INFOPRO RESEARCH

# Beirut Emerging Technology Zone

## Concept Test

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# INTRODUCTION

# Objectives

The main objectives of the study were to identify the technology industries most potentially suitable for Lebanon and creating a self-contained Technology, Industrial, and Research Center (BETZ). In due preparation of this study, three initial factors were considered:

Potential of technology industry in Lebanon: The analysis included the key success factors necessary for the development of technology industries in Lebanon and a list of such industries potentially suitable for Lebanon.

Development of a technology park in Lebanon: The technology park development (hereinafter referred to as BETZ) considered specific criteria along with technologies potentially suitable for BETZ.
The study set the key success factors for BETZ development in Lebanon and recommended concrete actions to be taken.

Mapping the existing technology industry environment in Lebanon: Profile the Lebanese technology industry and compared to its main competitors in the region. Approximate turnover, level of exports and imports, regulatory environment were some of the dependable criteria.

Additional data on technology industry sector was considered and respective companies were visited - in aims of assessing their current situation in terms of:

- Domestic marketing and expert capabilities
- Plans for expansion and growth
- Obstacles & impediments to expansion and growth
- Human resources availability

**I- Analysis of the technology industry in Lebanon**

A SWOT analysis (strengths, weaknesses, opportunities and threats) was drawn for the technology industry in Lebanon. The analysis considered the availability of resources, and access to both local and regional markets, etc. The findings highlighted Lebanon's competitive advantages and draw conclusions from apparent differences between Lebanon and its competitors.

**II- Technology industry potentially suitable for Lebanon**

Based on the criteria set and technology industry status quo, a list was defined, based on international standards, of technology industries that are most apt to succeed in Lebanon, satisfy the local market needs, and later on export to foreign ones. This list reflects the potential of the current technology projects and of prospective ones based on expected changes in the industry.

**III- Enhancing facilitators and overcoming barriers:**

Key success factors for technology industry in Lebanon are based on short, medium and long-term action plans. The purpose of this task is to highlight the main facilitators and barriers to technology industry development and identify practical approaches to enhancing facilitators and eliminating barriers. Potential key success factors considered:

1. Education: Measures to enhance the collaboration between the coordinates of industry and the educational system were suggested. As well, advisory notes on developing the education system in view of this sector were proposed.
2. Know-how transition:
   Recommend best practices (including amendments of laws and rules) that best allow know-how transfer for technology industry.

## IV- Technologies Suitable for the Park

Technology predevelopment matrix:
Develop a matrix defining the sectors and respective technologies within each sector that would be developed at BETZ and the production to be built on the site. The matrix defines the core technologies to be targeted upon the development of the project. Such technologies included, among others, the following:

- Software development
- Hardware assembly
- Broad band Internet service providing and hosting (Broad band ISP)
- E-technology and e-businesses
- Music production and recording
- Commercial / Movie production
- Printing and publishing

# Methodology

**Phase 1 – Sectoral analysis of the technology sector in Lebanon**
This phase is based on an extensive review of secondary sources of information. Data covering a five-year period (from 1998 to date) has been compiled in order to carry out a market trend analysis of the development and growth of the technology sector in Lebanon and provide a preliminary estimation of the hardware and software markets sizes.

**Phase 2 - Qualitative overview of the technology sector**
This phase is based on in-depth face-to-face interviews with experts and professionals in the technology sector in order to establish a SWOT analysis of the Beirut Emerging Technology Zone.

**PHASE 1 – Sectoral analysis of the technology sector in Lebanon**

Phase 1 is based on an in-depth desk research review.

1.1 Desk research
The following sources of information used for the desk research section of the study:
- The Trade Information Center
- The PCA
- InfoPro data bank

1.2 Data processing and analysis
A five-year compilation of market trends is analyzed and reported in a tabulated format.

**PHASE 2 – Qualitative overview of the technology sector**

Phase 2 is based on an in-depth face-to-face interview effort.

2.1 Face-to-face interviews
The face-to-face interviews were conducted by the project manager, guided by customized semi-structured interview guides for each area of focus. The interview guide was designed by InfoPro Research based on the objectives of the study and varied depending on the person being interviewed.

2.2 Sample selection
Phase 2 was based on a 50-interview sample base. The interviews were conducted with the decision-makers or general managers of the following categories of companies:
- Software developers
- Hardware assemblers
- Internet Server Providing & Web developers
- Music production
- Commercial / Movie production
- Printing & publishing

2.3 Data Analysis and Presentation
All completed interviews were transcribed and analyzed in a qualitative format.

# Executive summary

All participants in the Information Communication Technology (ICT) sector agree that the BETZ project can be effective if it is used as a tool to enhance and develop the industry in Lebanon, as a whole. This means not only government support, but organization, cooperation and a well-planned strategy with clear objectives and developed ideas. These prerequisites will insure that the right infrastructure is created at BETZ – one that caters to all participants, whether local or international, providing them with reliable internet connectivity and of course, making it all cost effective.

| Concept evaluation of Beirut Emerging Technology Zone | | |
|---|---|---|
| **Sector** | **Appeal of BETZ[1]** | **Willingness to move to BETZ[2]** |
| Software | High | High |
| Hardware | High | Medium |
| Broad band ISP | Medium | High |
| E-tech / e-business | High | High |
| Music production | Low | Low |
| Movie / Commercial production | High | High |
| Printing & publishing | Medium | Medium |

*[1]Average appeal of the BETZ concept to the above sectors*
*[2]Average willingness of the ICT companies by sector to move and relocate to BETZ*

Refer to Appendix A – BETZ Concept Evaluation for a detailed review of the above table.

## SWOT analysis summary of the software sector

Current sector situation: There is an estimated $100 million annual turnover for this sector which comprises around 500 companies and a workforce of around 4,000. This number refers to all the operations undertaken for this sector including development and training activities. Disagreement on the level of growth exists but it is apparent that there is much potential for improvement and increased exports.

Strengths: The most outstanding strength of this sector is its ability to produce software at a lower cost than required in Europe. Its large number of talented, multi-lingual programmers and IT professionals makes for good communication with international clients. Finally, this sector has an advantage in that it is already established in the Arab Gulf Region.

Weaknesses: Production levels are low and quality could be better. Challenging economic conditions have also forced the best talent to work abroad. Other weaknesses come from the undeveloped infrastructure needed for software companies and limited, expensive Internet connection. Software companies also lack adequate approaches for doing business that could allow the sector to flourish. This is apparent from deficient measures for financing projects, for development plans and from the lack of vision to consider the regional market as a local market - all of which are major elements needed to break down the barriers that hold this sector back.

Opportunities: Opportunities lie in making the regional software market a “local” market. Significant opportunity lies in the Gulf and in Europe where the market for Lebanese software can be increased with better quality, government support and organization. Also, an improvement in infrastructure and Internet connectivity can open doors to new types of businesses that work online. Making a presence at foreign IT exhibitions will also open up new markets for Lebanese software. Venture capital and investments can provide significant opportunities that will drive the sector forward.

Threats: Piracy threatens this sector by attacking it from many angles: it reduces revenues, dissuades foreigners’ outsourcing from Lebanon and keeps them from locating here. In addition, package deals for software of high quality and low cost are available in Lebanon from overseas and threaten the local sector by making it less competitive. As significant, is the unstructured local market that allows in many amateurs who enter and then leave it quickly, periodically destabilizing normal activity. Other countries in the region have been working towards developing their own technology sectors and will come to pose a major threat to ours with time.

## SWOT analysis summary of the hardware sector

Current sector situation: A sector suffering heavily from illegal trade and fierce competition, it is engaged mainly in the assembly of machines using imported components. Recent records show yearly sales of up to 50 to 60 thousand machines however, there has been no growth in revenue, profit or participants.

Strengths: There is constantly increasing demand for new technology. The facilities needed to assemble, store and effectively sell assembled products are available. Human resources are also plentiful as well as talented.

Weaknesses: Due to rapidly improving technology and its availability, the selling prices for computers and similar products have decreased significantly, making the sector less profitable than it was in its early stages. This is a result of poorly structured sector, where production lines and distribution channels are unorganized and at a very primitive and stage. The sector also lacks adequate approaches to marketing its products and getting investments and finance.

Opportunities: There are great opportunities for this sector. Unifying production and assembly lines and structuring distribution channels will create an efficient industry that can cater to the needs of the regional market.

Threats: Illegal imports of hardware components and counterfeit parts from Syria force businesses to compete with products that are not only cheaper, but invade the market before those that use legally imported components. This is so because they avoid the customs procedures that would delay their release into the market. There is a lack of legal recourse for this and other such illegal activity. Other countries in the region have ministries whose focus is to improve this sector and they will pose a major threat in that their products will be better, cheaper and perhaps even more readily available.

## SWOT analysis summary of the Internet service providing sector

Current sector situation: The market for this sector is a relatively large one in the region, with the percentage of the population accessing the internet standing at 8.6% in 2002, the highest internet penetration in the Arab world. It is also higher than the worldwide average of 6%. Dominating the market now are five companies which expect not more than 10 to 15 percent yearly growth. There has been a noticeable branching out of activities by participants in this sector.

Strengths: Having passed through a period of consolidation, the existing firms in this sector are very well structured, organized and able to reach large audiences. They are creative and have been demonstrating that they are able to expand with new services and complementary businesses. It is a stable sector but also a fast-moving one where there is constant development and improvement of technology, so there is always something to be introduced to the market.

Weaknesses: Entry into this market is difficult and may reduce the competitiveness of Lebanese ISPs. Determining growth of the sector and identifying its market is problematic mainly due to the fact that the number of users to a subscription, corporate or household, is difficult to measure. This in turn leads to skepticism about the effectiveness of advertising online, which is often the main source of financing for sites that rely heavily on ISPs. The limited capacity of the ministry of telecommunications to handle lines for the ISPs is also keeping the sector in a box. Moreover, Lebanon still lacks broad bandwidth for households and the price of such connectivity for companies is high due to low supply. Making the digital signature legitimate is another issue that weakens this sector, as it remains unresolved.

Opportunities: There lies opportunity in regional expansion as well as through developing new services. There are projects in the works for providing newer features and faster technology that may be very profitable. After having discussed the cable connection issue with ISPs, the government is now in the process of issuing licenses, for the first time, to three cable companies to provide cable line connections. The fact that technology constantly improves means that ISPs can continuously add to their business. If Internet connection was fast and reliable, numerous kinds of e-business that rely on ISPs could sprout and be profitable. Presently, ISPs are developing services in addition to Internet access that subscribers can benefit from. In addition, the Professional Computer Association (PCA) has launched the "Pipop" program in order to make Internet accessible to people in rural areas at a low cost; the objective is to develop computer literacy across Lebanon and thus reduce the "digital divide".

Threats: In its attempt to regulate this sector, the government has been limiting its growth. Even though the cost of telecom has just decreased, Internet connection remains expensive and keeps demand lower than its potential. By failing to organize the distribution of cable lines and then banning them, the government has extremely limited the sector. It is kept from providing a demanded service that could lead to expansion of online businesses and services, which in turn may generate even more Internet usage.

## SWOT analysis summary of the e-business sector

Current sector situation: This sector is in its nascent stages, limited by lack of legislation, initiatives and investment, it is still open to much potential growth. Presently, there is an involvement in online shopping, auctions and content publishing.

Strengths: Basic requirements for this sector such as payment mechanisms and credit card ownership exist. The Lebanese are known to be receptive to new technologies and are also entrepreneurial, possessing the creativity for further developing them.

Weaknesses: Lack of legislation and initiatives have not encouraged development of this sector nor allowed it to progress. As important, is the weak infrastructure that exists for technology-based business and especially slow, expensive Internet connection. There is also a lack of consumer confidence in payment and logistics systems.

Opportunities: There is much room to grow within this sector because of the wide range of e-businesses possible and because of the willingness that exists to develop initiatives for promoting it. Legislation for legalizing electronic signatures is under review by the government but if passed, will help establish a framework for online business dealings and will provide greater assurance for customers wishing to make transactions online. Lebanese e-businesses will also benefit from the ability to reach international consumers.

Threats: Presenting a threat to e-business in Lebanon, are the more developed services of international companies. They may have a wider range of products, of perhaps even better quality, but more importantly, they are able to reach local markets through well-organized shipping and delivery services. Access to banks for financing is another advantage they have over local e-business.

## SWOT analysis summary of the music production and distribution sector

Current sector situation: A sector plagued by piracy, demand exists but neither sales nor distribution of originals are what they could be. Music imports in 2002 declined to 1.5 million US dollars after having reached its peak at 2.5 million US dollars in the year 2001. The sector as a whole is shrinking.

Strengths: Some of the best production studios are located in Lebanon, supported by talented staff with much technical know-how. Qualified people are actually in oversupply. Also, there is a system of exclusive dealership that keeps prices constant and competition at a minimum.

Weaknesses: Artists ignore the high level of production studios in Lebanon and tend to record their music abroad. Also, the government imposes a process of censorship that takes only one day but is estimated to limit the whole market by 10%.

Opportunities: The opportunities in this sector are dependent on resolving issues of piracy and also lie in making our music international.

Threats: Piracy threatens this sector on every level and impedes its growth. The potential for sales in this market will never be attained without the enforcement of copyright laws. This directly affects distributors and consequently, the business of importers and producers will remain stagnant, if not decline, as well.

## SWOT analysis summary of the commercial / movie production sector

Current sector situation: A few large companies dominate this sector where total estimated annual turnover is $20 million. Producing commercials represents 80% of the business – this can be attributed to Lebanon's huge advertising industry. Music videos, short films and documentaries compose the remainder of production.

Strengths: Lebanon being the advertising center for the Middle East means much business, both local and international, for production houses and their support companies. Supply of fresh talent is plentiful and the system of education in Lebanon is in harmony with the needs of the sector.

Weaknesses: This sector is heavily dependent on one industry – advertising. Production is thus directly affected by its well being. Diversification into other areas of production has begun but is still limited. Also, tariffs are imposed on this sector while neighboring Arab countries have made it tax-free.

Opportunities: The fact that many advertising agencies have international partners can give production companies recognition abroad as well as locally. More consideration should be made however, toward the production feature films, TV documentaries, music videos and cartoon shows, rather than just commercials. Such types of production can be distributed worldwide as they have the potential to reach large audiences around the world, in French, English and Arabic. Talent is available and it goes a long way in this sector, therefore it can be capitalized on for all such types of production.

Threats: The government's proposed advertising law is not sitting well with advertising firms and could have repercussions on production. Also, labor laws make it difficult to recruit new talent and thus limit the sector's creativity. There is competition, from Cairo and Morocco, which poses a threat to the sector in Lebanon because of their lower costs. Dubai, although more expensive, represents the next most threatening competitor because it has emerged as a center for big international and regional firms which have a high demand for advertising and consequently, production.

**SWOT analysis summary of the printing and publishing sector**

Current sector situation: This sector exports 40% of all its printed material, an amount that also represents 50% of all publications in Arabic in the Arab world. The largest segment of print has been books until the recent shift to periodicals.

Strengths: This sector is well established, possesses high technology, is capable of handling great workloads and printing and distributing on time. It has a reputation for professionalism and quality, which it has maintained especially in the Arab world. The sector continues to develop, especially in the newer field of graphic design where the available talent supports it.

Weaknesses: Most of the businesses in this sector are family owned, which has its own implications on the sector.

Opportunities: Europe represents a great potential market as it is attracted to Lebanon's high quality and lower prices.

Threats: Newer media such as television and Internet pose a significant threat to this sector. The former does so by way of reducing interest in reading as leisure or for news and information. As shown in a study by Stanford University in year 2000 regarding Internet use, the latter does so as well, as it is an alternate source for written information that is often cheaper and easier to access.

# PROFILE OF LEBANESE TECHNOLOGY INDUSTRY

**Sector overview**

Technology is big business. Few sectors are growing as fast, with the same ever-expanding employment opportunities, especially in software programming and telecom engineering.

Imports of computer related products shot up from $47.7 million in 2001 to slightly under $79 million the following year. Exports doubled in the same period to $2.2 million and figures for the first seven months of 2002 indicate that this level would also be well surpassed.[1]

**Sector structure**

Most IT indicators rank Lebanon third or fourth among Arab countries in the region. Many major international hardware producers are well represented locally and software developers and services are widespread. New policy initiatives and legislative reforms to support and improve the industry include an intellectual property rights (IPR) law, e-banking, other forms of e-business, and e-Government initiatives.

Local competitive advantages were identified in a report by PriceWaterhouseCooper as including a strong entrepreneurial tradition, a strongly private-sector oriented business climate, open markets and supportive government policies, as well as the country having an outward-oriented, multicultural and multilingual society with a strong interest in technological progress. The report also pointed out high Internet usage and the modernization of the landline telephone system as aides to the development of the IT sector.

Companies in Lebanon have financed themselves according to few methods:

| METHOD OF FINANCING TOP ICT COMPANIES | |
|---|---|
| **Type** | **Percentage*** |
| Individual investors | 54.5 |
| Bank loans | 36.4 |
| Public stock offering | 9.1 |
| Joint venture funding | 27.3 |
| Others | 13.6 |
| * Total more than 100 because some firms used more than one type of financing. | |

***Source: PriceWaterhouseCoopers***
***Last updated: December 2002***

Regional IT growth is expected to continue according to studies showing that expenditure for products and services in the Middle East is growing at twice the average rate worldwide. This is due to the regional market's high potential and need for such technology. This demand is explained by the fact that businesses in the region used to count less on technology. Thus, business procedures coated by technology, making it a minimal component of their work, while now we see a 'catching up' to Western countries where business is highly mechanized. The regional market is then considered a big one in which to invest.

[1] Refer to Appendix B – Market Size of IT Related Products and Accessories.

An expert in the field said that local companies measure very well in several areas – mainly in business applications, portal development, infrastructure services and multimedia. Another specialist also reported that Lebanese developers and suppliers of IT services underestimate the value of their products: IT specialists think their products cannot compete in international markets and companies are unaware of their value as well as the weakness of their competitors. The source added that as the Lebanese are proving they can compete, they have begun to feel more confident about penetrating foreign markets.

The new Intellectual Property Rights law adopted in March 1999, helped to decrease the level of piracy, yet it still remains high. A report by the International Planning Research (IPR) corporation for the Business Software Alliance (BSA) said that software piracy decreased by four percent from 83% to 79%. The Middle East as a region, saw a six percent drop in piracy rates, to 51% compared with 63% in Eastern Europe, 57% in Latin America, and 54% in Asia.

# DETAILED OVERVIEW OF IT INDUSTRIES

# Software

### Business overview

There are around 500 software development companies in Lebanon, which provide employment to some 4,000 people. The combined annual turnover is difficult to calculate, but total operations, including development and training activities are estimated by industry professionals to be around $100 million. The software industry has grown at an estimated rate of 10-20% per year. Most exports are destined for Gulf countries, but a significant export market exists to Europe, particularly by French companies outsourcing from Lebanon. Estimates show that the cost of producing a unit of software in Lebanon is 60% of the cost of its production in Europe. More and more, Lebanese companies are realizing the importance of product placement, particularly in international markets.

The Lebanese software industry has already gained a strong foothold in the worldwide market. This booming business has created demand from end-users and businesses alike for software solutions and as well as the simplest to the most complex sets of problems. Subsequently, software development companies in Europe, Canada, and the United States are increasingly outsourcing software development projects to countries like Lebanon, attracted by both the lower cost of development and the sheer number of talented programmers and IT workers. According to a general manager of a software development company, Lebanese software companies are in a unique position because they can operate in several different cultural and linguistic environments.

The industry has taken on a more formalized structure in recent years. Since 1996, the Professional Computer Association (PCA) has provided a voice for all sectors of IT, including software, hardware, and other applications. Berytech, a software production incubator, has also emerged at Saint Joseph University. The Kafalat loan program, aimed at delivering loans to small and medium sized entrepreneurial business, has been a very effective tool in aiding growth of the software industry. While the regulatory environment has in general not impeded the development of the software industry in Lebanon, industry participants say that the government could be more proactive. Providing subsides and tax exemptions are examples of initiatives taken by other regional players such as Jordan and Egypt, in support of their tech industry.

### Location overview

The software industry is relatively flexible in terms of location requirements. Industry participants value proximity to clients and supporting services such as banks, accounting firms and others. But the critical component of location to industry participants remains connectivity: inexpensive, reliable, continuous and fast bandwidth. Presently, it is limited and expensive, posing a threat to Lebanon’s software industry. Rent prices for software companies reveal that some still pay old rates while others located in Administrative Beirut, pay between $100 and $200 per meter square depending on the particular site. Ample, nearby parking for employees and guests is a major facility that these companies often lack.

**Growth**
Goldman Sachs estimates that there will be a $585 billion global software market by 2004. The market size for the Arab region and Turkey was estimated to be $1.2 billion in 1997. This market has been growing at approximately 19% annually since 1998. Estimations show that the current market in the Arab region and Turkey is around $2.4 billion. Lebanon urgently needs to compete in order to secure a share of this market. Having Lebanese connections in senior positions at several multinationals can be critical to the success of our industry. Such executives in the Gulf region have been known to draw on Lebanese production.

Strengths that the software industry can draw upon include:

- A culture of entrepreneurship and a talent for innovation
- A vibrant emigrant network with deep pockets and strong relationships with pillar multinationals that support entrepreneurial activity
- A mass of available sources of capital that is passively used in most part, to finance the large government budget deficit
- The potential to expand its small market through free trade agreements (FTAs) with Syria, Jordan, Egypt and other MENA countries
- The availability of specialized support services such as financial services, accountants, lawyers, media, and market research
- The tradition of a tolerant, free-market state with minimal government intervention and a relatively low corporate tax rate, stable exchange rate, low inflation as well as unrestricted repatriation of profits.

Although telecommunication is at an advanced stage in Lebanon, its cost represents a major hurdle to the software industry. This is because corporate internet connection remains very expensive, as reported by one software company executive who noted that his company pays a total $2,600 per month for one 256K and one 128K connection, while in Paris, the same company pays 200 euros per month for a 600K, high speed, DSL line. Others add that an important facility to them is video conferencing, which despite its availability at Berytech, remains very expensive at a rate of $500 per two hours.

One threat facing the industry comes in the form of Intellectual Property Rights (IPR) offenses and the widespread practice of software piracy. New legislation has resulted in decreased piracy but still, it continues at a level of around 80%. Not only is this a threat to Lebanese companies, as it impacts revenue, it is also a factor which dissuades foreign firms from locating here or even outsourcing their software from here. According to a report by the International Planning Research (IPR) corporation compiled for the Business Software Alliance (BSA), Lebanon still shows piracy rates of more than 80% and ranks among the world's top ten countries for software theft. Others within the region are the UAE, which exhibited the lowest piracy rate (44%), followed by Egypt (56%) and then Saudi Arabia (59%). The Middle East as a whole is at 57%, the third highest level of piracy among world regions.

Another factor limiting the growth of the industry, particularly for outsourcing by international companies, is the lack of accreditation by local participants, by international software standards. In order to develop a globally competitive software industry, more firms will have to take on certifications such as SEI-CMM. They will also need to work toward more concrete domestic and international alliances.

The software industry's greatest potential however, lies in the regional market. Participants first need vision to consider focusing in that direction, but to capitalize on this opportunity, companies also need more adequate approaches for doing business and more efficient measures for financing projects and carrying out development plans. Using venture capital and making the effort to attract investments would prove effective in working toward these goals and moving the sector forward.

**Competition**

The market is divided into packaged (imported) software and locally developed software. Accurate data on each category is not available, but packaged software is considered by far the larger segment. Most Lebanese firms develop industry-oriented software, such as banking, insurance, hospital and healthcare packages. The cost structure is competitive with that of most other countries engaged in software subcontracting however, package deals from overseas threaten the local sector because their products are also of high quality and low cost. Another threat comes from amateurs who enter the market periodically and interfere with normal activity.

Although Lebanese entrepreneurs face ever-increasing competition in the global market, they remain poised to capture a larger percentage of it in the near future. Overseas IT exhibitions are a good gauge of the market share as well as a great channel for increasing it, so software developers are increasingly focusing on the export potential from making a presence at such gatherings.

Within the region, Lebanon is not alone in seeking to establish its software industry. Egypt, Jordan, and Syria are striving to become regional IT hubs. Jordan plans to do this with $20 million in government funds having already been allocated to the development of its IT industry. Egypt has made the software sector tax exempt. It is said that an investment of one billion dollars was made there for development of IT and telecom infrastructure during the year 2000. It is also anticipated that their profits from exports will reach on excess of $500 million per year. Finally, Dubai has already cemented itself as an IT capital in the Gulf.

Eastern European and Indian companies have an advantage over the Lebanese on price. The main reason for this price gap is the cost of labor in this field. An advanced Indian software engineer for instance, is paid $600 per month whereas in Lebanon a senior software engineer is paid a minimum of $1300 per month.
Below is a table showing the salary scales (per year) offered by the Lebanese software industry and other countries in the region.

| Lebanon | | |
|---|---|---|
| **Job title** | **Years of experience** | **Annual Salary (USD)** |
| Beginner | 0 – 1 | 7,500 – 9,000 |
| Junior | 1 – 2.5 | 11,000 – 14,000 |
| Senior | 2.5 – 5 | 16,000 – 20,000 |
| Team leader | 5 – 8 | 22,000 – 28,000 |
| Systems designer | 8+ | 30,000+ |
| Executive manager | 8+ | 50,000 – 70,000 |

***Source: PCA***

| Dubai | | |
|---|---|---|
| **Industry / Job title** | **Annual Salary Range** | **Average Annual Salary (USD)** |
| Software Industry | 17,000 – 36,000 | 24,000 |
| Senior | 17000 - 25750 | 20,500 |
| Team leader | - | 20,000 |
| Systems designer | - | 36,000 |
| IS manager | - | 20,000 |

***Source: PayScale, Inc.***

| India | | |
|---|---|---|
| **Industry / Job title** | **Annual Salary Range** | **Average Annual Salary (USD)** |
| Software Industry | 6,000 – 16,000 | 10,886 |
| Senior | 6,000 –14,400 | 11,860 |
| Team leader | 8,575 – 18,750 | 13,000 |
| Software Engineer | 5400 – 9,000 | 7,200 |
| IS manager | 12,000 – 20,000 | 12,000 |

***Source: PayScale, Inc.***

However, the Lebanese have an advantage over their competitors in the Gulf region where the decision makers at numerous companies are Lebanese and tend to prefer dealing with and granting contracts to Lebanese software businesses. They also prefer Lebanese IT software and services over Indian ones. This is an advantage that the Lebanese benefit from in the Gulf over all their competitors.

## Human resources

One of Lebanon's major competitive advantages is the ability of its engineers to operate in several cultures and languages. The crop of employees is being steadily augmented by the supply from Lebanon's top universities. AUB, LAU, NDU, the University of Balamand, the Lebanese University and the Ecole Superieur des Ingenieurs de Beirut have between them an annual output of around 500 computer engineers. The yearly headcount for newly trained technicians from both technical schools and universities comes to around 1,200. Lebanon's graduates are not only 'low cost', they are highly capable and talented prospective recruits for most MENA economies. They are skilled, multilingual and educated in all sorts of fields including engineering, finance, law, and business administration. Some say that it is difficult to find a higher quality of engineer at a lower price anywhere else. However, many companies still look to better educational programs where performance is better on the practical side and where courses on quality assurance and international standards are introduced.

Lebanese companies often have to compete for its new graduates with foreign companies, particularly those from France, who are also aware of their talent. However, some companies claim that they are having to train hired new graduates for a period of 3 months before integrating them into the system. They feel that the educational system is not tuned in to the needs of the industrial sector.

While the pipeline of human resources is substantial, maintaining it is a more difficult challenge. As employees are trained, they become more valuable and thus their price rises, often beyond the capacity of local firms to pay. An expert added that the best talent is going outside (Dubai, Europe, etc…) while medium and weak class graduates are the ones who remain. This "brain-drain" was a reference made by all experts interviewed in describing Lebanon's main human resource concern.

# Hardware

**Business overview**

There are more than 40 major computer companies in Lebanon involved in computer manufacturing, hardware assembly, and computer services. Many that began in hardware gradually shifted to the more profitable field of software development and as a result their work in hardware and software is tightly bound. The bulk of the hardware industry is involved in the assembly of IT products, specifically, computers, the components of which have been made elsewhere. Few major companies dominate this field. Since the year 2000, estimated annual sales of locally assembled machines have been between 62 and 80 thousand. Imports of computer related products skyrocketed from under $48 million in 2001 to almost $79 million the following year while exports doubled in the same period to $2.2 million.

When the government first reduced tariffs on the import of IT products to 5% and then later to 0%, it provided a significant benefit to the industry as a whole and to hardware in particular. However, this proved to be short lived because the introduction of the 10% VAT created a situation as before, where Syria's imports are cheaper and thus threaten the Lebanese industry.

At this stage, an illegal influx of hardware components originating from Syria began crossing into the Lebanese market without claiming VAT or customs duties. Thus, some Lebanese hardware traders acquired offices in Syrian coastal cities such as Latakiah where imported materials can be received and then transported illegally into Lebanon, avoiding VAT and customs duties. Moreover, a major computer assembly company claims that it is easy for any hardware company to bring in huge amount of CPUs (computer processing units) to Lebanon from Syria. Such behavior destabilizes the market and creates uncertainty.

Other companies that abide by the law are left at a great disadvantage because they have more expenses, deliver a more expensive product and also do so later because the procedures at the ports and for tariffs are difficult, time consuming and frustrating. Most companies feel that the situation has become intolerable and as a result they intend to diminish their local activities. Thus, a free-trade zone at BETZ can offer the right solution.

A similar threat exists whereby goods bought illegally are available on the market, and are resold at a discount. Industry participants cite the lack of effective legal recourse as a deterrent to their growth.

Finally, companies often receive checks backed by insufficient funds. This is another problem they cited as creating uncertainty because the law has not proven to be effective recourse and industrialists fear that many of their investments will be lost this way.

**Location overview**

Hardware assembly is a space-requiring industry, but different locations are needed depending on the business purposes: a hardware assembly company would need a production unit characterized by large space for technical procedures and storage, as well as an attractive commercial zone for a successful marketing of products. Thus, warehouse and wholesale outlets tend to be located in lower rent industrial areas. Companies aiming at direct marketing tend to be located in high-traffic shopping areas, such as BCD, Hamra, Ashrafieh. The cost of office space is a major factor weighing on the location decision of hardware companies.

**Growth**

Hardware companies call the 5% annual increase in demand for locally assembled machines a false growth because the participants are actually facing drastically declining profits. Sales of locally assembled machines were estimated to be 60,000 in the year 2000 and 90,000 in 2002. However, in the past five years, there was no growth in revenue, profit or even the number of participants in the industry. A major hardware assembling company actually notes shrinking revenues of 10% per year. In 1995, profit margins for computers reached 75%, now however, they do not exceed 7% per computer. Moreover, companies report that in 1999, most hardware purchases were paid in cash. Nowadays, they are being made by checks of prolonged period, which means prolonging receipt of revenue.

An expert in the field suggested that in this industry, as in software, the participants need to look to regional markets. A more efficient structure needs to be created to replace the current primitive one. By unifying production lines with assembly lines and by reorganizing distribution channels, Lebanon's hardware sector can be overall more efficient and able to cater to the needs of the regional market. Also lacking in this sector, are adequate approaches to marketing products and obtaining the investments and finance necessary to promote growth.

**Competition**

There are numerous competitors in the market engaged in fierce competition especially on price. The CEO of a major Lebanese hardware assembly company suggests that Lebanon become more industrialist-friendly and refers to Dubai as example. These have, for instance, 24-hour fully operational ports as well as low cost transport between ports and zones and a well represented, powerful ministry of technology. Dubai's assembled products are inexpensive because most of its work force is from India, Pakistan and Bangladesh.

**Human resources**

The human resources available to this sector are in ample supply as well as being talented and affordable.

# Internet Service Providing

**Business overview**
The ISP industry has seen significant changes in the last years. A rapid proliferation of companies encouraged keen competition and connection rates were slashed from an initial subscription rate of several hundred dollars a month to, in some cases, less than $10. A period of consolidation followed and the number of companies dominating this market, estimated to consist of 100,000 - 120,000 strong subscribers and 300,000 - 400,000 strong users, fell to five. Internet was available via cable operators for some time but most have been adversely affected by recent government regulations.

By regional standards, Internet usage is high. Market size in 1999 was estimated at $22 million and the number of subscribers hit 60,300. In two years, Internet use increased by 23.4%, denoting a better comparative performance than both Bahrain and Saudi Arabia. Known figures regarding the percentage of the population accessing the Internet are 8.6% in 2002, the highest Internet penetration in the Arab world and also higher than the worldwide average 6%.

There are no official figures for the dollar size of the market, but subscriptions alone were estimated at more than $6 million by the Economist Intelligence Unit in its 2001 Country Report.

Significant opportunity remains in the industry and businesses are devoting an ever-greater part of their budget to Internet connectivity. Corporations need high value, high performance services such as high levels of bandwidth and firewalls because the consumer market is more developed and it continues to grow. One of the most important issues for ensuring this continued growth in the industry is the development of a facilitating regulatory environment, particularly with respect to telecommunications law.

**Location overview**
The nature of an ISP's business means that it is very flexible in terms of location. The vital requirement for the industry remains continuous, inexpensive and reliable bandwidth. ISPs consider the current infrastructure excellent for telephony but not for Internet.

Previously, the switchboards' capacities presented a major obstacle related to location, in that they could not accommodate ISPs. Some companies even had to lay their cables from the floor of their offices to these switchboard operators. The switch to E1 lines has however, helped minimize the load on operators. Initially, the telephone operators could afford to manage 10% of telephony subscribers but when ISPs launched their connection services, peoples' use of lines increased due to internet browsing, often for hours at a time, handicapping the telephone operator's normal functioning. Thus, ISPs chose to connect to different telephone operators and switches to accommodate a greater number of customers. Now there exist less expensive, 4-digit Internet connection lines which are reserved only for Internet connection and which can handle greater capacity. This should attract more subscribers, especially individuals, as it makes accessing the Internet less expensive and more efficient than did the 6-digit ones.

ISPs are invariably linked to telecommunications, thus, for these companies to move to a new location, they will have to carefully assess the accessibility of telecom and the infrastructure at that place.

**Growth**

ISPs expect growth of not more than 10-15% per year. For regional business - both Lebanese ISPs operating overseas (particularly in the Middle East) and multinational providers such as Fiberlink Networks operating out of Lebanon - there remain significant opportunities. Value added services and complementary businesses like portals, selling computers along with an Internet subscription and software or listening to email over the phone also represent significant growth opportunities for ISPs.

In order to remain competitive, ISPs have branched out into more diversified activities such as selling computer hardware and developing software such online-banking. Some have begun introducing an array of value-added services related to mobile phones and e-commerce as a way to grow and expand. Others still, are expanding into regional markets. Although providing connections remains an ISP's primary service, they continue adding others to their first generation of extras through the launch of sister companies concerned with web hosting, web design, Internet related software and e-solutions. These represent complementary business for ISP companies.

The ISP price war of 1999 – 2000 had damaging effects on some in terms of revenue and acquiring additional subscribers. When the prices were raised afterwards, ISPs also lost subscribers to illegal cable. In addition, advertisement revenues on the Internet sites remain low because there is a belief that traditional modes of advertising capture a wider audience than advertising on the net. A chairman of an ISP company explains that advertisement on the net has better exposure than in the press due to distribution factors and figures.

ISPs have a problem in identifying their market and thus, their growth. Some ISPs report witnessing an inverse relationship between the number of household subscribers and revenues; while the number of household subscribers decreased, their revenues increased. The chairman of a major ISP explains that while their number household subscribers decreased due to a shift to cable connection, corporate subscribers increased. Thus, it is very difficult to measure growth with tangible, quantitative data.

As for the results of the ban on broad bandwidth cable connection to households, they cannot yet be estimated. ISPs say that it will take several months before its effects become clear. Recently the government presented a resolution to this ban on cable and is currently in the process of issuing licenses to three cable companies, allowing them to provide an alternative form of cable line connection. Broad bandwidth to households however, is still lacking in Lebanon. It is useful because it provides high-speed, reliable and more organized 24-hour connection. For companies, who are allowed access to it, it is expensive because supply is low. As for the newly introduced alternative type of connection, this is true as well.

Another issue being debated by ISPs and the government involves legalizing the presence of ISPs at the CO (centers of operations) of the telecommunications ministry so that they can lease

DSL lines and provide a different kind of high-speed cable connection. DSL gives subscribers telephony, Internet, video conferencing, video antenna and TV channel connections through a single high-speed cable. These lines are forbidden and this issue, like most, is a legal one relating to the privatization of the ministry. A chairman of a leading ISP explained that the technology is available but a legal framework must be worked out. Doing so will result in a better configuration for distributing cable and an organized service that assures benefits for both the government and the ISPs, at the same present rates.

Thus, sorting out the telecommunications law soon is a must. It entails privatization of the ministry, and establishing a regulatory body that guides ISP behavior through policy issuing and also handles legal issues - like the FCC does in USA - to assure fair competition and prevent monopoly. ISP companies are confident that this is the right legal form for growth and for stabilizing the market.

Still unresolved, is the issue of legalizing digital signatures. They are needed for safe, legitimate transfer of data and funds online. Legislation for this is still under review by the government but if passed, will boost business for ISPs because companies previously hesitant to make transactions online, provide online services or carry out e-business will be highly likely to make new subscriptions and simply use the internet more.

Similarly, ISPs can benefit from greater computer literacy and the consequent greater, more widespread use of the Internet. The PCA has launched "PiPOP", a project aimed at making Internet accessible to people in rural areas at a low cost. It is hoped that this will reduce the "digital divide" between Lebanese while also serving as a good tool for improving conditions in the sector and creating growth.

**Competition**

The domestic market seems to have weathered the worst of storms in terms of competition. Specifically, the price wars of 1999 involved aggressive takeovers, mergers and a drop in connection rates to an average of $10 per month. At one time, there were 32 providers, now five remain. Small firms were absorbed by larger ones and the market has stabilized with these dominant providers. Players have invested heavily in their infrastructure and newcomers cannot penetrate the market at the present price level because it would be a losing venture. This makes the current environment an unhealthy one for competition.

All the major ISP companies are concentrated in the local market which is too small for them. Thus, some are currently looking for possibilities to expand their services regionally.

**Human resources**

As stated by ISPs, human resources available in Lebanon are very important to them. Graduates from academic institutions here are professional and capable engineers who can handle several projects. They are also good problem solvers, a necessary characteristic for a good engineer. Besides this, Lebanese engineers have a very good educational base from which to start their careers. As for experience, a specialist in the field says that ISP is a new technology that will simply require time spent within the field to help engineers develop the necessary skills.

Trained employees however, are difficult to maintain. This is because Lebanese engineers are able to compete with foreign ones and receive salaries overseas that are significantly higher than what the local market offers. Many international companies have established recruitment centers to prepare Lebanese engineers to enter foreign markets.

# E-Business

**Business overview**

There is extensive range of possible e-businesses, including e-commerce, e-banking, e-government, e-trading, e-municipality and more. In Lebanon however, this sector is mainly limited to online shopping, auctions, and content publishing. The basic requirements for this sector do exist though; there is for example, extensive credit-card ownership and established, secure electronic payment mechanisms. Also, consumers are known to take advantage of available technology. Companies such as NetCommerce, act as payment gateways to provide credit card certification for e-commerce while several banks issue Internet only debit cards that are limited to $200 so as to reduce the risk of fraud online. The limits to this sector then are due in part, to a low level of consumer confidence in online payment and logistics systems and in part to legislation not yet passed, that will give legal recognition to electronic signatures.

**Location**

E-business companies, like software companies, are relatively free of constraints in terms of location. Many are cost sensitive and eager to find affordable real estate rates. Others highly value the cachet of a good location and other interests include being in close quarters with other like-minded companies. But the critical prerequisite of e-business industry participants remains connectivity: inexpensive, reliable, continuous and fast bandwidth.

**Growth**

The industry is still in its nascent stages. The combination of local entrepreneurial initiative with IT talent sets Lebanon in a strong position to compete on a regional and global level. Growth however, is hampered by the lack of a world class communications infrastructure. E-business firms are dependent on reliable connectivity to such an extent that without it, they simply will be unable to continue and may be driven elsewhere.

This sector will also require safeguards against theft, fraud and hackers, if it is to expand. Firewalls and other security systems are available for the transfer of data and funds online, however, making such transactions requires digital or electronic signatures. These are encrypted, unique marks of recognition, used in developed countries and recognized by law but in Lebanon, passing such legislation is still under review by the government. E-business and e-commerce will need a legal framework to follow - for credibility and to assure customers of the safety of dealing online.

**Competition**

Its global reach means Lebanon's e-businesses will face competition substantially from abroad. Lebanon's trilingual nature can be critical in helping it make a place for itself in Arab countries as well as English and French speaking ones.

**Human resources**

Lebanese talent in the e-business field is well known. As previously mentioned, graduates are plentiful but labor laws and competition from well paying foreign companies for the best of them, keep this sector from being able to take advantage of the talented and large pool of human resources available.

# Music Production & Distribution

**Business overview**
The music industry has been alive in Lebanon for over 50 years, this country being one of the first to manufacture and sell long play records (LPs). Since those early days the industry has evolved, absorbing many new elements including the influx of non-Arabic international music, issues of piracy and of censorship. Globally, the industry is dominated by five main companies: Sony Music International, EMI, BMG, Warner Music, and Universal Music. Most of them have branches in Lebanon while some like Warner and Universal are represented by an agent. Local production companies and distributors include A. Chahine et Fils and Mozart Chahine.

In recent years, the import of international music has grown on a massive scale in response to the younger generation's wider taste in music. During the year 2000, 4.2 million imported compact discs (CDs) and around half a million imported cassettes were sold in Lebanon. Customs figures show that imports, which represent around a quarter of all music sold, increased from $3.1 million in 1999 to $3.4 million in the year 2000. This rise can be attributed to several factors including the growing number of retail stores, the opening of Virgin Megastore and the removal of customs duties. However, the rise in imports was not matched by an increase in sales. In fact, overall sales which were at $10.1 million in the year 2000, later decreased. This highlights the impact of piracy, which all companies claimed as a major factor in the slump of sales. In 2001, imports dropped to $2.8 million so as to cope with little distribution.

Lebanon lacks a CD manufacturing plant and thus, Arabic music in the form of CDs is manufactured in European countries like Greece, at Digital Press Hellas (DPH) and then exported from there. A music producer and distributor noted that building a CD manufacturing plant in Lebanon is currently difficult. One reason is its cost of half a million to a million dollars, which the current level of sales of Arabic CDs would be unable to cover, even considering the rising popularity of Arabic music in West.

There are many other factors holding the music industry back. Specialists in music production claim that artists are recording and producing their albums in other Arab countries, assuming that they are more equipped and technologically advanced. This is untrue, reports a production specialist, because Lebanon harbors some of the best production studios such as Elias Rahbani Studios, Rotana and Music Master. A master music producer claims that other Arab producers are actually overly equipped with high technology and their know-how is below average. The Lebanese music production industry lost one million dollars last year due to this ignorance on behalf of the artists. As for distribution, the economic slowdown has prompted consumers to lower spending of non-essential items such as CDs or cassettes. Sales dropped from 1999 to 2000. Moreover, censorship subjects every imported CD or cassette to approval before going on sale. This process usually takes just 24 hours but still, a major distributor claims, lifting the current law could boost the market by 10 percent.

However, what is most critical at both the production and the distribution level is the issue of piracy. Main companies claim that it is the principal reason for the difficulties faced in the distribution process, even though albums are in considerable demand. The situation worsens for

Lebanese in this sector when the album production is done here because both local distributors and producers lose in such a case. A major Lebanese music producer noted that his company loses one million dollars for each album produced. The International Federation of Phonographic Information (IFP) released figures for the years 1999 and 2000 showing that pirated goods represented 25 to 50 percent of total goods sold worldwide. In Lebanon, this figure is considerably higher, constituting a main reason why major international companies represented in Lebanon plan to move their production studios and offices to nearby countries where the execution of IPR laws are assured. Specialists agree that enforcing the March 1999 copyright law would boost sales by at least 60 percent.

**Location overview**

Major companies report that their choice of location is affected mainly by security and being easily accessible. Proximity to clients is important as is easy access via public transportation. The head manager of a music distribution company noted that some staff members resigned due to transportation difficulties. Security and parking areas represent additional facilities important to them. Also, the ideal location for a music distributor must include a facility for off-loading products to be packed, received and shipped out. Most production companies prefer Beirut because the majority of clients are located there, a key factor in facilitating the marketing process. Major distributors prefer it because they consider that retailers and clients want to be able to clearly and conveniently view the wide range of music and CDs at their showrooms or warehouse.

Music companies have begun using high speed Internet connection such as the leased line to release them from the burden of a dial up connection. However, this service is still noted as costly by many companies but is so desirable because having VPN network lines within all their branches allows for automatic updates of stock, transactions and the like. While companies are pleased with improving communications, the costs are some of the highest in the region.

**Growth**

Companies reported that their growth is directly bound to the issue of illegal competition from piracy. The distributors' business is hindered, thus affecting revenues of production companies as well. Music companies reported that while their products are well respected in professional places, in others, illegal products emerge. Controlling piracy would result in an automatic expansion of 10% per month for music companies.

A major international company represented in Lebanon reported that the market has been shrinking for the last five years, hence the negative growth rate. Estimates however, show that growth for the coming five years could be 15% to doubling. Still, enforcement of anti-piracy laws that could lead to more growth.

**Competition**

Most distribution companies report that there is not much competition either locally or regionally. This is mainly due to signed contracts for exclusive dealers. A music distribution manager explains that each company has the exclusive right to distribute the albums of certain artists. So while different companies offer different brands and different products, their success will only be a reflection of consumer taste. There is no competition on the price level.

However, pirates destabilize this market condition. A music producer claims that two major factories in a nearby country copy on average 40 million CDs and cassettes which appear on the market quite early and are sold illegally on Lebanese streets.

As for production, music producers continuously update their technology to enhance their techniques and offer competitive production quality. An important music producer mentions however, that producers in the region, mainly in the Gulf, have high technology without the necessary know-how.

**Human resources**

Companies agreed that Lebanon's human resource pool is of very good quality in both production and distribution. Also, the quantity of qualified people is above the demand of the market. One music distributor adds that Lebanon is the easiest place to find talent in the region as opposed to the Gulf for example, where it is more difficult. Lebanon exports staff, and the main managers in all Gulf locations are Lebanese. For Lebanon, foreign expertise is needed to a very minimal extent but it remains very expensive for the current market.

# Commercial / Movie Production

**Business overview**

In Lebanon, making TV commercials is big business for advertising agencies, production houses and a range of support companies. Although there is a growing market for locally produced music videos and a tiny niche for short films and documentaries, 80% of local film and video business is dedicated to producing TV commercials. A chief creative officer at one advertising agency reports that advertising in the Middle East is centered in Lebanon and thus, it is natural that it dominates the production industry.

The advertising industry in Lebanon is in the process of a major overhaul. This $100 million sector is entering into international partnerships and placing more focus on the creative side of the business. It rose to a peak of $105 million in 1998, a figure that was matched in 1999, when international, regional and local companies of all sizes scrambled to open up offices here and benefit from the upward trend. But by 2000 they were already being forced to adapt to changes both on the local and global front.

Locally, the market proved to be too small to handle the large number of agencies (around 250), forcing many to merge. This trend matched the pattern taking place on a global scale too, where agencies were increasingly banding together to form large, powerful international groups. In fact, Lebanon is duplicating what already took place in the West, with companies increasing capitalization for increased leverage and effectiveness for their clients.

**Location overview**

A large number of advertising agencies, movie production and distribution companies are located in Sin El Fil and Ashrafieh. While this was perhaps just a trend, rent also played a role in it. Many still pay old rates but new rent prices in these two regions range from $100 to $180 per meter square.

Advertising agencies have a high need for fast, continuous Internet connection. Some have acquired microwave Internet links so that they can send video commercials by email to regional offices or partners.

A major facility that companies require is accessible parking. As reported by these companies, assuring parking spaces would be a factor in the decision to relocate or increase its services by recruiting additional personnel.

**Growth**

Production companies claim that the local market is saturated due to their huge number. The chairman of a leading production company reported that instead of the market developing, it is actually getting smaller: It used to reach $110 million in above the line spending each year whereas today it is at $85 million. The main factor affecting growth is the market size, and to deal with this the chairman says, production companies have tended to grow horizontally through sister companies that deal in things like event management or customer relationships.

Global trends in the advertising industry are not only reshaping the corporate structure, they are also affecting the creative aspect and how clients are spending their money. The 2001 figures for advertising expenditure showed a 10% decrease from the previous year, from $100 million to $90 million. Industry sources point to spending trends and political happenings as the reason for the drop. A specialist in the field reported that there has been a shift from above the line, to the below the line spending and made reference to supermarkets where consumers are bombarded with promotions such as gifts and bonus-packs instead of advertising ads.

The emergence of these powerful players, the giant supermarkets, is recent. They are able to charge very high prices for shelf space and display stands, presenting an added pressure to a company's marketing budget, notes a major commercial production agency. While the clients' budgets, which are stretched three ways - media, consumer promotions and trade channels – have not changed, there has been a shift away from above the line media spending to promotions.

Regarding the legal limitations that impede growth, companies cited many within this sector. Taxation is one issue in debate. Most Arab countries are tax free for the commercial production industry however, Lebanon still imposes taxes even if low. Low taxes versus no taxes still present a disadvantage.

Managers at different commercial production agencies complain about rigid labor laws that make it costly to replace employees with new, creative talent, a key success factor in this domain. Companies want to reward best performers, but constantly need the injection of talented, better-educated human resources for better performance and growth.

The advertising law currently under debate is felt by many to be an attempt to control the media. One prevailing opinion is that passing it could devastate the ad industry, one of the most successful in Lebanon. A chairman of a commercial production agency explains that advertising requires ideas, creativity and communications which should not be subject to government regulations, however, companies follow self-regulation and code of ethics. The concerned companies feel that it is unacceptable to dictate a percent distribution required for the different media and impose on clients where to advertise. Many have indicated an intention to leave Lebanon if this takes place. Others similarly feel that introduction of this law would represent a shock but believe that the Lebanese will eventually adapt and emerge from this transitory period with a more professional industry.

For growth in this sector, production houses can look to different types of production. Feature films, TV documentaries, music videos and cartoon shows can reach large audiences worldwide, especially because local human resources can work in three languages. There are also several satellite and regional channels that reach the right potential target audiences and would be likely to carry such programs. Talented human resources are plentiful and are actually in over-supply, therefore, an expansion into other types of production could create the room and opportunity needed for them to remain in Lebanon.

**Competition**

The local market for producing commercials is dominated by a small number of companies with an estimated annual turnover of $20 million. The competition is now so tough, that many of the smaller ad agencies may not be able to survive. Increasingly, the industry is being driven by major holding companies.

A general manager of a producing company reports that Beirut has become a main production center for music videos and commercials but faces competition in the region mainly from Cairo and then Dubai. Dubai’s higher labor costs in commercial production gives Beirut an advantage over it but many multinationals which have their regional offices in there and in other Gulf countries have been providing it with big business in recent years. However, for Lebanon, Cairo poses the main threat says the owner of film production company, because its prices are unmatchable. They are lower because costs of cameras, lighting equipment and staff are lower. Dubai is not only more expensive than both cities, it is difficult to work there according to some.

Due to the recent productions of series, Syria is a growing center for TV production, though not commercials. As for producing commercials in Europe, the view is mixed. The managing director of a production company said that standards are often better locally.

**Human resources**

Across Beirut, there is an estimated 250 full-time workers in the industry and about 200 part-timers. Production companies report that Lebanon has much talent and that its human resources for this category are outstanding in the region. The education system is also in harmony with the present needs, providing graduates each year who are well educated and competitive. However, there is more supply than demand. Thus, many companies take trainees in Lebanon and then export them to their other regional offices. A chairman of an international commercial production agency explains that companies across the region are actually using Lebanon as a recruitment and training base for the Arab World.

**Business overview**

For years, Lebanon has been one of the Arab world's traditional centers for printing, confidently winning business away from competitors across the region. With 800 publishers (among which 630 are registered at the Syndicate) and about 700 printing presses, it has an enormous advantage in the Arab world. While the local market provides one source of business, Lebanon exports a massive 40 percent of its printed matter, which also represents 50 percent of all publications printed in Arabic, in the Arab World.

The industry does not only print in Arabic but turns out works in French, English and Armenian of the same professional standard. However, in more recent years, the local printing industry has had to cope with the challenges of a faster paced, more evolved market that has seen book production slump and competition from neighboring countries heighten. Still, Lebanon's printers have so far remained ahead of the competition due to continuing professionalism.

While publication of books has generally been the mainstay of the industry, there has been a recent shift in focus toward periodicals which have in the opinion of many, replaced books as the most lucrative market for printers. Some experts recalled the old saying, "in Egypt they write, in Beirut they print, and in Iraq they read" as still being somewhat true but since the first Gulf War, the Iraqis – one of the largest consumers of Arabic books – have lost their purchasing power. Furthermore, the president of a printing firm thinks that competition from cheaper sources of entertainment, namely the internet, has become more appealing to a new Arab generation that simply "doesn't like to read." Some distributors contend that there is still strong demand for books, citing increasing literacy and Lebanon's burgeoning number of universities and enrolling students as proof. By remaining the Arab world's center for printing Lebanon has shown it is able to adapt. In fact, while book sales plummeted following the Gulf War, a boom occurred in the number of periodicals sold.

An obstacle that local printers are keen to overcome is the current Lebanese law on the export and import of periodicals. They can be printed in Lebanon but cannot be distributed here because they could thus avoid the inspections and censorship to which foreign periodicals are subject. To export a periodical printed in Lebanon, a printer must apply for an export license, which costs around $4,000-$5,000 annually. The government contends that its restrictive import/export laws help the distribution of foreign periodicals within the country. However, experts feels that these laws are harmful to local publishers because in addition to the cost, acquiring an export license can take considerable time and red tape.

The Lebanese government has been taking some steps toward addressing the grievances of the local printing industry. It passed a law making it easier for foreign publications printed in Lebanon to distribute their products here by facilitating their export and then re-import. Lifting the taxes on raw materials used by the industry, like paper, was yet another government move welcomed by the Lebanese printing industry.

**Location**
Location is a primary concern of printing firms. They value being somewhere accessible and familiar to both their clients and technical staff. Also, some export-oriented printing firms prefer to be close to the airport and shipping ports.

Major printing firms say they have invested between $10 and $16 million in putting together the right infrastructure and machinery for their operations. Thus, there is reluctance in this sector to relocate, as they feel cemented to these long established locations.

**Growth**
The recent liberalization of printing laws in some Arab countries has made it easier for domestic printing. When the Saudi government lifted restrictions on printing periodicals in 1999, many Saudi publishers naturally decided to have their periodicals printed locally instead of in Lebanon. Apart from the nuisance of publishing abroad, the burden of export duties was removed. Likewise, the Egyptian government created a duty-free zone for its printing houses giving them an important asset in helping win regional business. An expert pointed to this as an opportunity for them to catch up with the Lebanese.

Some printers have entered the European periodicals market. By assembling all the components of the periodical in-house, some industrialists are creating a unique look and feel, attractive to European publishers but which they completely control. An industrialist argues that winning contracts with European publishers should be the goal of Lebanon's printing houses since the quality of Lebanese products and the prices are to Lebanon's advantage. Another expert in the field argues that before entering the European market, Lebanon's printers must tackle the older, deeper problem of family ownership which prevents the merging needed for the printing industry to thrive in the long-term.

**Competition**
Competition among printing companies is very professional. They compete according to product quality, efficiency of services and client procedures and fast delivery of products.

Local competition does not threaten major distributors. According to one expert, companies have reached gentlemen's agreement, which allows them to profit without entering a price war. A major distributor explains that this is possible because each one has its own field of specialization: one may distribute titles in English, another only reference books, or only titles in French and others may print in only Italian and Arabic.

It is countries like Egypt, Saudi Arabia, and Dubai - Lebanon's three main competitors that may have an edge with lower prices because of their low cost of labor. A printing company chairman reveals that a book printed in Beirut costing $2, may cost $1.75 in Syria or Egypt. However, Lebanon's printing industry continues to thrive because foreign publishing houses are attracted to the high quality and the reputation for speed and punctuality that Lebanon's printers have earned.

Finally, the Internet may pose a significant threat in the future. More and more publications are available online, reducing the need for printed material. A study carried out by Stanford

University shows that "the more people spend time on the Internet… the more they turn their back on the traditional media." However, newspapers are less affected than TV.
Refer to Appendix C for detailed overview of the internet impact on TV watchers and newspaper readers.

**Human resources**
Experts believe that Lebanon's wealth of local talent and technical expertise, particularly in graphic design, allows its printers to remain a step ahead of the competition. It was reported that in Dubai, the printing industry has experienced problems because their production team tends to be from Canada or Europe while technical workers are Filipino or Indian. As a consequence, they face difficulty communicating and also possess different work ethics. Thus, their products suffer and customers are often unhappy with the results.

# CONCEPT TEST

## I. BETZ Concept Evaluation

Interviewed companies had different feedback concerning the development of BETZ. There exists a large group of companies that are in full support of the BETZ undertaking as it is. However, some other companies reported that they have heard of it but are unaware of the details. Others expressed disappointment in a project that they feel will be carried out whether it is feasible or not, disregarding the advice and concerns of the IT companies to be involved.

Regardless, the view of most in the field was that this project must be used as a tool towards enhancing and developing the industry in Lebanon as opposed to just a project to be completed. In other areas of the world, technology zones have done this with government support, by cooperating, communicating, and being well organized, thus guiding the industry towards improvement. This way, BETZ becomes an integral part of a strategy to develop the ICT industry as a whole, in particular, the software industry. Anything else will result in lost money and lost focus, with BETZ taking on the form of a real estate venture where the bulk of activities entail bargaining and rent. Experts add that their companies do not need the luxurious fountains and super-deluxe reception that exist at Berytech since these only increase financial burdens. An adequate, organized environment where the infrastructure is available and reliable, and the cost of operating is more affordable, will suffice.

Many companies have also pointed out that before implementing BETZ, the concept must be well thought out, with its objectives well defined and with well developed ideas as to its activities and which companies will be targeted to relocate there. Some software companies note that it is essential to differentiate between local software developers and international ones, since each has different needs and location requirements. Local software companies still require basics that international ones have gradually overcome. They have a common need for the right infrastructure but international companies tend to want a fancy location and an elegant team dedicated to customer services, both of which increase costs. Thus, if BETZ intends to accommodate both types, it is preferable to cleave the grounds into two adjacent sections and offer suitably different packages and services.

When asked about the likelihood of ICT firms relocating to BETZ, many of those interviewed had positive but conditional answers. It was bluntly stated by all, that nothing but the availability of reliable infrastructure with a significant reduction on cost of operations could encourage ICT companies, especially local software companies to move. Berytech, demonstrates this reluctance of companies to move because while it possesses the right infrastructure, its high operating costs keep software them away.

Refer to Appendix A – BETZ concept evaluation for a detailed review.

Software companies believe that BETZ could affect their exports indirectly. They report that for exports to increase, BETZ should focus on the quality of production, on marketing processes abroad, and on lowering the cost of operations. If all of these requirements are fulfilled, BETZ could increase the exports of software industry by up to 20%. Ad and short film production companies report that BETZ could make the sector more competitive and increase its exports by 15% just by creating the right work environment and lowering the cost of operations.

Music production companies believe that BETZ will not affect export of Lebanese production, since it has already reached an optimal level. However, it could increase the export of imported music products and other related material by 40% if export procedures for importing and exporting were made simpler, easier and time-effective.

Printing firms that are not convinced by BETZ assume that this technology park will not help the sector and export will remain the same. However, those who are encouraged to move to BETZ report that export may increase by 20% just in case operational cost decreases and export formalities and procedures get simpler and less costly.

**Infrastructure**

The priority then, for ICT companies is adequate infrastructure at lower, more affordable rates. Companies also cite: accessible roads, space, telecommunication needs, and reliable, continuous electricity. Thus, BETZ should assure the following:

- **Develop state of the art, reliable, affordable communications infrastructure**: Including fast, continuous bandwidth available via terrestrial, microwave and satellite technologies. Provide easy, affordable access to Internet and related facilities, including video-conferencing via SDN lines.
- **State of the art general infrastructure, maintenance and security:** Including a constant power supply that will eliminate the need to invest in expensive back up battery and UPS systems. Reliable water is also critical. Furthermore, world-class maintenance and 24 hour security, will be an important plus in drawing in companies.

## II. BETZ Environment / Matrix

1. Work Environment:

One of the main factors affecting BETZ success is its ability to create and support an industry and business oriented environment, rather than making assets available. BETZ must harbor a significantly large number of IT companies to assure an efficient, supportive work environment that promotes cooperation and competition. Organizing seminars, conferences and training for all levels of personnel is an effective way of doing this. One expert cited the weekly conferences and discussions he attended at the Sophia-Antipolis technology zone in France as an example. Besides these methods, companies working in the same industry can together build strategies and action plans to enhance it. Thus, BETZ must not become overly involved in the real estate aspect, rather, it must forge goals toward improving the overall condition of the technology sector. Using the BETZ grounds to do so, is what makes it so valuable. The proximity of the different fields of technology to one another on this site is also of great value, as they are complementary businesses. Currently, much time is wasted in Beirut's traffic and similarly, BETZ can provide a quieter work environment.

2. Support Industries:

ICT companies will also require the presence of other complementary and supporting businesses to keep their own business expanding and functioning efficiently.

These include banks, law offices, financial institutions, auditors and others. An attraction of BETZ is the way it brings together companies with many common needs, creating an efficient market for support industries.

3. Facilities and Needs

Companies cited some important facilities necessary for BETZ:

- Ample space for parking: A concern felt across all industries is the lack of parking in and around urban Beirut offices. BETZ can capitalize on its location, providing free, easily accessible parking to all office units.
- Conference rooms where video conferencing is available with other technologies
- Hotel for business lodging at very affordable rates
- An efficient courier office and services
- Stock rooms and show-rooms
- Maintenance teams
- R&D offices and labs for product testing
- A cafeteria and canteen on the grounds

A regulatory body should be created by the participating companies at BETZ to carry out the following activities:

- Assure the best usage of resources
- Enhance cooperation and collaboration among participating companies
- Organize industry oriented-activities: Seminars, conferences, workshops, etc.
- Control and manage cost
- Nourish the education system by creating links (see Educational Support System)

4. Accessibility:

Its location in Damour has numerous advantages. It is near the urban center, without being surrounded by it and is also connected to other urban areas by newly built, world class standard highways. BETZ needs to ensure, however, that its location is a positive, rather than negative aspect. This means providing affordable and convenient public transit from all population centers. If employees and clients have difficulty reaching BETZ, companies will not be encouraged to relocate there.

Finally, being close to the airport, BETZ should attempt to create a 'free zone' where importing and exporting are made easier and where tariffs are reduced and more convenient. This will differentiate BETZ from other technology zones and help attract more regional clients. Local hardware companies, particularly wholesalers involved in assembly, will benefit from such a 'free zone' where triangulation of trade becomes much easier.

Specifically, BETZ should strive to:

- **Provide easy access**: Building on existing highways to provide easy access to and around BETZ

- **Provide easy access by public transit**: If employees are unable to easily reach BETZ, it will be extremely difficult for companies to relocate there. Access by public transit should be provided affordably and conveniently from all population centers. Many of the industries that will be attracted to BETZ work long and often unpredictable hours. Public transit should be available during all hours that a company's business requires.
- **Ease the process of product movement**: Streamline customs procedures and create inter-regional trade facilities. Provide easy transit for delivery of products to and from shipping ports and the airport.

## III. Regulatory Environment

Concerned IT companies, especially hardware companies engaged in local assembly and wholesale recommend that before initiating BETZ, the general environment should change.
Companies feel that BETZ must serve as a haven from political interference in business and as a refuge from illegal practices. This will allow them to be competitive again and serve as the most persuasive incentive to move there. One source would like to see BETZ as an industrial island isolated from Lebanon's rigid, tiring rules and procedures for export/imports, working hours, VAT and others. Industrialists add that BETZ can be the beacon of a new business culture by supporting and nourishing this industry.

One of the unique selling points of technology parks around the world is the concept of a free zone: An incentive on tariffs, taxation structures, import/export duties and others. Because high level technology and infrastructure can be found elsewhere, as can competitive supporting industries, it is these regulatory incentives that make the technology zone unique and most attractive. At BETZ, the burdensome regulations and procedures that apply to the sale of products on the local market can be avoided or at least eased.

Specifically, BETZ should strive to:

- **Ensure a facilitating regulatory environment**: Recommend amendments and creation of laws that will facilitate ICTs' business.
- **Manage the zone under a private subcontractor**
- **Provide tax/tariff incentives**: Recommend tax breaks, tariff and import duty reductions in order to facilitate BETZ.
- **Tackle IPR issues**: Assist in the enforcement of IPR legislation that will keep a company's intellectual property safe.
- **Assist in the development of industry friendly labor laws**: Companies held back from hiring new talent due to labor laws, risk losing the best and brightest to competitors, including foreigners.
- **Strict control on Lebanese-Syrian borders**: to prevent illegal entry of exported material

## IV. Educational Support System

Interviewees noted that tech-poles around the world receive reciprocal support from the educational system. BETZ can encourage the creation of an educational institution of engineers for aspiring engineers, to ensure better access to a talented pool of human resources that is tuned in to the actual needs of the industry. Also, it should go out of its way to form links to other educational institutions. This can include participation in job fairs, career counseling, providing internships, and the like. However it goes about it, industries through BETZ, could clearly communicate their needs to universities to help improve their programs.

Specifically BETZ should:

- **Enhance R&D cooperation**: Many of the world's most innovative technology poles have emerged as such due to the interaction between industry and university research centers. BETZ should promote cooperation in this area, and provide access to research units and labs on its grounds. BETZ could consider developing a proposal for a research university specialized in technology.
- Help universities focus on critical IT skills for all students
- Establish a "center of excellence" training institute

## VI. Marketing

In order to succeed, BETZ will need to clearly communicate its advantages to the participants in all of its target industries. Not only is BETZ selling office space, it is also selling a concept - a new way of doing business. Considering a somewhat skeptical audience, BETZ will need to effectively explain the meaning and significance of a technology park, as well as all the possibilities it holds. It must:

- **Provide relocation incentives**: Many of the industry participants we spoke to are sensitive to the location and strategic decisions made by their competitors. Providing incentives, especially to early movers, will establish from the outset, the viability of BETZ as a tech industry location.
- **Market to a domestic audience**: Address the suitable industry groups with targeted, timely, well thought out advertising campaigns.
- **Market to an international audience:** Tailor the advantages of BETZ to international clientele and stress the advantages of doing business in Lebanon. This country should be portrayed as a technology hub.

# ADDED VALUE OF  BETZ ON IT SECTORS

## Added Value of BETZ on IT Sectors

The major advantages BETZ can provide for all the sectors will be:

- BETZ will bring them in close proximity to one another so that combined efforts can be made to improve services, products, and strategies for production and marketing.
- Operating costs will be reduced by use of common resources and subsidized rates. Bandwidth, a particular concern, will be less expensive.
- The right infrastructure will be available for the needs of IT sector participants. Bandwidth in particular will be higher, and more reliable.
- For BETZ to improve exports, experts believe that a series of actions need to be taken. First, hardware and software products need to be branded so that they are recognizable. Also, high quality production and standards need to be assured at lower operational costs, and with a good marketing strategy to give Lebanese ICT products the advantages necessary to compete in regional markets. Marketing strategies must be established in order to raise awareness on Lebanese ICT production, introduce the brands and all their advantages and then keep pushing them through effective media, exhibitions and/or promotions.

  While these steps can do much to attract local companies, multinationals are easier satisfied and drawn by the right infrastructure; broad bandwidth, reliable and subsidized electricity, well designed offices and production facilities, labs, and communication technologies such as Internet conferencing.

  An import / export zone that eases the related processes and is free from taxes will benefit all participants (local and multinational companies) to establish export channels. In addition, the fact that they are located in one place means logistics are simplified.

  In addition to the conventional exports, BETZ will also enhance E-export. This will involve participants arranging business deals and selling a variety of their IT products via Internet, from music to databanks, multimedia designs and online videos. A wider audience and businesses can be reached from anywhere without any barrier. While this will increase exports, the exact figures will not be measurable since online transactions do not go through customs.

  If such an environment is assured at BETZ, experts believe that certain sectors will witness increased exports. The following list shows the estimated increase in exports for each sector:
    - Software: 20%
    - Hardware: unlimited
    - Music: 40%
    - Printing: 20%

**Software**

By organizing together at that zone, BETZ can provide the right environment for interaction. BETZ can create an opportunity for the software participants to develop a more organized approach to manage their sector and set them on the right track. A well-structured software sector could be more effective and have much more presence when penetrating regional or international markets. Financing can be more easily obtained and knowledge can be shared in the right working environment to strengthen the industry's competitiveness.

**Hardware**

BETZ is being seen as effective for centralizing hardware activities, which can be accomplished by centralizing production standards, hardware designs, production and assembly lines, as well as distribution channels. At a later stage, BETZ can be the common ground for creating strategies in production, distribution and also sales.

The hardware sector can increase its benefit if BETZ serve as an import / export zone free from taxes. Such a haven should limit illegal or gray market trade.

Branding locally assembled machines will give these products an identity so that regional penetration can be effective. Developing distribution and marketing strategies will help make them easily accessible.

**Internet Service Providing and Web developers**

ISPs, if located at BETZ, could be more effective at providing increased bandwidth. They could work together to organize cable lines from BETZ to all participants, with the cooperation of the ministry of telecommunications. Taking this approach, the presence of ISPs at BETZ can play a vital role in supporting the IT sector.

Locally, a plan should be devised to encourage and develop computer literacy to close the ‘digital divide’ that exists among the population. Incentives can be provided by the technology sector at BETZ to introduce computers and the Internet to schools and offices so that this generation and the next, create the demand needed for this sector to grow.

Being in close proximity to one another and to the other technology sectors such as software, hardware, and e-business, ISPs can make their operations more interactive and collaborative to form new ideas, which are more easily generated in an environment such as BETZ's. Most importantly, however, is that BETZ will make ISPs' cost of operations lower, including their infrastructure cost, which comprises a large part of their budgets. Participants may then find that they can combine extra funds to develop systems such as the secure payments system that will drive the sector forward.

**E-Business**

The well being of this sector is closely tied to that of the ISP, and software sectors since an increase in e-business requires secure Internet browsing as well as adequate software packages. At BETZ, the e-business sector can profit from the broad bandwidth and the adequate designed software to assure online transactions and safer, more secure Internet communication and services.

**Music Production and Distribution / Commercial and Movie Production**

The presence of music production and distribution companies, and the commercial and movie production companies at BETZ could mean crucial added value for them. Using the broad bandwidth, adequate software, hardware, and collaborating with the multimedia developers, both sectors can formulate a complete package whereby their product quality and their regional and international connections are enhanced.

Music production or commercial production companies could produce or record music, commercials, video clips or any type of their product at BETZ and send it via broad bandwidth to other production units to be complemented and received back for further completion work.

In collaboration with the e-business initiatives, the music production companies or commercial production companies can distribute, and even sell their music world wide via the Internet.

BETZ can provide the right, effective facilities for the production of not only commercials, but also animated films, documentaries, feature films, and pay-for-view program broadcasted over the Internet.

**Printing and Publishing**

Printing and publishing companies can collaborate with other sectors to redesign and produce print-based publications into interactive multimedia packages.

# IMPACT OF BETZ ON NEW IT DEVELOPEMT IN LEBANON

# Impact of BETZ on New IT Development in Lebanon

**Research and development**

Databases / Databanks

The importance of building up and storing information is growing in Lebanon as businesses expand and find that they need to keep track of their clients and related information. There are at least seven companies that have developed databases ranging from very detailed - including individual profiles and even their habits – to more general, basic information with only names and addresses.

Direct mailing is a marketing tool that is becoming popular among several types of businesses but is already common practice for big supermarkets and clothing stores. Many advertising agencies will even recommend such a strategy as part of a campaign or alone, usually to stores with high image campaigns and more specific target markets or niche markets. There are small businesses that carry it out individually, but all require the list of names, addresses and other more specific information that is collected onto databases.

In 2000 the United Nations Industrial Development Organization (UNIDO) began funding and creating a database with the Ministry of Industry for the information needs of this sector. And in 2002, Middle East Airlines (MEA) and five other Arab air carriers jointly invested $12 million for Market Information Database Technology (MIDT) that will allow them access to global computer reservation systems, scientific studies of the industry and market analyses. This demonstrates the importance of gathering and compiling data for the decision making, planning and carrying out business activity, for all sectors.

A database at BETZ should serve as a library of information, including books, journals, music and any other references pertaining to the ICT sector.

BETZ Coordinated Research Initiative

At BETZ, the proximity of several related sectors within ICT to each other can make information sharing and collecting easier and perhaps more effective. Rather than just general information, BETZ could create a department for compiling more specific data that would be useful in research and analysis. Access to such information would be useful to all participants in ICT as it would allow them to understand their market, make better business decisions, create better market and sales strategies and ease the process of forming contacts.

For all the sectors, a coordinated, organized effort to collect information could result in useful statistics for them all. The supply of human resources, which is great for all the sectors, can be constantly updated and used for hiring the best talent.

In Internet service providing, methods can be devised for monitoring the level of use of the Internet. This will be important for e-businesses because better figures on Internet usage mean that gains can be made from increased advertising online. Also, it would be beneficial to estimate the level of computer literacy so that action can be taken to promote it and thus help the whole sector grow.

Similarly, monitoring of television viewing can help the commercial and movie production sector to be more effective. By understanding who their audiences are, they will be better able to capture their target markets with commercials and produce documentaries and television shows for the right audiences. Overall more effective decision making should take place. This type of information is valuable to industries outside the ICT industry as well; advertising and marketing companies for example, will have a financial interest here and may wish to contribute to the venture for developing a research department.

For comparative analyses, research at BETZ could also involve keeping track of sales figures, exports and imports and the costs involved. Thus, participant can work toward improving conditions for trade, encouraging the appropriate changes and developing effective practices.

This venture could be a joint effort between participants at BETZ and any other sectors of business that have a stake in generating such information. It would higher the BETZ profile and further its greater purpose in helping the whole ICT sector move forward and in turn, contributing to several others. Such a program would make BETZ more than just another location to potentially move to - it would be a source for development, growth and cooperation.

### Biotechnology

In a report by the Lebanese government to the United Nations Commission on Sustainable Development in 1997, it was stated that biotechnology research is in its early stages in Lebanon. This field applies molecular biology to solving practical agricultural and health problems. It is mostly carried out by university research programs but also by a governmental organization called the Lebanese Agricultural Research Institute (LARI). This institution has eight experimental stations around the country where studies are conducted to help solve problems facing the agricultural sector in each area. Its aim is to advance the agricultural sector in Lebanon as a whole.

Such research can promote the agricultural sector with new developments in the production of better crops that can enter and compete in foreign markets. There are a significant number of Biology or Agriculture majored Lebanese who go on to study molecular biology abroad that could contribute to advancing this field in Lebanon if they were given the opportunity. Such an opportunity could be provided at BETZ by facilitating their research with the necessary technology, laboratories and teaching facilities.

### Animation, graphics and special effects

Much can be done with cartoons since this area is relatively undeveloped. There are facilities available for cartoon animation where new characters and shows can be developed. The language can easily be changed from French to English to Arabic and thus, Lebanese animation can reach more than just a local audience. There is also opportunity in dubbing popular foreign cartoons locally, since most of the dubbed cartoons seen on Lebanese channels come from Egypt.

More developed, is the field of graphics. Graphics are needed in the design of magazines, pamphlets, websites and more. At BETZ this can be developed along with special effects to provide a service that is demanded by many industries, especially production.

**Imagery, games and virtual reality**

There are facilities available for production of games and even talent in the development of games. Arrangements whereby Japanese technologies are produced here and then distributed regionally would be economical for Japanese exporters and good for Lebanese business as well. The ICT sector will gain skills and know-how from being involved in the production process of some of the world's most developed virtual reality games technologies.

Worldwide, the sector is booming at a size of $21 billion, with nearly 200 colleges offering videogame development coursework. In the United States alone, 2,500 developers enter the field each year and often earn up to $70,000 straight of school while in Korea, they are exempted from mandatory military service as an incentive to keep this important sector of their economy growing strong. In Lebanon, initiatives can also be taken to teach the available talent and use the facilities that exist to get this field of ICT started. Classes can be given at universities and technology schools. With enough time, talent and experience, this field has the potential to grow and perhaps cater to the regional market in ways that the leading producing countries have not as of yet.

Developing new fields such as this one in Lebanon also provides opportunity for the oversupply of human resources in this whole sector. The more new fields that are developed, the faster the ICT sector will grow and allow enough creativity to keep our best human resources here.

# APPENDIX A

## - BETZ Concept Evaluation -

| Sector | Concept evaluation | | | | Required facilities | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appeal of BETZ | Willingness to move to BETZ | Acceptable rental rate (US dollars per m.sqr) | Required surface area (meter square) | Reduction on operational cost[1] | Infrastructure / Telecommunication[2] | Parking | Financial services[3] | Associated free zone at airport | R&D | Software / Hardware test labs | Affordable video conferencing | Maintenance team | Regulatory body | Transport: busses… | Courier / post office | Business lodging houses / hotel | Stock rooms / Show rooms | A canteen / cafeteria / snack |
| Software | High | High | 50 - 75 | 500 - 800 | A | A | A- | B | A- | A- | A- | A- | A- | A- | B | B | A- | B | A |
| Hardware | High | Medium | 40 | 5,000 | A | A | A- | B | A | B | A- | B | A- | A | A- | B | A- | A- | A |
| ISP | Medium | High | 50 | 700 | A | A | A- | B | N/A | A- | B | N/A | A- | A- | A- | A- | B | N/A | A |
| E-tech / Business | High | High | 50 | 400 | A | A | A- | B | N/A | A- | C | B | B | A- | B | B | B | N/A | A |
| Music production | Low | Low | 50 | 250 - 400 | A | A | A- | B | A | B | N/A | C | B | A- | A- | A- | A- | A | A |
| Movie / Commercial production | High | High | 75 | N/A | A | A | A | B | N/A | A | B | A | B | A- | B | B | A- | B | A |
| Printing & publishing | Medium | Medium | 40 | 9,000 | A | B | A | A | A | B | N/A | N/A | A | A- | A- | A | B | C | A |

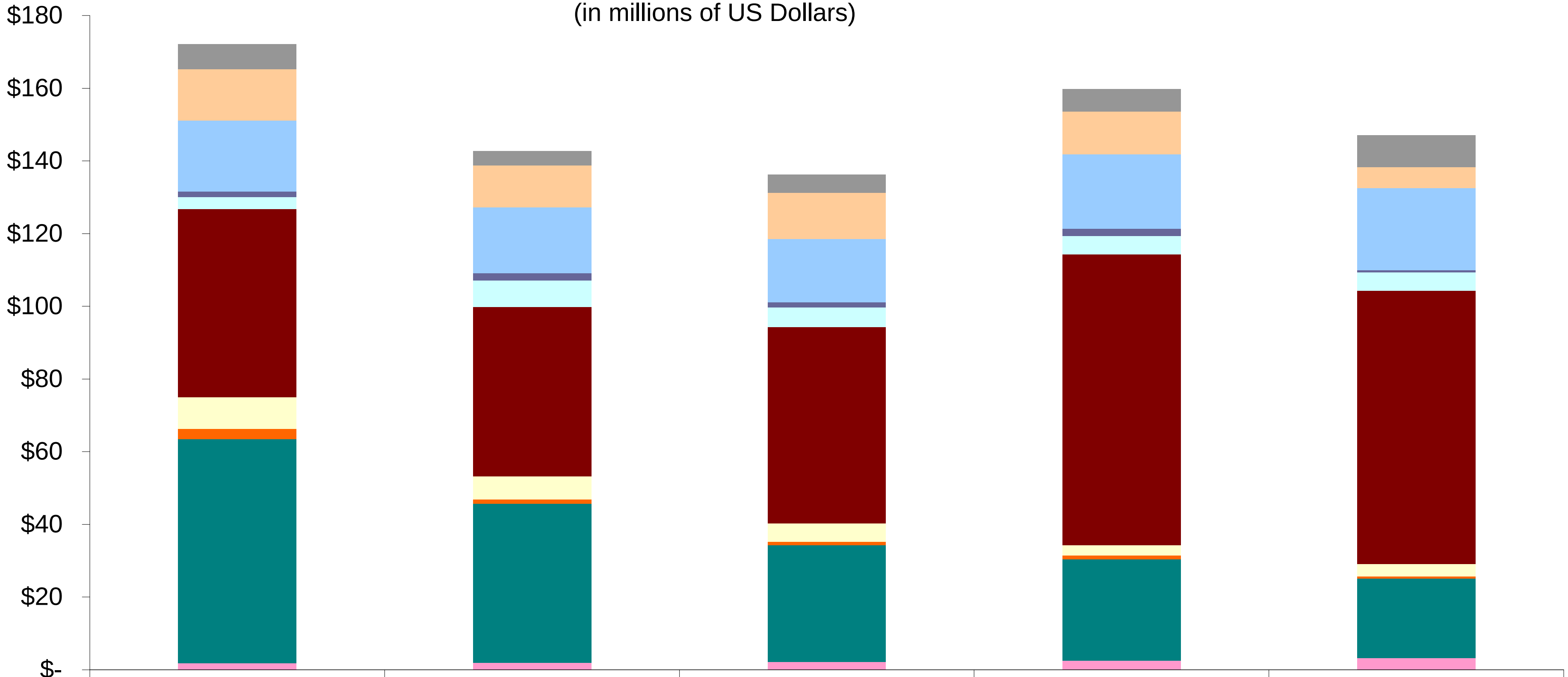
| | |
|---|---|
| A | Pre-requisite |
| A- | Required |
| B | Secondary |
| C | Added value |

1. Reduction on operational cost: electricity, rent prices, telecommunication, water, transport of goods
2. Infrastructure / Telecommunication: electricity, fast bandwidth, roads
3. Financial services: banks, accounting, auditing

# APPENDIX B
## - Market Size of IT Related Products and Accessories -

# Market Size of IT Products

(in millions of US Dollars)




| | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|
| Software | $7 | $4 | $5 | $6 | $9 |
| Scanners | $14 | $11 | $13 | $12 | $6 |
| Printers | $20 | $18 | $17 | $20 | $22 |
| Music (CDs, LPs, Tapes) | $1.56 | $1.91 | $1.41 | $2.03 | $0.53 |
| Modems | $3 | $7 | $5 | $5 | $5 |
| Hardware | $52 | $47 | $54 | $80 | $75 |
| Handsets | $9 | $6 | $5 | $3 | $3 |
| Faxes | $3 | $1 | $1 | $1 | $1 |
| Cellulars | $62 | $44 | $32 | $28 | $22 |
| Media | $2 | $2 | $2 | $3 | $3 |

# APPENDIX C
# - Impact of Internet on Watching TV and Reading Newspapers -

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# INTERNET USERS DESERT THE MASS MEDIA