the region, trade associations, and large international companies operating in the region and development agencies.</p>
High costs for local communications	Competitive local communication costs	<ul style="list-style-type: none"> • Palestinian Authority to support the development of a competitive infrastructure with competition and investment aids. Additionally work alongside banks and potential venture capital funds to free up investment capital at competitive rates.
Limited access to development capital	Easier access to development monies	<ul style="list-style-type: none"> • Palestinian Authority and Israeli government to ease restrictions on capital and profit flows into Palestine. • Palestinian Authority to provide incentives for banks to make investment monies more available. • Develop a pro-active effort to build an experienced venture capital type eco-system to provide access to investment money as well as business skills, contacts, planning expertise and sales and marketing skills. <p>This should be undertaken by a combination of interested VCs, development agencies and local companies.</p>

Commercial		
Lack of market position	Clear market positioning	<ul style="list-style-type: none"> • Instigate a focused marketing campaign targeted at specific geographies to create awareness, understanding and interest in working with Palestinian companies. This should include all types of communication including website, PR, local representation and advertising. • Undertake a company review to develop the SWOT for individual companies. • Develop a plan to leverage strengths and address weaknesses of the sector and of each individual company who is seeking to build their outsourcing services. • Use this information to clearly position each company in the market. • Leverage case studies and experience to illustrate capacity. <p>These actions are widespread and should be the responsibility of the local trade association, individual companies, commercial development agencies, and to some extent the Palestinian Authority.</p>
Limited management skills	Trained experienced management	<ul style="list-style-type: none"> • Bring in more internationally experienced management, either as direct hires or on consulting contracts. • Provide management skills training for middle management through education and training delivered by training organisations and experienced external managers.
Limited experience of international business	Experience of developing international business	<ul style="list-style-type: none"> • Undergo development training in commercial skills, focussed on international development. • Meet with international companies. • Increase business with international companies through individual efforts or through combined actions, such as joint sales centres. • As companies expand, try to hire experienced commercial management. <p>The responsibility for all this primarily lies with the individual companies with some support from development agencies.</p>
Small organisations	Larger organisations offering scale	<ul style="list-style-type: none"> • Look to create partnerships, acquisitions and new start-ups to build scale that can address larger projects and afford appropriate management structures. <p>The responsibility is twofold; companies must be willing to grow, acquire and be acquired; the infrastructure of finance, legal system and market development must be available through the banks, the PA and the development agencies.</p>

ICT Business Development Project

Technical		
Technical skills unknown	Awareness of skills	<ul style="list-style-type: none"> Communicate technical skills and make them available at industry level and company level. This is a responsibility of the education system and the companies. Use case studies to demonstrate technical skills and ability to deliver solutions.
Experience of known technologies	Develop skills in emerging technologies	<ul style="list-style-type: none"> Identify emerging technologies and build expertise, preferably by identifying potential customers and working with them. This needs to be a partnership between the companies, their customers and the education system.
Lack of recognised quality and process accreditations	Companies have appropriate quality and process accreditations	<ul style="list-style-type: none"> Identify the most important accreditations and undergo training for them. Leverage training availability from Mercy Corps and other development actors. Look to undergo training in cross-company groups to minimise cost, which could be aided by the development agencies.
Developing Business in Israel		
Lack of contacts in Israel	Developed business contacts in Israel	<ul style="list-style-type: none"> Identify potential customers in Israel and contact. Leverage Mercy Corps market mapping process whereby companies are put in touch with each other through the databases developed through this project Leverage Palestinian outsourcing website contact information.
Lack of knowledge of Israeli market	Understanding of Israeli market	<ul style="list-style-type: none"> Leverage information from Mercy Corps project. Carry out further research into the Israeli market, identifying companies with needs that match available skills in the Palestinian market.
Lack of local business representation	Customers have points of contact in Israel and other international markets	<ul style="list-style-type: none"> Develop local representation in key locations, initially through shared resources and ultimately by key companies. Explore a business model that allows shared representation and marketing and a route to move to company representation in the future. Consider options to finance the development in international markets and gain further investment from success.
International Market Development		
Lack of knowledge of other international markets	Understanding of market needs in international markets	<ul style="list-style-type: none"> Develop deeper understanding of specific international markets. Identify international strengths and match to chosen international market. Position companies individually to international prospects using website, e-mail, and phone contact.

		<ul style="list-style-type: none"> • Potentially appoint agents in some countries. The responsibility lies with the development actors, local trade associations and the companies themselves
Lack of contacts in other geographies	Developed contacts in international markets	<ul style="list-style-type: none"> • Agree on best countries to target. • Identify potential customers in chosen countries. • Leverage Palestinian outsourcing website as well as other marketing and sales campaigns. • Identify larger outsourcing companies and explore sub-contracting opportunities.
Lack of local business representation	Customers have points of contact in the appropriate geographies	<ul style="list-style-type: none"> • Develop local representation in key locations, initially through shared resources and ultimately by key companies. • Explore a business model that allows shared representation and marketing and a route to move to company representation in the future. • Consider options to finance the development and gain further investment from success.

9.6 Building Future Resources

The industry in Palestine needs to be clear about how it is supporting the education and practical development of the people, whether they are students or existing employees. The primary strategy should be based around education and helping graduates get support and training after graduation. Examples include the school-to-work initiatives carried out by Google, Intel and Cisco along with other organisations.

Additionally, the industry needs to ensure a meaningful dialogue and relationship with the universities so that appropriate technologies are studied and students understand the business requirements of companies using those technologies.

Companies also need to identify important emerging technologies and look to develop skills and experience in those areas. Through these kinds of efforts, Palestine has the opportunity to differentiate itself on technology and therefore gain higher revenues.

9.7 Develop International Business Strategies

Each company wanting to develop its international outsourcing business needs to first develop a clear business strategy regarding markets and service offerings. This needs to be undertaken at the individual company level, but could be built around the overall Palestinian outsourcing positioning. Topics should include:

- Market by geography and perhaps by sector;
- Target customers – defined in the market segmentation;
- Software skills requirements;

- Process and quality skills requirements, including required partnership status with the leading software organisations;
- Resources;
- Market proposition; and
- Financial implications.

9.8 Marketing Operations

Companies should review their marketing and sales operations with regard to marketing communications, including positioning, market propositions and messaging. They must then ensure that these are delivered through both electronic and physical media e.g. websites and printed material. Both forms of media should be high quality and ensure that the language used is grammatically correct and culturally appropriate.

9.9 Sales Operations

Companies should review their sales operations and access to channels to market in order to:

- Upgrade selling skills: recognising that each outsourcing sale requires the matching of a company's capability to a client's needs. This requires a high degree of consultative selling and negotiation skills. It is possible that this type of training and development could be undertaken as a group project with external funding.
- Develop contacts and channels to market in chosen sectors using people skilled in channel development. A potential opportunity here would to investigate the role the Palestinian Diaspora could play in developing contacts and building channel connections.

9.10 Recommended Follow-up Activity

The proposed follow-up activity is designed to help accelerate the growth of the Palestinian ICT sector, both within Palestine and in other locations, whilst addressing some of its weaknesses. Follow-up activities should include the following:

- Actively develop a venture capital type model to bring investment monies and expertise into Palestine;
- Extend the mapping exercise to other countries, looking to build more detailed market understanding, to capture attitudes to outsourcing and to develop mapping databases to drive direct contact;
- Explore the opportunity to develop local representation for "Palestinian ICT outsourcing" in key geographies, working on a shared basis with a route map to help the successful individual companies create their own international representation in the future. The model would need to consider sales, marketing, technical support and project management capabilities;
- Explore the opportunity to build a pool of expertise that can be accessed by Palestinian companies to address the varied management type issues. This might utilise the Palestinian

Diaspora or other international managers who would work on an interim basis or as consultants;

- Provide support for targeted marketing campaigns in key geographies;
- Provide marketing support for the Palestinian Outsourcing website to ensure it is communicated across Israel and to the other regions included in the report. Activities could include using Google Ad Words, setting up links from other sites, advertising, e-mail campaigns, etc.;
- Provide guidance on using the information contained in this report to help develop business, including the mapping database;
- Continue to support quality and process accreditation activities;
- Develop marketing and sales training to improve the overall commercial skills in the West Bank and Gaza. Content would need to include marketing planning, marketing communications and consultative selling techniques;
- Profile large services companies so that tailored approaches can be made to establish contacts; and
- Support individual companies in developing their outsourcing through a review and planning process. The objective will be to help them grow their business by building a deeper understanding of their strengths and weaknesses, supporting them in addressing challenges and helping them to build practical plans for extending their outsourcing services to Israel and other countries.

Some of these could be achieved on a joint funding basis between individual companies and a development body that shares the costs, thus cementing the buy-in of the company.

9.11 Using This Report

Both Palestinian and Israeli companies can use this report to identify potential partnerships by going to the company profiles section and looking for compatible organisations or going to the website www.Outsource2Pal.com and running a search in the database.

The contents of this publication is the sole responsibility of CIMS and Intellect and can in no way be taken to reflect the views of the European Union, the British Government, IAESI, PITA, or Mercy Corps.

Appendices

Appendix I

Market Drivers

Drivers for IT Spending

To understand the ICT market growth it is important to have insight into the three fundamental drivers behind it, the “consumers” of ICT technology: Businesses, Public Sector, and Individual Consumers. These are far from mutually exclusive, but it is worth considering each separately. It is here that the impact of the economic downturn can be estimated, though regional differences can be significant.

Factors impacting these include:

Business

- The business focus was on value for money, now it is more about cutting cost. In the short-term this has led to reducing purchasing, reducing headcount and looking for more efficient ways of running processes, either in house or through outsourcing.
- Legislation and Regulation has played a large part in driving up technology spend, as management seeks to meet the Regulatory requirements set out by governments and governing bodies. The two main regulatory drivers have been Financial Regulation and security, the latter in terms of physical continuity, money laundering, communications monitoring, as well as cyber threats.
- In the future it is highly likely that environmental issues will play a part in driving new technology, particularly around energy consumption, environmental regulation management and the need to replace some technologies to reduce costs and pollution.
- Building infrastructure and up-to-date systems, particularly in emerging economies, is likely to have a positive impact on spend, but here the technologies are not likely to be the very latest and therefore tend to be less costly. It will also favour IP and mobile type products and services.
- The growth of the Internet and particularly the influence of Web 2.0 have allowed technology to fundamentally change the way many businesses operate and communicate, both impacting many of the issues above and allowing the development of new industry models

Public Sector

The economic crisis will severely impact public sector spending in the medium term in many countries. With the amount of money put into propping up the banks, lower tax revenues due to lower spends and social spending increasing, budgets in many regions will be stretched thinly.

Region-to-region trends will differ depending upon economic position, rate of growth and modernisation. Major influences are likely to be:

- Spend focussed on reducing costs; this might include increased level of outsourcing, providing the political environment allows for jobs to be moved offshore,

- Transformational Government, where services are delivered both internally and externally across the network. Applications use the Web to communicate and interact with business and the public, though gated by enough people having access to these services. A good example would be on-line tax returns or situations where multiple facets can be brought together electronically, such as the UK's car tax system where applications online link to annual roadworthiness tests and insurance before a tax discount can be approved.
- Increased spending on security; physical security from threats such as flood, fire or terrorism, viral threats to software and operating systems and data security keeping confidential and sensitive data safe.
- Political and practical need to keep spending on healthcare and defence, which are the most likely areas least impacted by budgetary cuts.

Consumer

Consumer spending has a major impact in the market and is likely to remain under pressure for some time in many economies. Large differences exist between the regions based upon the lifecycle of the technology in the region and the infrastructure that supports it. In Europe, North America and parts of Asia there is a strong telecommunications network which tends to drive computer equipment and network sales, especially driven by the Internet; mobile communications, of course, are particularly important too. In many emerging regions mobile communications are more important and a very significant driver of ICT adoption.

Appendix II

Asia

Table 6: Asian ICT Market Size (€bn)

	2006	2007	2008	2009	2010
ICT	324.3	326.2	360.8	408.4	428.1
IT	107.3	113.8	123.0	131.1	136.7
Telecom	217.6	232.3	247.7	267.4	291.3

EITO June 2009

Appendix III

Palestinian Market FBI Analysis

A Features, Benefits, Interest analysis (FBI) develops the traditional features and benefits tool to understand why a buyer could be interested in the benefits. In a B2B environment, the interest will relate to aspects of commercial advantage, costs, time saving, time to market, etc.

Features	Benefits	Interest
Cultural Understanding of Israel, MENA, EU and North America	Understanding of how customers work and how to interact with them	Lowers resources to manage the contract hence reducing costs
		Improves the time it takes to build communications, lowering cost and providing faster time to market
	Better communication with peers and management in the customer organisation	Provides improved efficiency in day to day communications, operations and management reducing costs and building stronger satisfaction levels (Staff retention)
		Easier implementation driving down costs
		Staff retention easier
		Faster start-up time
	Better able to create a team between customer and provider	Staff retention
		Efficient management of projects
Experience of working outside of Palestine	Provides new knowledge, processes and delivery models	Aids easier implementation driving lower costs
		Faster time to market
		Improved quality of delivery

ICT Business Development Project

Staff retention and loyalty	One-time training cost and minimal retraining of new people	Provides higher return on investment for training
		Reduces overall training costs as no need to train new people too often
	Builds experience on the project drives improved skills and higher quality work	Increases efficiency in both costs and time
	Supports the building of strong relationships with the customer and their teams	Better customer retention and less churn as the groups work closely together – reducing downtimes and sales costs
Low costs	Customers get lower prices and good value for money	Easier to win new business and retain current business
		Keeps competition out
	Customers can afford more deliverables for budgets	Increased business for supplier
Proximity to customers	Easier communications between individuals and teams	Lowers management cost and stress based on time zone
		Faster start up times
		Increased efficiency
	Training easier	Lowers training costs
		Improves problem resolution
Language Skills	Ability to communicate in same language at a good level	Aids relationships and efficiency
		Reduces management costs
		Improves start-up and delivery time
Wide range of IT skills available	Can locate experience in required technology	Faster time to start-up
		Reduces training costs
	Choice of suppliers	Better value for money

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	Have experience in implementation	Lower training costs
		Faster time to market
Experienced Management with International experience in place in many companies	International standards and ways of working understood	Faster set-up times
		Accurate project planning reducing over runs and time issues
	Support integration of local teams into customer teams	Lowers risk, ramp-up costs and management intervention
Sector or application experience	Faster application of technology to the issue	Faster time to market
		Lower training costs
		Lower development costs
	Quality issues and process understood	Improved efficiency
High Intellectual Property security	Lowers risk of stealing of IP and ending up with competition	Protects investments
		Maintains competitive advantage
		Reduces costly law suits
Reliable telecoms infrastructure	Security of electronic communications	Low risk of costly outages

Appendix IV

Case Studies

Set out below are a number of case studies that demonstrate some of the external projects undertaken by Palestinian companies on behalf of clients

AlfaOmega and NTS

AlfaOmega, a leading medical and scientific equipment manufacturer, contracted the Palestinian company NTS, to develop the software interfaces between the equipment and the signal stimulators for a range of their products. The project included developing, building and integrating the software as well as QA and testing. The project was so successful that in 2008 the contract was extended for a further two years.

Volvo Truck and NTS

Volvo Trucks were being challenged by the increasingly complex documentation required for each new vehicle and recognised they needed to develop a Truck Delivery Bundle. NTS was chosen to develop the application; the system was built on the .NET framework and fulfilled the need to manage a French interface, links to legacy systems and interface with DB2 database, achieved through Web Services. Technology involved included; C#, Web Services, XML, Java, JavaScript, ActiveX.

NTS was chosen for its business and technical skills as well as its strong project management experience and willingness to partner other organisations to strengthen the delivery team.

Nuvoton and ASAL

Nuvoton, the multibillion dollar semiconductor company, appointed the Palestinian company ASAL to provide full design verification and testing for Nuvoton microcontrollers and super I/O boards over a period of several years. The project deployed a group of talented ASAL electrical, computer and electronic engineers who used the latest versions of Verilog and Specman to verify the quality of the hardware design at both the design and gate levels.

Extensive training was provided to the engineers to introduce them to the best practice for using Verilog and Specman over the Unix environment with full set of hands-on labs. The project also involved the development of a Windows Vista Gadget to provide an online web photo frame slideshow for a micro-controlled Nuvoton side show device.

The project was undertaken by ASAL with both the Israeli and Taiwanese offices of the company.

The technologies used were Verilog, Specman, Visual Studio 2005, and Vista Sideshow SDK.

Equiom International and ASAL

Equiom International, the Seattle-based leading consulting and software development company, appointed ASAL to develop an eBenefits web-based solution. The solution was aimed at the management, logistics and communications of employee benefits and is an online solution to understand the conditions, regulations and costs around insurable and uninsurable employment. The system manages the changes made by employers and communicates with the various providers, including automatic processing. The project took four months and included project management, systems architecture, development, testing and QA.

Technologies used were Microsoft™ Visual Studio 2008, C#, .Net Frame work 3.5, Microsoft™ Language Integrated Query (LINQ).

Al-Hammadi Hospital (Saudi Arabia) and Hulul

Hulul implemented their Human Resource System – HRMS – in Al- Hammadi Hospital, Riyadh, Saudi Arabia. The application met the customer's needs by:

- Efficiently & accurately managing the payroll, with minimum data entry and time calculation, using the Payroll Module;
- Supporting the recruitment of suitable employees, ensuring motivation, maintaining a high-performing workforce, and a 50% reduction of hiring time using the Recruitment Module;
- Developing an 'Employee Master File' which is the centre of the system and contains all vital employee information such as ID, title, job description, etc., through the Personnel Module;
- Applying the Attendance Module to efficiently track and monitor employees' attendance, including tardiness, missed punches, overtime and vacation time.

Cisco and ASAL (ANA Reporting)

Cisco Systems, the global networking and communications technology and Services Company, started working with ASAL Technologies in 2008, on software development projects based on building an R&D team.

Cisco's Active Network Abstraction (ANA) is a flexible and powerful vendor-neutral device management system that doubles as an enabling platform for value-added network and service management applications in a multi-technology, multi-service network environment. As part of the continued development programme, the product required the development of an upgraded reporting tool to enable a full reporting package. The projects goal was to develop a new reporting technology for the ANA and to monitor up-to-date events with the developed reports.

ASAL developed a complete reporting environment for ANA by using the latest enterprise reporting technologies like BIRT, which is a free open source application that cannot be found in other technologies like Jasper and Crystal reports. BIRT also offers a charting engine that allows the user to add charts to your own application.

ASAL is providing the following: reporting technologies investigation and development, system development, testing and QA, testing, documentation.

Benefits include timeline reduction, enabling Cisco to get their products faster, and increased revenues and market share. ASAL also achieved: cost saving, cutting operational costs by more than 50%, fast development, ASAL can complete critical work and send it to Cisco the next day; and access to professional, expert and high-quality services.

Cisco and ASAL (ANA Simulator)

Cisco Systems, the global networking and communications technology and Services Company, started working with ASAL Technologies in 2008, on software development projects based on building an R&D team.

Cisco's Active Network Abstraction (ANA) is a vendor-neutral device management system that doubles as an enabling platform for value-added network and service management applications in a multi-technology, multi-service network environment.

ASAL is engaged on the ANA Simulator, a tool for testing ANA with large numbers of practical network devices. A network device is 'recorded' using the Recorder component of the simulator. The resulting image is used by the Player component to simulate the device. With this tool, an arbitrary number of recorded devices can be simulated and used to test ANA. The project aim is to improve the current version of the Simulator so that it is able to cover all ANA testing needs related to the network device.

ASAL is providing the following: System Development, Testing and QA, Find creative solutions to current Simulator limitations, Design and Development of new features, Interface design and development, Testing and Documentation.

Benefits were similar to those in the ANA Reporting project.

Cisco and EXALT

EXALT is a Palestinian software company that is working as part of the mainstream development team of the Cisco Service Control Engine (SCE), which is a network element designed to provide carrier-grade application and session based classification and the control of application level IP traffic per subscriber. The scope of the project includes development for the management agents, development testing (automated test generation), "Deep Packet Inspection" (DPI) and L7 application signatures.

Alcatel-Lucent and EXALT

For more than two years, EXALT Technologies has worked with the development team of Alcatel-Lucent in Atlanta, Georgia on the development of various software products that relate to call centre solutions. EXALT has worked on the development and enhancement of a historic call analyzer system, the internationalization and localization of wide range of products, as well as the development of front line advisory solution for call centre clusters that work both on a desktop and

an iPhone. EXALT has utilised a wide range of technologies, covering development for web front end and back end as well as mobile technologies covering the iPhone, RIM (BlackBerry) and Android.

Palestine Youth Portal and Intertech

The Palestinian Youth Portal is a project funded by USAID/West Bank and Gaza under the U.S.-Palestinian Partnership (UPP) strategy, and has been set up jointly in consultation with the Palestinian Ministry of Youth and Sport, participating Youth Development and Resource Centers (YDRCs), Palestinian IT sector stakeholders, and leading international UPP partners including Intel and Cisco. The goal of the Youth Portal is to provide a comprehensive, integrated on-line portal to serve as the “one-stop shop” for youth members of the YDRCs and their affiliated youth clubs, Ministry and YDRC youth professionals and officials, and other partners and stakeholders involved with youth work and issues.

Intertech won the bid to act as the local IT expert, working closely with the GLP team on implementing “Liferay” open source technology to develop the portal. GLP was the US based company who were leading the project through US Aid funding. Work started early 2009 and by summer of 2009 Beta version was released. The success of this project relies on the various communication and collaboration tools it offers such as digital library, online forums, media centres and personal blogs. Most of the content and interface was developed in Arabic to maintain the Palestinian identity and to expose a wider audience to the portal.

Appendix V

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