

MADAR Research

S P E C I A L

Volume I

Dubai

Knowledge Economy

2003 ~ 2008

Milestones • Benchmarking Dubai • Knowledge Economy
Macroeconomic Analysis • IT Market Size and Growth
e-Government Technology and Services • ICT Clusters
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Forward

Dubai Knowledge Economy 2003-2008 is the result of intensive research carried out over the past 12 months to determine Dubai's capacity for the Knowledge Economy and to outline the development course it is taking in the next five years.

This research book inaugurates a series of Dubai Knowledge Economy Observatory studies that Madar Research Group will be publishing periodically. The series aims to study and analyze the components and characteristics of the local Knowledge Economy and how it is growing and contributing to the emirate's overall economy. All throughout, focus will be made on the strengths and weaknesses of Dubai's Knowledge Economy, along with the opportunities and risks associated with it.

Our goal is to make this book and the ensuing series a reference that serves the Dubai Government, as well as the international, regional and local companies based in Dubai, and potential investors. The body of knowledge produced by this endeavor will also be valuable for government planners, economists and business communities in Arab countries.

This endeavor constitutes a major part of our contribution to creating a research culture in Dubai, in particular, and the Arab world, in general. Above all, it will be our contribution to the Knowledge Economy, as research is recognized as one of its major pillars.

Abdul Kader Kamli

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Section 1

Overview & Dubai Competitiveness

1.1 UAE Overview

Since the establishment of the United Arab Emirates (UAE) federation thirty two years ago, economic development in the emirates has consistently been characterized by remarkable achievements that have far exceeded what might have been expected of a young state in a developing region. Realizing the challenges posed by the country's heavy reliance on finite hydrocarbon resources as the main source of income, the UAE leadership moved early to actively push for diversification of the national economic base towards non-hydrocarbon activities.

The ambitious diversification strategy pursued has thus far yielded a significant reduction in the share that crude oil production contributes to national income. The contribution of the crude oil sector to Gross Domestic Product (GDP) has fallen from above two thirds in the early seventies to less than one third in recent years.

The markedly free economic environment boasted by the UAE – as well as the unfettered will of the country's political leaders to create a dynamic modern economy that is less reliant on oil revenues – lend vital support to the diversification process. In fact, the UAE has always been widely hailed by independent observers for the level of economic freedom it enjoys and for the role played by government in promoting economic development.

The 2003 Index of Economic Freedom – which is a joint project by the Heritage Foundation and the *Wall Street Journal* – classifies the UAE as a “mostly free” economy and gives it the 24th position among 156 countries covered by the Index. Within the Middle East and North Africa region, the UAE economy turns out as the second freest, next to that of Bahrain.

According to the index's calculation method, which uses financial, monetary, legislative, market and other parameters to gauge economic freedom, the UAE fared exceptionally well in terms of monetary policy and lack of black markets. It also scored well with respect to the fiscal burden of government, enforcement of property rights, wages and prices and trade policy. The country's scores with respect to

government intervention, foreign investment, regulation and banking & finance were moderate.

The role of political leadership in the economic and social progress of a nation is another important factor to consider. In the case of the UAE, political leadership's role in supporting and promoting business and the quality of life has been acknowledged by heads of other nations, business leaders, analysts and students of economic development worldwide. In their *Global Information Technology Report 2002-2003*, researchers for the World Economic Forum (WEF), for instance, gave the UAE a full score on the role of its leaders in creating an environment that is conducive to development of information and communication technology (ICT). The UAE was the only Gulf Cooperation Council (GCC) country receiving such a score. The criteria used for assessment by the WEF report included the availability of a ‘clearly-spelled out ICT strategy’, ‘operational ICT-dedicated research facility’, ‘technology incubator’, and ‘technopole initiatives’. ‘Technopoles’ refer to geographically-defined entities aimed at fostering technology and expertise transfer – such as technology parks, innovation centers and high-tech clusters.

Indeed, encouraging ICT use and building a vibrant ICT sector have been high on the UAE agenda, as it seeks to identify new growth opportunities and also improve the overall competitiveness level of its economy by making it more knowledge-based. The country's goal to establish a framework for an economy encompassing a wide range of knowledge-based industries has gathered momentum. It has gathered significant momentum due to the UAE's active participation in, and adherence to, international treaties that govern the use and protection of intellectual property – the knowledge economy's primary currency.

The UAE became a member of the World Intellectual Property Organization (WIPO) in 1974. Then in 1992, two laws fundamental to intellectual property protection were passed, namely the Patent and Industrial Design Law and Trademark Law. In 1996, the UAE became a member of the World Trade Organization (WTO) and adopted the WTO

UAE's Performance on Index of Economic Freedom 2003

Trade Policy	Government Intervention	Foreign Investment	Wages & Prices	Regulation	Fiscal Burden	Monetary Policy	Banking & Finance	Property Rights	Black Market	Score	Change from 2002	World Rank
2	3	3	2	3	2	1	3	2	1	2.2	0.05	24

Source: 2003 Index of Economic Freedom by the Heritage Foundation and the Wall Street Journal

Notes: 1) The scoring system: 1= very low, 2 = low, 3 = moderate, 4 = high, 5 = very high; the lower the score, the lesser the degree of economic intervention and the higher the level of economic freedom as measured by the respective variable. 2) The overall score represents the average of all individual scores. 3) A negative change from the 2002 Index indicates an increase in the level of economic freedom.

Aspects of Political Leadership to Promote ICT Use

	ICT Strategy Clearly Spelled Out	ICT Implementation Plan Clearly Articulated	Operational ICT-Dedicated Research Facility	Plan of ICT-Dedicated Research Facility	Operational Technopole Initiative	Plan of Technopole Initiative	Existence of Technology Incubator	Planned Technology Incubator
UAE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Saudi Arabia	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Bahrain	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Kuwait	Yes	No	Yes	Yes	No	Yes	No	Yes
Qatar	Yes	No	No	No	No	No	No	Yes
Oman	No	No	No	Yes	No	No	No	Yes

Source: The Global Information Technology Report 2002-2003: Readiness for the Networked World

agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). Strong enforcement of intellectual property rights in the emirates has resulted in a piracy rate of 39 percent as of end 2002, according to the Business Software Alliance (BSA).

Interestingly, the UAE enjoys today the highest level of ICT use in the Arab World. Madar Research ICT Use Index gives the emirates the highest score among Arab countries as of June 2003, with mobile phone penetration standing at a high of 68 percent and Internet penetration pegged at 30 percent – three fold the world average of 10 percent.

1.2 Dubai Milestones

The emirate of Dubai has been at the helm of developments relating to economic diversification within the UAE. Dwindling oil reserves have prompted the emirate to put greater emphasis on identifying and nurturing new growth industries that can support a sustainable development process. This led to Dubai becoming the UAE's and wider Gulf region's premier commercial and trading center at an early stage.

As Dubai moved on with a very ambitious course of action, several industries – ranging from transport, construction and real-estate to finance, tourism and information and communication technologies – began to grow and flourish, bringing the contribution of the hydrocarbon sector to the emirate's GDP from a large double digit share to a modest single digit share.

Understanding the realities of today's global economy, Dubai is currently devoting massive efforts to fostering the competitiveness of its non-oil industries through different channels. The most noteworthy of these is the creation of a world class ICT sector and the promotion of stronger ICT use across all aspects of life – in government, industries and education – within the emirate. The ultimate aim, of course,

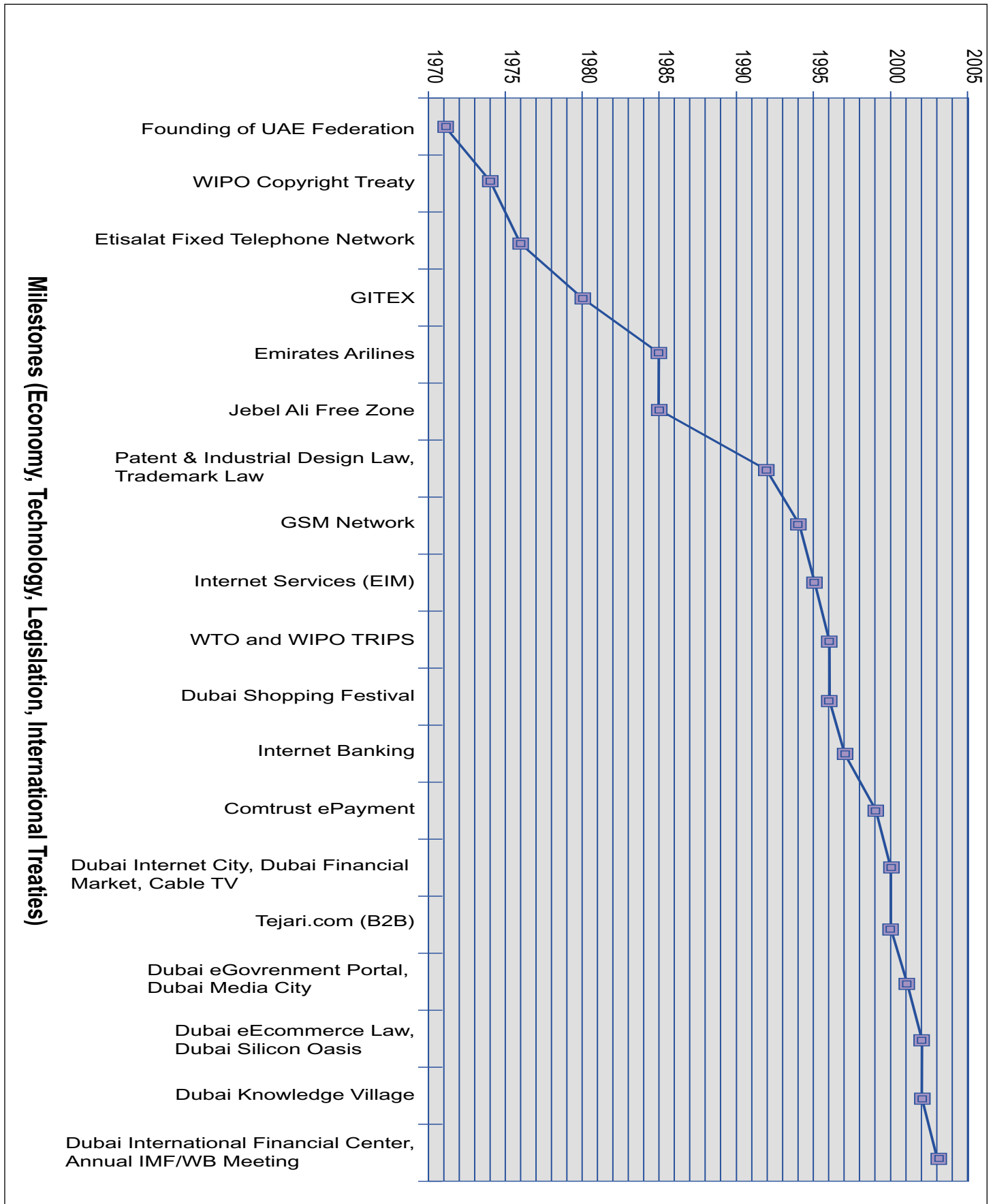
is to complete the vigorously sought transition to a diverse and knowledge-based economy.

The emirate is already being pump-primed as "ICT hub," not only for Gulf region but for the whole of Middle East, the Commonwealth of Independent States (CIS), Africa and the Indian subcontinent, which, together represent an annual GDP of above US\$1.1 trillion. A number of achievements that are economic, technological and legislative in nature have combined to elevate Dubai to this status.

Emirates Telecommunications Company (Etisalat) was established in 1976 as a public switched telephone network (PSTN). A mobile (GSM) network was added eight years later. With a world-class infrastructure behind it, Etisalat today is unrivalled in the Middle East in terms of the quality and affordability of its fixed and mobile telephone services. Even its Internet services arm, Emirates Internet and Multimedia (EIM), boasts of charging the lowest fees in the Gulf for its digital subscription line (DSL) access services. EIM's national bandwidth capacity today is equivalent to 155Gbps or 10 STM-1 lines, which form the backbone of a regional Internet exchange, a data center and its broadband Internet access services.

Nine out of every 10 residents in Dubai now use a mobile telephone and four out of ten use the Internet, so that Dubai wields the highest penetration rates among all cities or provinces in the Arab world.

Emirates Airlines, SkyTrax's Airline of the Year in 2001 and 2002, is one of the world's biggest and most profitable carriers. It expects to operate a fleet of 100 aircraft units by 2010, including the newest 575-seat Airbus A380 which will go into operation in 2005. A single order for an aircraft fleet of \$15 billion, placed in 2001, was a landmark deal defying a cautious world economy after the September 11 terrorist attacks in the US. The Emirates Group's role in putting its headquarters on the world map and in beefing up the local



economy – with profits in fiscal 2002-2003 of \$285.7 million out of revenues worth \$2.8 billion – has been impressive.

Subsequently, Dubai International Airport is now one of the top 10 largest airports in the world, with passengers passing through the airport estimated at 16 million in 2002. The airport is expected to only get bigger, and more impressive, with the \$4.1 billion expansion project which started last year and which is set to be completed in 2006. The flourishing travel industry in Dubai has had a spill over effect to cargo handling, as well as the hospitality industry. Dubai today is home to over 266 hotels, 32 of which are five-stars, including the only seven-star hotel in the world, the Burj Al Arab.

A vital and growing component of Dubai's hospitality industry is the slew of trade shows and conferences that take place at the Dubai International Exhibition Center and Dubai World Trade Center. These have been the venue of the Gulf Information Technology Exhibition (GITEX), as well as other trade shows for textile, fashion, construction, industrial products, oil and furniture. GITEX, now in its 23rd year, is acknowledged as the fourth largest IT show in the world next to Comdex (US), Cebit (Europe) and Computex (Asia), attracting over 60,000 visitors last year.

Shopping festivals have also become a staple in Dubai, drawing visitors from neighboring countries as well as from the rest of the world. The Dubai Shopping Festival and Dubai Summer Surprises are months-long events that offer discounted goods and merchandises and are heavily promoted both within and outside the country.

Likewise, a major turning point which irrevocably influenced Dubai's trading environment – or more aptly one that has set the precedent for a successful export and re-export industry – was the establishment of Jebel Ali Free Zone Authority (JAFZA) in 1985. JAFZA allows 100 percent tax-free foreign ownership of businesses as well as 100 percent repatriation of profits, among other incentives.

Over 2,200 companies, including leading world brands such as Sony, Black & Decker, GAP, Johnson & Johnson, Honda, Xerox and Nokia have set up offices, call centers, assembly plants or warehouse facilities at Jebel Ali. There are currently several specialized free zones in Dubai, including the Dubai Airport Free Zone (DAFZ) and the Technology, E-Commerce and Media (TECOM) Free Zone.

Meanwhile, the Dubai Financial Market (DFM) was established in March 2000. A total of 21 companies, including real-estate giant EMAAR and Emirates Airlines, are listed with DFM as of September 2003. The DFM will co-exist with the planned Dubai Regional Exchange (DRX), the stock exchange component of the Dubai International

Financial Center (DIFC) – a multi-billion dollar project with a free zone status, designed to be a leading capital and money market district catering to Middle East businesses.

It is worth mentioning that Dubai has a highly sophisticated banking sector, which was a relatively early adopter of Internet banking in the Middle East. Emirates Bank International (EBI) was the first local bank to offer Internet banking to its individual account holders in 1997. Today there are several local banks that offer retail services over the Internet, half of which offer online corporate banking transactions such as trade finance, treasury and payroll management. Major multinational banks such as HSBC and Standard Chartered Bank also offer Internet banking services in the emirate.

A significant component of the e-commerce ecosystem was established when Etisalat set up its e-business unit, Comtrust, in 1999. The company offers electronic payment solutions to local merchants, among other services. Today Comtrust counts a number of prominent sites such as the Dubai Electricity and Water Authority (DEWA) among its existing e-payment clients.

Tejari.com, a business to business electronic exchange or marketplace owned and operated by the Dubai Ports Authority, is another landmark achievement by Dubai in recent years. Initially designed as a government procurement portal and launched in 2000, Tejari.com has expanded in an unprecedented manner: it already counts 2,029 members as of third quarter 2003. Transactions conducted through Tejari.com over the past three years are valued at over \$550 million, and the company expects to break even this year.

As for dispensing government services online, Dubai put together a cohesive e-government framework in 2000 and an e-government portal was launched the following year. As with any e-government portal, the goal is to offer all customer-facing services such as utility payment, traffic fines and visa application and renewal from the portal through a single-sign-on Web capability. Today there are at least four customer-facing services offered by www.dubai.ae: the Etisalat bill inquiry and payment, DEWA online bill presentation and payment, and traffic and parking fines enquiry. The site also links to 22 government departments, including the Dubai Municipality and the Department of Naturalization and Residency.

Dubai went the extra mile in securing its nascent knowledge economy when it drafted and passed a local e-Commerce Law in 2002.

Such a sound legal framework, and the strong political will to attract the best of companies and talents in the ICT field, has gained a positive response from multinational IT

vendors as well as start-ups from Europe and the Indian sub-continent.

The large number of companies populating the Dubai Internet City (DIC) and its sister communities – Dubai Media City and Knowledge Village – is evidence of this overwhelming response. The DIC, DMC and Knowledge Village are a technology cluster under the Dubai Technology, Electronic Commerce and Media (TECOM) Free Zone and are home to over 1,400 ICT, media and training-related companies as of August 2003.

A sprawling 990 acres (400-hectare) complex 25 kilometers south of downtown Dubai, the technology enclave serves as regional headquarters to nearly every major IT vendor, including IBM, HP, Microsoft, Oracle, Logica, Canon and Siemens, to name a few. Multinational broadcast companies such as CNN, Reuters, MBC and CNBC are also located at the Dubai Media City.

At the pace with which things are evolving, no one can say Dubai’s aspiration to become a model knowledge-based economy in the region is overly ambitious; indeed, the enormous achievements made over the years would not have been possible if Dubai was less committed to this vision.

This book aims to substantiate press releases and popular claims with scientific and empirical evidence as to where the emirate is going with its ICT plans, while orienting guests and participants at Gulf Information Technology Exhibit (GITEX) Dubai 2003 towards the prospect of investing in Dubai’s ICT market.

1.3 Benchmarking Dubai

A benchmarking study on Dubai’s ‘value propositions’ for the knowledge economy carried out in 2002 by Ernst & Young for the Dubai Government – and presented by the CEO of Dubai Internet City, Omar Bin Sulaiman, at a conference held in Marseille, France, under the title ‘Knowledge for Development – A Forum for Middle East &

North Africa’ – has given the emirate a full score on infrastructure, on a scale of ‘zero, 25, 50, 75 and the full score of 100.’ Singapore and Dublin also received full score on infrastructure, outranking Warsaw, Bangalore, Bahrain and Cairo. Infrastructure scoring dealt with three elements: telecommunications, power utility, roads & transportation.

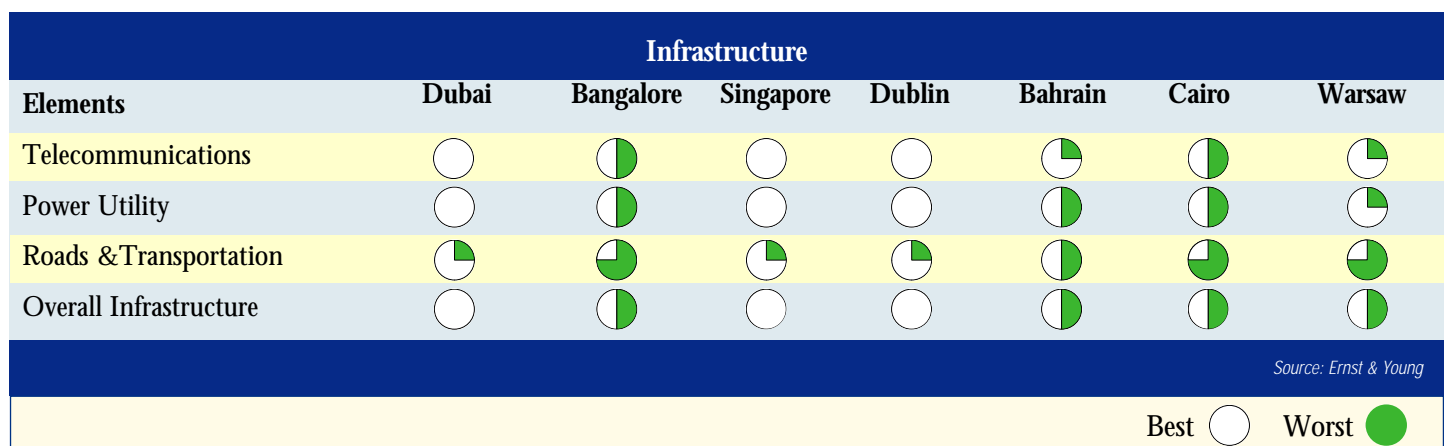
Beside infrastructure, the study benchmarked the areas of business environment, workforce and quality of life for recruiting talents. Though Bahrain, Cairo, Bangalore and Warsaw showed competitiveness in specific elements in each area, they were outperformed by Singapore, Dubai and Dublin.

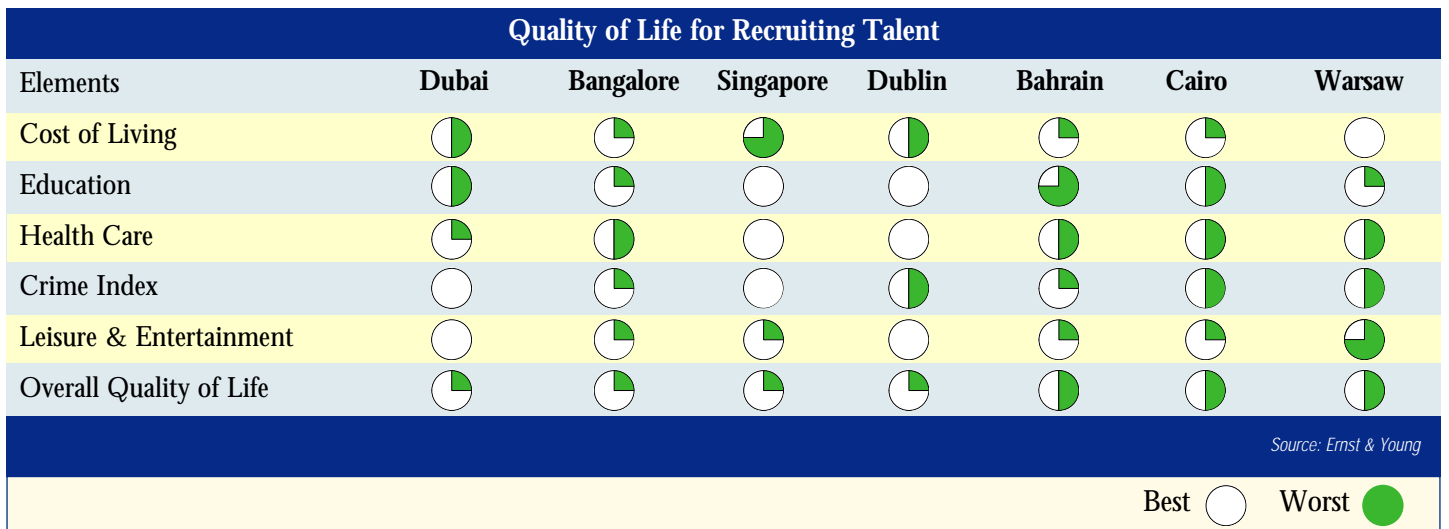
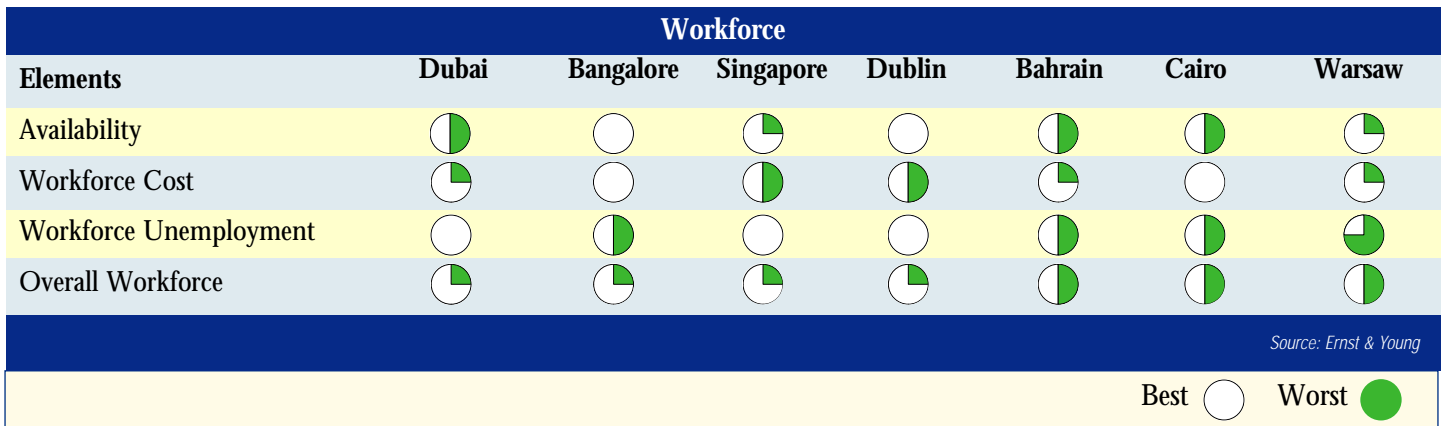
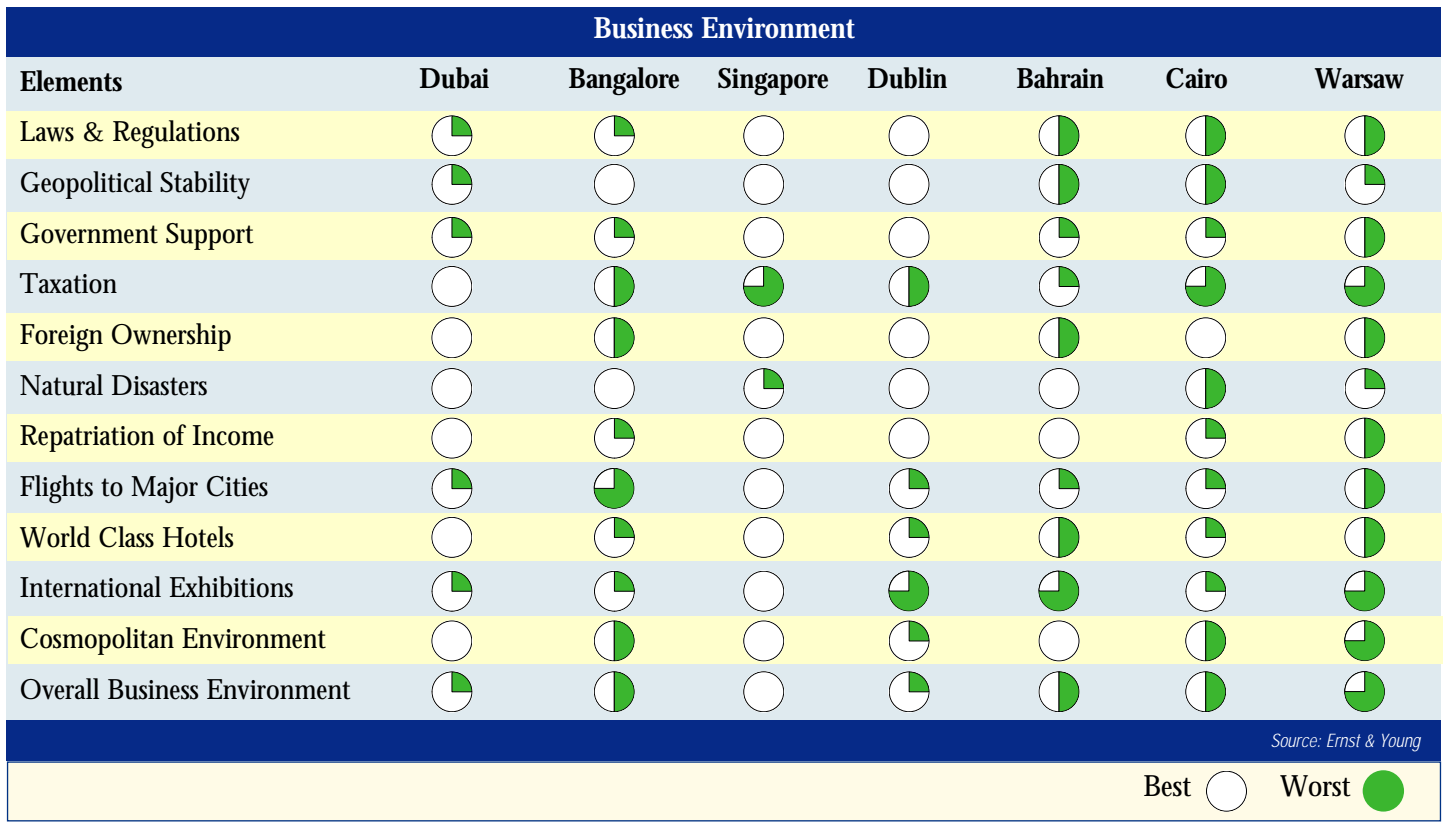
The overall result in each of the four areas showed that Dubai was on equal footing with top scorer Singapore in three areas except the business environment, where Dubai (scoring 75) came one notch lower than Singapore, which scored 100. Dubai matched Dublin in the four overall scores.

In terms of the ‘elements’ assessed under Business Environment, Singapore outranked Dubai in ‘law and regulations’, geopolitical stability, government support, ‘flights to major cities’, and international exhibitions, while Dubai outpaced Singapore in taxation (100 to 25) and ‘natural disasters’. According to the study, the two ‘city states’ were equally attractive in terms of ‘foreign ownership’, ‘repatriation of income’, ‘world class hotels’ and cosmopolitan environment’.

Benchmarking the labor market attribute (or element) of ‘workforce availability’, Dubai came behind Dublin and Singapore, which received 100 and 75 respectively. However, with a score of 75 the ‘workforce cost’ in Dubai was found to be lower than Dublin and Singapore, which both scored 25. All three cities had full score on the unemployment element.

In the overall ‘quality of life for recruiting talent’, Dubai joined Singapore, Dublin and Bangalore in making the highest score at 75. Dubai shared full score with Singapore in the (low) Crime Index, and full score with Dublin in terms





of its 'leisure and entertainment'. Both Dubai and Dublin scored 50 in the 'cost of living', while Singapore scored only 25.

Dubai, however, performed poorly in the 'education' element, scoring only 50 compared to 100 for each of Dublin and Singapore. Also, Dubai's score of 75 in 'health care' was topped by a full score for both Dublin and Singapore. Ongoing developments in the education and healthcare sectors in Dubai, especially new pioneering projects such as Healthcare City and Knowledge Village, are expected to considerably raise competencies in these sectors in the next five years.

1.4 Dubai Knowledge Economy

Dubai has over the last decade acquired all of the ingredients necessary for its transformation into a knowledge-based economy, including advanced telecommunications and information technology infrastructure, a pool of knowledge workers, cosmopolitan environment, dynamic business culture and government support. A full appreciation of Dubai's economic transformation and the challenges and opportunities that lie ahead requires an understanding of the concept and components of the 'knowledge economy'.

There are many widely used definitions for this. However, the World Bank broadly defines a knowledge economy as "an economy that makes effective use of knowledge for its economic and social development. This includes tapping foreign knowledge as well as adapting and creating knowledge for its specific needs." Information and communication technologies are the facilitators and the major driving force, for the knowledge economy, while knowledge is the capital asset for increased productivity.

Key drivers and concepts in the knowledge economy are competitiveness driven by innovation, the creation of knowledge industries, business/industry clusters, and lifelong learning.

The knowledge economy rests on four major pillars, which the World Bank sets as follows:

- Education systems which ensure that citizens are equipped to acquire, use and share knowledge
- Innovation systems that bring together researchers and businesses in commercial applications of science and technology
- Information Society infrastructure that gives all people

access to affordable and effective information and communications

- Economic and institutional framework that ensures a stable macroeconomic environment, competition, flexible labor markets and adequate social protection

Driven by technology and new demands, education is undergoing major changes at all levels and in various areas, including methodologies and delivery channels. Technology-aided lifelong learning and training, however, are the main characteristics of a knowledge economy environment, where the speed at which knowledge and technology are evolving – and the higher skills needed to be competitive – require 'knowledge workers' to regularly update their skills.

Innovation systems refer to strong and wide collaboration between businesses and think-tanks for the creation or implementation of innovative concepts, methods and technologies that give products and services a competitive edge, thus contributing to the development of a knowledge economy.

Information Society infrastructure mainly refers to ICT infrastructure – and how advanced, widespread and affordable this is. But in the broad sense, it includes all infrastructures that support viable knowledge society and knowledge economy.

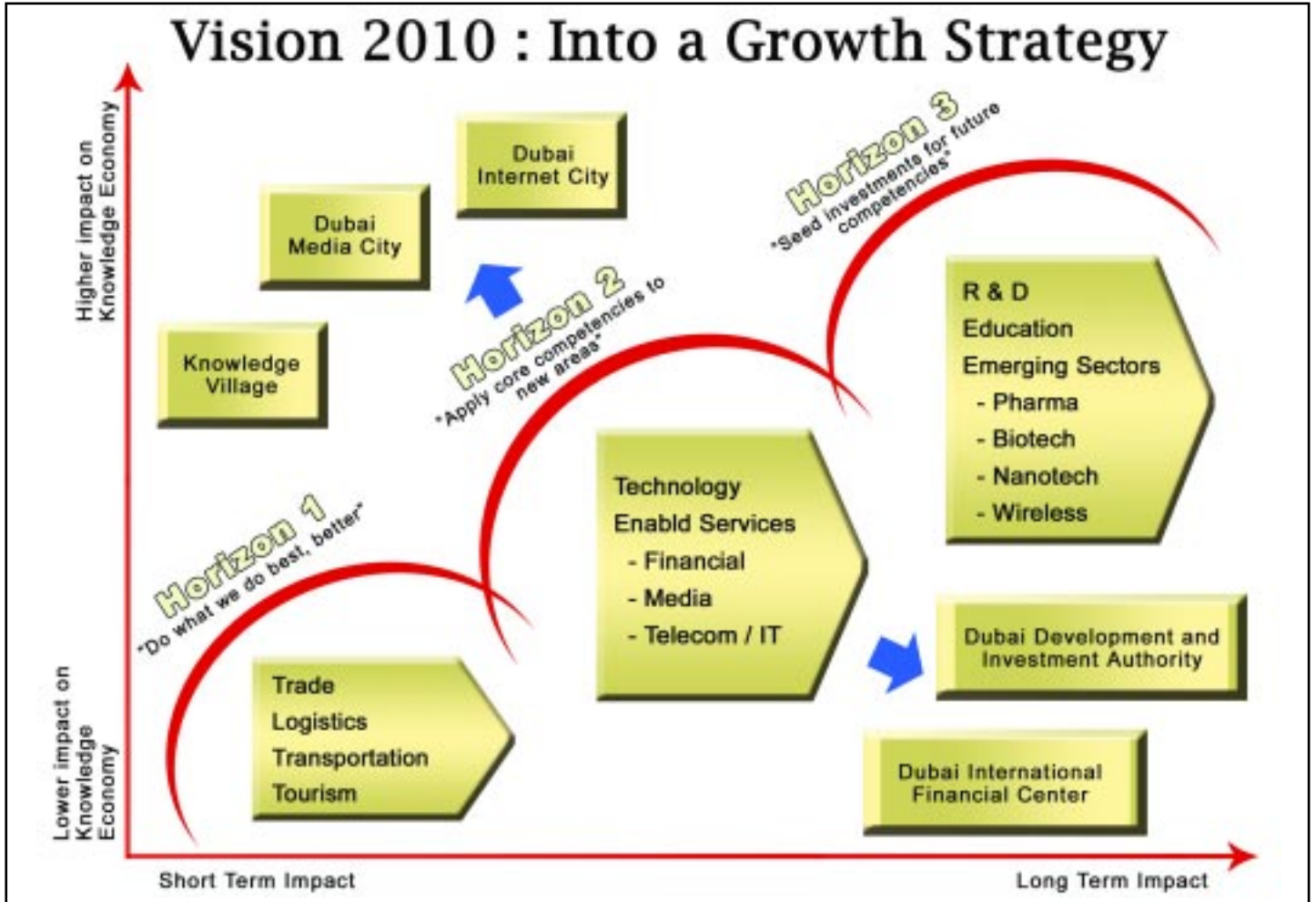
The fourth knowledge economy pillar is the role of the government in providing the legal framework, economic and business incentives, and other conditions that are conducive to the rise of a knowledge economy, in addition to the actual performance of the economy.

If these knowledge economy pillars are ranked in terms of Dubai's achievement, infrastructure would come first, followed by economic and institutional framework, innovation systems, and finally education systems.

Innovation and education systems, however, take a longer time to institute and nurture than the first two pillars. Dubai's young tertiary institutions, for instance, will need several years to build research assets, culture and experience that can enable them to strike viable partnership with businesses and industries.

Another innovation system that has not yet taken roots in Dubai (nor in the region) is venture capital. It is, however, only a matter of time until the model is adopted by the wealthy layer of businessmen and corporates in Dubai.

Illustration of the official vision of the different horizons making up Dubai's transition path towards a knowledge-based economy:



Source: Paper presented by DIC CEO Omar bin Sulaiman at the "Knowledge for Development" conference in Marseille, France, September 2002

Section 2

Macroeconomy & IT Market

2.1 Dubai Demographic & Macroeconomic Overview

The UAE population, which was estimated to have crossed 3.70 million by end 2002, is still recording strong expansion by world and regional standards. Official figures put the rate of population growth during 2002 at above 6 percent. This growth is clearly being fueled by the continued influx of foreign labor (and their families) in large numbers to support economic development – as well as a high birth rate among the relatively small local population.

Some 1.10 million – or around 30 percent – of the UAE population resides in Dubai which has over the years witnessed stronger population expansion than the rest of the country. According to Ministry of Planning figures, the Dubai population grew at a compound average growth rate of 6.90 percent from end 1995 to end 2002, while the other emirates combined barely crossed the six percent mark.

Madar Research forecasts that the Dubai population will continue to expand at high rates during the period from end 2002 to end 2008, given the emirate's clear and determined drive in continuing to diversify its economy and strengthen its position as a trading and business hub for the GCC region and the wider Middle East.

But since population growth rates witnessed in earlier years have slowed recently. And in light of the fact that ongoing and announced future development projects and initiatives seem to be generally directed at less-labor-intensive-activities than in the past, Madar Research foresees Dubai's population growing at a compound average rate of no less than 4.50 percent and no more than 6.50 percent during the forecast period.

As in the first scenario, Dubai's population will reach 1.43 million by end 2008, whereas the second scenario leads to a population level of 1.61 million in that year. Which scenario is more likely to take place? This depends entirely on the magnitude of the economic expansion that will be witnessed during the forecast period. Two corresponding scenarios for GDP growth during 2002 – 2008 are presented in the following paragraphs.

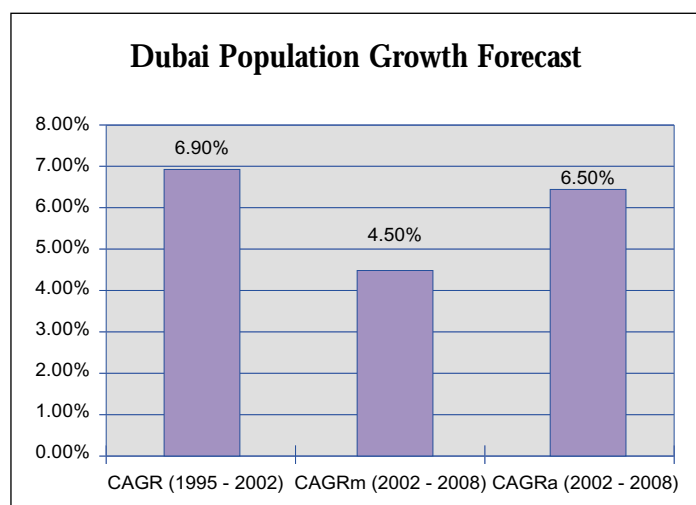
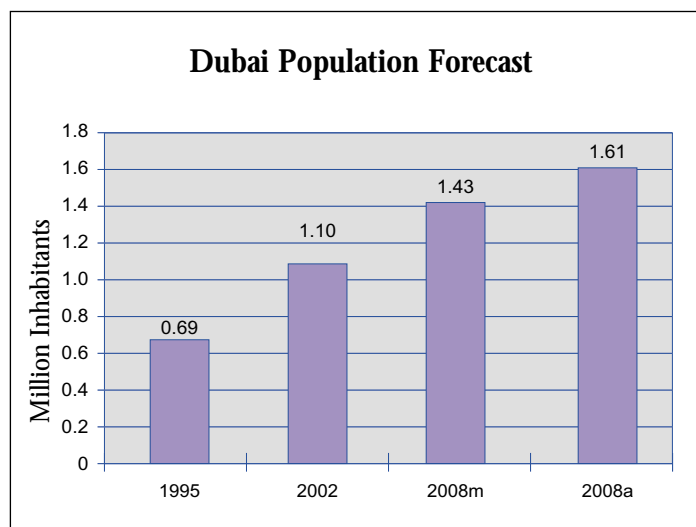
Close to 55 percent, or 2.03 million, of the UAE population are active in the labor market. The size of the Dubai labor force – which is estimated at 0.66 million – reflects higher participation in the labor market on the part of the population than in other emirates. Some 60.31 percent of the Dubai population are active in the labor market, compared to less than 53 percent elsewhere in the emirates.

Participation in the labor force by the Dubai population

has witnessed steady increases for many years – a strong indicator of the continuously rising intensity of local business activity. From end 1995 to end 2002, the percentage of the population active in the economy grew at a compound average rate of 1.61 percent.

Dubai Population	
1995	0.69 million
2002	1.10 million
2008 (moderate growth)	1.43 million
2008 (aggressive growth)	1.61 million
CAGR (1995 – 2002)	6.90 percent
CAGRm (2002 – 2008)	4.50 percent
CAGRa (2002 – 2008)	6.50 percent

Source: Madar Research

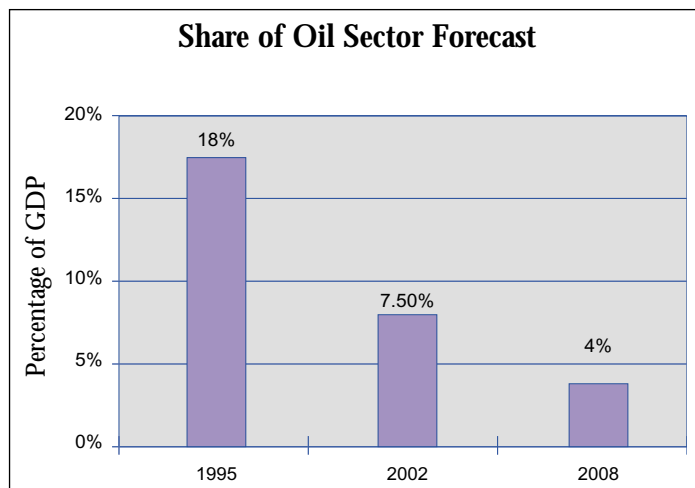


Given the large population expansion witnessed by Dubai during the past seven years due to a large influx of foreign labor – and since the rate at which UAE nationals entering the labor market for the first time has been increasing significantly for several years – it would be expected that growth in the emirate’s labor force between end 1995 and end 2002 was higher than that of the population. In fact, official figures reveal that Dubai labor force experienced a compound average growth rate of 8.63 percent over the said period.

According to the *UAE National Accounts*, economic growth in the country is estimated to have rebounded into positive territory in 2002 after the slowdown of 2001 – benefiting from improved oil prices and hitting a modest rate of 2.52 percent. By end 2002, GDP had reached \$70.92 billion, compared to \$69.18 billion in 2001.

Dubai – which possesses the second largest, but the most diversified economy within the emirates – witnessed a GDP growth rate of 4.56 percent during 2002. Although considered healthy by regional and even international standards for that year, this rate is still way below recent years.

Between end 1995 and end 2002, Dubai GDP has jumped by a staggering compound average growth rate of 7.64 percent, from \$11.22 billion to \$18.79 billion. This



Source: Madar Research

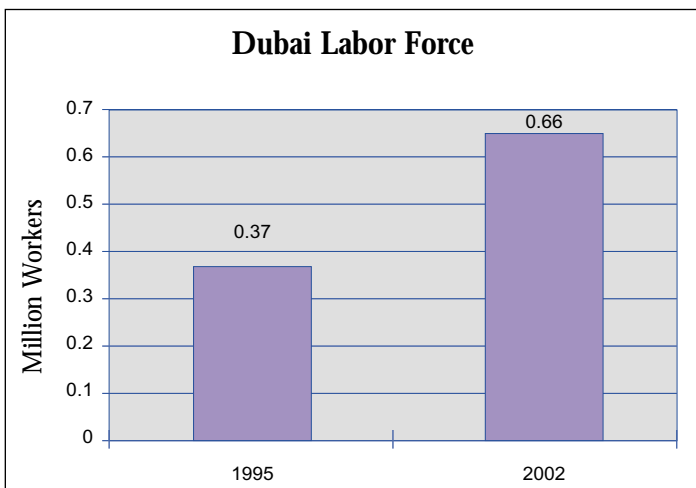
phenomenal growth has been driven by a strong and steady expansion in non-oil activities, such as tourism, re-export, construction and banking. In fact, Dubai non-oil GDP today comprises more than 92 percent of total GDP, in comparison to a share of 82 percent in 1995.

Madar Research forecasts that non-oil activities will account for no more than four percent of Dubai total GDP by end 2008, if the recent growth performance exhibited by the non-oil sectors is maintained.

Next we discuss the course that Dubai’s overall GDP is

Dubai Labor Force	
1995	0.37 million
2002	0.66 million
CAGR	8.63 percent

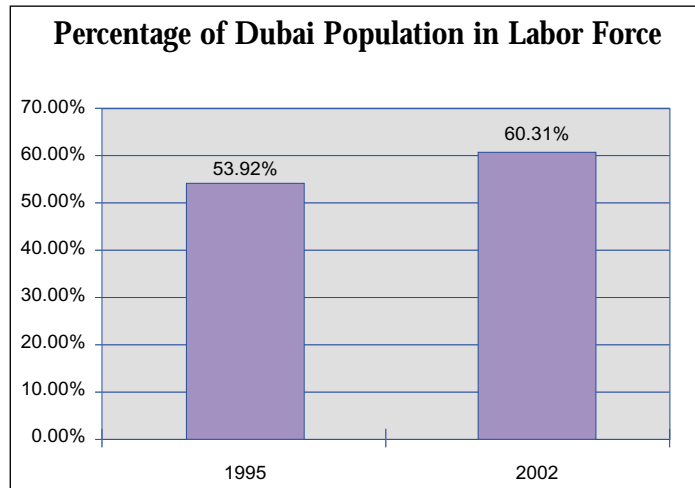
Source: Madar Research



Source: Madar Research

Dubai Population Participation in the Labor Force	
1995	53.92 percent
2002	60.31 percent
CAGR	1.61 percent

Source: Madar Research



Source: Madar Research

Dubai GDP

1995	US\$ 11.22 billion
2002	US\$ 18.79 billion
2008 (moderate growth)	US\$ 25.18 billion
2008 (aggressive growth)	US\$ 28.20 billion
CAGR (1995 – 2002)	7.64 percent
CAGRm (2002 – 2008)	5.00 percent
CAGRa (2002 – 2008)	7.00 percent

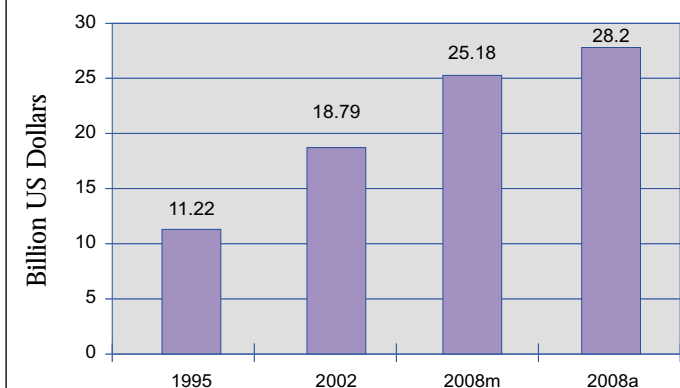
Source: Madar Research

Dubai Per Capita GDP

1995	US\$ 16,275
2002	US\$ 17,082
CAGR	0.69 percent

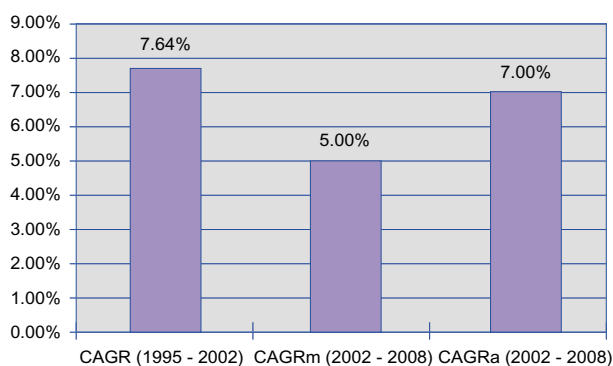
Source: Madar Research

Dubai GDP Forecast



Source: Madar Research

Dubai GDP Growth Forecast

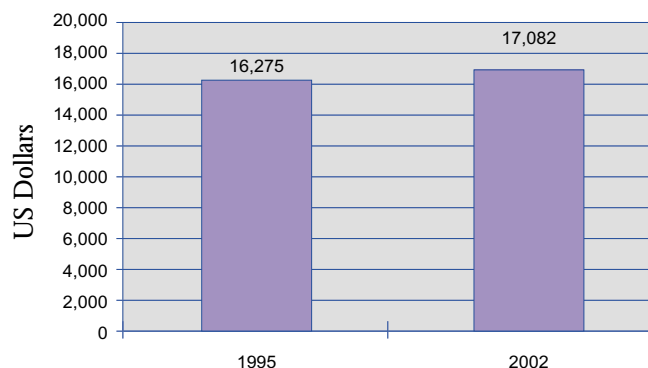


Source: Madar Research

likely to take between end 2002 and end 2008.

On the basis of historical trends and expected changes in growth fundamentals during 2002 – 2008, Madar Research devised two scenarios of overall GDP growth for Dubai during this period. The first, or “moderate growth” scenario, predicts a GDP level of 25.18 billion US dollars by end 2008 – reflecting a compound average growth rate of five percent.

Dubai Per Capita GDP



Source: Madar Research

The second, or “aggressive growth” scenario, predicts a GDP level of 28.20 billion US dollars by end 2008 – reflecting a compound average growth rate of seven percent.

With population expanding at a pace barely lower than that of economic growth, Dubai per capita GDP has only experienced a slight improvement between end 1995 and end 2002, growing at a compound average growth rate of 0.69 percent. Nonetheless, at 17,082 US dollars, Dubai per Capita GDP is among the highest in the world.

2.2 ICT Use Penetration

Use of PCs, the Internet, fixed lines and mobile phones has been growing at a staggering pace across the emirates over the past few years, and it is not expected to decelerate much in the near future. The UAE now stands ahead of all other Arab countries in terms of population penetration levels associated with these ICT parameters.

Among the seven emirates making up the UAE, Dubai takes the first position on all four fronts in terms of penetration levels. It comes first with respect to the absolute levels of Internet users, fixed line subscribers and mobile phone subscribers, but falls slightly behind Abu Dhabi in size of PC base.

The table entitled “Dubai ICT Use” features the absolute values and penetration levels of PC base, Internet users, fixed line subscribers and mobile phone subscribers in Dubai, as of

Dubai ICT Use

	PC Base	Penetration	Internet Users	Penetration	Fixed Lines	Penetration	Mobiles	Penetration
2002	210,000	19.09%	429,000	39.00%	432,000	39.27%	960,000	87.27%
2008	445,000	31.12%	780,000	54.55%	560,000	39.16%	1,420,000	99.30%
CAGR	13.33%		10.48%		4.42%		6.74%	

Source: Madar Research

end 2002. The table also illustrates the Madar Research growth forecast for each of the four ICT parameters during the period 2002 – 2008. The penetration levels provided for end 2008 are based on population growing at a compound average rate of 4.5 percent over the forecast period – i.e. population following the previously described moderate growth scenario.

The strongest growth is expected to be in the size of PC base, which is forecast to expand at a compound average rate of 13.33 percent, rising from 210,000 PCs by end 2002 to 445,000 by end 2008.

Number of Internet users is also seen to experience double digit growth (CAGR 10.48 percent), to reach 780,000 by end 2008 from 429,000 by end 2002. Both fixed lines and mobiles are forecast to register single digit growth rate at a compound average growth rate equal to 4.42 percent and 6.74 percent, respectively.

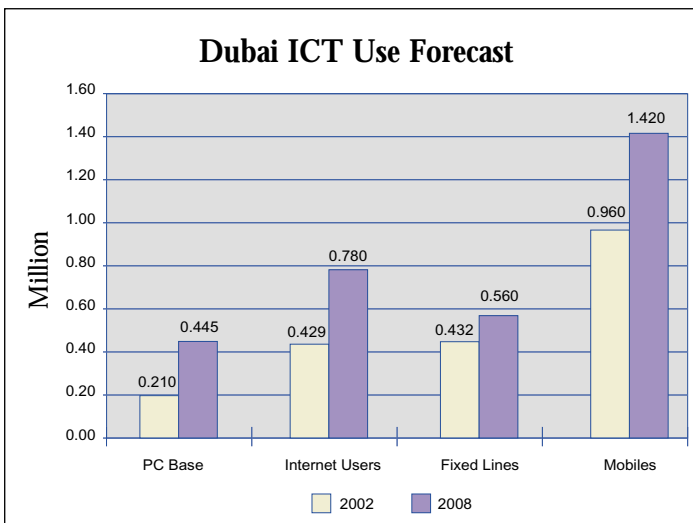
Penetration rates associated with forecast levels of PC base, Internet users, and mobile phones indicate that Dubai will be getting very close, by end 2008, to meeting penetration levels of Internet use and mobile use in many developed countries around the world. They also indicate that remarkable achievements in PC adoption will be accomplished.

2.3 Dubai IT Market: Current Size and Opportunity Assessment

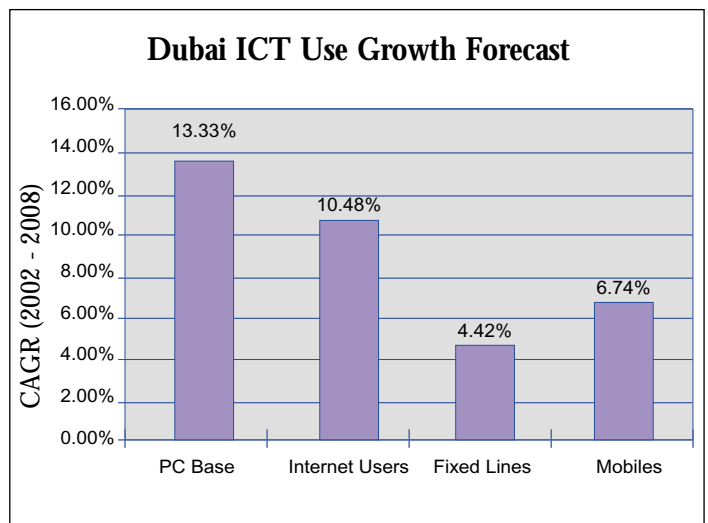
The slowdown in the global IT market in the last three years is having little impact on the UAE and Dubai – the country’s and region’s main and most vibrant trading and distribution market for IT products and services. There are two main reasons for this. First, the UAE is an emerging market and has yet to reach saturation stage. Secondly, the pace of IT development in Dubai – and other emirates – has been firmly set by the political will which is the core force driving the migration of both government and businesses towards the “digital economy.” Increased IT investment by local and federal government entities – as well as medium-to-large enterprises – to raise the efficiency of their operation has significantly contributed to maintaining the IT market growth across the emirates in 2002, and will continue to fuel expansion.

Many IT providers in the Dubai reported a slowdown in their activities during 2002 in comparison to the previous two years. But for the majority of providers, growth is still positive, increasing at slightly lower rates – and their outlook for 2003 and 2004 is optimistic.

Taking historical growth patterns and a number of key



Source: Madar Research



Source: Madar Research

Dubai IT Market (Million US Dollars)

	Software Products	Computer Equipment	IT Services	Data Communications	Total
2002	92	147	158	105	502
2008	146	260	312	196	915
CAGR	8%	10%	12%	11%	10.52%

Source: Madar Research

influencing factors into account, Madar Research expects the Dubai IT market to witness double digit growth rates between end 2002 and end 2008. The pace of IT market growth will by far exceed the pace of overall economic growth.

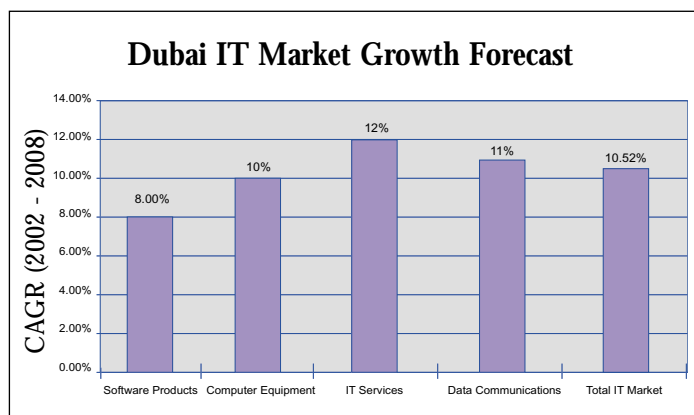
Among the trends that will affect Dubai and the whole UAE IT market over the short-term is growing sophistication, with more total solution and value-added service providers replacing pure box movers. High-growth IT market segments in coming years will include storage, security, CRM and ERP. In fact, IT services – which include professional services, IT training, system integration, hardware maintenance and technical support – have experienced an estimated 11 percent growth in 2002, clearly reflecting strong demand for an integrated technology approach that focuses on strategic consultancy and unified technology platforms, to address more advanced business requirements.

The table “Dubai IT Market” shows the values of all segments of the Dubai IT market in 2002 and the values they are forecast to reach by 2008. Total market value is expected

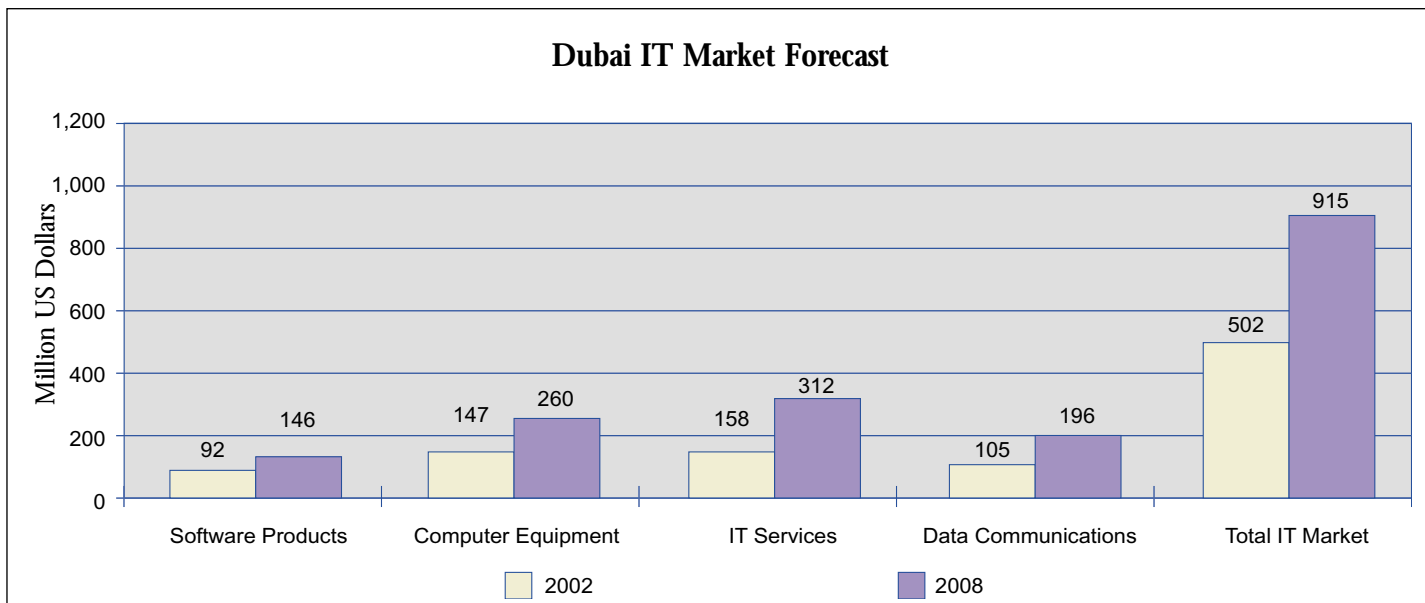
to grow at a compound average rate of 10.52 percent over the forecast period, rising from slightly above half a billion US dollars to less than one billion.

IT services will be the fastest growing segment. Fueled by a compound average growth rate of 12 percent, the value of IT services market will rise from 158 million US dollars to 312 million.

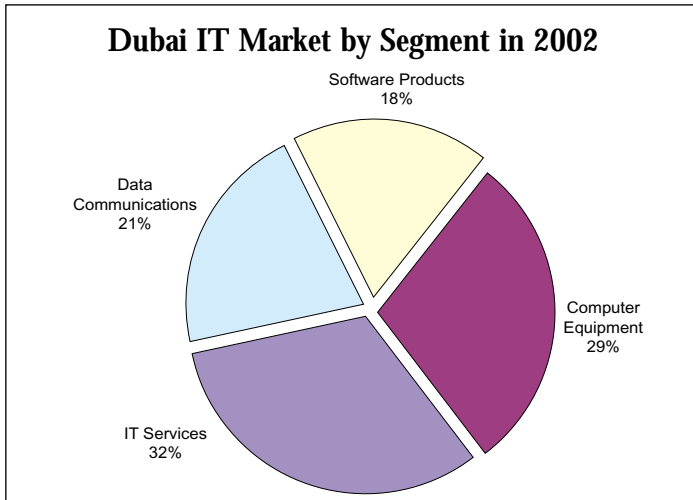
The data communications segment is also forecast to



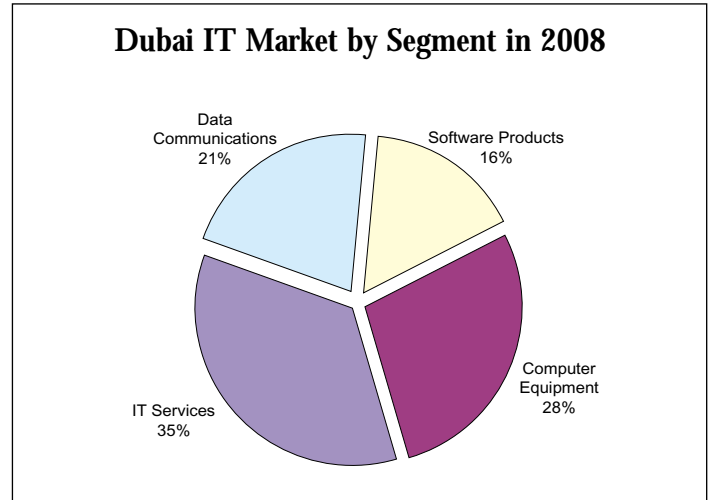
Source: Madar Research



Source: Madar Research



Source: Madar Research



Source: Madar Research

witness double digit growth during the period. Given that the UAE, and specifically Dubai, continue to work aggressively on developing and expanding its already sophisticated and competitive telecommunications networks – in order to sustain its position as the major hub for businesses in the region – growth in the data communications sector will definitely remain buoyant. Driven by a compound average growth rate of 11 percent, the value of the data communications segment will reach \$196 million by end 2008, compared to \$105 million by end of 2002.

Another market segment that is expected to grow at a

double digit compound average rate is computer equipment. The value of this segment is forecast to climb from \$147 million to \$260 million – reflecting a compound average growth rate of 10 percent.

Software products – which ranked last among the four IT market segments in terms of size by end 2002 – comprise the only segment forecast to grow at a single digit compound average rate. Value is expected to rise from \$92 million in 2002 to \$146 million in 2008, reflecting a growth rate of just eight percent.

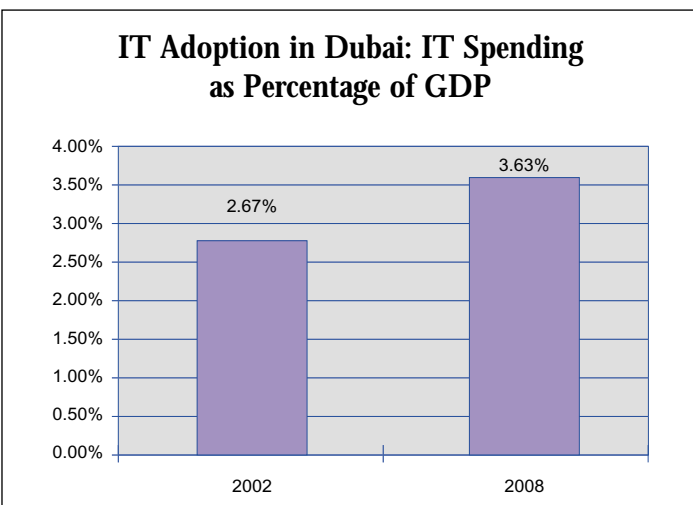
To shed light on Dubai’s aggressive level of IT adoption –

Dubai IT Spending as Percentage of GDP	
2002	2.67 percent
2008	3.63 percent

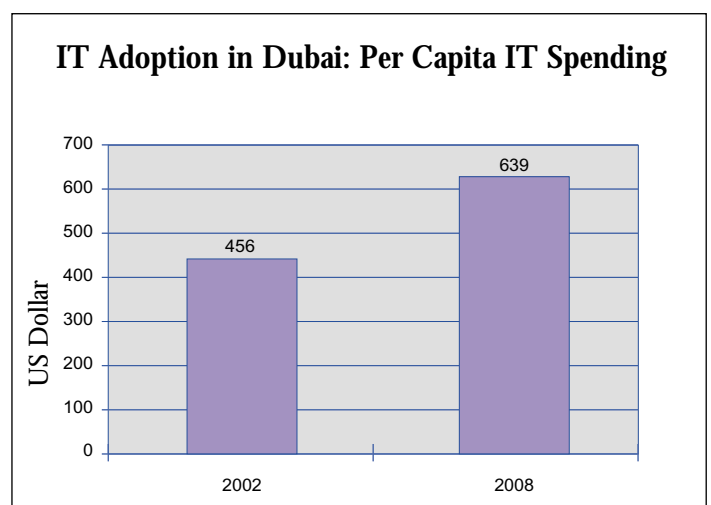
Source: Madar Research

Dubai IT Spending Per Capita	
2002	US\$ 456
2008	US\$ 639

Source: Madar Research



Source: Madar Research



Source: Madar Research

and how is that likely to progress in the near future – it's worthwhile resorting to the two most widely used indicators of an economy's aggressiveness in IT adoption: namely IT spending as a percentage of GDP, and per capita IT spending.

The values of these two variables for Dubai as of end 2002 and end 2008 can – of course – be derived from the actual figures and forecasts presented earlier for Dubai population, GDP and IT market size.

The ratio of IT spending to GDP for Dubai in 2002 is estimated at 2.67 percent. Although this level far exceeds that of almost all Arab countries, it is still lower than the world average for the same year, which is estimated at 3.88 percent. Nonetheless, it is important to note that the world average – by virtue of its calculation method (statistical averages are inherently biased towards extreme values) – is biased upward, due to the extremely high ratios of IT spending to GDP characterizing a number of the world's most developed economies.

Where will the ratio of IT spending to GDP in Dubai be by end 2008? Madar Research forecasts for the emirate's GDP (as per the moderate growth scenario), and the size of

its IT market in that year, point to a much improved ratio of 3.63 percent.

Examining the aggressiveness of Dubai in IT adoption through the second indicator – per capita IT spending – yields a dramatically different picture.

Given the large size of Dubai's economy relative to its population – as compared to most countries – the emirate's per capita IT spending level for 2002 emerges as significantly higher than the world average – US\$460 vs. US\$200. This clearly reflects a much stronger appetite for IT products and services than what is generally prevailing worldwide; an appetite that is also unmatched anywhere else in the Arab World.

What is even more striking is that Madar Research's forecasts of Dubai population (as per the moderate growth scenario) and IT market size show that per capita IT spending will record a significant jump over coming years to reach \$639 by end 2008.

By combining the results achieved through both indicators, it can be said that Dubai currently compares well with world standards in terms of its aggressiveness level towards IT adoption. It is most likely to witness a much increased aggressiveness over the period 2002 – 2008.

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Section 3

Major ICT-Intensive Clusters: Profiles and Objectives

3.1 Overview

Over half a century ago, Stanford University was having financial problems and decided to lease part of the university's land to high-tech companies for 99 years to raise much needed funds. Thus came the birth of Silicon Valley in California. After several years, this cluster became the birthplace of the first microprocessor (Intel's 4004 chip) and the first microcomputer (the Apple-1). It also became the launch pad of the Web revolution when Netscape Communications went public in 1995.

Zeroing in on the Arab Gulf region few decades later, Sheikh Mohammed bin Rashid Al Maktoum, Dubai crown prince and UAE defense minister, made no secret his vision to make the emirate a premier ICT hub, not only for the UAE and the Gulf but for a much larger base. Perhaps he was in some way recreating the success of Silicon Valley by attracting a large number of major technology investors and innovators. As it has turned out, Sheikh Mohammed's vision was as strong as his will to execute it, which resulted in the inauguration of the Dubai Internet City (DIC) in October 2000, exactly 12 months after it was conceived.

Other than DIC, which is just one of three Knowledge Economy communities under the Dubai Technology, Electronic Commerce and Media (TECOM) Free Zone, a number of high-tech clusters – all with free trade zone status – are being established in Dubai. Among them are the Dubai Silicon Oasis, managed by the Dubai Airport Free Zone Authority (which directly complements DIC); the Jebel Ali Technology Park; and the Dubai International Financial Center (DIFC).

3.2 Free Trade Zones: Knowledge Economy Engines

Liberal economic policies, world-class telecom and data communication infrastructure, and the advantage of being part of technology-oriented industry clusters in one of the world's fastest growing economic regions, are major incentives for both start-ups and multinational companies in these locations.

The role of free zones in Dubai, however, cannot be overrated, since it goes beyond traditional economic benefits. Dubai free zones are now turning into innovation centers and "knowledge clusters", creating communities of talents and knowledge workers. In line with its economic diversification policy, and taking full advantage of the free zone concept, Dubai has in the last three years established or announced more than 10 free zones in new and old areas of competency, such as the Gold & Diamond Park and Dubai Maritime City (old competencies), and Dubai Healthcare City and Dubai

Metals & Commodities Center (new competencies). The common denominator between all these competencies is the Knowledge Economy: they are all focused on excellence, innovation, added value and the latest technologies and knowledge. The vision is that as these clusters grow and mature they will interact, thus complementing and contributing to each other's growth, and creating a vibrant Knowledge Economy base.

Dubai free zones have already attracted thousands of companies from around the world. These benefit from special decrees that exempt them from the restrictive Commercial Companies Law (UAE Federal Law No. 8 of 1984, as amended), which stipulates that foreign parties who want to actively participate in a company through which they import or sell goods in the UAE can only own a maximum of 49 percent of the share capital of such companies. Under the said law a local partner or sponsor should own 51 percent of the business entity. Otherwise, a less restrictive local service agency may be used by foreign investors.

TECOM and the other free zones in Dubai, however, offer 100 percent tax-free ownership, 100 percent repatriation of capital and profits, quick business registration and licensing, stringent cyber regulations (see section 4, e-Commerce Market and Infrastructure: Dubai Legal Framework supporting ICT) and protection of intellectual property rights.

It is worth mentioning that Dubai's first free trade zone, which was established in Jebel Ali in 1985, made an early contribution to the ICT scene in Dubai. A number of high-technology and consumer appliance companies such as HP,

Free Zones in Dubai
1 Dubai Airport Free Zone
2 Dubai Cars and Automotive Zone*
3 Dubai Gold and Diamond Park*
4 Dubai Healthcare City
5 Dubai Investments Park
6 Dubai International Financial Center
7 Jebel Ali Free Zone incl. Technology Park
8 Dubai Maritime City
9 Dubai Metals and Commodities Centre
10 Dubai Technology, Electronic-Commerce and Media (TECOM) Free Zone
11 Dubai Textile Village
12 International Media Production Zone**
13 Dubai Aid City*

Source: Madar Research

*Supervised by Jebel Ali Free Zone
** Extension of Dubai Media City

DIC / DMC Tenant Breakdown (2001-2003)

	End 2001	End 2002	End 2003
DIC			
Number of Companies	191	364	548*
Average number of employees per company	n/a	n/a	10.3
Highest number of registered companies based on type of business	IT support	Sales and marketing	Web-based
DMC			
Number of Companies	300	500	905*
Average number of employees per company	5	4.6	5.2*
Highest number of registered companies, based on type of business	Publishing and advertising	New media	Publishing and advertising
Total Number of Companies	491	864	1,453*

*Madar Research estimates

Source: Madar Research

Sony and Acer have built million-dollar assembly plants, customer service or call centers and warehouse facilities at the Jebel Ali Free Zone (JAFZ) long before the establishment of DIC. This means that a de-facto ICT cluster exists and will continue to operate from the JAFZ, some 10 kilometers away from DIC, even though DIC has been designated as the ICT free zone in the emirate. Some companies, like HP, maintain an operation at both sites. JAFZ is located next to the Jebel Ali Port, which facilitates the shipment of raw materials and finished goods to and from the UAE.

Total exports and re-exports from the free trade zones in Dubai are estimated to have reached \$8.846 billion, according to 2002 figures.

3.3 Dubai Technology, Electronic Commerce and Media (TECOM) Free Zone

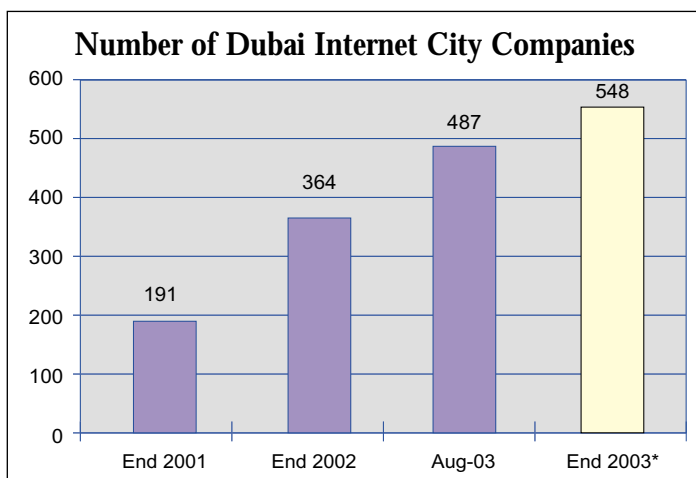
The idea behind the DIC is an all encompassing one-stop-shop for IT: software, hardware, consultancy, services, training and e-hosting, among a range of services. The target market extends from the Gulf to the Levant, Africa, the

Commonwealth of Independent States (CIS) and the Indian subcontinent, whose aggregate annual GDP is over \$1.1 trillion.

Total investment cost for the entire TECOM – which oversees DIC and its sister communities, the Dubai Media City (DMC) and Knowledge Village (KV) – has been estimated at \$700 million, excluding the value of its 990-acre site. This investment went primarily on the construction of the facilities and the support infrastructure including telecom and data communications.

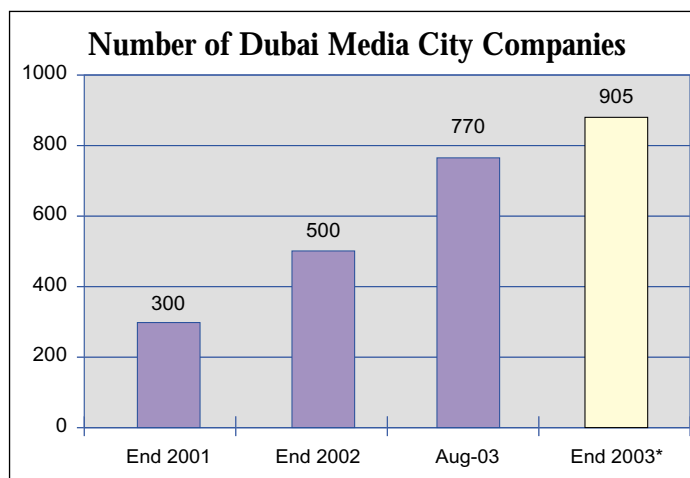
The number of companies registered and/or operating in DIC and DMC proves that Dubai's value proposition as an ICT hub is strong.

According to DIC, it hosts 487 operating companies as of August 2003, up from 364 at end 2002, and 191 at end 2001. This means that 123 new companies joined DIC during the first eight months of 2003. If new companies join DIC at the same rate for the last four months of 2003, the total number of DIC companies would reach 548. This would register almost 50 percent growth for the whole year.



*Madar Research estimates

Source: Madar Research



*Madar Research estimates

Source: Madar Research

Dubai Media City, which opened in 2001, meanwhile reported 300 companies at the end of that year. This grew to 500 by end 2002, and as of August 2003, an impressive total of 770 companies already populate the DMC. This means that 270 new companies joined DMC in the first eight months of 2003. Assuming that the same rate of new comers is maintained till the end of 2003, DMC will have a total of 905 members, leading to almost 80 percent growth for 2003.

This makes for a total of 1,453 companies at the TECOM by end 2003, plus some 58 companies now based at the Knowledge Village, which opened only last year. This figure is already remarkable; Silicon Valley, for instance, has clustered over 6,000 technology and support companies, but after existing for five decades.

The average number of employees per company at DIC is significantly higher than at DMC – 10.3 (DIC) to 5.2 (DMC).

DIC further reports that companies whose lines of business are concentrated on “IT Support” dominated their client list in 2001, but were overtaken by “Sales and Marketing-related” companies in 2002, and by “Web-based” companies in 2003. DMC’s list was topped by publishing and advertising firms in 2001, new media in 2002, and back to publishing and advertising in 2003.

In terms of expansion, TECOM management is using a phased approach in building facilities within the premises to accommodate new comers. DIC, meanwhile, continues to seek out trade partners outside the UAE such as the Australian Information Industry Association (AIIA) to ensure access to new technologies, ideas and potential business ventures.

According to Dr Omar Bin Sulaiman, CEO of DIC, partnerships such as that with AIIA aim to organize “the exchange of information and trade missions and also facilitation of joint ventures among member companies of the organizations involved.”

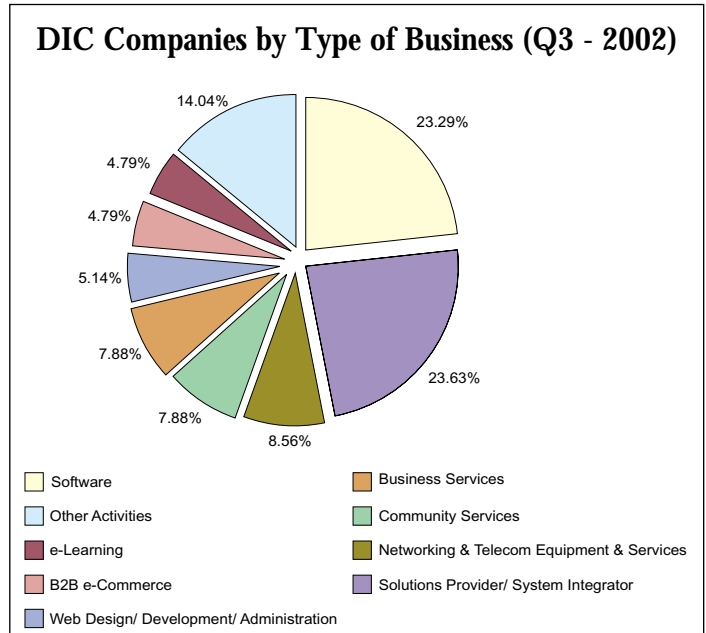
3.3.1 Dubai Internet City

A Madar Research Group study conducted in October 2002 yielded interesting results in terms of countries of origin and types of business of DIC-based companies. Since the nationality and type of business of 11 of the 303 companies registered with DIC at the time could not be determined, the Madar Research team was left with a total of only 292 companies to evaluate. While the number of DIC companies has significantly increased over the past 12 months, Madar Research analysts also believe that the representation of companies according to the two categories is generally still valid for 2003.

Madar Research Journal (October 2002) findings:

- Two hundred and twenty-six (226) of the 292 companies then with offices in DIC were registered abroad or in the United Arab Emirates, with only branch offices registered at DIC. The remaining 66, or 22.6 percent, have set up their offices in DIC as DIC-registered companies.

- DIC-registered companies include a number of



Source: Madar Research

Breakdown of DIC Companies by Business Type (Q3 - 2002)

Type of Business	Percentage Share
Solution Providers/ System Integrators	23.63%
Software	23.29%
Networking & Telecom Equipment and Services	8.56%
Community Services	7.88%
Business Services	7.88%
Website Design / Development / Administration	5.14%
B2B eCommerce	4.79%
eLearning	4.79%
Resellers / Distributors	2.74%
Dot com (excluding eCommerce)	2.05%
Peripheral Equipment and Storage Devices	2.05%
Handheld and Wireless Devices	1.37%
Computers	1.37%
B2C eCommerce	1.03%
ASP	1.03%
Hardware Components	1.03%
Consultancies	1.03%
Market Research	0.34%
Total	100.00%

Source: Madar Research

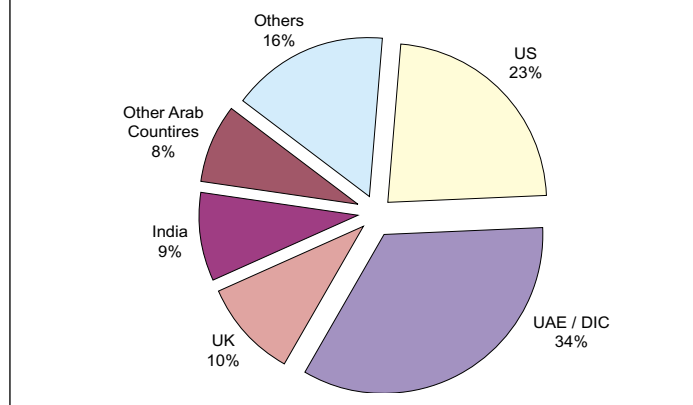
DIC Companies Based on Country of Origin (Q3 - 2002)

Country of Origin	Percentage Share
UAE/DIC	34.25%
USA	23.29%
UK	9.59%
India	9.25%
Saudi Arabia	2.40%
Jordan	2.05%
Germany	1.71%
Canada	1.37%
Egypt	1.37%
France	1.03%
Holland	1.03%
Japan	1.03%
Singapore	1.03%
South Africa	1.03%
Switzerland	1.03%
Norway	1.03%
Austria	0.68%
Bahrain	0.68%
Finland	0.68%
Australia	0.34%
Hong Kong	0.34%
Ireland	0.34%
Italy	0.34%
Kenya	0.34%
Korea	0.34%
Kuwait	0.34%
Lebanon	0.34%
Liechtenstein	0.34%
Malaysia	0.34%
Oman	0.34%
Portugal	0.34%
Qatar	0.34%
Sri Lanka	0.34%
Sweden	0.34%
Turkey	0.34%
Total	100%

Source: Madar Research

companies previously registered elsewhere – either abroad or in the UAE – and have moved their operations exclusively to DIC; or businesses that are headquartered at DIC and maintain branch offices elsewhere.

- UAE and DIC-registered companies dominated the list at 34.25 percent, followed by representative offices or branches of companies that are headquartered in the US, at 23.29 percent. Nearly 10 percent have mother companies based in the UK, while 9.25 percent are of Indian origin.

DIC Companies by Country of Origin (Q3 - 2002)

Source: Madar Research

Only eight percent of the total are from other Arab states such as Saudi Arabia, Jordan and Egypt. The remaining companies are from countries such as Germany, Canada, France and Japan.

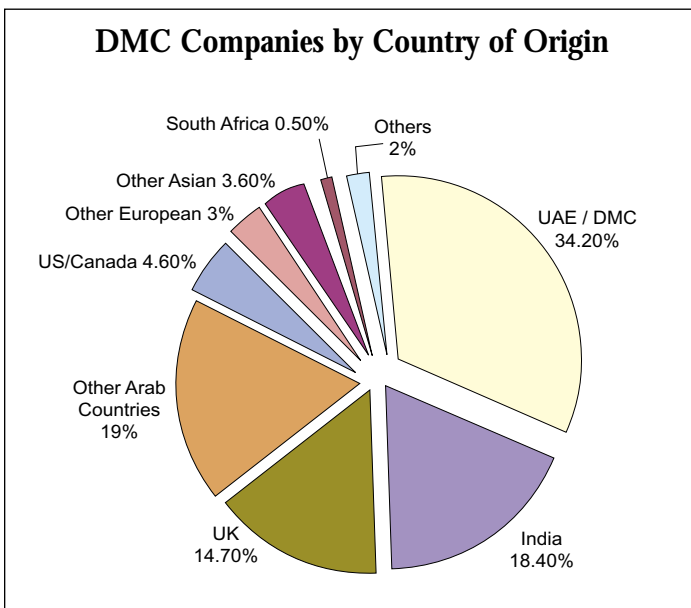
As for types of business activity, DIC companies fell into 18 categories. Solution providers/systems integrators outnumbered software companies by only one point: 69 (23.63 percent) against 68 (23.29 percent). A distant third were networking and telecom equipment and services companies, numbering 25 (8.56 percent), followed by companies offering community services (or auxiliary support) such as legal, food and beverage, travel and banking services, at 23 or 7.88 percent. Business services companies, which provide financial, marketing and other related services, make up 7.88 percent of the total 292 firms in DIC. This sector was followed by smaller categories such as website design and development, and B2B.

3.3.2 Dubai Media City

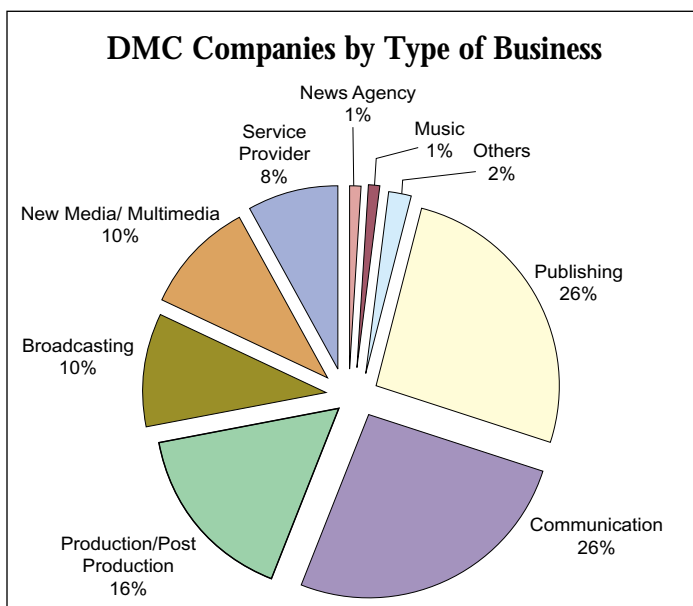
The Dubai Media City, designed as a regional base for quad-media (broadcast, print, radio and the Internet) companies, had a total of 770 firms as of August 2003. These include media giants such as CNN, Reuters, MBC, Sony Broadcast & Professional, and McGraw Hill Publishing. The bulk of companies are start-ups specialized in media activities such as advertising, marketing, research, public relations, publishing or digital content creation. DMC's website says that it currently has a pool of 170 freelance media professionals.

UAE and DMC-registered companies dominate the list of DMC tenants at 34.2 percent, followed by companies coming from other Arab countries (19 percent) and those of Indian origin (18.4 percent). Companies with head offices in

the UK – or are registered in the UK with a branch or representative office at DMC – follow closely with a 14.7 percent share. Unlike DIC, where the second highest number of companies comes from the US, only 4.6 percent of DMC tenants originate from North America (US and Canada). Companies with origins in Asia, South Africa and other European companies have shares of 3.6, 0.50 and three percent, respectively. The countries of origin of the remaining two percent of the companies could either not be established or are not classified under the covered regions.



Source: Dubai Media City (2002)



Source: Dubai Media City (2002)

In terms of type of business activity, those in publishing and communication formed over half the whole community, at 52 percent. The remaining 48 percent is shared by production and post-production companies (16 percent), broadcasting (10 percent), new/multimedia (10 percent), service providers (eight percent), news agencies (one percent) and music (one percent). Two percent of the companies in DMC could not be classified under any of the above types of business.

A DMC extension, the International Media Production Zone (IMPZ), was launched in mid 2003. Located outside the TECOM domicile on a 35 million-square foot (over 800 acres) site along Emirates Road, the IMPZ seeks to create “a cluster environment for media production, from across the industry value chain, to interact and collaborate effectively.” The first production cluster to be built at the IMPZ will focus on the printing industry.

3.3.3 Knowledge Village

The Knowledge Village is envisioned as a technologically advanced training and learning hub that brings world-class education to the whole Middle East.

In the recent past, thousands of Arab students have enrolled yearly at universities in North America, Europe and Australia; Dubai’s Knowledge Village (KV) seeks to give them a more convenient option by bringing the world’s top universities and their programs to Dubai.

Educational services offered by KV tenants focus on specializations that are growing in demand, as well those that are most useful for knowledge economies. They range from corporate IT training to masters degrees in business management and engineering. But mostly, the aim is to offer these courses online to create a new culture conducive to life-long learning, and to exploit new technologies in aiding the process of knowledge dissemination.

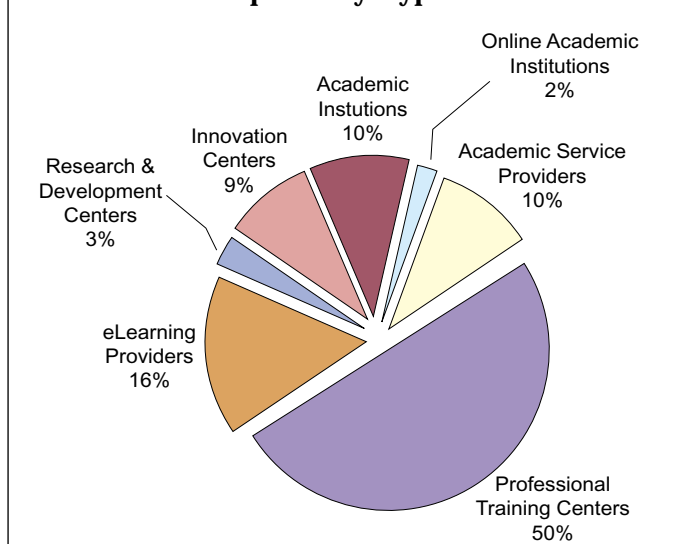
Professional training centers lead the crop of institutions at the Knowledge Village, representing 50 percent of the 58 registered organizations as of August 2003. e-Learning providers – or those companies offering electronic learning technologies and support services – are a far second, numbering only nine or 15.5 percent. Meanwhile there are equal numbers of academic institutions and academic service providers, that is six, or 10.3 percent. An academic institution is defined as a foreign branch of a university, college or school providing accredited academic programs and degrees, whereas an academic service provider offers services to international accredited universities and colleges. An example of an academic service provider is Gateway Institute, which

KV Companies by Type of Service

	Number of Companies	Percentage Share
Academic Institutions	6	10.3%
Online Academic Institutions	1	1.7%
Academic Service Providers	6	10.3%
Professional Training Centers	29	50.0%
eLearning Provider	9	15.5%
Research & Development Center	2	3.4%
Innovation Center	5	8.6%
TOTAL	58	100.0%

Source: Madar Research

KV Companies by Type of Service



Source: Madar Research

represents and supports the courses offered by the renowned Purdue University in the USA.

So far there are only two research and development-oriented companies at the KV – the Innovation Business Factory International and the UAE’s Higher Colleges of Technology – and only one online academic institution, the online college for Total Quality Management (e-TQM). Specialized business and resource management courses are provided by at least five companies (termed innovation centers).

Interestingly, TECOM has recently signed an agreement with the American University of Dubai to provide training services in exchange for technology services. This move reinforces the goal to forge a strong alliance between the education and industry sectors – an important collaborative feature of Knowledge Economy.

3.4 Mohammed Bin Rashid Technology Park

Designed to become a regional technology and science hub, the three square kilometer Mohammed Bin Rashid Technology Park will house clusters dedicated to a wide range of research and development projects including those in the fields of oil and gas, biotechnology, pharmaceuticals, agricultural technology (agrotech) and material science.

A prominent tenant of the Jebel Ali-based “technopole” will be the MenaLink Center, a business accelerator owned by MenaLink Holdings, which is a leading company specialized in cross border technology transfer. Upon announcement of the technology park in 2002, a MenaLink partner, Gas Technology Institute, immediately expressed its intent to set up a base in the park. Other companies being eyed are General Electric EDG (a GE subsidiary specialized in complex engineering and design); the Manufacturing Extension Partnership (MEP), which is a leading US consortium specialized in technology transfer to manufacturers; and the Idaho National Engineering and Environmental Lab (INEEL), an environmental lab serving the United States Department of Energy.

A key focus of the cluster will be ‘demand-driven’ industrial technologies, particularly desalination. It should be noted that countries in the Gulf region use a staggering 50 percent plus of the global desalination supply, with UAE demand expected to double by 2010. It is estimated that the Arab world will invest \$30 billion in desalination by end 2025, yet there is no specialized centre dedicated to this industry’s development.

3.5 Dubai Silicon Oasis

The main goal of the Silicon Oasis is to create an industry base for highly advanced hardware components. The first such company is a \$1.7 billion semiconductor facility planned for 2007. The investor, Communicant Semiconductor Technologies AG, is jointly owned by Intel and the governments of Dubai and Germany. A similar facility is planned for late 2003 in Brandenburg, Germany.

Communicant is a semiconductor wafer foundry “focused on high-end applications for the broadband, mobile communications, storage network and high speed power management industry segments.” It will be the pioneering facility on the 6.5 million square meter ready-built property owned by the Dubai Silicon Oasis (DSO).

A press release issued by the Dubai Airport Free Zone Authority (DAFZA), which is implementing the DSO project, states: “By the time the chip plant (Communicant) begins production in 2007, some 1,200 new high-tech workers will have taken up residence in the emirate.” The

press statement, however, stopped short of projecting a production or revenue turnover once the facility starts running.

The DSO is a bold move for any Middle Eastern economy venturing into non-energy production, and the amount of capital involved is probably one of the single biggest, non-energy foreign direct investment (FDI) projects in the Arab world. Communicant, observers say, could be a more significant project than Dubai Aluminum or Bahrain Aluminum in their day.

The DSO occupies a ready-built estate (with power, water, telecom and datacom) and enjoys all the privileges typical of a Dubai free zone entity (see Section 4.1).

3.6 The Dubai International Financial Center

The world's newest, most ambitious financial center – and the freest yet – was set up in Dubai in mid-2003, with aims to channel and manage more than a trillion dollars of wealth and funds generated from the Middle East, CIS and the Indian sub-continent. It also aims to present the biggest financial institutions of the world with a venue halfway between the East (Hong Kong, Singapore) and West (New York, London, Frankfurt), through which to offer their full range of services.

The Dubai International Financial Center (DIFC), which sits on a 110-acre property, focuses on five areas of the financial services industry: asset management, Islamic finance, reinsurance, securities and back-office operations. It will also operate the Dubai Regional Exchange (DRX), which is set to be operational by third quarter, 2004.

Designed as a fully self-governing entity (according to a UAE federal decree issued in Jul 2003), DIFC has already established the Dubai Financial Services Authority (DFSA), which will oversee the drafting and enactment of laws, among other functions. A pool of international legal experts has been tapped to draft laws that meet international financial industry standards, so as to create the most appropriate business environment conducive to a successful money and capital market. The DFSA has so far prepared seven of the 19 laws that will be issued in due course.

The legal framework of DIFC consists of three tracks:

- Core Financial Services Legislation, or laws that create the Regulatory Authority and the core financial services covering banking, insurance, securities and other investment activities.
- Commercial Legislation, or a set of laws that constitutes a 'commercial code' comprising companies law, security and collateral law, title to goods and securities

law, commercial transactions and contracts law, and insolvency law.

- Supplementary Legislation, or laws that deal with more specific or peripheral matters including intellectual property law, auditors and accounting policies, employment regulations, data protection and privacy, and the more detailed requirements relating to specific financial products.

The Annual Meeting of the Board of Governors of the International Monetary Fund and the World Bank, held last month (September 2003) in Dubai, provided an impetus for Dubai's goal to attract the biggest financial services companies to its fold.

The physical infrastructure designed to support the DIFC is highly impressive. The main building, to be called The Gate, is a translucent office-arch offering 100,000 square meters of office space. This is only the first phase of the real-estate development project, which will eventually create 1.2 million square meters of accommodation, including a hotel, to be built over the next six and a half years (ready by 2010). The stock exchange component of the project (DRX) will occupy 2,000 square meters, or two of The Gate's 15 floors.

The Gate expects its first tenants to move in by July 2004, exactly 13.5 months after the project began. Ninety of the world's top 200 banks have also reportedly indicated their willingness to set up operations in DIFC. The earliest blue-chip financial services institutions that have committed to obtaining operating licenses at DIFC are Standard Chartered Bank, Deutsche Bank and the Swiss bank Julius Baer.

At the helm of DIFC as Chief Executive Officer is Naser Nabulsi, who has spent more than 10 years as a vice-president with financial heavyweight Merrill Lynch. A group of distinguished executives also make up DFSA, with Ian Hay Davison, former chairman of Lloyds of London, as chairman and Phillip Thorpe, former managing director of the Financial Services Authority in the city of London, as vice chairman. The advisory board includes Kenneth Courtis of Goldman Sachs, Lord David Currie, chairman of the UK communications authority and Makoto Utsumi, president and executive director of Japan Centre for International Finance. Lynton Jones, a financial exchange expert, has been appointed chairman of DRX. Jones was responsible for setting up and running NASDAQ Europe and Jiway, a pan-European electronic stock market aimed at retail investors.

The DIFC at this early stage has attracted both supporters and critics. Nabulsi, the staunchest advocate of the concept next to His Highness Sheikh Mohammed and DIFC Board of Directors' Chairman Anis Al-Jallaf, asserts that they

are in the right place at the right time.

According to DIFC supporters, there are at least 150 companies in the Arab world as big as, or bigger than, Emirates Airlines (with profits exceeding \$247 million in fiscal 2002-2003) with no regional listing. Davison has been quoted as saying these companies “will come to us to raise equity capital and funds within the region.”

An unnamed banker source of the UAE daily Gulf News, however, is doubtful whether the project is going to advance very far, very fast. It will reportedly take at least five more years for DIFC to truly deliver on its promises, if it ever succeeds to the planned extent.

Meanwhile, most observers foresee competition between DIFC and neighboring Bahrain’s forthcoming Financial Harbour. Bahrain’s key strength has been in Islamic finance – but both entities have repeatedly ruled out direct competition. In a report that recently appeared in Gulf News,

Bahrain’s Minister of Economy and Finance Abdullah Hassan Saif was quoted as saying, “there is plenty of scope for both the Bahrain Financial Harbour and Dubai International Financial Center to be viable entities.”

He also added that Bahrain had always pursued the development of a traditional banking system, moving on from retail, high-street banking to high-end syndicated loans. Bahrain has reportedly allocated \$1.3 billion for the development of BFH.

Following the successful joint World Bank and IMF meetings, the most recent development arising from the DIFC is the creation of a regional blue-chip index in conjunction with Dow Jones Indexes. The index, called Dow Jones DIFC Arabia Titans 50, will be based on the stock prices of 50 leading companies in the region and will be developed in collaboration with Shuaa Capital, a Dubai-based investment bank.

Section 4

E-Commerce Market & Infrastructure

4.1 B2B and B2C E-Commerce Market Size & Growth Forecast

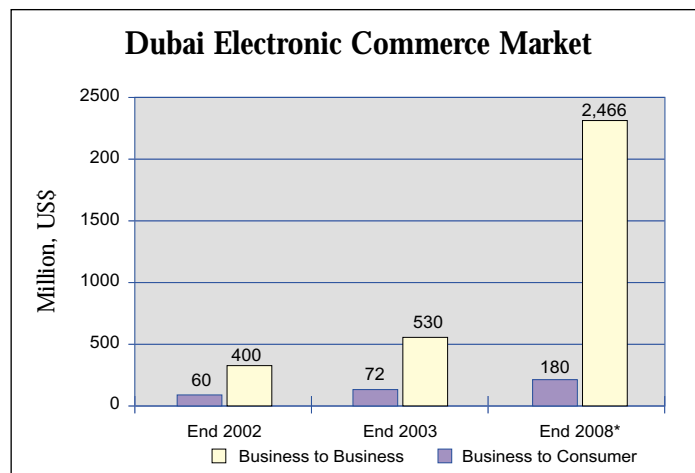
Looking back at the “hype” that surrounded dot-com businesses from 1998 to 2000 and the mass failure that shortly followed, Dubai has been in the fortunate position of not coming in too early and not withdrawing too soon as far as electronic commerce is concerned. While the emirate was not completely inoculated from the hype – for instance, the proposed technology incubator Dubai Ideas Oasis, took a back seat in 2002 – Dubai nevertheless was able to nurture the most successful business-to-business electronic marketplace in the Middle East, Tejari.com. Only slightly impacted by the global dot-com collapse, e-business adoption in Dubai continued at a paced momentum.

Today, a very high Internet penetration rate – pegged at close to 40 percent as of Q1 2003 – as well as an impressive payment cards penetration (51 out of every 100 residents in the UAE have a payment card), lend themselves well to driving consumer e-commerce activities in the emirate.

According to Madar Research Group, Dubai’s business-to-business (B2B) market will be worth \$530 million by end 2003. This is expected to reach an estimated \$2.4 billion in 2008, registering a compounded average growth rate (CAGR) of 36 percent over five years. These values are representative of transactions conducted on both private and public exchanges. They include transactions conducted on exchanges that are principally located in Dubai – such as Dubai Port Authority’s Tejari.com, Petrocommerce.com and Mesteeel.com – as well as those conducted in marketplaces owned by consortia and private companies with whom suppliers and buyers from Dubai will have sold or bought goods.

An example of a group or consortium-sponsored exchange is the Middle East Airport Exchange (www.ax-max.com) where tenders, auctions and reverse auctions for the Middle East aviation industry are conducted.

The projected B2B figure also includes both Dubai



*Madar Research forecast

Source: Madar Research

inbound and outbound trade conducted in electronic marketplaces such as GXS.com – which is one of the world’s largest private exchanges, with over 100,000 members and with annual transactions reportedly reaching \$1 trillion – or conducted in other Middle Eastern regional public exchanges based outside Dubai, such as Aregon.com.

Madar Research’s moderate forecast for Dubai’s B2B market, at \$2.4 billion, compares with projected \$12.8 trillion global online trade in 2008, based on market estimates published by Forrester Research.

Madar Research has assumed a relatively conservative market value estimate and growth projection for the business-to-consumer (B2C) segment of e-commerce in Dubai, as compared to B2B primarily because of two factors. The first relates to the dynamics of B2C markets – which are affected by local cultures and the mindset of consumers, which take long time to change – unlike B2B markets, which are driven by corporate strategies and globalization. The second factor is that the incentives for implementing or participating in a B2B marketplace far outweigh those present in creating consumer-oriented e-commerce sites.

Primary among these incentives for B2B e-commerce is

Dubai E-commerce Market Estimate & Forecast (Million, US\$)

	End 2002	End 2003	End 2008	CAGR (2003-2008)
Business to Consumer	60	72	180	20.0%
Business to Business	400	530	2,466	36.0%

Source: Madar Research

Notes:

Business-to-Business Electronic Commerce - refers to all forms of wholesale commercial transactions conducted over an exclusive computer-mediated network or an open computer-mediated network, with the payment and ultimate delivery of the good or service may be conducted on or off-line.

Exclusions: Foreign exchange, futures, derivatives, bill payments, unsuccessful online bidding, GIRO, inter-bank transfers and other financial instrument trading.

Business-to-Consumer Electronic Commerce - refers to all forms of retail commercial transactions occurring over an open network, which include online selling of goods and services directly to consumers.

Exclusions: Online bill payments (or fund transfers) for transactions performed off-line and unsuccessful online bidding.

the reduction of procurement costs. According to Morgan Stanley Dean Witter estimates, manual processing of a single purchase order costs anywhere from \$125 to \$175 compared to as little as \$10 to \$15 when done online. And since every business – regardless of size and industry – procures goods and services, then it’s only a matter of time until a good number of businesses in the UAE will have joined an e-marketplace. This is regardless of whether these marketplaces offer full-blown e-procurement services – such as Tejari.com – or are mere online business matchmakers such as Mesteel.com, where contract negotiations still take place offline.

Being part of a consortium also ensures a stronger bargaining power for buyers to pressure suppliers in bringing down the prices of their goods, resulting in what should be an ideal “win-win” deal for both buyers and suppliers. Since suppliers are able to reduce the costs of purchase order processing, inventory management and other product handling chores, then they are more willing to offer their products at a lower price.

Another incentive is the operational efficiency offered by these B2B exchanges. As our Tejari case study in the latter part of this chapter indicates, online procurement can significantly reduce the time required in making a purchase, and can eliminate the errors that are typical of manual procurement processes.

B2C e-commerce in Dubai is estimated to be worth \$72 million as of end 2003, and will grow to \$180 million in 2008 – registering a CAGR of 20 percent over five years. These values reflect purchases made by Dubai residents, on both local and international consumer e-commerce sites. Indeed, B2C sites such as UAEmail.com, Magrudry.com, UAEflowers.com, CompuME and UAEfoodmall.com, among others, have come a long way in establishing themselves as online shops for products and services. Given time and the right technology, they can possibly compete with international sites such as Amazon.com in fulfilling local residents’ electronic shopping requirements.

4.2 Legal Framework

While there is a legal vacuum for e-commerce trade protection in most Arab countries, Dubai set a precedent in terms of establishing a legal framework, when it passed a local e-commerce law in early 2002 (Law No. 2 of 2002 Concerning Electronic Transactions and Commerce).

This local law aims to “facilitate e-correspondence through reliable e-books; remove any barriers to e-commerce and other e-transactions; facilitate submitting e-documents to government departments and institutions; reduce the

UAE’s Participation in International Treaties

Treaty	Year of Signing
World Trade Organization	1996
WIPO Paris Convention	1996
WIPO Copyright Treaties	1974
Patent Cooperation Treaty	1999
Patent Law Treaty	1999
TRIPS	1996

Source: Madar Research

number of submissions of e-correspondence and amendments; set uniform criteria for documentation and security of e-correspondence; boost the public’s confidence in security and validity of e-books and correspondence; and enhance development of e-commerce and other transactions, locally and internationally, through using e-signature.”

An earlier law, Dubai Law No. 5 of 2001, is also important in that it allowed documents with electronic signatures to be admissible as evidence in criminal investigations.

There have been pressing recommendations for the Dubai E-Commerce Law to be adopted by the Federal Government. In response, federal officials are looking into a more encompassing law, which will serve all the emirates including Dubai. Federal officials are currently reviewing a “Cybercrime Law” for the UAE, with direct reference to the Singapore Electronic Transactions Act. The draft law is expected to cover two areas relating to crimes committed on the Internet. One is a set of laws on digital signatures and issues related to signing and forgery of electronic documents. The other set will address crimes such as hacking, stealing credit card numbers, invasion of privacy, copyright violations and online theft. The articles will be flexible enough to allow amendments to cover situations arising from newer developments in IT.

Electronic Commerce- and IP-Related National Legislations

Legislation	Year of Passage
Copyright Law	1992
Patent Law	1992
Trademarks Law	1992
E-Signature Law	Draft
E-Government Law	-
Data Protection/Privacy Law	-
Freedom of Information Law	-
Cybercrime and Computer Misuse Law	Draft

Source: Madar Research

Until such a law is passed and enforced, the requirements in the existing UAE Law of Evidence still make it risky to transact, sell, buy, communicate and acknowledge payments or forward payments through electronic means.

This gap in the law is being managed by buyers and sellers in an e-marketplace by resorting to contractual terms, although this may not be a flawless measure by itself. Dr. Habib Al Mulla, owner of a law firm in Dubai, says: "These contractual provisions have to be tested by a court of law to be effective. In the absence of such testing, uncertainty will continue to prevail."

Meanwhile, the domain of intellectual property rights in the UAE is sufficiently covered by the UAE Copyright Law, Trademark Law and Patent Law. Strong enforcement of such laws has been largely responsible in bringing the level of pirated business software usage down to 39 percent in 2002, so far the lowest in the Arab world. Furthermore, the UAE is a member of the World Intellectual Property Organization (WIPO) and the Paris Convention for the Protection of Intellectual Property. The UAE, which is member to the World Trade Organization (WTO), has also fully ratified the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement, which is one of the WTO's main agreements.

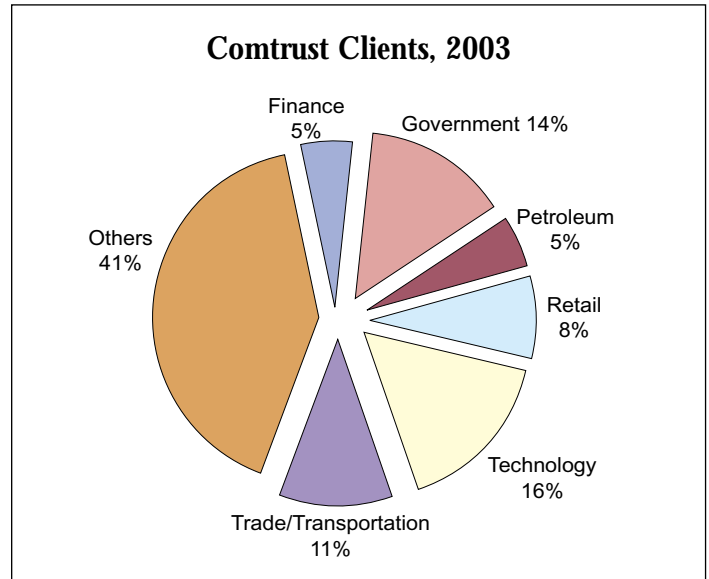
Multinational software companies have often cited the UAE's participation in these international treaties as well as the copyright-related legislations as reasons for setting up their regional headquarters in the country, specifically Dubai.

Indeed, the country provides a strong legal recourse for companies whose products and intellectual property are being used illegally, which more often than not hurts a software company's revenue therefore stifling future investments, research and development, and even the creation of new jobs.

4.3 Online Payment Systems

Secure online payment systems are a key component of the whole B2C e-commerce milieu. Comtrust, the e-business services arm of Etisalat, offers electronic payment (ePayment) services similar to those offered by US-based service provider VeriSign. An ePayment service comprises digital certificates that allow merchants to accept credit card payments through their websites.

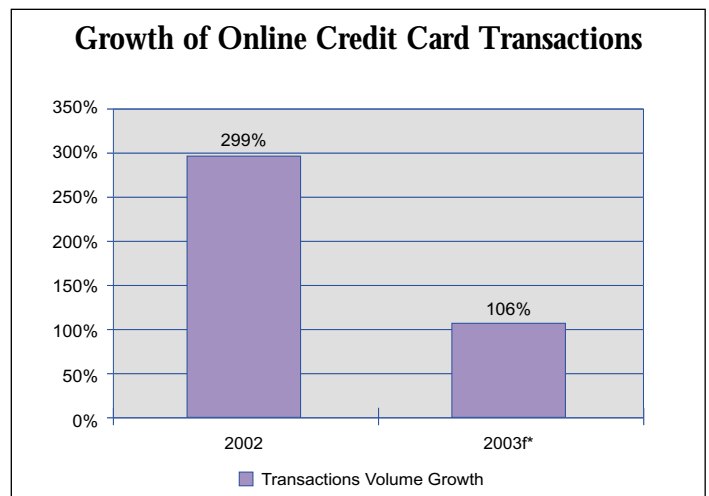
Online payment services basically simplify e-commerce, by providing secure and encrypted payment connectivity over the Internet between online customers, merchants, buyers, sellers and the financial networks that move money between them.



Source: Comtrust

The Central Bank of the UAE has linked Comtrust's ePayment systems with the UAE exchange network in August 2001. This link helped facilitate payments for goods and services through direct debit requests processed in a secure environment and transmitted over the Internet. The Dubai e-Government portal will also start utilizing Comtrust's ePayment systems by end 2003.

A major stumbling block, however, has been the reluctance of local banks to open online credit-card acquiring accounts for merchants. The Comtrust ePayment service may provide local support and more or less the same



Source: Madar Research

*Forecast by Madar Research Group

The credit card transactions refer to those processed by online merchants in the UAE utilizing Comtrust's ePayment solutions only. Those processed by online merchants utilizing solutions such as VeriSign are not included.

services as its foreign counterparts. In other words it may enable merchants and e-commerce organizations to initiate the authorization and settlement by their acquiring bank of online transactions, as well as perform adjustments such as reversals and credits on previous requests. But if the banks do not offer the option for such a service, then the merchants are basically limited to the conventional forms of payment such as cheques or cash on delivery.

Furthermore, only three (14 percent), of the 21 local banks operating in the UAE have tied up with Comtrust for the processing of online credit card payments. These banks are the National Bank of Dubai, National Bank of Abu Dhabi and Emirates Bank International.

Comtrust, nevertheless, has been performing well. It reported a 585 percent growth in its digital certificates in the first half of 2003, compared to the same period last year.

A digital certificate is an “electronic credit card” that establishes a website’s or a user’s credentials. It contains the owner’s name, a unique serial number, expiration dates and a copy of the certificate holder’s public key, which is used for encrypting messages and digital signatures. It also contains the digital signature of the certificate-issuing authority so that a recipient can verify that the certificate is real.

Credit card transactions processed by online merchants using the Comtrust ePayment service grew 53 percent for the period January to June 2003, compared to 299 percent for 2002 over 2001. The actual number of credit card transactions could eventually outnumber the projected 2003 moderate growth of 106 percent, depending on two variables: more online merchants acquiring Comtrust e-payment services this year, or the number of e-shoppers in these websites increase.

The lower growth in the volume of online credit card transactions during the first six months of 2003 as compared to 2002 does not, however, imply that the actual number of transactions will decrease this year. Regardless of the lower growth rate, the actual number of transactions per month this year is significantly higher than last year, especially given

Protection Against Net Fraud

To further alleviate fears of using credit cards online, Emirates Bank Group affiliate Network International introduced iPay in 2000. iPay is a virtual MasterCard account designed exclusively for shopping on the Internet.

Unlike a credit card that could carry credit lines as high as several thousand dollars, iPay has a maximum limit of US\$1,000 allowing the user flexibility and control over their Internet purchases. Even non-EBI and Middle East Bank account holders can apply for an iPay account online or in the various EBI and ME Bank branches. Account holders, however, can avail of direct funds transfer from their checking or savings account.

The iPay account is treated like any credit card account except that no physical plastic cards are issued to the user. Instead, the iPay comprises a set of numbers that is sent to the user for their online shopping activities. This further minimizes the risk of fraud through a lost or stolen card.

that a much bigger transactions base has been achieved in the beginning of 2003.

4.3.1 E-Banking

Thirty-three percent, or seven, of the 21 local banks operating in the UAE offered retail banking services over the Internet as of July 2003. These banks allow individual as well as corporate account holders to conduct online account balance inquiry, credit card and utility payments, and to transfer funds between accounts within the bank, or send money to any bank account worldwide.

Less than half of the banks which offer Internet retail banking services offer corporate banking functions such as trade finance (Letters of Credit/Guarantee), treasury (foreign exchange and money market deals) and payroll management. The rest of the seven banks including Emirates Bank International – which pioneered personal e-banking in the UAE – have promised to roll out their online corporate

Local Banks and Internet-related Services

Online Retail Banking	Online Corporate Banking	Online Acquiring Services
Dubai Islamic Bank	Mashreqbank	Emirates Bank International
Mashreqbank	National Bank of Abu Dhabi	National Bank of Abu Dhabi
Middle East Bank	National Bank of Dubai	National Bank of Dubai
National Bank of Abu Dhabi		
National Bank of Dubai		
Union National Bank		

Data Source: Individual banks' websites, Madar and Comtrust

banking modules “at some point in the future.” Two of the 21 local banks, namely National Bank of Sharjah and National Bank of Umm Al Quwain, still do not have a website.

Foreign banks operating in Dubai such as Standard Chartered Bank and HSBC offer both personal and corporate Internet banking services that include funds transfers, utility and credit card payments as well as cash management solutions. They also offer online trade, lending and foreign exchange information.

4.4 Data Centers

There are currently two data centers in Dubai offering hosting services to companies operating in the UAE and the whole Arab world. These are a dual center operated by Etisalat and another one hosted by Dubai Internet City.

Etisalat’s eHosting Data Centers – with one site in Abu Dhabi and another in Dubai – are multi-million dollar investments, boasting a 24 x 7 network operations center (NOC). A round-the-clock security operations center (SOC) monitoring both data centers is also in place at the Dubai site.

The data centers are supported “by seven STM1 lines (155Mbps each), multiple layers of network security, core switching and fiber redundancy, and fully meshed and redundant networks built on Cisco and Juniper data communications products.” Etisalat’s world-class technology infrastructure bears strongly on the data centers – Comtrust, entrusted with the task of selling the hosting

services, guarantees its clients 99.98 percent network availability.

The redundancy built in at all levels– equipment, network, electricity, connectivity and SOC – as well as the fiber optic cables linking the two data centers ensure that whenever an emergency occurs at one of the NOCs, then the other automatically takes over.

Security, which is a top priority in outsourcing hosting solutions, is also a defining attribute of the data centers. The security solutions employed by Etisalat, which match those of pioneering data centers in the United States, are highly sophisticated: no one person within or outside the organization knows the complete security combinations spanning the physical premises, down to the network, server and application levels.

The data centers’ physical premises are secured by on-premise guards and secured access breach alarms, smoke detection and fire suppression systems, motion sensors, video camera surveillance, and a safe location away from major landmarks and utility stations. On the network level the SOC provides standard and firewall security to all customers by employing anti-spoofing and sniffing systems to protect internal addresses and eliminate impersonation attacks, providing packet filtering and monitoring systems, and an isolated virtual LAN dedicated for each customer.

Companies looking to host their website and email applications – or even their backend mission critical systems – can choose from a number of options depending on their requirements and budget. They could use the managed

Pricing Structure: Comtrust eHosting Service Packages

Service/Package	Lite	Professional	Enterprise
Price (US\$/month)	147	408	749
Setup fee (US\$)	272	463	830
Transfer (per month)*	5 GBytes	10 GBytes	20 GBytes
Space **	3 Us	6 Us	8 Us
Domain Name	One	One	One
Computer Restarts (per month)	One	Unlimited	Unlimited
Tape Backup	-	Weekly	Daily
Server Certificate	-	-	One
Additional IP Address	-	-	5
DNS Update	-	-	3 Free/month
Security	Standard	Standard + Firewall	Standard + Firewall
Support	Standard	Standard	Standard
Etisalat Data Center facilities	Standard	Standard	Standard

Source: Comtrust website

* Transfer (price/month): \$16 per GB; or \$67 per 5 GB

** U Space (price/month): \$28 per U (Discount for Lite = 15%, Prof=20%, Ent=25%)

eHosting solution, where, for a fixed fee, Comtrust will maintain the whole IT infrastructure, from software and hardware maintenance and upgrades to Internet connection. Alternatively, they could lease a space and bring in servers which they themselves will manage and maintain (co-location).

Additionally, while a client may choose the option of sharing a server with other clients – for a simple application such as email, bigger companies with high-end applications could demand a dedicated server or an enclosure. The data centers could also serve as disaster or backup recovery facilities for the mission critical applications of banks and other types of businesses with extensive information system operations.

The dual location of the data centers – it is assumed – is designed to meet best practice for data center security, which requires, among other things, backup or secondary sites to be built on a different power grid and aviation path from the primary data center.

The other data center in the emirate is implemented, managed and owned by Dubai Internet City. Designed by IBM Global Services, the facility offers an array of solutions starting from co-location to hosting turnkey enterprise implementations such as enterprise resource planning (ERP) and customer relationship management (CRM) systems. The DIC eHosting Center is connected to IBM's network of data centers worldwide, ensuring that customers have the flexibility to choose the solution that best meets their needs. One of the data center's first clients is the Dubai e-Government portal.

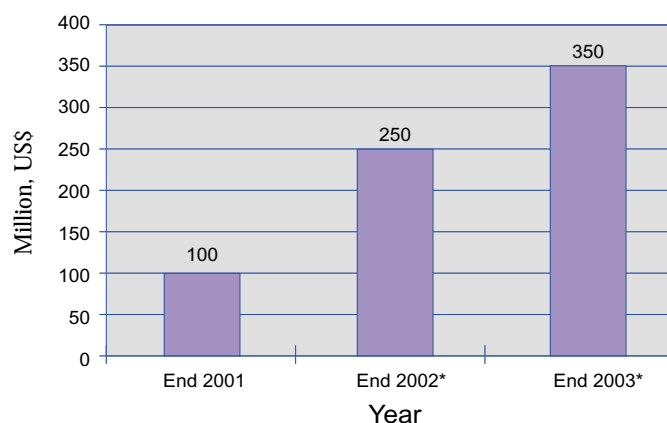
It has to be said, however, that early Internet adopters such as the B2C e-commerce sites in the UAE have opted to host applications in data centers based in the United States and the United Kingdom. Both DIC or Etisalat, however, maintain that their local presence, lower price and on par security measures will eventually convince these companies to shift.

4.5. Case Study: Tejari.com

There are many factors that could have made Tejari.com, the Dubai Ports and Authority-owned B2B marketplace, fail. Instead it has reaped success not only in its home market but even beyond, while serving as the prime example of a successful B2B implementation in the Middle East. Tejari.com, built on an Oracle platform, has been featured as a "success story" at the Oracle Open World in Paris in 2001 and the World Economic Forum (WEF) in Davos in 2002.

Led by a charismatic woman, CEO Sheikha Lubna Al

Annual Tejari.com Transactions Value (2001-2003)



*Madar Research estimate

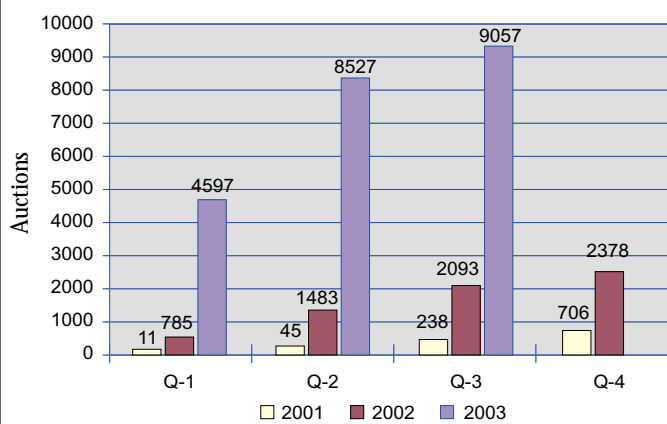
Source: Madar Research & Tejari.com

Qasimi, Tejari has succeeded – and continues to succeed – by removing the traditional obstacles faced by trading companies (geographical, cultural and language) not only for itself but for the thousands of companies buying and selling products on its electronic marketplace.

Tejari's paying members – ranging from small businesses to large companies which include government and semi-government organizations – have grown to 2,029 as of Q3 2003. This compares to 1,350 at end 2002, and only 374 at end 2001. The number of members have grown at about 50 percent during the first nine months of 2003, as compared to 2002.

Meanwhile, transactions carried out in the marketplace during the first nine months of 2003 reached 9,057, from only 2,378 at end 2002. This means a 281 percent increase in transactions was registered between end 2002 and

Quarterly Growth of Auctions



Source: Tejari.com

September 2003, or an average of a 31 percent increase in transactions per month.

In terms of actual electronic purchasing orders handled by Tejari, the figure skyrocketed in the second quarter of 2003, numbering 5,280 from only 245 in Q2 2002, representing a quarter-on-quarter growth of over 2,000 percent.

As far as transaction value is concerned, Tejari has publicized generating over \$550 million since it started operations in late 2000. Tejari has not yet entered the profit-making stage. However, it expects to break even by end 2003, which is quite impressive for a 'new' company.

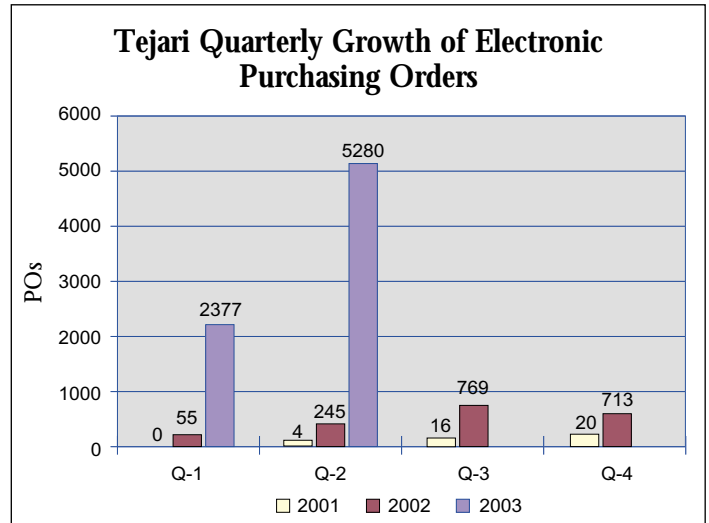
Tejari is now actively expanding into the rest of the Middle East, through local partnerships with influential private and public sector groups, the first being with Jordan which it signed in June 2002.

Tejari has also diversified the commodities offered in its marketplace, which now include regular auctions and transactions for computers, IT and office equipment, stationery, automotive and spare parts, pharmaceutical, FMCG (fast moving consumer goods), office furniture and building and construction materials.

Key Features

Auctions and tendering (reverse auctions)

Tejari supports both seller and buyer auctions, to fully maximize the value of business-to-business transactions conducted through the marketplace. Customers can simply activate the Create New Auctions feature to meet specific purchasing requirements; or choose the Auto-Extend Auctions, so that auctions extend if new bids are received in the closing minutes, driving competitive behavior among



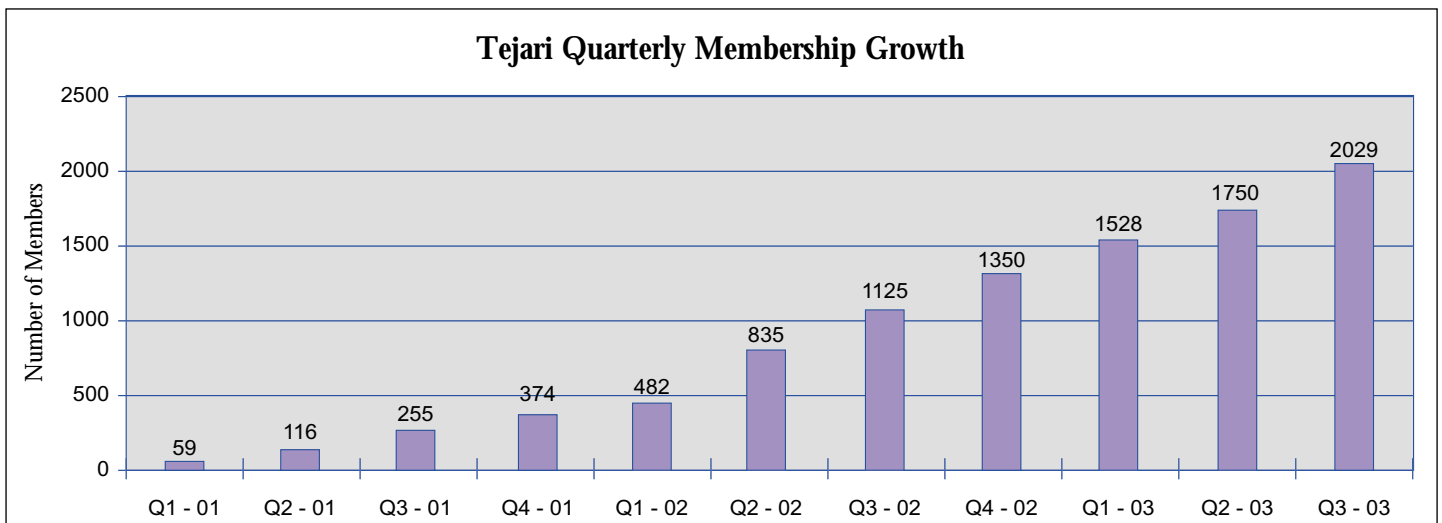
Source: Tejari.com

suppliers. They may also opt for the option Place Bids Online, where suppliers can bid in real-time at online auctions; or choose the Monitor Bidding Action option that allows users to see what's happening in the marketplace around the clock.

Auctions carried out on Tejari during the first nine months of 2003 have surged to more than 9,000 compared to some 2,100 during the same period in 2002.

Catalogue management, hosting and search facilities

Tejari enables manufacturers and suppliers to post their products and services on the marketplace, providing them with access to new markets without the associated start-up costs – and enabling them to acquire new customers without the need for a physical presence. The cutting-edge taxonomy



Source: Tejari.com

and categorization features of Tejari enable suppliers to review, approve and audit their catalogue data, load pricing for the entire marketplace or adjust price bands for specific customers.

Spot buying

Buyers can source products using the powerful search facilities of the Tejari marketplace or via the Tejari Trading Partner Directory, enabling them to leverage cost scales and efficiencies, buy goods at the best-fit price, and find goods and services not available to them in their local market.

The Tejari portal experience

The Tejari portal enables both buyers and suppliers trading on Tejari to create their own personalized marketplaces, and to receive up-to-the-minute information on their online activities, including tenders and auctions, by text SMS or e-mail. The portal features a wizard-driven, easy-to-use personalization functionality that enables every Tejari member to design a personal Tejari version of the marketplace and access more easily the information and services that are most relevant to them. The new Tejari portal's single sign-on feature (SSO) simplifies Tejari members' access to information within the marketplace's different areas.

Transaction delivery

Transaction delivery and messaging are key services that enable commerce between trading partners in a business-to-business marketplace. Tejari supports robust and secure business document delivery services between marketplace participants. Business documents – such as purchase orders, order acknowledgments and invoices – can be sent between Tejari and legacy or ERP systems promptly, via a process that is easy to set-up and completely transparent to the user.

Supply Chain Management

Tejari provides a direct window into the operations of trading partners and collaborative companies, so that

customers can view inventory levels, rapidly fulfill purchase needs and ensure smooth interaction. Partners can improve their forecast accuracy through the information supplied via Tejari and then build virtual supply chains through collaborative order promising processes, automatically managed through the Tejari platform. In this way, Tejari can become a critical part of an organization's collaborative infrastructure.

Real-time information delivery

Empowered by Tejari's portal capabilities, members are kept informed of new tenders and transactions that fit their customer profile, delivering business opportunities in real-time. In addition, Tejari's hosted open discussion forums enable users to share information and ideas with other companies in comparable and collaborative industries.

Skills development supported by e-learning

One of Tejari's core missions is to educate its users and provide customers with high quality training on Tejari's features and functions. Tejari provides advanced e-learning modules that help users learn about integrated online business procedures, best practice techniques for reducing operational costs and core processes for improving internal performance levels. The training program enables customers to participate in virtual tendering processes, mock bids and online auctions, so that managers and IT experts gain full confidence in using the Tejari platform.

Tejari in the Middle East

Capitalizing on its knowledge of the unique challenges and traditions of the region's business community, Tejari is well on its way to building a comprehensive regional presence. With the Tejari Jordan branch operational since August 2002, the company is planning further expansion into the rest of the Levant markets – Lebanon and Syria – as well as the Gulf States and North Africa. Partnerships in subcontinental Asia are also being considered to further enhance trading opportunities for Tejari's members.

Section 5

e-Learning in Dubai

5.1 What is e-Learning?

The terms distance learning, online learning, computer based training, just-in-time training, virtual classrooms and many others are used interchangeably, although they differ slightly in their scope. For the purpose of this report, Madar Research will use the term e-learning, defined broadly as the delivery of training content through a network infrastructure. This may be over the Internet, intranet or extranet.

e-Learning falls into two main categories, asynchronous learning and synchronous learning, as well as a combination of both. Synchronous learning is any training that takes place in real-time, while asynchronous learning is training that is delayed over time.

The e-learning market, however, can be broken down into three key components: e-learning content, delivery solutions and services.

5.2 Dubai e-Learning Market Assessment

Dubai has long advocated the role of e-learning in the building of a knowledge economy in the UAE and the creation of a knowledge hub in the region. Encouraged by forward looking government strategies, e-learning has been adopted by key sectors in Dubai, including government, education and the hospitality industry. The e-learning market in Dubai is estimated at \$6 million in 2003 and is expected to grow to \$24 million by end 2008 – at a compound average growth rate (CAGR) of 32 percent – in the wake of concerted efforts to increase e-learning penetration in Dubai.

5.3 Academic e-Learning Market

Though in its early stages, e-learning in Dubai has been supported by a number of initiatives, most notably the IT

Education Project established by Crown Prince Sheikh Mohammed bin Rashid Al-Maktoum, as part of his vision for the introduction of IT to all walks of life in the emirate. The project was launched in 2000, with the aim of delivering industry-relevant IT curricula through e-learning, initially to students at first and second year secondary school levels in Dubai.

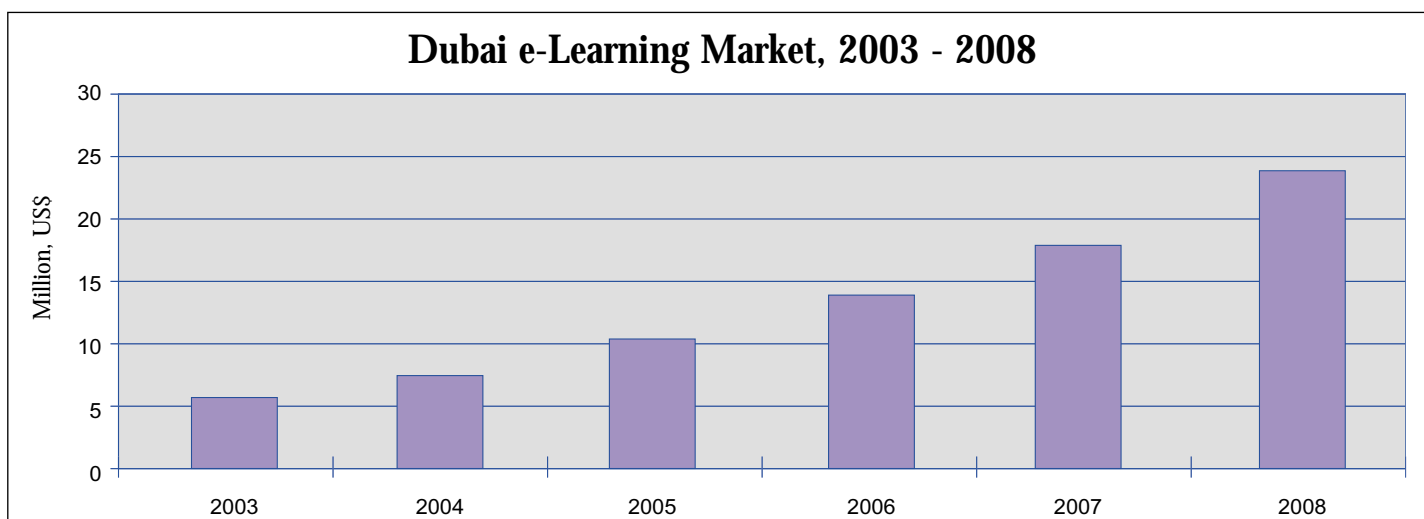
The project has since expanded to cover all public secondary schools in Dubai and Abu Dhabi, and is set to be introduced throughout the UAE, eventually, down to the primary school level.

According to figures published by the Dubai Department of Economic Development and the Ministry of Education, 8,561 secondary school students were enrolled in a total of 24 public schools during the 2001/2002 scholastic year in Dubai. The IT Education Project's scope of reach extends to all these secondary school students.

In early 2001, the Dubai IT Academy was set up to support the IT Education Project, both technically and administratively. The academy is responsible for curriculum development and design, content production and Arabization, and teacher and IT literacy training, as well as infrastructure design, implementation and support for the project.

IT course syllabi are featured on the IT Education Project's Web portal, in addition to short online instructional

Dubai e-Learning Market	
2003 (Million, US\$)	2008* (Million, US\$)
6	24
<i>Source: Madar Research</i>	
<i>*2003 – 2008 Compound Average Growth Rate of 32 percent</i>	



Source: Madar Research

courses or presentations, ranging from a simple introduction to e-mail, through to an in-depth explanation of networking infrastructure. Students interact on the portal through an e-community, open not only to project students, but to users from the region as well.

The potential to expand e-learning to public and private schools in Dubai is great, with several private schools already offering e-learning modules to their students – though on an ad hoc basis – as well as access to computer labs and the Internet. More than 200 private and public schools in the emirate serve a student population of over 130,000 students.

At university level, e-learning has been introduced in a more structured manner, as part of the universities' long-term strategies to migrate online a large section of their general curricula, and their IT curricula in particular, as well as to offer continuing education courses for adults and corporate users.

The Higher Colleges of Technology (HCT) in Dubai, namely the Dubai Men's College and the Dubai Women's College, are among the front runners in the move to build a knowledge based economy in the country, and in Dubai in particular.

Among strategies pursued by the colleges has been the introduction of laptop computers to all students, gradually phased in to be a staple in every student's learning experience by end 2003. Over 1,750 students (2002/2003 academic year) at Dubai Men's College and over 2,180 students (2002/2003 academic year) at Dubai Women's College are

connected through a state-of-the-art fixed line as well as wireless LAN network, at key locations on campus.

Several fully online courses, as well as combination online and instructor-led courses, are on offer to students. Faculty, staff and other users may also register for many of these courses to enhance their skills or further their careers.

Recently, Dubai Men's College also became the first in the United Arab Emirates to offer the International Computer Driving License (ICDL) exam, which it initially introduced to ensure that its staff was equipped with the IT skills necessary for their jobs. The content for the ICDL was supplied by e-learning solutions and content provider, Element K, through its KnowledgeHub bilingual learning management system.

Students at Dubai Men's College use a combination e-learning system that utilizes the e-learning content in instructor-led sessions, while other users such as government employees are offered training on a fully online basis. Dubai Men's College's ICDL training is especially favorable as it offers Arabic language content, an important element in training in the public sector in the United Arab Emirates.

If the ICDL program at Dubai Men's College turns out to be a success, it is likely to be adopted by the rest of the Higher Colleges of Technology as part of the IT curriculum.

The Emirates Academy of Hospitality Management was the first hospitality business school in the region to offer its students e-learning courses, to supplement their classroom instruction. All students at the academy are provided with laptop computers, connected through a wireless broadband network, which provides them with access to complete online courses and modules, as well as access to library resources and the Internet. The academy also allows hospitality industry professionals to enhance their careers with continuing education courses, through an e-learning setting.

5.4 Corporate & Government e-Learning Market

While academic e-learning was at the forefront of e-learning initiatives in Dubai in its earlier stages, Madar Research expects corporate and government e-learning to grow at a faster rate, making up the greater part of the market. This trend, in line with the worldwide move in this direction, has already become evident by the large number of corporate and government e-learning initiatives now in place.

The Dubai hospitality industry has been among the most enthusiastic adopters of e-learning. The Dubai Department of Tourism and Commerce Marketing launched an e-learning program in January 2001, targeting the hospitality industry. The initial e-learning project offered by the Tourism and Hospitality Training Solutions department

Accredited Higher Institutions in Dubai

American University in Dubai
Dubai College for Islamic and Arabic Studies
Dubai Medical College for Girls
Dubai Police Academy
Dubai Pharmacy College
Dubai University College for Applied Studies
Emirates Academy of Hospitality Management
Etisalat College of Engineering
University of Wollongong in Dubai
Dubai Men's College (HCT)
Dubai Women's College (HCT)
Zayed University

Source: UAE Ministry of Education

Licensed Higher Institutions in Dubai, Not Accredited Yet

The American College in Dubai
Al Ghurair University
Emirates Aviation College

Source: UAE Ministry of Education

targeted staff from the Rotana, Intercontinental, Meridian and Ramada hotels, as well as Emirates Golf.

Hotel chains such as Jumeirah International and Hilton International have recently implemented e-learning training modules for their own staff, in order to bring them world-class training, as well as to cut down on travel and other expenses associated with traditional training methods.

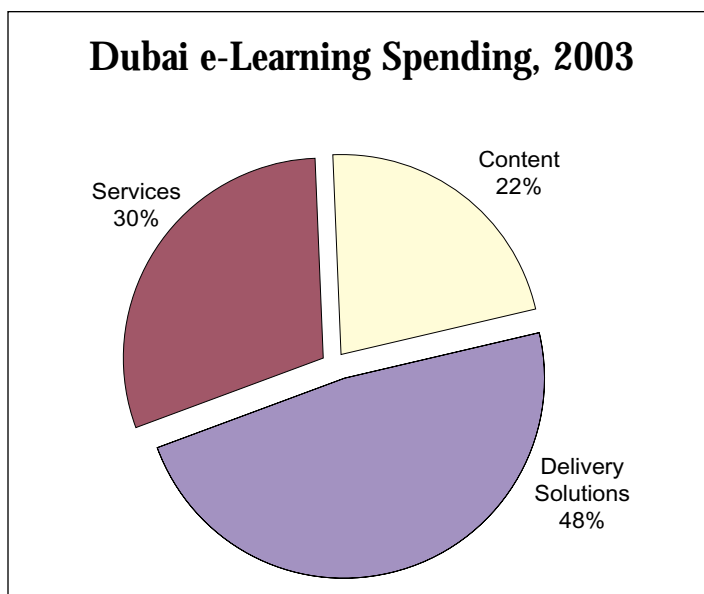
Another e-learning milestone in corporate training in Dubai has been the setting up of Dubai Police Department's Electronic Total Quality Management College (E-TQM), based in Knowledge Village. E-TQM was launched in September 2002, as the region's first virtual institution offering total quality accreditation and courses. The larger part of the courses is conducted online, with presentations, discussions, interactive exercises and case studies available to users in both English and Arabic. E-TQM targets not only police personnel, but users interested in specializing in quality management. It is affiliated with several international associations such as the European Center for Total Quality Management, the British Quality Foundation and the International Academy for Quality. As of June 2003, more than 200 students had already enrolled in the virtual college.

Emirates Airlines is another major player in the e-learning markets, with online training in IT and business skills available to over 3,000 staff members. Gulf Computing was responsible for setting up an integrated learning management system for the airline. Emirates Airlines' IT division, Mercator, is also responsible for providing, as well as developing e-learning courses for all Emirates staff, in a wide range of areas, both technical and administrative, designed to enhance employee skills.

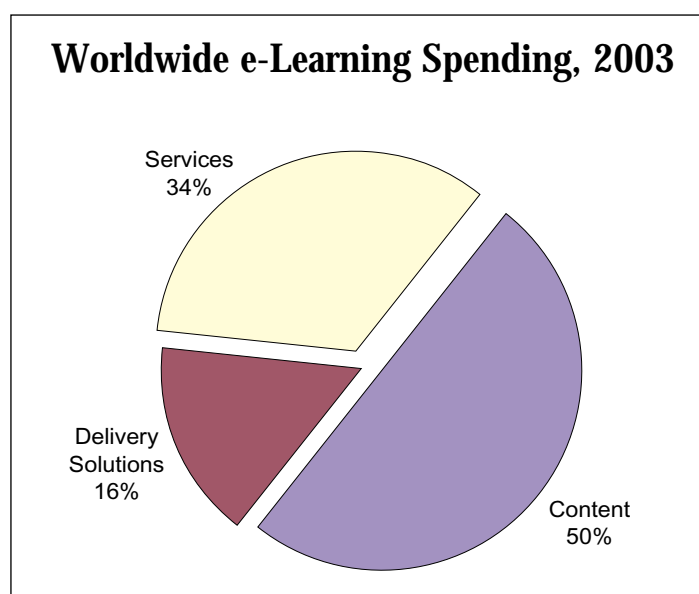
Select List of Institutions or Corporations in Dubai Offering Full or Partial e-Learning Facilities
Dubai Men's College (HCT)
Dubai Women's College (HCT)
Zayed University
American University of Dubai
Online college for Total Quality (e-TQM)
Sheikh Mohamad IT Education Project
Emirates Academy of Hospitality Management
Emirates Aviation College
Etisalat Academy
Emirates Institute of Banking & Financial Studies
Department of Tourism and Commerce Marketing
Emirates Airlines
Mercator
Mashreq Bank
Emirates Bank International
Aramex International
Hilton International
Jumeirah International
Dubai Police
Tejari
Dubai Petroleum Company
Dubai e-Government Project

Source: Madar Research

The finance and banking sector has also been moving towards offering e-learning capabilities to staff as well as customers. Among the Dubai banks offering e-learning courses are Mashreq Bank and Emirates Bank International. E-learning is also picking up pace in the retail sector and



Source: Madar Research



Source: Madar Research

among large multinational corporations based in Dubai who are choosing to train their employees through more economical and time-saving methods, on a just-in-time learning basis.

With an increasing number of public services moving online, many government departments in Dubai now offer their employees some form of online training, as part of the emirate's strategy to enhance national skills and increase the level of IT penetration among national employees.

Dubai e-Government has been among the most active advocates of e-learning in the emirate, recently initiating two IT certification programs leading to e-Citizen and e-Employee certifications. Launched in association with the European Computer Driving License Foundation and Element K, the program aims at creating an e-population, comfortable with increased IT penetration and capable of benefiting from the services on offer from the e-government initiative. These are estimated at 600 individual e-services as of September 2003. While the e-Citizen program, based on the ICDL-Start certification, is open to all residents, the e-Employee program will be open to all government employees in Dubai. In addition to the ICDL-Start certificate, e-Employee trainees will be required to take another three courses selected by the e-Government. Eventually, the courses are expected to cover a wider range of IT-related topics – they will later include managerial courses provided in association with Harvard University.

Meanwhile, in June 2003, Dubai e-Government launched the e4all initiative, also aimed at creating an IT literate community, through the provision of IT packages consisting of laptops or PCs, software, free e-training, and Internet access schemes. The program was set up in association with top industry players, such as Intel, Fujitsu Siemens Computers, Microsoft, Epson Middle East, the National Bank of Dubai and leading training institutes in Dubai.

5.5 Dubai e-Learning Trends

It is evident that the drive for e-learning in Dubai is not a passing trend. Various private and public sector bodies are adopting e-learning as part of their strategy to create a skilled labor force – equipped with the necessary tools for success in an increasingly competitive knowledge economy. However, e-learning has yet to take root in a structured manner. This is similar to the trend worldwide, where e-learning has yet to take off on a large scale, with estimates for the e-learning market size falling short by several years.

However, while the worldwide market has moved from its focus on delivery solutions to content, which now makes up approximately 50 percent of the market, the larger percentage of e-learning spending in Dubai goes on delivery solutions. By end 2003, delivery solutions will make up 48 percent, followed by e-learning services, which will constitute 30 percent. Content will account for a low 22 percent, but this is only natural at this stage, until delivery solutions have taken root in the market, and the culture and acceptance of e-learning become more widespread as a credible option for traditional learning.

5.6 e-Learning Support Infrastructure

The potential for growth in both the academic and corporate e-learning market in Dubai is great, but this needs to be met with enhanced infrastructure, which currently does not support some of the higher-end e-learning features such as video streaming applications on a widespread basis. Broadband speeds are relatively slow compared with developed nations, such as the United States and United Kingdom. Moreover, broadband Internet users currently make up only some 20 percent of Internet users in the emirate. For e-learning to truly take off in Dubai, higher broadband speeds need to be introduced at competitive prices.

Knowledge Village

The Knowledge Village (KV) was established in February 2002, as the third business entity of the Dubai TECOM Free Zone, alongside Dubai Internet City and Dubai Media City. With the UAE moving rapidly towards a knowledge-based economy, the creation of a competent and skilled workforce to steer the country towards this goal became necessary. The KV was created, in part, to address this need. However, it has since evolved its objectives to also become the leading e-learning and educational hub in the region, harnessing both traditional and electronic educational tools to achieve its objective.

Although KV's official launch is scheduled for mid-October 2003, many of its partners are already conducting business in the Village. The community brings together a number of top-notch international universities, professional training centers, e-learning providers, and R&D centers from around the world, to serve the educational needs of the local community as well as the region. KV also hopes to attract young entrepreneurs and independent professionals to its community, to complement the big names on board. Its Business Center, launched in July 2003, offers about 80 open and executive offices, available to freelancers in e-learning and training.

The range of education services offered by KV tenants range from corporate IT training to master's degrees in business management or engineering. But mostly, the aim is to offer these courses online to create a new culture towards "life-long learning" and to exploit new technologies in aiding the process of knowledge dissemination. In providing the infrastructure, technology and support services, as well as state of the art facilities such as classrooms, computer and media labs, conference rooms, multimedia libraries and auditoriums, KV aims to enable its partners with the right conditions to turn Dubai into the e-learning and educational hub it envisions.

Section 6

Dubai e-Government Project

6.1 Outline & Objectives

The Dubai e-government initiative was launched in April 2000, with a vision to turn the emirate into a leading hub of the Knowledge Economy. Accordingly, e-government in Dubai has been driven by two factors: its role in increasing government services' efficiency, accessibility and transparency (while cutting costs), and on the other hand, its role in supporting the Knowledge Economy and enhancing Dubai's image as an "information age" society. The stated overall objective of Dubai e-Government is to turn Dubai into a model society driven by technology and innovation.

Upon his launch of the project, Dubai Crown Prince and UAE Defence Minister, Sheikh Mohammed bin Rashid Al-Maktoum announced a tight deadline and a warning for senior civil servants to have e-government in place within 18 months. This was followed by the formation of a high profile 14-member executive team from experts at various government departments. The team, which was supported by several committees, was responsible for drawing the e-government roadmap and creating a centralized, automated platform in cooperation with 24 government departments, in order to offer all basic public services online to the community and to businesses.

The executive team had to formulate the overall strategy of the project and lay down guidelines and parameters. Their responsibilities also included coordination with government departments to ensure standardization across platforms and systems, in addition to fostering integration between e-government and public sector units to ensure smooth running of online services.

6.2 e-Government Project Phases

The e-government project has six phases:

Phase One involved laying down a strategy, a roadmap and working out the mechanism.

Phase Two required the Dubai officials to learn from the experience of existing e-governments by studying their models and conducting field visits to the United States, United Kingdom, India, Malaysia, Singapore and Hong Kong. United Nations organizations were also consulted.

Phase Three involved using the body of knowledge obtained in Phase Two to design and implement an e-government model for Dubai. Intensive consultations with global experts in the field, such as McKinsey, EDS and AT Kearney, were initiated in this phase.

Phase Four saw the launch of an initial set of 14 basic public e-services, and the preparation of hundreds of other services for online launch. Systematic campaigning – targeting various communities to increase awareness and

encourage the use of e-services – was launched in this phase.

Phase Five saw the standardization and integration of public services over the e-government portal www.dubai.ae, which was launched on schedule in October 2001. The portal now offers around 600 services to businesses and individuals.

Phase Six witnessed the incorporation into the portal of some advanced, fully transactional facilities such as e-Pay, which is a secure payment gateway, and e-Jawaz, which is a single log-on system that allows users to access the websites of all government departments through a single password.

Initially the e-government project ran into hitches as government departments speeded up the development of their own IT infrastructure and online presence without sufficient central coordination. However, the Dubai government was successful in meeting the many challenges and in delivering an e-government on time. But, there was still much work to be done on integration, added functionality, trouble-shooting and enhancement of e-services, which led to a revamped e-government portal that was launched in October 2002 – one year after the launch of www.dubai.ae. This concluded the portal's first year of operation. What remains to be implemented is a one-stop gateway, with a truly user-centric, customizable and seamlessly integrated interface, where only layers of services could be seen, regardless of which government departments are providing them. By the end of the second year of operations in October 2003, many developments on this line are expected to be on offer through the Dubai e-government portal.

The success and regional leadership of the Dubai e-government project, and the wealth of knowledge and experience gathered around it, may lead to "know-how" transfer to other Arab or developing countries interested in digital migration. Senior government officials are reportedly considering such a consultative role for Dubai.

6.3 Core Dubai e-Government Solutions

- Vignette content management system
- Solaris 8 operating system
- Sun ONE Web Server (Solution components include iPlanet applications, Internet Security Systems' intrusion detection software, Micromuse Netcool suite, Extreme Networks management software, BMC Software Patrol and Remedy Helpdesk)
- Oracle Database 8.1.7 database management system
- Bahwan CyberTek ePay payment solution
- Sakhr Idrisi search engine
- HP Openview network management solution

- Cisco and Etisalat government information network
- Netegrity SiteMinder security management system
- e-Hosting Data Fort hosting of e-government portal (joint IBM-DIC venture)
- Nokia Networks and Atlas Telecommunications – Dubai e-government TETRA network

6.3.1 Dubai e-Government Project Consultants

EDS was the prime contractor, consultant and content development partner for the Dubai e-Government project, but the partnership has since been dissolved, as was the partnership with EDS' management consulting subsidiary, AT Kearney. McKinsey was also brought on board for a short period as consultant. Currently, Dubai e-government carries out its own consultancy work for the project.

6.3.2 Other Government Solutions

Other Dubai government departments are carrying out the development of their portals and services, independently, with different partners and providers. The Dubai Chamber of Commerce and Industry, for example, has engaged Microsoft to develop their multilingual portal, built on a Microsoft technology platform that includes Microsoft Windows 2000 Advanced Server, Microsoft SQL Server 2000, Microsoft Commerce Server 2000 and Microsoft Visual Studio 6.0. Microsoft has also deployed its BizTalk Server 2002 at the Dubai Naturalization and Residency Department.

Another government department, Dubai Municipality, has deployed an HP StorageWorks storage-area network (SAN), to boost access to vital information for the municipality's 6,000 employees and its website's tens of thousands of users. The solution that was deployed consists of both hardware and software components, including an HP StorageWorks NAS E7000 system, four pairs of HP StorageWorks HSG80 controllers, HP StorageWorks tape libraries, 40 HP different model servers, HP OpenView Storage Management Appliance II and HP StorageWorks Secure Path.

6.4 Benchmarking Dubai e-Government Services

The United Arab Emirates has made significant progress in bringing its services online, for both business and individual users. Behind this progress (which sets Dubai ahead of its fellow emirates as well as other Arab countries) are two factors vital for the creation of e-government in the developing world. These are the political will of Dubai's leaders and the availability of funds and relevant resources.

The Dubai e-government initiative, which was launched

in 2000, has accelerated adoption of e-services by many government bodies to an extent that the UAE ranks 21st worldwide in a United Nations report which evaluated e-government performance by 190 countries in 2001. The initiative – the most advanced of its kind in the Arab world – marked a new phase, characterized by a strong drive towards improving the emirate's ability to provide government services through the Internet.

As the initiative has gained momentum, wider segments of the household, business and government sectors are gradually feeling the benefits of such services. The online availability of government services has made it much easier to access related information and has drastically reduced the time required – by businesses and individuals alike – to carry out transactions with government bodies. The benefit to government is coming in terms of increased efficiency, and ultimately reduced expenses on provision of public services.

Objective: The primary goal of this chapter is to evaluate the levels of online availability, 'online percentages', of the basic public services provided by the Dubai government – i.e. the degree to which each service is available online – and to compare them to the 'online percentages' of such services in Europe. This benchmarking exercise will provide a deeper understanding of the initiative's progress to date.

Methodology: The methodology employed is based on that adopted by the European Commission to evaluate online basic public services provided by European Union (EU) member governments.

Scope: The study covers basic public services provided by Dubai government bodies through the Internet as on October 31, 2002. This includes services used by both individuals and businesses. Initially, 226 services provided by 28 government or semi-government bodies in Dubai were surveyed, in order to identify basic services. The result was a list of 19 – 10 available to businesses and nine others available to individuals. Services provided by federal government agencies do not fall within the scope of the study.

The 226 services initially surveyed ranged from government information services available at various departments' websites (such as business directories, government laws and regulations, hospitals and clinics listings, etc.) to electronic fee collection services which require registration at the websites. The 19 basic public services listed in this report fall into four clusters: income generating services, registration services, returns, permits and licenses.

Major Findings

- The study shows that the Dubai Government has made significant strides in bringing online the basic services that it provides to the public. Online availability of such services in Dubai is higher (76.4 percent) than it is in Europe (the average score estimated for Europe by end October 2002 is 60 percent). Dubai's score is comparable with that of Finland (76 percent) which comes in the fourth position in Europe.

- The overall 'online percentages' of the basic public services provided to businesses in the emirate is 85.2 percent, whereas the 'online percentages' of the basic public services to individuals is 67.7 percent.

- Some 30 percent of Dubai government's basic services to individuals get scores that correspond to the highest possible level of online availability, while 44 percent of the basic public services provided to businesses also achieve full score.

- Around 66.7 percent of the basic services provided by Dubai's free zones to their partners are available online.

6.4.1 Methodology

The study relies mainly on a methodology adopted by the European Commission in evaluating the level of online availability of EU basic public services, in addition to the governments of Iceland, Norway and Switzerland. The EU member states adopted the commission's eEurope Action Plan which includes 23 indicators for evaluating e-government progress in member countries. Those indicators were chosen on the basis of what individuals and businesses require in their relationship with the government.

One indicator is the 'percentage of basic public services available online', on which this study is based. To deal with this indicator, the Internal Market Council of the European Commission agreed to a definition of 20 basic public services (12 for citizens and 8 for businesses) that constituted the most important services required from European Union governments. The set of 20 basic public services was chosen irrespective of which government bodies provided them, and was divided only in terms of who uses them: individuals or businesses.

The EU list of 20 basic public services was examined from the point of view of individuals and businesses in Dubai. This examination resulted in various changes to the list required by the business and household sectors in Dubai, and the outcome was a new matrix with 10 basic public services for individuals and another eight for businesses.

In assigning an 'online percentage' to a service, the level of online sophistication of the service needs to be measured. To

this end, the four-stage framework described below is employed in many European countries. The framework was found suitable for evaluating online sophistication of the 19 selected basic public services provided by Dubai government:

- Stage 1 Information: online information about public services
- Stage 2 Interaction: downloading of application forms
- Stage 3 Two-way interaction: processing of forms including authentication.
- Stage 4 Transaction: handling: decision and delivery (payment)

This framework is based on a method developed by the Dutch government and adopted by the European Commission. The 'online percentage' of a service is determined by the extent to which it is possible to carry out the service electronically. Not all of the four stages above have to be relevant to all types of public service (as some services do not require a transaction). Hence, the highest relevant stage for each service had to be determined before attempting to evaluate the level of its online presence.

The degree to which a service is available online was determined depending on whether that service had reached a certain stage. For instance, a service that is provided as a full transaction gets a maximum of four points (1 point for each of the four stages). Thus, the score that a service can get ranges between 0 and 4 points (a 0 score indicates that the service is not available online and that none of the four stages is reached). Meanwhile, a service that does not require a transaction gets a full score of 3.

6.4.2 Formulating Dubai's List of Public Services

The Dubai list of basic e-services is an adaptation and modification of the European Commission's group of basic public services, as listed in the following table.

Adapting the above list to Dubai's environment, so that it can be used in measuring the 'online percentages' of basic public services provided by Dubai government, required omission of some services and the addition of others considered to be of high importance to businesses and individuals in the emirate. Occasionally, however, a basic public service in Dubai did not follow the same scoring scheme as its European equivalent, due to different procedures or requirements.

The selection process of the Dubai list of basic public services resulted in a total of 19 as compared with 20 in the European list. The Dubai list also had more business-related basic services and less of those offered to individuals. This can be understood, given that services covered by this study

EU Basic Services

Basic Public Services for Individuals	Basic Public Services for Businesses
Income taxes	Social contribution for employees
Job Search services by labor offices	Corporation tax
Social security contributions (unemployment benefits, child allowances, medical costs, student grants)	Value added tax (VAT)
Announcement of moving (change of address)	Registration of a new company
Personal documents (passport and driver's license)	Submission of data to statistical offices
Car registration (new, used and imported cars)	Customs declarations
Application for building permission	Environment-related permits
Declaration to the police (e.g. in case of theft)	Public procurement
Public libraries (availability of catalogues, search tools)	
Certificates (birth and marriage); request and delivery	
Enrolment in higher education / university	
Health related services (interactive advice on the availability of services in different hospitals; appointments for hospitals)	

Source: European Commission

exclude those provided by federal government institutions in the UAE, some of which are important for individuals (such as those provided by the Ministry of Labor and Social Affairs). Also, by virtue of being a leading business center in the region, Dubai offers a wide range of public services that are specifically of high importance to the business sector in the Emirate, such as those available to free zone establishments.

The alterations made to the European Commission's list of basic public services come in the form of omitting or

replacing services that can be expressed in two broad groupings. The first group includes those that are not applicable in Dubai for either businesses or individuals (income tax, corporation tax, VAT and announcement of moving). The second group covers the services that are basically not provided by Dubai government to either businesses or individuals. These include social security contributions, social contributions, and submission of data to statistical offices. Some of those services are available through the federal government.

Basic Services Omitted from EC List

Services Description	Businesses/Individuals	Reason for Omission
Income taxes	Individuals	No income taxes available in Dubai
Social security contributions	Individuals	Available in one form or another through the federal government or personal contributions rather than the government of Dubai
Announcement of moving	Individuals	It is not legally binding on individuals to inform the authorities of changes in residence address
Social contributions for employees	Businesses	Though this service is available unofficially in Dubai in one form or another (personal contributions), it was excluded because the government does not make a provision for it.
Corporation tax	Businesses	No taxes on corporate income in Dubai. 'tax' is replaced with 'local fees collection'
VAT	Businesses	There is no VAT in Dubai
Submission of data to statistical offices	Businesses	There is no law in Dubai requiring business firms to submit data on their activities to government departments (though several government statistical offices are available).

Source: Madar Research

Dubai's Basic Services

Basic Public Services for Individuals	Basic Public Services for Businesses
Visas	Visas
Job search	Local fees collection
Payment of utility bills (electricity and water)	Engineering services (application for building permission, buildings services, inspection of engineering material)
Personal documents (passport and driver's license)	Registration of a new company
Car registration (new, renewal)	Legal services (attorneys, expert and companies' services)
Declaration to the police (traffic offences, crimes)	Customs declarations
Public libraries (availability of catalogues, search tools)	Environment-related permits (hazardous waste disposal, veterinary certification, Dubai central laboratory, no objection certificates for drainage and irrigation networks)
Certificates (birth and marriage)	Public procurement
Enrollment in higher education	Free zones establishments (Jebel Ali, Dubai Airport, Technology e-Commerce and Media)
Health-related services (interactive advice on the availability of services in different hospitals, appointments for doctors, health card renewal)	

Source: Madar Research

Below is a review of amendments applied to the European list of public basic services to make them relevant for Dubai.

- 'Visa services' were added for both businesses and individuals, since they are a vital service for the two sectors, due to movement of an exceptionally large expatriate community which constitutes the majority of the workforce.

- 'Legal services' related to Dubai Courts were added for businesses. These included attorney services as well as those of expert and companies services; the average of 'online percentages' of the three services was considered.

- 'Payment of electricity and water bills' (to a government authority) was added for individuals, as it is considered of high importance for Dubai residents.

- 'Health card renewal service' was taken as a partial service under the 'health related services' available to individuals.

- Europe's 'corporation tax service' was replaced by the 'local fees collection service' which is provided by Dubai Municipality and applies to most of the business sector in the emirate.

- The highest relevant stage (based on the four stage framework) for the 'personal documents service' was raised from 3 to 4, since – unlike Europe – there are fees associated with the service in Dubai.

- The 'application for building permission service' was omitted from the list of services for the individual, and was added as a partial service for businesses, since Dubai is witnessing strong construction activities in its business sector. 'Engineering services' also include buildings services' and engineering material inspection service'.

- 'Free zones establishment services' were added to the services available to businesses, as Dubai's free zones (which encompass thousands of business firms) play a vital role in driving economic activities in the emirate – and those firms place high value on the availability of public services online. The average of 'online percentages' for services provided by the three free zones - Jebel Ali (JAFZA), Dubai Airport (DAFZA) and Technology, eCommerce and Media (TECOM) – was taken as a measure of the level of online availability of 'free zones establishment services'.

- The average online availability level of 'job search services' was considered, as this service is provided unilaterally by several government departments in Dubai and not by a single specialized department (as in the EU).

- Public or quasi-government higher education institutions in Dubai offer online enrolment on websites of government departments with which they are associated. The average level of online availability of the various services was

Evaluation of job search services

Each government department in Dubai provides a different level of online 'job search'. While certain departments – such as Dubai Municipality and the Real Estate Department – provide the highest possible online level of this service (stage 3), nine departments do not provide any type of online 'job search' services. This reduced the average level of online availability of 'job search services' to 'one'. It should be noted, however, that a new 'job search service' under the name 'eJob' was launched in October 2002 on the Dubai e-Government Portal. This service claims to allow individuals to view all vacant positions in the government sector and to interact with opportunities electronically. Nonetheless, as this study was being conducted, many placements listed in individual government websites were absent from the eJob listing. Hence, eJob was not rated as one of the 'Job search services', although its structure would have qualified it for the highest level (stage 3) of online availability that a job search service can attain. eJob is apparently still undergoing development.

used for 'enrolment in higher education services'. Such institutions include the Dubai Aviation College of the Civil Aviation Department, Dubai University College of Dubai Chamber of Commerce and Industry and several colleges for medical sciences linked to the Department of Health. None of these institutions offer online 'enrolment services' that qualify them to surpass stage one (providing information about the service). The Electronic Total Quality Management College (E-TQM), associated with Dubai Police, allows online registration of courses.

The table titled "Basic Services Omitted from EC List" lists the type of services which were omitted from the European Union's list of 20 basic public services to make it compatible with the needs of individuals and businesses in Dubai.

Dubai's 19 basic public services which constitute the main focus of this study are listed in the table titled "Dubai's Basic Services".

6.4.3 'Online Percentages' of Dubai's Public Services

Description of the calculations of the 'online percentages' of Dubai's basic public services, based on the methodology adopted by the European Union, is detailed as follows:

1. For services that come under the four-stage model, the 'online percentages' are calculated as shown.
2. Services, where the highest relevant stage is three, 'online percentages' are calculated as follows.
3. Where a basic service is made up of multiple partial services, the 'online percentage' of the service is arrived at by calculating the average of the 'online percentages' of all the partial services. For example, the 'online percentage' of 'health related services' is measured by taking the average of the 'online percentages' of the three partial services coming under this category; interactive advice on the availability of services in different hospitals, appointments with doctors and health card renewal. This is also the case with the 'job search' category, where the 'online percentage' is calculated by taking the average of the 'online percentages' of the 'job search services' provided by 28 government and semi-government department in Dubai.
4. The overall figure – representing the level at which the 19 selected basic public services are available online is arrived at by calculating the average of 'online percentages' of the ten basic public services relating to individuals, and the nine relating to businesses. No account is taken of the relative importance of the 19 services in terms of the number of customers using each service.
5. This study focuses only on availability of the selected services on the Internet. No value is given to availability of a service by other electronic means such as SMS, fax or

Four-Stage Calculation Model

Stage	Score	Online Percentage	Explanation
Stage 0	0 - 0.99	0 percent - 24 percent	The service is not available online or its availability does not meet the minimum requirements of the four stage framework
Stage 1	1 - 1.99	25 percent - 49 percent	Online information about the service is available
Stage 2	2 - 2.99	50 percent - 74 percent	Online forms that can be filled out and printed or downloaded are available
Stage 3	3 - 3.99	75 percent - 99 percent	Online processing of forms is available
Stage 4	4	100 percent	The whole process required for obtaining the service can be executed online, including decision, delivery and payment

Source: European Commission

Three-Stage Calculation Model

Stage	Score	Online Percentage	Explanation
Stage 0	0 - 0.99	0 percent - 32 percent	The service is not available online, or its availability does not meet the minimum requirements of the four stage framework
Stage 1	1 - 1.99	33 percent - 66 percent	Online information about the service is available
Stage 2	2 - 2.99	67 percent - 99 percent	Online forms that can be filled out and printed or downloaded are available
Stage 3	3	100 percent	Online processing of forms is available

Source: European Commission

telephone.

6. Several government departments in Dubai utilize the electronic market place of 'Tejari.com' (Dubai Ports Authority) for procurement purposes. However, some of these departments still use their own websites to post tenders without making reference to Tejari services. This has led to ranking the online public procurement services offered by such departments in the first or the second stage based on the

four stage framework, whereas the services provided by Tejari ranked at the highest possible stage (stage four). In the final analysis, wherever the service is duplicated, the Tejari ranking took precedence for the service.

7. Some government departments in Dubai (such as Dubai Airport Free Zone Authority) use the service provided by eMirsal of Dubai Customs Department for customs declaration purposes. The eMirsal level of service is

Scores for Dubai's Basic Public Services for Individuals

Service	Stage / Online Percentage				Details				
	Actual Stage	Highest Relevant Stage	Online Percentage (%)	0	1	2	3	4	
1 Visas (Residence & Naturalization)	3	4	75				<input type="checkbox"/>		
2 Job search (all departments)	1	3	37.4	<input type="checkbox"/>					
3 Payment of water and electricity bills (Electricity and Water Department)	4	4	100					<input type="checkbox"/>	
4 Personal documents - Passport (Residence & Naturalization) - Driver's license (Police)	2	4	50		<input type="checkbox"/>		<input type="checkbox"/>		
5 Car registration (new, renewal) (Police)	3	4	75				<input type="checkbox"/>		
6 Police declaration - Traffic offences - Crimes	3	3	100				<input type="checkbox"/>	<input type="checkbox"/>	
7 Public libraries (availability of catalogues, search tools) (Municipality)	3	3	100				<input type="checkbox"/>		
8 Certificates - Birth (Health Department) - Marriage (Dubai Courts)	1	3	50			<input type="checkbox"/>	<input type="checkbox"/>		
9 Enrolment in higher education (all departments)	1	4	31.25			<input type="checkbox"/>			
10 Health related services - interactive advice on the availability of services in different hospitals - appointments for doctors - health card renewal	2	4	58.33			<input type="checkbox"/>	<input type="checkbox"/>		
Total	23	36	67.69						

Source: Madar Research

Scores for Dubai's Basic Public Services for Businesses

Service	Stage / Online Percentage			Details				
	Actual Stage	Highest Relevant Stage	Online Percentage (%)	0	1	2	3	4
1 Visas (Residence & Naturalization)	3	4	75				<input type="checkbox"/>	
2 Local fees collection (Municipality)	3	4	75				<input type="checkbox"/>	
3 Engineering services (Municipality)	3	4	75				<input type="checkbox"/>	
- buildings services							<input type="checkbox"/>	
- inspection of engineering material							<input type="checkbox"/>	
- application for building permission							<input type="checkbox"/>	
4 Registration of a new company (Department of Economic Development)	4	4	100					<input type="checkbox"/>
5 Legal services (Dubai Courts)	3	3	100				<input type="checkbox"/>	
- attorneys services							<input type="checkbox"/>	
- expert services							<input type="checkbox"/>	
- companies' services							<input type="checkbox"/>	
6 Customs declarations (Customs Department)	4	4	100					
7 Environment-related permits (Municipality)	3	4	75				<input type="checkbox"/>	
- hazardous waste disposal							<input type="checkbox"/>	
- Veterinary Certification							<input type="checkbox"/>	
- Dubai Central Laboratory							<input type="checkbox"/>	
- no objection certificate for drainage and irrigation networks							<input type="checkbox"/>	
8 Public Procurement (Tejari eMarket Place)	4	4	100					<input type="checkbox"/>
9 Free zones establishments	2	4	66.66				<input type="checkbox"/>	
- Jebel Ali							<input type="checkbox"/>	
- Dubai Airport							<input type="checkbox"/>	
- Technology, e-Commerce and Media						<input type="checkbox"/>		
Total	29	35	85.18					

Source: Madar Research

compatible with stage four, based on the four stage framework.

6.4.4 Basic Services Cluster

Dubai's 19 basic public services which constitute the focus of this study fall into four clusters:

- **Income generating services:** Services that generate income for the government from individuals and businesses (e.g. local fees collection, payment of water and electricity bills, and customs declarations)

- **Registration services:** Services that include adding information about an individual or a business to the records of a government department (e.g. registration of a new company, car registration, birth and marriage certificates).

- **Returns:** Public services provided by the government

to individuals and businesses (e.g. job search, declaration to the police, legal services, health related services, public libraries and public procurement)

- **Permits and licenses:** Services that include receiving a permit or a license from the bodies providing them (e.g. visa services, environment-related permits, enrolment in higher education, personal documents, engineering services, free zones establishments).

The table titled "Comparison between Dubai and EU Clusters" exhibits a comparison between the 'average online percentage' of each cluster in Dubai with its counterpart in Europe.

The European Commission has recommended that online public services in the European Union member states be provided in multiple languages that meet the needs of the

Comparison between Dubai and EU Clusters

Cluster	Dubai Average Online Percentage (October 2002)	EU Average Online Percentage (April 2002)	EU Average Online Percentage (October 2002 - est.)
Income generating services	91.70	79	82
Registration services	75.00	53	58
Returns	82.62	48	53
Permits and licenses	63.98	41	41

Source: European Commission and Madar Research

Languages Supported by Dubai Government Website

Arabic Only		English Only		Two or more languages	
# of Bodies	Percentage (%)	# of Bodies	Percentage (%)	# of Bodies	Percentage (%)
3	11	8	29	16	57

Source: Madar Research

residents of those states. In Dubai, 57 percent of government departments provide their services to the public in two languages (Arabic, English). The Department of Al Awqaf and Islamic Affairs is the only body offering its services in three languages (Arabic, English, and Urdu). Eleven percent of government departments in Dubai offer their services only in Arabic and 29 percent offer theirs only in English.

Conclusions

- The overall 'online percentage' of the basic public

Overall 'Online Percentage' of e-Services in Dubai

	Total (Actual Stages)	Total (Highest Relevant Stages)	Online Percentage (%)
Individuals	23	36	67.69
Businesses	29	35	85.18
Overall	53	71	76.44

Source: Madar Research

services in Dubai is 76.44 percent; such a level of online availability is considered high in comparison with the 60 percent estimated average for EU countries.

- Having exceeded the 75 percent mark, such a level of online availability indicates that the majority of Dubai's basic public services have already reached the two-way interaction stage between the government on one side and individuals and businesses on the other – and are moving towards a common point where complete transactions can be carried out between the two side electronically.

- The 'online percentage' of Dubai's basic public services for businesses (85.18 percent) is higher than the 'online percentage' of the emirate's basic public services for individuals (67.69 percent). This falls in line with the developments in e-government internationally, as services targeting businesses are getting more attention than services targeting individuals. It also reflects Dubai's focus on the

business sector, as a part of its strategy to strengthen the role it plays as a regional business center.

- Some 30 percent of Dubai's basic public services for individuals have the highest possible level of online availability, whereas 44 percent of Dubai's basic public services for businesses have the highest possible level of online availability. This means that an individual residing in Dubai can fully benefit from 30 percent of basic public services without having to be in direct physical contact with any government body, while businesses can similarly benefit from 44 percent of their dedicated basic services.

- The sophistication level of government departments' basic public services in Dubai varies vastly. While Dubai Economic Department, for instance, offers most of its services online in a manner that qualifies it for high 'online percentages', the Department of Finance offers no online services yet; the department does not even have a website.

ANNEX 1

A Comparison with the Findings of the e-Europe Action Plan

In June 2000, the European Commission adopted a plan aimed at transforming the European economy by 2010 into one that is more dynamic and fully 'knowledge-based'. Part of this goal is to arrive at a comprehensive implementation of eGovernment throughout European Union member states in the shortest time possible. All member states agreed to achieve online availability of the 20 basic public services listed earlier, by end 2002. The following table shows the empirical results from the European Commission's study (carried out three times so far; once in October 2001, once in April 2002 and again in October 2002).

- In October 2002, the overall 'online percentage' of Europe's basic public services was found to be 60 percent; representing a 15 percent increase above the level of October

EU Member States' Online Percentages

Country	Online Percentage (%)	Online Percentage (%)	Online Percentage (%)
	October 2001	April 2002	October 2002
Sweden	61	81	87
Ireland	68	85	85
Denmark	59	69	82
Finland	66	70	76
Norway	63	63	66
Spain	50	58	64
France	49	61	63
United Kingdom	50	63	62
Portugal	51	56	58
Italy	39	51	57
Austria	40	49	56
The Netherlands	37	42	54
Iceland	38	50	53
Greece	39	54	52
Switzerland	Not rated	35	49
Germany	40	46	48
Belgium	23	43	47
Luxembourg	15	22	32

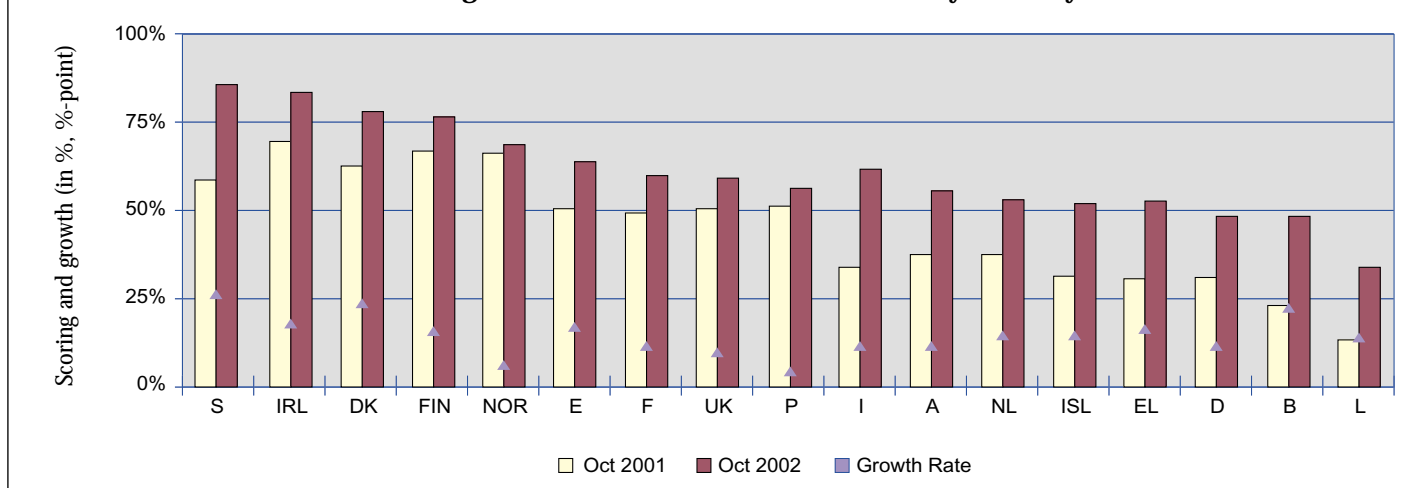
Source: European Commission/ Cap Gemini Ernst & Young

2001. This is still significantly lower than the score achieved by Dubai's basic public services (76.4 percent), as shown in this study.

● Public e-services in four countries, namely, Sweden, Ireland, Denmark and Finland, have on average moved beyond the two-way online interaction level corresponding

to a score above 75 percent. In the first survey, no country received a score of 75 percent or more, and eight countries scored below 50 percent – the transition point from downloadable forms to online forms. The results per country of the third survey confirm that Dubai's score is on a par with the top four European states by end October 2002, in

Scoring and Growth of the Public Services by Country



Source: Cap Gemini Ernst & Young

A – Austria	Fin – Finland	EL – Greece	I – Italy	NOR – Norway	UK – United Kingdom
B – Belgium	F – France	ISL – Iceland	L – Luxembourg	P – Portugal	S – Sweden
DK – Denmark	D – Germany	IRL – Ireland	NL – Netherlands	E – Spain	

terms of online availability of public services.

- eEurope Action Plan for 2002 seeks to ensure that basic public services are available online in ways that allow people with special needs (e.g. handicapped people, the elderly) to use them. In Dubai, there is still no plan to take the needs of these groups into consideration.

- e-Europe Action Plan recommends that all public basic services in Europe become interactive by the end of 2004, taking advantage of the deployment of a broadband network and providing multi-platform access.

- The European Commission is studying the establishment of a secure environment for the exchange of classified information among government departments by the end of 2003.

- The European Commission has concluded that the spread of e-government use requires the implementation of efficient electronic authentication means. The Commission recommends the use of smart cards, and expanding the use of electronic signatures at government level. So far the UAE has not announced any plan or deadline for the issuance of National ID Numbers, despite ongoing discussions at both the federal and local government levels. Once this project is implemented, e-government transactions will become much easier, especially with reference to user authentication.

ANNEX 2: Outstanding Websites

Dubai e-Government Portal: The portal, www.dubai.ae, was launched in October 2001, and has undergone several improvements since then. In the beginning, it included a comprehensive list of online services available through Dubai governments' websites, direct links to these services and general information for residents, visitors and businesses.

Later on, a search facility was added to the portal, followed by some downloadable application forms for government services which were not yet available on the departments' websites.

The Dubai e-Government Portal offers an ePay service (a unified payment service) as well as eJawaz (a unified username) which will allow the user to utilize all public services, without having to register with each relevant government department separately. Both services are currently being enhanced. The Dubai e-Government Portal has the infrastructure required for the integration of all government services, where services can be fully used and paid for on a single, secure platform – but government departments have not yet made full use of this infrastructure.

Dubai Courts: This website is highly organized and includes a large amount of information concerning the law

and related legal matters.

Dubai Economic Development Department: Most of the department's services are available online and are characterized by a high level of sophistication.

Department of Endowments: This is the only website which offers information in the three widely spoken languages in Dubai – English, Arabic and Urdu – in an attempt to attract wide participation from the UAE Internet community.

The Dubai Municipality

Twenty-two main online services are now offered by the Dubai Municipality (DM) through its website, which are further divided into over 55 sub-services. These Web services offer a varying degree of electronic transactions ranging from downloading certification or application forms, to browsing a public library to revalidating or canceling certifications. Non objection certificates (NOCs) from the Municipality are required documents for a wide range of activities such as running an ad campaign or building a structure or traffic diversions.

First on the list of e-services offered by DM is the Demarcation Service designed to make it accessible to landowners, civil engineering consultants and contractors. The DM Clinic Health Services, on the other hand, allows establishments such as hotels and nursery schools to apply and consequently track their application for occupational health cards or medical certificates.

Business establishments such as cinemas, retail shops, hotels, and apartments and restaurants can now submit their monthly income statements online via the Revenue Collection Service of the Dubai Municipality website. Other e-services available on the Dubai Municipality website include Drainage and Irrigation Systems, the various operations of the Dubai Central Labs, Food Control Health Certificates, Geographical Information System, Recruitment Services and Parking Fines Inquiry, among others.

A total of 400 DM employees are using the e-services to process the 16,600 odd transactions that are registered through their website on a monthly basis. The Online Payment Service, which allows customers to pay their transaction fees through the DM portal will be launched in late 2003. This service is linked to the Centralized Government Online Payment System.

The DM's IT Department supports about 80 IT applications and systems – catering to both internal and external customers. A good number of DM's 6,000 employees in nearly 90 locations across the emirate access the Municipality's network, which connects 3,000 PCs and around 1,000 printers from 21 departments.

ANNEX 3

Dubai Government and Quasi-Government Website		
Department	Website	Languages
Dubai Electricity and Water Authority (DEWA)	www.dewa.gov.ae	English
Dubai Courts Department	www.dubaicourts.gov.ae	Arabic
Dubai Police	www.dubaipolice.gov.ae	Ar/En
Dubai Police Traffic Department	www.dxbtraffic.gov.ae	Ar/En
Electronic Total Quality Management College (eTQM)	www.etqm.net	Ar/En
Dubai Civil Aviation Department	www.dca.gov.ae	Ar/En
Dubai Airport	www.dubaiairport.com	English
Dubai Duty Free	www.dubaidutyfree.com	English
Dubai Cargo Village	www.dubaicargovillage.com	English
Dubai Aviation College	www.dac.ac.ae	English
Department of Health and Medical Services	www.dohms.gov.ae	English
The Nursing Institute/ Dubai Women Medical College/ Dubai Pharmacy College	www.dohms.gov.ae/education.html	
Dubai Municipality	www.dm.gov.ae	Ar/En
Dubai Development Board	www.dubaiddb.gov.ae	Ar/En
Dubai Chamber of Commerce & Industry	www.dcci.gov.ae	Ar/En
Dubai University College	www.dcci.gov.ae/contents.asp?page=dub	English
Dubai Ports Authority	www.dpa.co.ae	English
Tejari marketplace	www.tejari.com	Ar/En
Department of Ports & Customs	www.dxbcustoms.gov.ae	English
eMirsal	www.emirsal.com	English
Naturalization and Residency Department	www.dnrd.gov.ae	Ar/En
Department of Tourism and Commerce Marketing	www.dubaitourism.co.ae	Ar/En
Department of Economic Development	www.dubaided.gov.ae	Ar/En
Dubai Civil Defence	www.dcd.gov.ae	Arabic
Department of Information	www.dubaitv.gov.ae	Ar/En
Dubai Land Department	www.dubailand.gov.ae	Ar/En
Dubai Drydocks	www.drydocks.gov.ae	English
Dubai Ship Docking yard (Jaddaf)	www.jadafdubai.com	English
Dubai Transport Department	www.dubaitransport.gov.ae	Ar/En
Dubai Airport Free Zone Authority	www.dafza.gov.ae	English
Dubai Public Prosecution	www.dxbpp.gov.ae	Arabic
Real Estate Department	www.realestate-dubai.gov.ae	Ar/En
Dubai eGovernment Portal	www.dubai.ae	Ar/En
Technology Electronic Commerce and Media Free Zone	www.dubaiinternetcity.com www.dubaimediacity.com www.kv.ae	English English English
Dubai Government Workshop	www.dgw.gov.ae	Ar/En
Dubai Financial Market	www.dfm.co.ae	Ar/En
Finance Department	Not available	----
Dubai International Financial Center	www.difc.ae	English
Al Awqaf and Islamic Affairs department	www.awqafdubai.gov.ae	Ar/En/Urdu

Source: Madar Research

ANNEX 4

Individual Scores of Free Zones		
Free Zones establishments services	Online Percentage (%)	Stage (4 max.)
Jebel Ali Free Zone Authority	75	3
Dubai Airport Free Zone Authority	75	3
Technology Electronic Commerce and Media Free Zone	50	2
Average Score/Overall Stage	66.66	2.66

Source: Madar Research

Individual Scores of Higher-Education Online Enrolment Services		
Enrolment in Higher Education Services	Online Percentage (%)	Stage (4 max.)
Electronic Total Quality Management College (Dubai Police)	25	1
Dubai Aviation College (Dubai Civil Aviation Department)	50	2
The Nursing Institute/ Dubai Women Medical College/ Dubai sPharmacy College (Department of Health and Medical Services)	25	1
Dubai University College (Dubai Chamber of Commerce & Industry)	25	1
Average Score/Overall Stage	31.25	1.25

Source: Madar Research

Individual Scores of Government Job-Search Services

Job Search Services	Online Percentage (%)	Stage (3 max.)
Dubai Electricity and Water Authority (DEWA)	67	2
Dubai Courts Department	0	0
Dubai Police	67	2
Al Awqaf and Islamic Affairs department	33	1
Dubai Civil Aviation Department	0	0
Department of Health and Medical Services	0	0
Dubai Municipality	100	3
Dubai Development Board	0	0
Dubai Chamber of Commerce & Industry	67	2
Dubai Ports Authority	33	1
Department of Ports & Customs	0	0
Naturalization and Residency Department	0	0
Department of Tourism and Commerce Marketing	0	0
Department of Economic Development	0	0
Dubai Civil Defence	0	0
Department of Information	67	2
Dubai Land Department	67	2
Dubai Drydocks	67	2
Dubai Transport Department	67	2
Real Estate Department	100	3
Dubai Public Prosecution	67	2
Dubai Airport Free Zone Authority	33	1
Technology Electronic Commerce and Media Free Zone	67	2
Dubai International Financial Center	33	1
Finance Department	0	0
Average Score/Overall Stage	37.40%	1.12

Source: Madar Research

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2003-2008

Volume II

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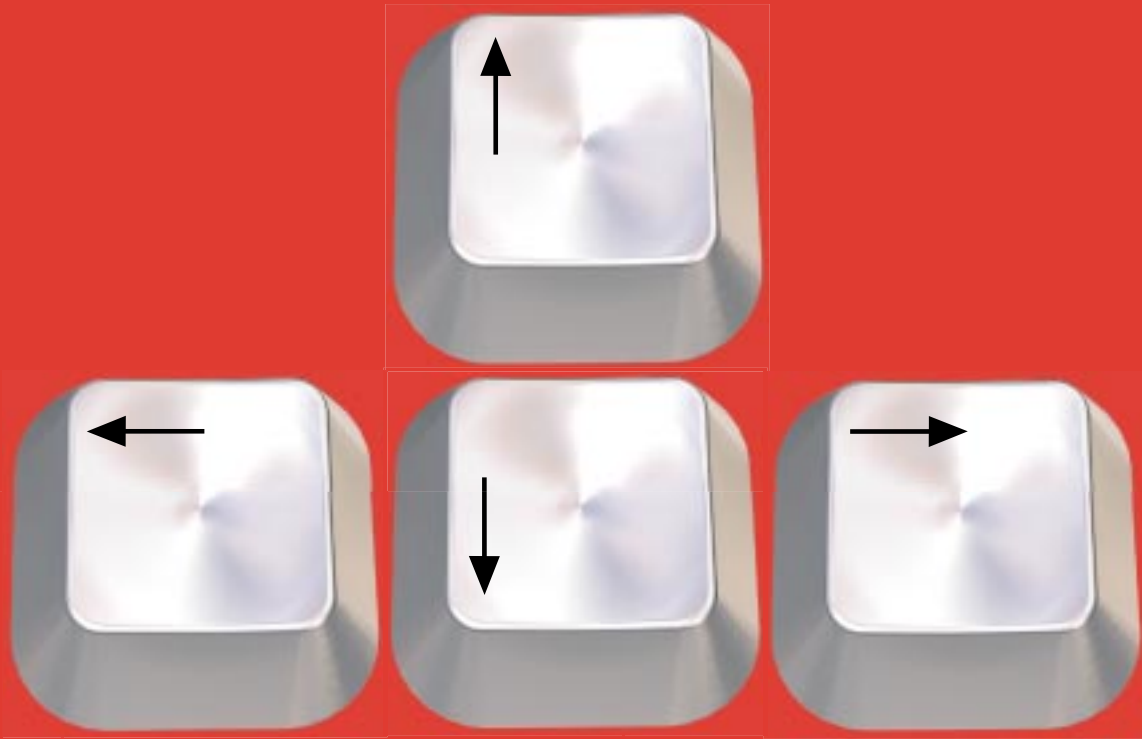
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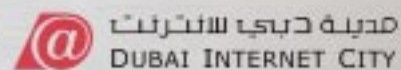
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