THE UNIVERSITY OF HULL

THE CONSTRUCTION SECTOR IN THE UAE:
GENESIS AND DEVELOPMENT

being a Thesis submitted for the PhD Degree
BUSINESS MANAGEMENT

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by

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Chapter I

Introduction
Introduction

The United Arab Emirates (also, 'the UAE') is an integral geographical, historical and demographic part of the Arabian Gulf Region and enjoys a strategic location near the entry to the Gulf itself. As a result of this positioning the UAE has always been an outstanding centre for trade and business and, in addition, because the Arabian Gulf has always been a vital waterway joining the Mid-Asian to the North-Eastern Asian countries, many historical and archaeological studies have suggested the UAE has also contributed as one of the original cradles of human civilization\(^1\).

The creation of the United Arab Emirates as a national entity on December 02, 1971 was the starting point of the UAE's road to fast track socio-economic development and the founding of the Federal entity and unification of the (seven) Emirates were the key factors behind the rapid development that was to follow: development based on investment across all economic sectors.

Over the years the UAE's economic boom has resulted in radical changes within the country, including changes to its basic infrastructure, and has also resulted in improvements to a wide variety of social services throughout all seven Emirates. One major factor behind the success the UAE has enjoyed has been its ability to adhere to national unity: enabling all seven Emirates to both contribute and benefit in unison.

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1. Modern and Contemporary History of the UAE – Dar Al Thaqafa Al Arabiyah, p. 12
The UAE makes use of one institutional and organizational State/Federal entity and one combined market for all seven Emirates to enjoy. Thanks to the creation of capital and financing resources, throughout the Emirates, the basic material needs for development were made available and because Federal investment has, typically and regularly, been directed towards the Emirates with less resources than others a social balance and uniform quality in infrastructure have both been achieved. Thus development in the smaller Emirates has been effected by means of Federal and local resources and also through private sector initiatives.\(^1\)

The Construction Sector has always played a vital role in the economy of the UAE. It contributes in no small way to the national income and contributes to the development of the UAE’s other economic sectors as well. The Construction Sector has also played a major part in the infrastructural establishment of the state and, indeed, also contributed to the intellectual development of the country.

Although the Construction Sector has been, and still is, one of the key influences on general economic growth it is now facing, for the first time, a number of challenges and difficulties including:

- challenges relating to internal and external competitiveness
- challenges relating to the need for more advanced building codes and quality systems
- difficulties specific to the Construction Sector such as the need to be less dependant on foreign labour

\(^1\) The Main Features of Socio-Economic Development in the UAE during 1972 – 1977, Ministry Planning, UAE, 1978, p.1
problems brought about by the need for a more appropriate legal entity to represent
the various elements in and associated with the industry and to enable a more
formal, interactive interface with Government to take place
and
- challenges which emanate from the need for a more appropriate sectoral
organization structure, a structure which would enable the sector reap the benefits
from operating in a more functionally efficient manner

It is interesting to note that, whilst the banking and manufacturing industries in the
UAE have developed strong formal interactive links with Government (both have
Ministries designated responsible for their affairs), in the case of the Construction
Sector the affairs of the industry are administered piecemeal in that a number of
Ministries (e.g. Labour, Finance & Economic Development, Immigration, etc.) are
responsible for upholding legislation in respect of the industry but none are charged
with ensuring the corporate health and development of the industry.

Whilst the Construction Sector has done what it can to develop an organization
structure to protect its interests (through its formation of the UAE Contractors
Association in September 1985), this is on a voluntary basis only because the sector
still has no legal mandate to represent the industry and is poorly funded — with the
disadvantages this entails.
There has never been any significant research carried out on the needs of the Construction Sector in the UAE, although the researcher himself conducted a preliminary study on this sector for a Master's degree which he completed in 1998\(^1\). This study yielded a certain amount of informative data and findings on a number of key aspects of the Sector but did not explore the options for reform or result in the selection of options which would offer long lasting and optimum solutions. The study was also based on circumstances which have changed considerably since it was carried out.

This current study is therefore the first major study of its kind and the researcher trusts that it will enable the Construction Sector to benefit from its findings and recommendations.

The researcher recognizes that the types of change needed to meet the challenges the sector faces will, of necessity, require the support of the many interests involved, and in close proximity to, the sector and that, because of this, change may be more gradual and measured in pace than is required. If a framework for change has, however, been agreed this may, the researcher hopes, encourage the rate of change to take place in a more immediate timeframe than would, otherwise, have been the case.

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Chapter 2

Background To Study
2.(i) Historical Background

Any researcher engaged in the history of the genesis and development of the Construction Sector in the UAE should have his attention drawn to the size of the achievement that has been registered. Such progress reflects the ever increasing aspirations of the UAE people coupled with their vision of what the UAE should be like in the future - since they lived, in the not so distant past, in a collection of tiny coastal villages and towns, scattered houses on mountains, in the desert and around various oases.

As a starting point, one's address of the history of the UAE should take into account the geographical, economic, social and cultural relations between the UAE and other regional countries, countries which have shared a common history with the UAE (formerly the Coast of Oman). For this reason, the backwardness which engulfed the region should not be judged as being the key factor behind the local inhabitants inability to develop their region but, rather, the reason is attributable to several key factors, the main one of which is probably the region's exposure, over a fairly long period of time, to colonial raids/occupation, the first and most important of which was at the hands of the Portuguese circa 1481-1487, well before the Cape of Good Hope was discovered. At that time, Dom Joe II sent a number of expeditions into the Middle East trying to satiate his desire to discover the sources of the spice trade. In one of these expeditions, Joabir de Kasilhod, whose name was associated with Alsonso de Beva and who was in command of the expedition, led his men in 1487 to Naples and then to Rhodes (en route to Cairo) where he met a group of travellers who intended to travel to Aden. The expedition and the group joined together and the combined caravan set out to Al-toor and then ventured on to the Red Sea from where they set sail to Aden.
It was then indicated that the caravan reached Hormuz Island. After this episode the Portuguese emerged on the Arabian Gulf scene: stripping the Arabs of their trade and managing to retain it for more than 300 years, as colonizers depriving people of their rights of heritage and, it could be argued, adversely affecting the national economies of the region\(^{(1)}\). The Portuguese colonization was not the only one suffered by the region - there were also Dutch colonizers who fought with the Portuguese and who finally evicted them from the region. Then came the turn of British colonialism which, vying for the upper hand, eventually expelled the Dutch, thus extending British sway over the Arabian Peninsula and the Arabian Gulf until the end of 1971.

In addition to these developments the region witnessed several incursions made by regional countries, particularly Oman and Iran, of their neighbours. These raids, along with the European imperialist hegemony, all affected the region’s economies and left their marks on its economic, social and cultural development. These historical developments all influenced the types and shapes of building which arose from the mixture of cultures that successively left their distinctive imprints on the region.

These historical events, the researcher believes, invite further examination of the history of construction in the region and an attempt to try to define the stages of this history through human settlement, with the emphasis on construction patterns and the types of building materials used in construction. Undoubtedly, the historical roots of construction in the UAE should, logically, serve as the main starting point for any study on the genesis of development of the Construction Sector.

With the creation of the UAE on December 2, 1971, and amid soaring oil prices, the state began to devise and implement comprehensive development plans aimed at mobilising the UAE community towards making progress in its standard of living, sloughing off the stigmas of poverty and backwardness, arguably left behind by British colonization.

The human and administrative capabilities of the UAE at that time, however, were not up to the standard required to implement the projects envisaged in the comprehensive development plans that had been drawn up - especially in relation to the Construction Sector, without which no real development in living standards could take place. Given very limited technical expertise, a limited number of national contracting companies, limited national manpower due to the state's small population and limited local administrative capabilities in relation to the requirement for the immediate planning and execution of very large projects, the national contracting companies were not ready at that time to undertake the execution of a substantial number of major projects without asking for help from foreign contracting companies.

All of the reasons mentioned above made it imperative for the UAE to resort to help from foreign companies who were supported by expatriate administrators, technicians and labourers and who managed, through their expertise, to fill the vacuum at that time. This development enabled the UAE to implement major projects and complete infrastructure in a very short timeframe when compared to other countries which would have needed tens of years before achieving such progress and attaining the benefits therefrom.
The following, the researcher believes, are the main conclusions that can be drawn from the history of the UAE as far as the Construction Sector is concerned:

- The region was void of multi-storey buildings until the end of the 1950s - the buildings that did exist did not exceed three storeys in height and the location of these buildings was mainly in town centres.

- A large proportion of houses until the 1970s were made from palm leaves and residential units were made of mountain rocks and mud as were found in some agricultural areas such as Ras Al- Khaimah and the mountainous region.

- Accommodation units in the main cities were built from coral bricks taken from the sea or ‘whitewash’ which was a type of charred desert rock processed and transformed into a white cement-like substance. (Many houses, castles and archaeological buildings decorated with these substances still exist).

- Other parts of buildings, such as ceilings, were covered with palm stumps and other types of wood made up of palm leaves, for protection against the sun’s heat.

- Doors and windows were manufactured from timber imported from abroad -since only in the 1950’s were modern building materials, such as cement, iron and sanitary equipment brought into the region.

- The trade in imported building materials continued in a very limited way until the 1960s when modern building materials began flowing in in commercial quantities.
2.(ii) Birth of a Diverse Economy

The economic growth witnessed in the United Arab Emirates, since its establishment in 1971, has taken place as a result of a comprehensive and balanced approach to economic development by government, supported by the acquisition of the necessary financial and investment resources/capabilities - the result of increasingly large oil revenues.

During these years of development the government focused on a number of key priorities at the same time, including raising living standards, building the infrastructure of a modern economy, developing social services and developing the skills of the national workforce – across all economic sectors. Major investments were undertaken in relation to the development of both the productive and service sectors of the economy, rendering the economy far more diverse, and bringing into existence a number of relatively sophisticated productive and service institutions.

This increase in general economic activity level was apparent across all economic sectors, including the Construction Sector, and it is interesting to note that the various economic sectors depended on one another to sustain development: whilst some sectors provided raw materials to other sectors, these, other, sectors provided further sectors with manufactured materials. In addition to this it is apparent the Construction Sector played a major role in the development of most of the other sectors of the economy: such is the nature of the Construction Sector.
The Services Sector (communications, transportation, banking, insurance and investment) required the Construction Sector to meet the requirements of its own development, necessary for it to be able to support and serve the productive sectors of the UAE economy. In addition, the infrastructural projects - roads, ports, airports, schools, hospitals, government institutions water, electricity, drainage and communications - could not have taken place but for the contribution of the contracting sector.

Before examining how the Construction Sector, with its substantial contribution to the overall development of the UAE, originated and developed, it is important to obtain a good understating of the UAE’s geographical position and the importance of this.

The UAE is a part of the Arabian Gulf region, connects the Oman Coast with the Arabian Peninsula and constitutes a natural extension of the body of the Arab nation, which stretches from the Atlantic Ocean to the Arabian Gulf and the Arabian Sea. The UAE enjoys wide variations in geographical and topographical features and also has a large number of islands, estimated at approximately 200. Generally speaking the UAE coasts (for there are two of them) are mostly sandy and even, except for the Musandam Peninsula where steep slopes, high mountains and sprawling oases are all apparent.

The UAE is composed of seven Emirates, namely:

a) Abu Dhabi Emirate:

Abu Dhabi Emirate is located on the Arabian Gulf between Parallels 22,5° and 25° to the north and lattitudes 51° and 55° to the east and is the biggest of all the seven
Emirates, with an area of about 67,340 square kms, thus equating to 86.7% of the total area of the UAE. Abu Dhabi is the capital of the UAE and its population was estimated at some 841,000 in 1992(1) which then rose to 928,360 by 1995(2). The number of Abu Dhabi’s residents thus constituted 39% of the UAE’s total population by 1995.

b) Dubai Emirate:

Dubai has a 72 kms coastline situated along the Arabian Gulf with an area of 3,885 square kms, equivalent to 5% of the total area of the UAE. The Emirate’s population was put at about 529,000(1) in 1992 and rose to 674,101(2) by 1995, an annual growth rate of 8.4% and constituting 28.35% of the UAE’s total population by 1995.

c) Sharjah Emirate:

Sharjah Emirate has a coastline of more than 16 kms stretching along the Arabian Gulf and extends inland for more than 80 kms. It also encompasses three regions bordering the Gulf of Oman - Kalba, Khorfakan and Daba Al Hisn. Sharjah has an area of 2,590 square kms, equivalent to 3.3% of the total area of the UAE and approximately 330,000 people inhabited the Emirate in 1992.(1) The number of inhabitants of Sharjah rose in the 1995 Census to 400,339(2) giving it an annual growth rate of 6.6% over the period 1992-1995 and making up 16.84% of the total population.

(1) Statistical Set, Ministry of Planning, UAE, Seventeenth Edition, 1992, p.4
(2) UAE National Report to UN Second Conference on Human Habitat, (Based on 1995 census), Ministry of Public Works & Housing, UAE, Dec. 1995, P.10
d) **Ajman Emirate:**

Ajman Emirate has a coastline of some 16 kms extending along the Arabian Gulf between Sharjah and Umm Al Quwain Emirates. It has an area of 259 square kms, equivalent to 0.3% of the total area of the UAE and about 80,000 people inhabited Ajman in 1992\(^{(1)}\). The population then rose to 118,812 at the time of the 1995 census\(^{(2)}\), giving an annual growth rate of 14% between 1992-1995 and accounting for 5% of the total population.

e) **Umm Al Quwain Emirate:**

Umm Al-Quwain Emirate has a coastline of some 24 kms along the Arabian Gulf between Sharjah in the west and Ras Al Khaimah in the east. The Emirate’s territory stretches up to 32 kms inland, with a total area of 777 square kms, equivalent to 1% of the total area of the UAE. Umm Al Quwain’s population was estimated at some 28,000 in 1992\(^{(1)}\) and this rose to 35,157 in the 1995 Census, \(^{(2)}\) giving an annual growth rate of 7.9% during 1992-1995 and constituting only 1.5% of the total population.

f) **Ras Al Khaimah Emirate:**

Ras Al Khaimah Emirate has a coastline of some 64 kms in the easternmost part of the Arabian Gulf and extends inland over a distance of more than 128 kms. It shares mountainous borders with the Sultanate of Oman in the south, the east and the north.

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\(^{(1)}\) Statistical Set, ibid, p.5  
A number of islands in the Arabian Gulf belong to the Emirate - most notably, Greater Tunb and Lesser Tunb. Ras Al Khaimah has an area of 1684 square kms, equivalent to 2.2% of the total area of the UAE. Estimated in 1992, Ras Al Khaimah's population was 136,000 but rose, according to the 1995 Census, to 144,430, giving an annual growth rate of 2% between 1992-1995. The Emirate's population accounted for 6% of the state population in 1995.

g) Fujairah Emirate:

Fujairah is the only Emirate that is located on the Gulf of Oman and outside the Straits of Hormuz and has a coastline stretching 90 kms along the Gulf of Oman - a location which gives it significant strategic importance. The Emirate has an area of 1,165 square kms, equivalent to 1.5% of the total area of the UAE, and has a population estimated in 1992 at approximately 66,000. By the time of the 1995 census the population numbered 76,254, giving the Emirate an annual growth rate of 4.9% over the period 1992-1995 and accounting for 3.2% of the total state population.

Turning now to the economic history of the UAE, even a cursory reading makes it clear that the Construction Sector played an important role in the UAE's development drive since it started on December 2, 1971.
Undoubtedly it was revenue from oil that played the key role in underwriting the development of the UAE and enabled it to carry out the substantiated number of successful projects it has undertaken. Through these projects the state has fulfilled its aims of building social facilities and the transforming of the desert into model villages and cities in which a good quality of life for both residents and non-residents is now available.

As a result of this drive for development the Construction Sector had a prominent role to play in the overall development process and also in the development of construction styles used in the UAE which, after its founding in 1971, has become an outstanding centre of trade and business at both regional and international levels due to its location, facilities and the sheer size of its economy. Today the UAE has a number of economic sectors which are becoming increasingly developed, all supported, to a greater or lesser extent, by the Construction Sector.

Further examination of the UAE’s economic history also shows that the Construction Sector registered remarkable rates of growth since its genesis in 1970 - for instance, the value of construction was valued at Dh. 8.1 billion in 1975, rose to Dh. 15.1 billion in 1985 and then to Dh. 17.2 billion by the year 2000, achieving steady rates of growth even through periods of recession(1). The next two sections examine this growth in more detail.

(1) Statistics Released by the Ministry of Planning and the Central Bank, UAE, 1985, p. 26, 27 & 28
2.(iii) Birth of the Construction Sector

What were the construction companies in the UAE in the 'early' days like? How did they develop? What methods did they use in the building process?

Any researcher of the history of the Construction Sector would notice:

a. There were no construction companies in the true sense of the word in the UAE until the 1930s when the first construction company was founded in 1934 to meet the needs of the British forces and to carry out work for them - in fact the company relied on projects required by the British not only in the UAE but throughout the region. On the other hand, other, miscellaneous, work was carried out but by individual construction workers, each of whom was named at that time as “The Master.” Most of these masons and other types of skilled tradesmen came from Iran - communications with the Persian country were frequent thanks to sailing ships that plied every day between Iran and the Arabian Gulf countries.

b. In the late 1950s, the shapes and types of building began to change with the arrival of modern building materials in the region. Construction requirements also changed, requiring increasingly skilled workers and technicians who were better qualified to carry out such work.

Due to the dearth of labour in general, and of technicians in particular, labour was sought from outside the region. Groups of Arab workers from neighbouring countries came in, contributing to all types of work, particularly in ferrocement, power, paint and sanitary work.
The Construction Sector remained limited in scope and size until the region witnessed the beginning of large scale petroleum exports in the early 1960s. At that time the British set up a council of Governors, named ‘The Development Council’, which was entrusted with the task of spending income from petroleum exports on the development of the UAE. This expenditure by The Development Council on behalf of the UAE from 1965 to 1971 was estimated at approximately 72 million Dirhams but accelerated after independence, through UAE government spending, from 1972 to 1977, to 2.5 billion Dirhams, equivalent to a thirty-five fold increase.

From these figures it can be seen that whilst the average expenditure by The Development Council did not exceed 12 million Dirhams annually the average annual expenditure by the UAE government, after independence, rose to 417 million Dirhams. It is also noteworthy that the reason that expenditure was able to increase to the level of this 2.5 billion Dirhams between 1972 and 1977 was due to the increase in industry capacity to deliver at this level.\(^{(1)}\)

Tables (1-A) and (1-B) give details of the numbers of construction companies operating in the UAE and rates of changes in these numbers, by Emirate, between 1970 and 1995. The two Tables indicate:

- The number of construction companies in the UAE increased to keep pace with the increase in economic development because the major increases took place during periods when the pace of economic development was particularly high.

\(^{(1)}\) The Main Features, ibid
The growth rate percentages clearly show that, during the major periods of political uncertainty (the Iran-Iraq War and the Gulf War), growth was less spectacular – following the general economic trends experienced by the Arabian Gulf Cooperation Council (AGCC) memberstates, since all these states were uniformly affected by these circumstances. After the end of each of these periods of political uncertainty it is apparent that the UAE economy continued its strong upward growth curve, mainly as a result of growing activity in oil exportation and due to the further development of all of its economic sectors. Of particular note is the fact that the number of construction companies in the UAE rose strongly during the period 1990 to 1995, part of which resulted from stored demand during the Gulf War of 1990/1991.

The rejuvenation of the UAE's economy after 1990/1991 was further enhanced as a result of the UAE strengthening its position as a regional supplier of goods and services which brought in additional income to the state's coffers: a substantial part of this income being directed into the construction industry.

The 1995 National Report presented by the UAE to the United Nations Conference on Human Habitations supported this analysis of the contracting sector and stated: "The state's basic needs in the building and construction field were requirements necessary to cope with income and population development and, most importantly, requirements to support state-planned development activities. The economic and social development process has kept abreast with ambitious investment activities, channelling available financial resources and sophisticated productive energies and setting up basic structures, which covered the various sectors in the UAE in its entirety"\(^{(1)}\).

Statistics indicate that the number of construction companies in the Emirate of Dubai retreated from 932 in 1987 to 431 in 1991 but then began to rise gradually until they reached 977 in 1995 i.e. a growth rate of 127% between 1991 and 1995(1).

Even in Sharjah (one of the smaller Emirates) the growth rate of the Construction Sector was substantial between 1991 and 1995 in that the number of construction companies increased from 803 to 1326, a growth of 65%. This increase took place as Sharjah gradually took on its (current) role as a dormitory town for Dubai, offering substantially cheaper accommodation than Dubai for those working in Dubai / the specialized economic zones south of Dubai such as the Jebel Ali Free Zone.

Analysis of other economic indicators demonstrates the significance of the Construction Sector to the overall economy and the following is of particular note:

a. By the mid 1970s the UAE economy was already moving ahead strongly resulting in a more established infrastructure and increased output from the productive sectors of the economy: all contributing to growth in GDP.

b. In the early days after independence concentration was very much on the Oil Sector and this was the main source of the UAE's revenues. Such revenues contributed largely to the development of the Financial, Industrial, Agricultural and Trade Sectors as well as the Construction Sector: the latter achieving phenomenal growth and resulting in a large number of construction companies.

(1) Dubai Statistics Book, Dubai Municipality, UAE, 1991, p-105
As an example, in 1990, the number of construction companies was 1027 in Abu Dhabi, 902 in Dubai, 787 in Sharjah, 209 in Ajman and 44 in Ras Al-Khaimah. As regards other Emirates – Umm Al-Quwain and Fujairah – construction companies numbered 51 and 56 respectively. These numbers then increased, by 1995, to 2111 Construction companies in Abu Dhabi, 977 in Dubai, 1326 in Sharjah, 142 in Ajman, 375 in Ras Al-Khaimah, 202 in Umm Al-Quwain and 222 in Fujairah: in total an increase of 747 in 5 years or, as a broad average, an annual increase of 15%.

c. The ever-increasing investment in the public and private sectors provided the momentum for the Construction Sector to expand and embark on the execution of the numerous projects that were required - whether industrial, agricultural, oil, trade or the service sector - projects on which the Government had focussed its attention in order to achieve its economic growth programme.

d. All economic sectors, with their various enterprises, contributed to the development of the Construction Sector, which, as a result, grew and invested in substantial increases in labour recruitment and the introduction of increasingly modern technology.

Though newly established, the UAE had, by the mid 1970s, engaged in numerous activities which would result in the development of its various economic sectors and increased social development and living standards. Despite nascent productive and administrative institutions, the Federal Government and the Governments of all the Emirates sought to develop public services in addition to expanding and developing the infrastructure.
In the social services field, for example, the 1970's growth in population, the different customs and habits of arrivals and the expectation of increased living standards had a great effect on increasing the demand for social services. The population grew quickly over this period and an annual average of around 5.4% was recorded.

Table (2) shows the growth of population in the UAE during the period 1975 – 1995, averaging around 7% per annum, and Table (3) shows population growth rates by Emirate, which broadly increased in line with the UAE’s overall rate of economic development.

As a result of the UAE’s rapidly increasing population, a number of additional social services were required, a matter which prompted the Government to respond to this requirement urgently - both Federal and Regional Governments allocating substantial sums for expenditure on hospitals, health centers, schools, educational institutes and utilities.

Available data indicates that the numbers employed in the Social Services Sector rose from 44,000 in 1975 to 103,000 in 1985 (an increase of 59,000 or 134%, approximately 13% per annum) and this trend of high growth continued, albeit at a slightly lower rate, until 1994 when the number employed was 111,100 and the rate of growth subsided somewhat. (1)

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(1) National Report, op cit., p.16.
To conclude, the Construction Sector had begun to play an important role in its relationship with other economic sectors fairly early in the UAE's period of rapid development in that it had carried out a substantial number of projects required by these sectors, thus allowing these sectors to further develop and contribute to GDP - borne out by the fact that the contracting sector contributed 7.7% to GDP in 1990 and 9.5% in 1995.
2.(iv) Development of the Construction Sector

The importance of the Construction Sector to the UAE economy lies in the fact that it is the sector responsible for all projects underpinning the economic and social service activities in the UAE, including refurbishment and maintenance work for public installations and utilities.

Over the past 30 years, as the state economy witnessed extensive and continual growth, characterised by substantial increases in building and construction activity, the Construction Sector established new cities, road networks, ports, airports, hospitals, schools, Government buildings, industrial, agricultural and residential projects.

The Construction Sector ranked second after the Oil Sector in terms of its contribution to GDP during the period 1975-1980 and the cost of buildings and construction works undertaken by this sector over the period 1975-1985 amounted to Dhs. 152.2 billion, equivalent to 53.7% of the total investment made in the UAE during the same period, estimated at Dhs. 283.3 billion. The contribution of the Construction Sector to the UAE economy increased in subsequent years, with a staggering value of Dhs. 61.2 billion for buildings and construction work undertaken by the sector in the period 1991-1995, equivalent to 34.5% of the total investment in the UAE during this period of Dhs. 177.1 billion.

Development of the UAE during the 1970s, 1980s and 1990s was carried out in specific, individual, development phases for ease of management, each period experiencing further tranches of investment: the 1975-1980 period was characterized by a particularly high increase in the rates of construction activity.
Table (4) shows the amount of national investment during the time the Government needed to carry out largely infrastructural projects, 1970 to 1995. During this time building and construction remained the main focus of the Government as it concentrated its efforts on developing all sectors – as far as the level of oil revenues available and the level of political certainty prevailing at the time would allow.

Statistics show that the activity trend in the Construction Sector (reconstructed and constructed buildings) began to decline from 1981-1985 and maintained a downward trend until the value of reconstructed and constructed buildings reached Dhs. 50 billion in 1986-1990.

Following 1990, however, the improving economic environment resulted in the volume of construction rising to Dhs. 61 billion during the period 1991-1995, an increase of 23% over the previous five year period. These figures are indicative of the strength and resilience of the Construction Sector, which responded well to the need for increased construction volume.

The Ministry of Housing and Public Works alone spent 7 billion Dirhams on public buildings, works and housing projects during 1991-1995, of which 21% went on housing enterprises, in addition to the sums the private sector invested on housing.

The production of the Construction Sector was valued at Dhs. 8.1 billion for 1975 and rose to Dhs. 18.7 billion for 1980 (an annual growth rate of 18.2%) but then declined to Dhs. 15.1 billion for 1985, an annual reduction of 4.2% over the period 1980-1985.
Production then recorded a record low of Dhs. 14.3 billion for 1987, a negative annual growth rate of 2.8% for the period 1985-1987.

After 1987, production began to recover due to a relative improvement in the economic climate in all sectors after 1987, hitting Dhs. 16.7 billion, with an annual growth rate of 5.7% during the period 1988-1990. Overall, during the period 1995 - 1990\(^{(1)}\), the Construction Sector achieved an annual growth rate of 2.1% but then increased its value of production to Dhs. 61 billion for the period 1991 to 1995, an increase of 23% over the previous five year period, as indicated by Tables (4) and (5).

According to a survey carried out by the Dubai Chamber of Commerce and Industry "The Construction Sector achieved 7% of the total national income of the UAE during the year 2001, which was Dhs. 249 billion compared to 6.6% during the year 2000, which was Dhs. 259 billion.

The Ministry of Planning statistics showed that the cost of construction and building projects implemented by this sector, represented by contractors, reached about Dhs. 161.2 billion, i.e. 52.6% of the total national investment during the period from the year 1995 to the year 2000 as further investments were directed at implementing infrastructural and periodic replacement and maintenance projects.

\(^{(1)}\) The Socio-Economic Development In the UAE During 1985-1990, Ministry of Planning, UAE, 1991, p.93
According to the same data, the added value generated within the Construction Sector increased from Dhs.13.7 billion during the year 1995 to Dhs.17.4 billion during the year 2000 - a total increase of Dhs. 3.7 billion and an annual growth rate of 4.9 % during this period."(1)

Table (5) shows the development of the most important variables of the Construction Sector during 1975 – 1995:

- Production value increased by an average of 2.1% per annum between 1985-1990 and between 1991-1995.

- The annual value added growth rate was 1.8% between 1985-1990 and 2.1% between 1991-1995.

- Worker numbers increased from 117,000 in 1985 to 119,200 in 1990 - an annual growth rate of 1.1%. Between 1991 and 1995, however, worker numbers increased annually by 4.9% from 126,200 in 1991 to 152,800 in 1995.

During the period of its genesis and development the Construction Sector was given maximum attention and care by Government to enable it to carry out the Government's projects and an Information Ministry Report of 1993 referred to the density of "development spending on vital projects and utilities in the electricity and water sector, development of cities, building economically priced houses for citizens and expanding various government buildings."(1) This assertion was supported by statistics released by the Ministry of Planning and the UAE Central Bank which also suggested that the performance of the Construction Sector was remarkable during the period 1995 – 2000.

Table (6) shows the construction value of work completed by the Construction Sector, its contribution to the GDP and the size of the workforce during the same period, 1995 to 2000.

Between 1995 and 1996 construction value increased from Dhs. 13.57 billion to Dhs. 14.14 billion, an increase of Dh. 570 million and a growth rate of 4.2 per cent, and despite a slight reduction in 1997, the annual values of construction continued to grow, as did the number of construction workers: by 2000 construction value had reached Dhs. 17.25 billion and the number of construction workers 267,300.

The annual contribution of the Construction Sector to GDP fluctuated in the 1990s between 7% and 9%, not due to recessionary influences but due to the remarkable contribution of the oil and gas industries to GDP, due to the rise of oil prices.

Table (7) indicates the Construction Sector's contribution percentages to GDP over the five year period 1989-1995 from which a similar pattern to the period 1995 - 2000 can be seen.

Despite varying growth percentages, the Construction Sector registered substantial growth over the period 1989 to 1995, Table (8) giving the production cost value of the Construction Sector over this period and showing, that, in particular, 1993 showed a higher growth rate (over 1992) than usual because:

- In 1993, substantial cost increases became apparent – partly as a result of the Government pursuing such an aggressive economic development policy

(1) The United Arab Emirates, Ministry of Information and Culture, UAE (1993), p.83
The UAE as a whole witnessed growth in all its productive economic sectors – which, in turn, had a substantial effect on the Construction Sector, as illustrated in the following Section.
2.(v) Effect of Other Sectors on the Construction Sector

The economic development plan launched in the UAE from 1971 focused on fulfilling a number of key aims amongst which were raising living standards, building the foundations for a modern economy as well as developing social services and training the national workforce. To achieve these aims a number of different landmark projects were initiated in each sector which, in turn, provided substantial work for the Construction Sector. Also, as a result of these economic programmes, the state’s economy had become increasing varied by the late 1980s, early 1990s.

From a total annual Government investment in 1972 estimated at Dirhams 1.7 billion the annual Government investment had risen to Dirhams 37.3 billion by 1994 and the ratio of Government investment to the GDP in 1994 stood at 27.6% – indicative of the continued expanding nature of the economy. To further follow this theme it is interesting to note that the average annual growth rate of Government investment in the Construction Sector between 1972 and 1994 was approximately 16%, reflective of the high number of productive and social service institutions that were brought into existence during this period.(1)

As an illustration of the effects of this high rate of growth in Government investment in, particularly, the productive sectors of the economy, the Agricultural and Industrial Production Sectors in crude, average, terms, more than doubled their outputs each year between 1975 and 1995, underpinned by the substantial growth in both population and consumption.

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(1) Ministry of Public Works & Housing, National Report, op cit., p.10
Dwelling on the economic and political changes that were taking place at the time, the National Report stated that:

"The population growth in the UAE has been associated with the economic and political change represented in the shift from dependence on a traditional economy based on trade, agriculture and fishing, to a modern economy, relying primarily on extracted petroleum and revenue derived therefrom and, with the founding of the UAE in 1971, these changes have had their impact on the population growth in the UAE."(1)

Noticeable from this analysis is that all economic sectors were mutually interdependent and this holds particularly true in the case of the Construction Sector where the demand for increased construction volume resulted in the growth of the aluminum, wood product and cement industries. In similar vein the Communications, Transportation, Services, Insurance, Banking and Investment Sectors are inseparably interrelated and the resultant growth in these sectors contributed hugely to the growth in the Construction Sector that took place over the same period.

Rapid economic expansion across such a broad front could be expected to stimulate the local market for all products and services and to raise living standards and this certainly took place, as expected, in the 1970s, 1980s and 1990s in the UAE.

In relation to the performance of the economy at this time and in specific reference to the Nation’s five year Economic Plans, the National Report commented:

(1) Ministry of Public Works & Housing, ibid, p.13
"The Gross Domestic Product (GDP) is expressive of the development of economic performance of the different economic sectors. The UAE has exerted major efforts to diversify its economic base and has thus contributed to harnessing new sources of income and minimizing dependence on oil income."\(^{1}\)

This leads us to consider the one major economic sector whose contribution to the economy and relationship with the Construction Sector we have not yet touched on - the Oil Sector. The importance of this sector to the economy during the 1970s and the 1980s in particular cannot be overestimated since there is no doubt that, without the oil revenues that the UAE received during this period, the economy stood little or no chance of performing other than very modestly. In illustration of the constant underpinning of the economy by the Oil Sector it is pertinent to note that average GDP growth was 5.9% during the years 1975 to 1988 and 6.7% during the years 1989 to 1995 — a remarkable and sustained record of achievement over a comparatively long period of time.

The dependence of the Construction Sector on the Oil Sector for corporate health has never been in doubt and was illustrated well after the suicide attacks that took place on the US on 11 September 2001. Following these attacks, the Construction Sector, at that time looking forward to a recovery in its fortunes after a comparatively minor downturn, became concerned, not about the possible implications of Washington’s response, but about the threat of weaker oil prices.

As another illustration of the importance of the Oil Sector to the overall economy, it should be noted that the Oil Sector contribution percentage to GDP rose to 46% by 1990 but then began gradually to recede each year until it reached 31.5% in 1995, the reductions coming about due to oil price oscillation and with output reductions, when compared to previous years.\(^1\) To make up for this reduction in Oil Sector contribution the Government focused more strongly on developing other economic sectors such as Manufacturing, Tourism and Services.

To provide an indication as to the relative contributions of each economic sector to GDP between 1990 and 1995 the following is of note:

- Manufacturing fluctuated around 8%, with a high of 8.3% in 1994
- Construction fluctuated between 7.7% and 9.5%, which it reached in 1995.
- Wholesale, Retail, Restaurants and the Hotel Trade fluctuated between 9.5% and 11%.
- Transportation, Communications and Storage fluctuated between 5.5% and 6.2% and more closely mirrored the fluctuations in the economy as a whole between 1990 and 1995 than all other sectors\(^1\). Emphasising the importance of this sector in indicative terms, the Annual Economic Report in respect of 1995 said: “This sector is considered to provide one of the more prominent indicators of social development witnessed by the UAE”.
- The Finance and Insurance Sector fluctuated closely around 5%.
- The Real Estate Sector fluctuated between 6.4% and 7.3%.

\(^1\) Annual Economic Report, ibid., p.16.
- The Government Services Sector gradually increased its contribution to GDP from a low base of 3.4% in 1975 as the production of Government Services such as water and power increased in all seven Emirates.

- Household Services only contributed small percentages to the GDP in relation to other economic sectors.

Fundamental to being able to explain the contribution each economic sector was able to contribute to GDP is the identification of how strongly, or otherwise, each sector itself was growing and Table (9) gives these growth rates in relation to a typical year in the 1990s, that of 1993. From Table (9) one can discern that the remarkable growth rate in various parts of the service industry (Transportation & Communications, Finance & Insurance) that was to take place from 1995 onwards had already started to take shape in the early 1990s.

Prior to examining the development of each economic sector separately the following random observations are worth making:

- total investment across all sectors of the economy was Dirhams 1.75 billion in 1972 and rose to Dirhams 33.2 billion in 1993, an average annual growth rate of 15.2%.

- in 1991 investments across all sectors of the economy amounted to 20% of GDP and of this investment 28% related to the Extractive Sector and 17% to manufacturing.
- in 1994 investment across all sectors of the economy amounted to Dirhams 37.3 billion and equated to 27.6% of GDP. This, comparatively high, rate of investment to GDP was largely the result of a higher than usual level of investment in building and construction since this sector was still growing strongly: the average annual rate of growth in the building and construction sector between 1972 and 1994 was approximately 16%.

- in 1994 58.2% of investment was channelled into the productive sectors of the economy: building and construction, manufacturing, trading, agriculture, etc.

and one can conclude that Government was still taking the lead in the Nation's investment through making outlays on social/welfare institutions and infrastructure.

Having examined the overall position in relation to GDP and investment it is now pertinent to review the major economic sectors of the UAE economy one by one and establish both the influences behind each sector's growth and the interaction that took place with other sectors of the economy.

a) The Industrial Sector

As indicated previously, the UAE Government was keen on developing the country's Non-Oil Sectors from an early date and over the years many different types of industry were encouraged: chemicals, building materials, foodstuffs, paper, ready-made clothes etc. Whilst the Government sponsored large scale projects the Private Sector was encouraged to invest in medium and small - scale undertakings, especially those producing consumer commodities. One of the manifestations of the Government's
interest in the Industrial Sector was its sponsorship / setting up of the Industrial Bank, which significantly aided the capital formation process, and the establishment of a number of Free Trade Zones.

To further its encouragement of the Industrial Sector Government also strongly encouraged the importation of high technology and, indeed, the establishment of links between the country's academic institutions and the sources of applied technology. In later years, towards the end of 1990s, Dubai, in particular, took a number of further measures – setting up Technology Parks, Internet Cities, Media Cities, etc.

As the country's industrial base strengthened it also broadened, becoming more diverse and self sufficient, and Government actively encouraged overseas businessmen, particularly from the sub-continent of India, to move their businesses to the UAE. This was achieved partly through strengthening trade links at the official level and setting up local good quality facilities in respect of trade shows, exhibitions, etc.

Government's efforts to stimulate growth and diversity in manufacturing paid dividends, as evidenced by the growth of the Non-Oil Sectors of the economy: added value in these sectors rose from Dirhams 9,242 billion in 1990 to Dirhams 9,476 billion in 1991 and then to Dirhams 9,700 billion in 1992(1). Also evidenced were continual rises in the number of the nation's factories which reached 1,122 by 1991 from a near zero base in 1971: this growth in factory numbers taking place across all Emirates.

In 1993 a Ministry of Information Publication indicated that, in relation to Abu Dhabi:

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"The Industrial Sector in Abu Dhabi is vibrant and includes activities which concentrate on the manufacturing and food processing industries. The number of industrial institutions which have 10 or more workers is 213." (1)

Investment by the Governments of individual Emirates also played a major role in the development of the Industrial Sector with the Governments of Abu Dhabi and Dubai leading the way. In Dubai Government investment in the metallurgical industries, chemical and chemical products industry (including products from oil refining, rubber and plastics) and paper, paper products and printing/publishing was substantial and the Dubai Government had an accumulated investment in the Dubai Industrial Sector amounting to 51.2% of the total accumulated investment in this sector in 1992 (2).

The Dubai Government’s investment in Dubai Aluminum Company illustrates well how a substantial Government investment would lead the way to any number of downstream investments by the Private Sector.

In summary, and from further reading and analysis, it is apparent that, in its effort to develop the GDP contribution from the Non-Oil Sector, the Government:

- focused its attention on industries where there was clear and sustainable competitive advantage in relation to inputs: cheap energy, low cost labour, low cost land and zero taxes in particular.
- led by example and invested in large scale projects such as fertilizers and aluminum which in turn encouraged downstream investment from the Private Sector in smaller businesses.

(2) Economic Report of Arab Confederation of Chambers, ibid.
- also focused attention on businesses which provided import substitution.

Since a number of industries the Government developed, such as the aluminum business, had strong links into the Construction Sector, the latter sector benefitted strongly from Government policy in relation to industrial development.

b) Education and Training:

As a result of the rapid economic development policy pursued by the Government, a substantial demand for virtually all types of education and training developed to keep pace with this demand. The number of students in the UAE thus quadrupled between 1975 and 1985, rising from 60,300 students in the 1974-1975 academic year to 229,800 in the 1984-1985 academic year: an average annual growth rate of 14.3%.

For further details of the statistics relating to the Education And Training Sector please refer to Tables (10), (11) and (12).

c) Health:

Rapid economic development and increases in population during the 1970s, 1980s and 1990s, both National and expatriate, made major demands on the UAE’s ability to provide suitable medical facilities. Both Government and the private sector responded to this requirement/opportunity and Tables (13), (14-A) and (14-B) show the development of health services in statistical terms between 1985 and 1990 as an illustrative period.
d) Water and Electricity:

Natural potable water resources were scarce in the UAE prior to 1971 and the comparatively high population growth and increased needs for industrial production meant substantial additional water resources were required during the sustained period of economic growth that took place after 1971. The extent of this increase in demand is evidenced by figures (given in Table 16) showing that water quantities consumed between 1975 and 1985 increased six-fold, with water consumed rising from 8.9 billion gallons in 1975 to 54.6 billion gallons in 1985.

To meet increases for both water and electricity, for electricity requirements also rose substantially during the same period, the Government turned to the construction of major water desalination and thermal power plants - whilst small power stations were also installed to meet the needs of residential communities. As a result of this investment programme in water and electricity the total investment in water and electricity projects between 1975 and 1985 amounted to Dhs. 26.7 billion (Dhs. 19 billion for electricity projects and Dhs. 7.7 billion for water projects) and the added value from this sector increased at an average annual growth rate of 26.4% during the same period.

As one would have expected, the number of electricity sector workers also rose substantially, registering an average annual growth rate of 12.9% between 1975 and 1985, less than the added value growth rate, meaning substantial increases in worker productivity took place during the same period.
After 1985 growth in the Water And Electricity Sector continued with units of energy generated increasing at an average annual growth rate of 7.2% between 1985 and 1990 whilst the volume of energy consumed increased 42% over the same period. Between 1991 and 1995 further increases in both electricity generation and consumption took place: generation increasing by 48% (average annual growth 10%), consumption by 31% (average annual growth 7%).

Tables (15) and (16) show the production and consumption of electricity and water in the UAE between 1975 and 1995.

e) Land, Air and Maritime Transportation

The Transportation Sector plays an important role in socio-economic development, since an accessible road network connecting all parts of the country facilitates transportation movement. Between 1975 and 1985, 48.7 billion Dirhams were spent on projects related to this sector.

Table (17) shows some of the more important indicators of land transportation activity in the UAE between 1975 and 1995 and Table (17) shows the lengths of main roads in the country as well as the number of cars and oil and gas transportation pipelines which all increased in tandem with the developing economy. The Construction Sector was a major beneficiary of this growth in transport facilities since road, bridge and other civil contracting work became the province of increasing numbers of specialist local contractors as critical mass, in demand terms, became apparent.
Table (18) gives a number of indicators relating to the growth in maritime trade and facilities that took place between 1975 and 1995: in all cases it is evident that substantial increases in facilities took place over this period. The Construction Sector was, again, a major beneficiary of these increases in facilities.

In addition to the expansion of land and maritime transportation facilities, the expansion of air transportation facilities during the 1970s, 1980s and 1990s is also noteworthy. The number of airports in 1972 was only two (Abu Dhabi and Dubai) and now Abu Dhabi has three airports and Dubai, Sharjah, Ras Al-Khaimah and Fujairah each have an airport, bringing the total number of airports in the UAE to seven, a large figure for a country of no more than 3 million people.

By reviewing the growth that took place in each of the UAE’s economic sectors during the period 1971 to 1995 it should have been possible to grasp the dimensions of the challenge (and opportunity) faced by the Construction Sector during these years.
2.(vi) Investment Into The Construction Sector

Whilst Section 2 (iv) considered the development of the Construction Sector in broad terms we should now address this development in specific financial terms- to help us better understand how the consistently high growth rates demanded of the Construction Sector led to a substantial number of the challenges the industry faces today.

To identify the scale of the development that took place in the industry during the 1970s, 1980s and 1990s four Tables have been included which show:

- at Table (19) the Investment By Sector By Emirate Included in the Five Year Plan 1981-1985.

- at Table (20) the Total Investment In the Construction Sector in the Five Year Plan 1981-1985 Analysed By Type Of Investor: Federal Government, Regional Government, Regional Government Business Interests and the Private Sector.

- at Table (26) Investment In The Building & Construction Industry As A % Of The Total Investment In The Economy.

and

- at Table 21 the Value of Construction Projects Between 1975 and 1990 Analysed Between Civil and Non Civil Work.
Reference to Table (19) shows that the investment of Dhs 161 billion that was planned to take place during the period 1981 to 1985 was anticipated to take place fairly equally between the years: Dhs 31 billion, Dhs 36 billion, Dhs 34 billion, Dhs 30 billion and Dhs 30 billion for each year respectively.

The Government formed the 5 Year Plan after balancing the needs of each Emirate in relation to demographics and after considering the level of services needed in each Emirate to bring each up to the National level. Another consideration was the need to bridge the gap in per capita income between Abu Dhabi and the poorer, Northern Emirates which did not have the access to oil income that the capital had.

Of the total Dhs 161 billion in the Plan a ‘mere’ Dhs 5 billion (3.1%) was estimated as referring to the Construction Sector and, of this, over 50% related to Abu Dhabi. Between them Abu Dhabi, Dubai and Sharjah had 85% of the total estimated expenditure: reflective of the disposition of the population at that time.

Table (20) indicates that 88% (Dhs 4.4 billion) of the investment during the Five Year Plan was expected to be sourced from the Private Sector, again more than 50% from/in Abu Dhabi. In reality the amount of investment into the Construction Sector from both Government and non Government sources bore no relationship to the Plan since it exceeded, many times over, the Plan amounts: the investment into the Construction Sector was, in reality, Dhs 73 billion as opposed to the Dhs 5 billion planned.
Table (26) gives the total investments made into the UAE economy in 5 year periods between 1975 and 1995 and, of these total investments, the amounts that were invested into the Construction Sector. From this Table one can see that

- investment into the economy continued to rise between 1975 and 1985, the result of high oil prices and quantities, but fell between 1986 and 1990 as a result of the economic slowdown from the fallout of the Iran/Iraq war and the tension that existed in the build up to the First Gulf war: the UAE being a major transshipment centre for trade into Iran in particular and around the Gulf in general. After 1990 the economy picked up substantially, partly as a result of the pent up demand from 1988 and 1989.

- investment into the Construction Sector followed the general trend of investment into the economy as a whole: rising and falling in unison

- the % of the total investment that went into the Construction Sector started at 57.8% during the period 1975 to 1980 and fell during each 5 year period thereafter: the result of the initial (substantial) injection of funds into the infrastructure which gradually declined in terms of % to total investment.

As an illustration of the differences between the amounts invested by the Government and Non Government sectors into the Construction Sector at specific time intervals the following is of interest
Dhs Billions

<table>
<thead>
<tr>
<th>Years</th>
<th>Total Investment</th>
<th>Ex Government</th>
<th>Ex Non Government*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>12.0</td>
<td>3.8</td>
<td>8.2</td>
</tr>
<tr>
<td>1980</td>
<td>30.2</td>
<td>12.5</td>
<td>17.7</td>
</tr>
<tr>
<td>1985</td>
<td>16.9</td>
<td>7.6</td>
<td>9.3</td>
</tr>
<tr>
<td>1990</td>
<td>16.0</td>
<td>8.3</td>
<td>7.7</td>
</tr>
</tbody>
</table>

*‘Non Government’ in this context includes investments by Government into Productive parts of the economy such as the State run Power, Water, Telecoms and other State owned service industries.

and shows that investment by Government in the non Productive sectors of the economy remained at almost 50% of total investment apart from during 1975.

To obtain an estimate of the extent to which investment in the Construction Sector went into civil work (steel, blocks, cement, tiles, labour etc) as opposed to non civil work (generating equipment, lifts, air conditioning equipment etc) Table (21) has been prepared to give us this type of analysis between 1975 and 1990. From this Table one can see that civil work gradually declined over the period from around 63% in 1975 to between 40 and 45% of the total invested in the Construction Sector: this was because, in the earlier periods, more expenditure on the communications and social services infrastructure (roads, bridges, ports, schools etc ) took place than in later years resulting in a higher usage of construction materials.
2.(vii) Analysis Of Sectoral Contribution To The GDP

To consider the contribution each economic sector made to overall GDP between 1975 and 1995 the following Tables were prepared:

- Table (22) which gives GDP split between the Oil and Non Oil Sectors For Years 1975, 1980, 1990 and 1995

- Table (23) which gives the GDP Analysed by Economic Sector Between 1975 and 1984

- Table (24) which gives the GDP Analysed by Economic Sector Between 1985 and 1988

and

- Table (25) which gives the GDP Analysed by Economic Sector Between 1989 and 1995

and the following commentary is valid:

Although Table (22) takes specific years only it suggests that, in relation to the quantum of GDP, it is apparent the economy grew much faster in the period 1975 to 1980 (in fact it more than doubled between these years) than in any other period to 1995. The main reasons for this were the increases in both oil prices and oil volumes exported and the growth rate of the non oil sector, both starting from a very low base.
Whilst GDP increased from Dhs 53 billion in 1975 to Dhs 126 billion in 1995 the contribution of the Non Oil Sector GDP to the total GDP decreased, at current prices, from 66.5% of the total GDP in 1975 to 31.5% by 1995 as the Non Oil Sector gradually expanded and diversified.

It is also interesting to note that, at current prices, the Oil Sector GDP, in quantum terms, increased from a low of Dhs 26 billion in 1975 to a high of Dhs 71 billion by 1980 and then fluctuated between Dhs 70 billion (in 1981) and Dhs 27 billion per annum (in 1986) between 1981 and 1995: please see the detail provided in Tables (23) to (25). The low of 1986 was the result of the turmoil of the Iran/Iraq war where price increases did not recompense suppliers for the volume losses.

In relation to the contribution of each sector of the economy to overall GDP between 1975 and 1995 the following is of note:

- after the Extractive Sector (Oil and Other Extractive Industries) the major contributors to GDP were Government Service Products, Building & Construction, Finance / Insurance / Real Estate and Wholesale / Retail / Restaurants / Hotels which, on average, contributed between 9 and 11% each

- in the case of the Government Services Products (mostly power, water and telecoms) growth was gradual, starting at a contribution of only 3.4% in 1975, peaking at 13.3% in 1988 and finishing in 1995 at 11.6%. This sector follows closely the population trend
and the resultant provision of services to the population

- the Building & Construction Sector contribution to total GDP has always been robust and has fluctuated between 7.7% (in 1990) and 13.5% (in 1979). Whilst no real trends are apparent during the 20 year period given in the Tables, the period 1975 to 1979 saw a generally higher % contribution to total GDP from this sector since this was a time of major infrastructural investment.

- in the case of the Finance / Insurance / Real Estate sector the contribution to overall GDP started at a low of 5.6% in 1975 and did not increase much until 1981, when it contributed 10.9%. Since that date the sector contributed between 10.5% and 12.4% each year to GDP up until 1995: now having become a major part of the UAE economy.

- the Wholesale / Retail / Restaurants / Hotels sector has, like the Building & Construction Sector, also been a regularly robust contributor to overall GDP: fluctuating between 7.9% (in 1976) and 11.5% (in 1986 and 1988) over the 20 year period. Again no real trends are discernible over the 20 year period although the % contribution from this sector to overall GDP was at the lower end of its range during the period 1975 to 1985, before Dubai, in particular, started to develop its Tourism & Leisure business.

Amongst the other sectors of the economy there were, during the period 1975 to 1995, no obvious trends of either increase or decrease in influence on the total GDP apart from, arguably, manufacturing perhaps which started at a low 0.9% in 1975, had reached 8.2% by 1982 and was a steady contributor at around that % ever since.
To enable us to form an appreciation of the quantum size of the contribution the Construction Sector rendered to the national economy and to see more clearly still the varying rates of change between various time periods between 1975 and 1995 Table (27), Indicators Relating To The Building & Construction Industry 1975-1995, has been prepared.

From Table (27) one can see that

- by far the greatest growth period experienced by the Construction Sector took place between 1975 and 1980 when an 18.2% average annual period of growth took place. This period of substantial growth took place primarily as a result of Governments drive to create infrastructure but the growth %s themselves were also affected by the low base at the start of the period: Production Value more than doubled during this 5 year period

- from 1980 to 1995 Production Value fluctuated in accordance with the economic fortunes being experienced by the UAE economy in general but it is interesting to note that the Dhs 19.7 billion Production Value of 1980 was not again achieved in the period under review: the closest being the Dhs 18.6 billion achieved during 1995 when the demands of the Real Estate Sector replaced the infrastructural demands placed on the Industry between 1975 and 1980

- Added Value changes between 1975 and 1995 broadly mirrored the changes in Production Value but of interest is that the %s of Added Value to Production Value (not given in the Table) changed as follows
- 1975 and 1980 53%
- 1985 and 1990 59%
- 1991 to 1995 55%

- the initial comparatively low figures being due to the (high) nature of infrastructural work (where a comparatively high % of material is used), the figures of 1985/1990 reflecting a swing towards more non infrastructural work and the figures between 1991 and 1995 being reflective of a swing back towards more infrastructural work.

- movements in Worker numbers over the period 1975 to 1995 appear to broadly correlate to movements in Production Value and movements in Wages appear to broadly correlate to movements in Added Value. As we shall see later the Construction Sector was heavily reliant on overseas labour and the problems emanating from this are not inconsiderable.

Before closing our review of each economic sector’s contribution to GDP we should review the growth of the Real Estate Sector in the UAE during the period 1975 to 1995 since the growth of this sector had, and increasingly has, a major impact on the growth of the Construction Sector. Tables (28) and (29) have been drawn up to illustrate various aspects of the Real Estate Business: Table (28) summarising some of the more important indicators of the growth of the Real Estate Sector during this period and Table (29) giving an analysis of residential units by type of dwelling from 1975 to 1995.

From Table (28), it is possible to see that:
- The average annual growth in Production Value between the years 1975 and 1980 (at 20.2%) was the highest during the entire 20-year period: due mostly to the low base starting point.

- The average annual growth in Added Value followed the average annual growth in Production Value very closely.

- The number of staff employed in the sector rose far more steeply than the Production Value between 1975 and 1985 but then increased at a lower level than Production Value.

From Table (29) it is possible to see that:

- The growth in housing stock was much higher during the years 1975 to 1985 than in the last 10 years of the period: mostly due to the low base starting point.

- As a % of the overall housing stock, Economy Houses increased over the period, at the cost of Low Cost Houses.

From this analysis it is possible to see just what effect the Real Estate Sector had, and still has, on the Construction Sector: effectively helping to underpin the Construction Sector's contribution to the GDP.
2.(viii) Contribution of the Construction Sector to Other Sectors

As we have already seen, the Construction Sector played a vital role in the enhancement of the whole economic structure of the UAE and could be considered, in many ways, as the backbone of the UAE's economic development since it organically interlinks with all other sectors of the economy - be they commercial, productive, utility, services or relating to the infrastructure. An Economic Development Specialist once described the construction sector as the “basic sector” – characterised by its comprehensiveness.

Within the UAE economy development projects heavily depended on the construction sector during the 1970s, 1980s and 1990s and the number of roads, bridges, dams, tunnels, power and water stations as well as commercial, housing and industrial buildings could not have been undertaken without heavy commitment by the construction sector.

To ensure the construction sector could commit itself to the extent required it needed both the necessary degree of capacity and corporate health to make this commitment and, in 1993, a number of prominent UAE businessmen were interviewed by "Al Tijarah Magazine" about the importance of the Construction Sector and its interrelation with other economic sectors. The Chairman of the UAE Contractors' Association was quoted as saying:

"Construction companies are in need of support and protection and positive measures must be taken to protect national companies from foreign ones. The contractors, as well, must be locally protected in terms of their rights and their relationship with
engineering consultants and this can only take place if we have substantially more specific documentation relating to contracts and contractors. It is worthy of note that local engineering consultants have not risen to prominence as yet because they remain largely influenced by foreign engineering consultants.

Most of the big contracting companies operating in the country are members of the Contractors’ Association and they all carry out large scale competing projects in the UAE."(1) In fact not only did the Members of the Association carry out large scale projects inside the UAE but they were also to become involved in overseas projects.

Mr. Abdul Al Aziz Khansaheb – a major contractor – recently delivered a speech in which he stated:

“The real support of the Contractors’ Association to the construction industry in the country can be witnessed through the support it offers by holding Conferences, specialized Seminars and Exhibitions displaying the most up to date building materials as well as the latest developments in applied technology in the field of construction and building. The Contractors’ Association always invites contracting companies to participate in all its activities so that they may improve their performance and develop the quality of their work”.

and, from Mr. Khansaheb’s speech we can conclude that the Construction Sector has been active in developing both its capability and its technology.

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(1) The Construction Sector is the Basis of Economic Development, Al Tijarah Magazine, no. 6, June 1993, p.44, Sharjah Chamber of Commerce and Industry.
In the 1970's and the early 1980s the ability of the Construction Sector to meet the demands placed on it largely depended on the ability of the local building material industry to supply the various components required in the quantities, quality and timeframes required. Thus the import trade in relation to these materials gradually gave way to local manufacture and any number of building material plants were established across all seven Emirates.

There was no shortage of investment into building material production in the UAE at that time because sales of these products were largely guaranteed by the ongoing boom in construction activity: underwritten by Government investment, itself underpinned by oil revenues. At the same time Government, as we have seen before, actively encouraged import substitution through pursuance of an industrial development policy which made land and other facilities available at very economic rates to encourage these investments – as well as taking the lead in major investment projects such as in the metallurgical industries.

Since the early 1980s, therefore, the UAE witnessed a rapid growth in industrial plants producing a wide variety of building materials – ceramics, blocks, paints, cement, sanitaryware, pipes, electrical cable – and we should now review the growth of this sector of the economy in a little more detail in that it represents another facet of the Construction Sector’s contribution to the economy.
a) Paints

There are now more than 20 paint factories in the UAE that produce, between them, around 8000 tons of paints monthly – which well exceeds local market demand and leads to exports to neighbouring countries, particularly to the Gulf and African countries.

b) Ceramics

Local factories produce around 5,750,000 sq.m. of ceramics annually with RAK Ceramics alone producing 5,000,000 sq.m. annually.\(^{(1)}\) RAK Ceramics currently supplies around 75% of the total local market requirement for ceramics and also exports to some 80 countries around the world, including some of the industrialized European countries such as France and Germany.

The Fujairah Ceramics Factory produces 750,000 sq.m. of ceramics annually, supplies the local market, and exports the balance to the AGCC markets, Hong Kong, Australia, Singapore, New Zealand, Taiwan, ... etc.

c) Cement

There are 8 cement factories in the UAE at present and local demand for cement takes up about 85% of the total local annual production (5,000,000 tons) - the excess amount being exported to Yemen, the Sultanate of Oman, Qatar and other countries.

\(^{(1)}\) RAK Exports to Meet Our Demands, the Gulf Construction Journal, February 1998. Dubai, UAE.
d) Aluminium

The number of aluminium factories and workshops in the UAE has recently increased to 2000\(^{(1)}\) and UAE aluminium products compete with their international counterparts, so advanced is local technology, design and general overall quality.

In addition to the construction sector contributing to the growth in building material products manufactured locally it is pertinent to review some of the contributions of the Construction Sector in relation to it being able to complete a wide variety and substantial volume of projects in a short time frame. For example random projects which related to the early to mid 1990s included:

- the public works department of Abu Dhabi requiring the construction of 41 major projects in one development programme alone: the programme cost Dhs. 5.2 billion and consisted of roads, bridges, excavations and a variety of different building structures.

- the Dubai Government requirement to build the World Trade Centre Intersection (in 1996)

- the Sheikh Zayed Road construction requirement: a major motorway of around 200kms.

- the Sharjah Trade Centre requirements, including the offices of the Sharjah Chamber of Commerce and the Sharjah Expo Exhibition premises.

- the requirements needed to build the new Al Saf residential area in Kalbaa.

- the Sharjah International Airport project.

In summary, the above analysis constitutes a broad review of the major contribution made by the Construction Sector to the National economy, to the UAE’s Gross Domestic Product and to other economic sectors of the UAE economy. It has also shown how the other economic sectors of the UAE grew and prospered in tandem with the Construction Sector and has suggested that the sector forms one of the main pillars of the UAE economy.
Fundamental to the growth of the Construction Sector during most of the 1970s, 1980s and 1990s was the availability of credit: credit for the Government and credit for the Private Sector, including the Construction Sector. As we have already seen the massive increase in oil prices in the early 1970s gave the newly formed UAE Government a strong start in relation to available income and this income percolated, much of it through the Construction Sector, to the Private Sector.

Another fundamental to the growth of the Construction Sector was the efficiency of the system that made credit available to the sector, and to the Private Sector in general, since problems in negotiating credit and poor credit administration had the potential to act as retardants of development.

At the time of independence the UAE’s banking system was very different from what exists today: both in the way the Central Bank operates and in the availability of choice at the Commercial Banking level. The operations of the Central Bank did not receive any degree of real Government attention, and support, until the late 1970s since the volume of oil based revenue pouring into the economy meant that, for the first few years, Government’s attention was primarily taken up in designing development programmes and initiating key projects: not on questioning how effectively its control and support of the banking system was functioning.
This situation changed at the end of the 1970s however when the way the Central Bank operated was overhauled and its structures and systems reorganized, resulting in a strengthening of its supervisory role, both in terms of currency/investment supervision and in its supervision of the Commercial Banks.

At the Commercial Banking level a number of Government owned, family owned and overseas controlled banks met the day to day service requirements of the marketplace. Lending, even then, was on a very secured basis: corporate borrowings needed, and still need in the majority of cases today, to be personally guaranteed by the individual owner(s) of businesses.

The amount of credit finding its way into the economy fluctuated according to oil prices and volume of oil sales: prices and volumes being dependant mostly on the political situation in the Gulf at the time but also due to circumstances relating to oil producers outside the Gulf.

In the case of Commercial Bank lending to the Construction Sector the amount of credit available depended on the overall amount of money available to the individual Commercial Bank itself (a function of its deposits: typically 85%) and the value of the individual projects in hand: funds being paid to contractors based on Consultants Certificates of work completed at each month end.

In general terms oil revenues and credit flowing into the economy increased substantially throughout the period 1971 to 1990 but there were periods of stagnation or
slower growth during the late 1970s and mid/late 1980s, as the effects and events of the Iran/Iraq war influenced the oil business.

To give an idea of the quantum of credit passing into the economy and the amounts of credit passing into each sector of the economy Table (30) has been prepared: giving this data for two sample years, 1985 and 1990. From this Table it can be seen that

- overall the amount of credit passing into the economy increased by an average annual 5.2% between 1985 and 1990

- the largest borrower was the Trade Sector whose borrowings increased from Dhs 13.3 billion in 1985 to Dhs 19.2 billion in 1990, an average annual increase of 7.7% higher than the overall expansion of credit

- the Construction Sector used Dhs 10.6 billion credit (23.4% of the total credit used) in 1985 and this increased to Dhs 11.4 billion in 1990, although its share fell to 19.5% of the total by then.

To give an impression of how credit passing into each sector of the economy changed over a longer period of time Table (31) has been prepared. This Table shows that, over the period 1975 to 1995

- Trade traditionally took the largest share of credit but this gradually declined from a high of 51% in 1995 to around 33 or 34% during the early 1990s
- the Construction Sector traditionally took second place after Trade since it had a 25% share of the total in 1975 but this declined to 15% by 1995: being superseded by 'Other Activities', which included the burgeoning Real Estate sector.

- the Government Sector fluctuated between 5 and 10% between 1975 and 1980, went to a high of 21% in 1985 and since declined to around 10% which it has maintained from 1992 onwards

- Industry has taken a share of between 5 and 6% over the whole period 1975 to 1995

In more recent years the pattern of credit going into the various economic sectors has not moved substantially away from that of 1995, with Trade, Real Estate and Construction being by far the largest borrowers.
Chapter 3

Review of Literature
3. Review of Literature

Although publications on the organization of the Construction Sector, other than those consisting of plain factual data, are not plentiful, publications on Industrial Organization in general are available and have been used in the consideration of options and the selection of the options of 'best fit'.

The main publications referenced in relation to the general principles of organization were:

- Richard Brown: "Understanding Industrial Organisations"
  (This publication considers 'Atkinson’s Flexible Firm', Woodford’s research on organization and technology, Burns and Stalkers work on innovation, the work of the ‘Aston School’ and ‘Contingency Theories’).

- Bernard Burns: “Managing Change”. This work considers a strategic approach to organizational dynamics.

- Laurie Mullins: “Management and Organizational Behaviour”

whilst those relating to published statistics and the Construction Sector in particular were:

- Recommendations of symposia hosted jointly by Abu Dhabi Chamber of Commerce and Industry and the UAE Contractors’ Association.
- Interviews.
- Related research papers available.
- Field studies and field reports provided by contractors.
- English and Arabic references.
- Statistics released by the various Chambers of Commerce and Industry in the UAE.
- Statistics issued by various Ministries in the UAE.
- Statistics issued by the Planning Dept. in Abu Dhabi.
- Statistics issued by the UAE Municipalities.
- Statistics available at the UAE Contractors' Association.

In addition to the above, reference to any number of articles in periodicals, journals, magazines and reports has been made, too numerous to mention here, but where reference is made to published work, this is acknowledged and the source given at the foot of each page.
Chapter 4

Research Aims and Objectives
4. Research Aims and Objectives

As we have seen previously the UAE Construction Sector has been engaged and is still engaged in a continual process of evolution and change in response to the needs of a continually growing and diversifying economy. The importance of the Construction Sector to the overall economy should, therefore, not be underestimated and it is reasonable to assume that any problems the Construction Sector faces will, unless addressed and rectified, sooner or later, adversely impact on the UAE's economy as a whole.

Bearing this in mind the researcher believes there is a pressing need to identify any problems the Construction Sector currently has and to consider resolution of these problems, especially those relating to Building Control Systems, Codes of Practice and the general policies in operation.

The most effective way to assist the Construction Sector address its challenges, the researcher believes, is to set up and pursue a number of key objectives as follows:

1. To precisely identify the current role of the Construction Sector in its support of economic development in the UAE.

2. To study the factors influencing efficiency and performance of the Construction Sector.

3. To identify the obstacles to effective law making and regulation as far as laws and regulations can assist the Construction Sector.

4. Creating new organizational, legal and technical frameworks which contribute to the advancement of the Construction Sector.
5. To formulate a framework for development of the Construction Sector.

To address the objectives identified above it is pertinent to raise the following questions and to find the answers to these questions:

1. How big is the current volume of investment in the Construction Sector?
2. To what extent does the Construction Sector currently contribute to the gross national product (GNP) of the country?
3. How far are the systems in use within the Construction Sector compatible with the developmental aims of the UAE?
4. Are the current systems in use within the Construction Sector contributing sufficiently to the corporate health of the Construction Sector and to national needs?
5. What are the key factors and problems which influence the efficiency of the Construction Sector?
6. Do the Building and Control Systems in use in the UAE compare favorably with their international counterparts?
7. Is it possible to protect the national contracting companies from overseas competitors yet not adversely affect development of the UAE economy?
8. Are the existing laws and regulations able to protect this vital sector and encourage its development?
9. Does the Construction Sector rely on relevant organizational, administrative and technical bases at present?
10. How far has the Construction Sector developed technically?
11. Should there be an official institution responsible for planning and monitoring the Construction Sector in the UAE?
Note: 'Current' and 'currently' have been printed in bold type since the relevant historic circumstances have already been identified and recorded, in Section 2 of this Thesis.

The researcher developed a comprehensive questionnaire (given at Appendix 3) and conducted surveys and field studies to address these questions and the findings from this research forms the basis of this Thesis.
Chapter 5

Research Methodology
5. Research Methodology

The Research Programme on which the conclusions and recommendations of this Thesis are based made use of a number of different methodologies amongst which were

- design and distribution of a questionnaire which canvassed both qualitative and quantitative data from a sample of companies operating in the Construction Sector in the UAE (given at Appendix 3). Selection of the sample, from the Members of the UAE Contractors Association, took place by using the formula

\[ N = \frac{p (1-p) (Z_o)}{Qp^2} \]

where \( p \) stands for the proportion of the Construction Sector’s contribution to UAE economic development and \( Z \) is the standard distribution norm. According to Dr Mahammad, the originator of the formula, the contribution never exceeds 30% of the total and the estimate error odds are not more than 9.5% (\( pQ \)) so the researcher selected 60 companies.

- reviewing the results of Field Studies carried out over the years by the UAE Contractors Association

personally consulting a number of authorities on the Construction Sector within the UAE including

- owners and General Managers of construction companies
- Consulting Engineers
- Labour Contract suppliers
- Construction plant suppliers
- Architects
- Owners of properties
- Quantity Surveyors
- Planning Officials from Government
- Lawyers dealing with Construction Sector cases
- Suppliers of materials into the Construction Sector and Sub Contractors

reviewing a substantial amount of published UAE Government statistics, not only relating to the Construction Sector but to the economy as a whole, and consulting with the Government Officials responsible for these statistics to ensure that definitions were correctly understood before any inferences were drawn from these statistics.

- personally consulting a number of overseas authorities on the Construction Sector in their own countries including owners and General Managers of construction companies, Government Officials who deal with the Construction Sector, Building Code Officials, Lawyers who deal with the Construction Sector and those who deal with labour supply.
Chapter 6

Research Findings
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6.(i) Organizational Framework

By the word “framework” we mean the social order or system controlling the Construction Sector in the UAE. In this chapter the researcher is dealing with two types of organizations. The first type deals with the various governmental and nongovernmental institutions with which the Construction Sector is in close relations. The second type is the organization of companies and their management in order to produce their products and satisfy their members and clients. In both cases the researcher is trying to study the organizational status of the Construction Sector to recognize the problems and challenges facing it.

Institutions Looking after the Construction Sector

When compared with the other economic sectors closely associated with official or governmental institutions, there is no doubt that the Construction Sector is inter-related with the various public administrative sectors and governmental institutions of the country. The expanding activity of the Construction Sector and its interdependence on other sectors facilitate smooth execution of work. Figure (1) is the organizational structures of the official and non-official establishments. It shows that there are various government and public institutions, which are closely associated with the construction industry as follows:

- The Ministry of public works & Housing undertakes the federal projects of the state that are usually executed by the Private Construction Sector.
- The regional government of each emirate, represented by municipalities and economic departments, issues work licenses for private contracting companies which execute the projects entrusted to them.

- The Ministry of Economy and Commerce is the federal government institution authorized to enforce the Federal Law No. 8 of 1984 and other related laws for registering and licensing companies after getting the approval of the regional authority of the concerned emirate.

- The Ministry of Labour and Social Affairs is the authorized institution that issues licences and labour permits, and is responsible for licensing public benevolent societies and associations to enable them to perform their activities in the country – outstanding among them is the UAE Contractors Association.

- The regional government* in each emirate includes municipalities and economic departments. The Construction Sector is closely associated with these departments. The regional economic department should first issue a license to any contractor. Before the license is fully endorsed it should go through other offices such as the License Office and the Commercial Registration Office. Rules are not always the same in all emirates. In some emirates registration and licensing transactions are finalised by the Municipality, which issues licences for all types of such activities on behalf of the Economic Department.

* A regional government belongs to an emirate. The UAE consists of 7 emirates with seven regional governments and one federal government.
A contractor or a contracting company has close relations with the Ministry of Labour and Social Affairs because it looks after the Contractors' Association according to the Federal Law No. 5 of 1974 which regulates the work of public benevolent societies and associations. Since the Contractors' Association was established according to this law, it is affiliated with the Ministry of Public Works and Social Affairs.

From the forementioned, we conclude that the Construction Sector has interrelations with the local and federal governmental institutions and is closely linked with other sectors. This is one of the main pivots of the researcher's proposed model for the development of institutions within the building and Construction Sector in the UAE. In Chapter IX, the researcher gives more information about these institutions and proposes the role for each of them. He also proposes a Higher Council for Building and Construction and the relationship during this Council and these institutions.
Organizational Status

The organizational system of any enterprise has two major functions: producing a product and satisfying its members.\(^1\) The first function is economic while the second is related to internal equilibrium, but both functions and the problems are interrelated and interdependent.

The human organization of an industrial firm can be distinguished from its technical organization (the arrangement of machinery, materials, etc.). The human organization can be seen as consisting of individuals, each with their own experiences, needs and sentiments, but also of the social organization, the patterns of relations during the individuals and groups who constitute the organization.

The social organization of the enterprise is then divided into the formal and the informal organization. The formal organization is the one, which is concerned with the systems, policies, rules and regulations of the firm and the type of human interrelations, which should be in place to ensure cooperative efforts and achieve the economic goals of the enterprise. The informal organization comprises of all the social relations and social evaluations and distinctions which are not formally created or recognized.

In the seventies, the conditions of contracting companies in the UAE were different from their conditions in the nineties. The companies began to develop their management and began to look forward for improving their performance by adopting modern technology and employing skilled labour.

They mainly began to develop their organizational and administrative structures and update their management systems. However, these contracting companies left many areas with problems, which had their reflection on the Construction Sector in its entirety.

The questionnaires designed by the researcher for studying the organizational changes and problems have yielded useful indications and facts about the status and conditions of contracting companies during 1970 – 1990 in terms of performance. A sample questionnaire is attached in Appendix 3. This study covered a representative sample of 52 companies. Table (32) reflects what respondents thought of their companies in terms of performance and profits.

Analysis of the data in the table yielded the following:

a) Level of Operation Performance:

We notice that 13.6% of the total sample thought that in the seventies the level of operation was “Poor”, while 40.9% agreed that the level, was “Fair” and 45.5% thought that the operation performance was “Excellent”.

This was the case in the seventies but the standard of operation performance improved and response “Excellent” increased from 45.5% in 1970 to 54.5% in 1990 i.e. it signaled an increase of 19.8%. On the other hand the response “Fair” decreased from 40.9% in 1970 to 31.8% in 1995 and the response “Poor” remained as it was in 1970.

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(1) Questionnaire used for field survey attempted by the researcher
b) Performance Level of the Enterprise

The response to "Poor" was 15% of the total sample but 55% of the total sample believed that it was "Fair and Medium" and needed improvement in order to cope with modern technological and administrative requirements while 30% believed that the level of performance of the enterprise was "Excellent.

Along with the development of the Construction Sector, some contracting companies spared no effort to organize themselves so as to catch up with the prevailing progress and advances.

This is clearly evidenced by the decline in the response to the category "Poor" to zero and category "Fair" from 55% to 25%. The category "Excellent" increased to substantiate that the level of performance of the enterprise improved in the nineties to 75% of the total sample.

c) Assessment of the Enterprise Profitability

From table (32) we infer that 10% of the total sample assessed the enterprise profitability as "Poor" but 45% assessed it as "Fair" and 45% assessed it as "Excellent".

In the nineties the situation was different from that of the seventies. The Construction Sector developed and gained enough confidence. It began to adopt modern technologies and skilled labour. 41.7% of sample respondents assessed the enterprise profit as "Excellent".
The researcher tried to assess the performance of foreign contracting companies operating in the UAE and compare them to their local counterparts. He found out that the main difference between foreign companies and national companies in the UAE, in terms of management and organizational structures, is that foreign companies adopt the Triple Level Organization: the enterprise level, the operation unit level and the project level. At the project level foreign companies can apply the "Matrix System". This ensures experience and enables staff to keep up with technology. It also instills a sense of affiliation by the workers.

On the other hand national companies in the UAE apply the "Project Team System" which fails to develop the spirit of affiliation of the workers because they are temporarily employed to execute certain projects, and their contracts are terminated directly as soon as the projects are completed. Moreover, it doesn't provide or allow access to experience and technology. Consequently such expertise or technology cannot be put to good use for future projects thus minimizing both the accumulation of experience and adaptation of technology.

The second difference is that national companies are more inclined towards employment of engineers in administrative and technical posts. They give less importance to other professionals such as managers, programmers, system analysts, cost estimators, scheduling specialists and so on. Contrary to this, big foreign companies give due importance to these types of specialists due to the major roles they play in a successful construction establishment.

It is noteworthy that foreign construction companies heavily depend on permanent labour force but national companies depend mostly on temporary labour force. That is
why foreign companies are keen on training their labourers whereas national companies consider training a waste of money because they cannot guarantee the availability of the trained labourers when needed.

In fact the dependence of big foreign companies on permanent labour force is attributed to the steady demand, stability and considerable volumes of business. This stability is a result of the vast international construction market, which is considered to be a real market for foreign companies.

It goes without saying that this is not the case with national companies, which only work in the limited local market of the UAE. The result is that these companies are exposed to market fluctuations and changes of organizational forms every now and then.

The rate of average labour productivity in national companies is lower than the usual rate in foreign companies. This was one of the findings of the researcher's questionnaire. After analysing the data it was found out that the productivity of a worker in a local construction company in the UAE was assessed as only "satisfactory".

The researcher found out that companies that worked in a stable market preferred the "Matrix System" while the companies, which were uncertain about their future business, preferred the "Project Team System" (this will be discussed in detail in Chapter VII). The shortcomings demonstrated and tackled in this chapter, as well as in other chapters, have been taken into consideration and had their reflections in the researcher's proposed model for the development of institutions within the building and construction sector in the UAE.
The Construction Sector is trying to effect qualitative changes in its administrative structures to enable the contracting companies to attain their aims and complete their projects within the set time and according to plans and specifications. The whole thing may be attributed to the development of the organizational structures and the application of modern technology.

This section deals with the organizational frameworks of the contracting companies so as to assess their development during 1975-1995 as shown in Table (33).

From the foregoing response, it is noticeable that the status of the organizational frameworks of the Construction Sector, in terms of implementation of plans and assessment of work laws and systems during 1975 – 1995, were as follows:

28.6% of the total respondents believed that plan implementation was (Poor) whereas 38.1% believed that it was (Fair) and 33.3% thought it was (Excellent).

Thus, most respondents believed that it was just (Fair) i.e. it still needed more care to reach the required standard.

Due to the improvement of many aspects of the Construction Sector the assessment improved from “Fair” to “Excellent”. The response rate in the category “Fair” and in the category “Excellent” was 37.5% while the latter was 62.5%. This indicated that the Construction Sector gave due regard to the administrative aspects. This sector was also beginning to give importance to organization and management in terms of personnel
development and training. This is clear evidence that the sector readily responded positively to any supporting ideas or methods to develop its performance.

Case Studies of Some Contracting Companies:

a) Case Study 1: Belhasa Engineering and Contracting LLC

Belhasa Engineering and Contracting LLC was established in Dubai in February 1977. The Company's main activities are building and construction. Now this company has become one of the most outstanding contracting companies in the UAE.

Table (34) provides information on Belhasa Engineering and Contracting LLC and draws a comparison during its positions during 1977 - 1990.

Figure (2) is the organizational chart of Belhasa Engineering & Contracting LLC that shows the relationship during business volume, labour force and the executed projects.

But in 1990 this company prospered due to the economic boom which led to the development of other economic sectors among which was the contracting sector. This was reflected in the company's activities and consequently influenced its employment policy as shown in Figures (3) and (4) of the organizational charts of the company.

It is noticeable that the status of Belhasa Engineering & Contracting LLC changed in 1977 but developed and improved in 1990 and 1995 due to modern economic and technological changes. This had its effect on the company itself and helped to develop its organizational structure. The company started to give more importance to skilled labour and apply modern construction methods and techniques.
From the 1977 and 1990 charts, it is evident that the organizational structure of 1990 showed better administrative improvement as follows:

- The departments were set up in an organized way thus including all types of sections.
- A Public Relations section was added
- The job of "Quantity Engineer" was newly introduced for general administration and for each project.

Guided by the analysis of the organizational structure of 1995 we notice that it expanded and the number of site officers increased to cope with the expansion occurring in many areas and consequently resulted in the following:

1. The company's budget increased from five million dirhams to ten million dirhams.
2. The number of engineers increased from 15 in 1990 to 20 in 1995.
3. The number of workers increased from 700 in 1990 to 1500 in 1995.
4. The projects' value increased from one hundred million dirhams in 1990 to three hundred million dirhams in 1995.
5. The number of the executed projects increased from 9 in 1990 to 12 in 1995.

In the light of the above facts and figures we understand that the development of the company led to the existence of more project sites where engineers and labourers managed to undertake work and it in time.

One of the key aspects of updating management was the designation of project managers besides project engineers, technical supervisors, and the project general coordinator, as well as adoption of modern administrative and technological methods.
and techniques. These things have enabled the company to depend more on technology and reduce manpower, which resulted in better performance and lower costs.

Figures (2, 3 & 4) show the various organizational structures of Belhasa Engineering & Contracting LLC during the periods 1975-1981 and 1990-1995. The structure in 1975 was simple and consisted of no more than three departments. As the company grew, its organizational structure expanded horizontally and five new departments were set up. The company continued to flourish and develop until it became huge which needed change in its administrative structure. Now it included newly introduced jobs. In 1995 the administrative structure remained the same but the company’s activities outgrew its capital, number of engineers, labour force and number of projects.

b) Case Study 2: Belhasa Projects LLC

Belhasa Projects LLC was established in Dubai in March 1975. The Company’s main activities are civil works, landscaping and swimming pools. Now this Company has become one of the most outstanding companies in the UAE. Table (35) shows the areas of development of Belhasa Projects LLC during 1975-1981 and 1990-1995.

The table shows the following:

- The company's capital increased from Dhs. 10 million in 1975 to Dhs. 15 million in 1990 then Dhs. 20 million in 1995.
- The number of engineers increased from 13 in 1975 to 21 in 1990 to 24 in 1995.
- The labour force increased from 400 in 1975 to 1200 in 1990 to 1476 in 1995.
- The value of the annual projects increased from Dhs. 110 million in 1995 to Dhs. 270 million in 1990 and to Dhs. 324 million in 1995.
- This company carried out road projects and civil works which were estimated according to their value and not their numbers.

The table also shows the areas of development and growth of the company in the years 1975, 1981 and 1990, which influenced the organizational structure and improved it as compared to its previous status in the early seventies. But in 1995 the organizational structure remained same without adding any new departments. The existing departments employed more people in order to cope with the growing size of work entrusted to the company. Figures (5, 6, 7 & 8) show the various charts of Belhasa Projects LLC for years 1975, 1981, 1990 and 1995.

Table (36) draws a comparison between the various organizational charts of Belhasa Projects LLC during 1975 – 1995.

The comparison yielded the following:

- In 1975 the company started with a simple organizational structure that included three departments.
- During 1975 – 1980 it developed and expanded. Consequently the business required the setting up of new departments. The company expanded its structure horizontally and added five more departments. Comparing the organizational structures of 1975 and 1981 shows the inclusion of the following:
  - Factory and Development Manager
  - Chief Estimator
The company's business flourished and this required the setting up of a new department to improve performance. The department of the Central Cement Mixers was added so as to cope with the growing activities of the company. If we look at the organizational structures of the company in 1975 and 1981 we can see the difference in the horizontal expansion of its structure. Similarly if we look at the organizational structure of 1990 and compare it with the 1981 structure we see the rapid expansion and the introduction of the following jobs:

- Vice Chairman
- Commercial Manager (Liaison Office & Factory and Transport Manager)
- Technical Manager
- Purchase Department

The organizational structure was modified in 1990 and the job of Commercial Manager was set up to take over liaison, factory management and transportation.

We also notice that in 1995 the company continued to have the same level of organizational structure as in year 1990. The departments expanded to train the employees who newly joined the company.

c) Case Study 3: Six Construct LLC

Six Construct LLC is a foreign contracting company that moved to the UAE in 1974. Since the Company began operating in the UAE, it is well reputed for its organizational
and administrative systems, which helped to attain its objectives and complete world-class projects in the region.

Table (37) compares the volume and activity of Six Construct LLC during 1975 – 1995 and following are the observations:

- The company’s capital increased from Dhs. 15 million in 1975, to Dhs. 40 million in 1990, and to Dhs. 46 million in 1995.
- The number of Engineers increased from 21 in 1984 to 45 in 1990 and to 52 in 1995.
- Due to extension of the company’s activity, the demand for labour increased as well. It was 300 in 1984, 1300 in 1990, and 1656 in 1995.
- The value of annual projects amounted to Dhs 160 million in 1984, Dhs. 360 million in 1990, and in 1995 it amounted to Dhs. 416 million.
- The number of executed projects increased from 11 in 1984 to 20 in 1990 and to 22 in 1995.

Table (38) compares the organizational structures of Six Construct LLC during 1984 – 1988 and 1990 - 1995. From the table we notice the following:

- In 1982, 1984, 1990 & 1995 the company had the same horizontal organizational structure but there were some expansions in the vertical structure.
- This company was a foreign one that moved to the UAE with its sophisticated organizational structure that adopted and applied the best administrative methods and techniques available at that time.
Figures (9, 10, 11 & 12) are the various organizational charts of Six Construct LLC in 1984, 1988, 1990 and 1995.

The comparison between the two organizational charts of 1984 and 1988 shows that the vertical expansion was as follows:

1. The Financial Department was included in the Administration Department and all the other departments were developed and a vertical expansion took place by adding the following departments:
   - Insurance
   - Labour Transport and Housing
2. The Technical Department
3. As for the Operation Department, the number of project managers was reduced to 6 in 1984 and then to 4 in 1988.

The Department of Labour Transportation and Housing was shifted from the organizational structure of 1988 to the organizational structure in 1995.

We understand from the foregoing analysis that the company could improve its organizational structure in accordance with the yearly requirements so as to cope with the growth of the company. It is noteworthy that the company improved its administrative structure in 1995 to include the Labour and Housing Department expanded as follows:

- The capital increased from Dhs. 40 million in 1990 to Dhs. 46 million in 1995.
- The number of engineers increased from 45 in 1990 to 52 in 1995.
- The number of workers increased from 1300 in 1990 to 1656 in 1995.
The value of projects increased from Dhs. 360 million to Dhs. 416 million and the number of executed projects increased from 20 in 1990 to 22 in 1995. The existing departments could include the increased number of engineers and labourers in order to enable the company to operate to the satisfaction of all the concerned parties without the need for new departments.

d) Case Study 4: Al Aref Contractors LLC

Al Aref Contractors LLC was established in Dubai in 1970. Its main activities are building and construction.

Table (39) compares the organizational structures of Al Aref Contractors LLC during 1970 – 1995 and shows how far the company flourished and developed. The summary is as follows:

- The capital increased from Dhs. 0.2 million in 1970 to Dhs. 6 million in 1990, and to Dhs. 10 million in 1995.
- In 1970 it did not have any engineers but in 1990 there were 11 engineers, and in 1995 it increased to 15.
- The number of labourers was 350 in 1990 and increased to 500 in 1995.
- The value of projects was half a million dirhams in 1970, increased to Dhs. 55 million in 1990, and Dhs. 100 million in 1995.
- The number of executed projects increased from 3 in 1970 to 7 in 1990, and to 10 in 1995.
The foregoing observations from Table (39) are indicative of the company's flourishing activity and its interaction with the general economic development, a matter that prompted the company to initiate a new structure to replace the old one.

Table (40) shows the organizational structures of Al Aref Contractors LLC during 1970-1990.


Comparison of the charts in 1970 and 1990 shows the radical and comprehensive changes in the organizational structure. The structure in 1970 was rather simple while the structure in 1990 consisted of eight departments, which indicated vertical and horizontal expansion of the company. These departments did not increase in 1995 as indicated in figure (15). The company had the same number of engineers and labourers in these departments without setting up new ones.

This implies that the company complied with labour regulations, which were modified due to the flourishing construction sector that led to the growth of project volumes and activities in general. This could easily be observed in the case studies the researcher attempted. The companies had different approaches in expanding their organizational structures. Some structures expanded horizontally while others expanded vertically which showed their abilities to attain their planned targets. Companies exerted efforts to change their organizational structures in order to implement the plans drawn up by their owners who wanted to extend their operations and keep in line with the development plans of the UAE Government.
The researcher has so far dealt with the factors and problems which influenced the efficiency of the organizational and administrative systems of the Construction Sector in the United Arab Emirates. He has also outlined the attempts of the Construction Sector to develop its organizational structures in order to be able to cope with the requirements of modern times and keep abreast with the technological and scientific advancement in the field. Despite all the efforts exerted by contracting companies to develop their organizational structures, many actions are still to be implemented. Based on the responses in this study, the Construction Sector is in need of developing its organizational and administrative framework for effectiveness and efficiency of operations.
6.(ii) Legal Framework

Some comprehensive survey studies were conducted to identify the development of laws and regulations relating to the Construction Sector in the UAE. These surveys showed that before the seventies the rules and regulations controlling the Construction Sector were inadequate. This could be attributed to the very limited volume of construction activities in the country at that time. After the forming of the UAE in 1971 a comprehensive development was witnessed in the country, which gave the Construction Sector an impetus to grow and expand its activities.

This made it imperative for the officials in charge to enact laws and regulations to control this sector so as to be able to keep abreast with the progress and development of other economic sectors. The Construction Sector, then, began to get support from foreign companies through their expertise as the number of projects increased and the volume of business expanded. This required new laws and regulations to control all construction and building contracts.

A related survey conducted by the researcher could assess the relevance, acceptability and adequacy of the laws and regulations applied then by the sector. It was found that 54.2% of the sample stated that the Commercial Companies Law of 1984 and the licensing Regulations were improved in the nineties. On the other hand, 25% of the sample believed that those laws were satisfactory while 20.8% showed less satisfaction with those laws. Hence, a comparison during the seventies and the nineties showed that the nineties witnessed more prosperity and development of the Construction Sector especially in legal, technical and administrative aspects.
Legal Forms of Contracting Companies

The Federal Law of Commercial Companies No. 8 of 1984 was enacted for the establishment of commercial companies including construction and building companies. It is regarded as the main legislation for the licensing and registration of commercial companies. According to Article 8 of this Law any company to be established in the UAE has to adopt one of the following types: Joint Liability Co., Limited Partnership, Joint Venture, Public Shareholding Co., Private Shareholding Co., Limited Liability Co. or Partnership by Share.

Article No. 6 of the same Law provides that any company that is not one of the types mentioned in Article 8 will be considered illegal. Signatories of such companies will be individually or jointly responsible for any liabilities or obligations resulting from their contracts. In compliance with this Law, construction companies established so far in the UAE are either limited, joint or private companies\(^{(1)}\).

The following are the only three types of companies adopted within the Construction Sector according to Law No. 8 for 1984.

a) Limited Liability Companies:

A limited liability company is not allowed to exercise public share offering to raise or increase its capital or to get loans. Neither is it allowed to issue any outstanding stocks. It is obligatory for the company to distribute all the money and in kind shares stated in the company's contract among the shareholders — and to pay the whole value of each share when established.

\(^{(1)}\) The Commercial Companies Law No. 8 for 1984, Official Journal, no. 137 – UAE.
The money would be deposited in one of the banks operating in the UAE and the bank will pay them back only to the managers after the company’s registration. As far as the capital is concerned, it should not be less than Dhs. 150,000 (One hundred and fifty thousand UAE Dirhams) and it is made up of equal shares not less Dhs. 1000 (One thousand UAE Dirhams). A limited liability company should be run by one or more managers who should be selected either from the partners or others on conditions that their number should exceed five.

The sample analysis attempted by the researcher – as a part of his research on the legal status of the construction companies in the UAE – showed that 30 out 52 companies (57.7%) are limited liability companies.

b) Partnerships:

A partnership is a firm owned by two or more partners who are liable (with all their personal property) for all the obligations of their partnership. The name of a partnership should bear the names of all its partners. In addition to this a partnership may have a special trade name. If the name of a person who is not a partner is knowingly included he will be jointly accountable for the liabilities of the partnership.

In addition to this, the following rules are essential:

- All partners should be UAE nationals
- The company’s memorandum of association should include:
  a) Names and nicknames if any, nationality, date of birth and residence place.
  b) The company’s name and mission.
  c) The company’s head office and branches.
d) The capital and in kind shares to be provided by each partner whether in cash, in kind or in rights and the estimated value of these shares and their due dates.

e) Date of establishment.

f) Management system and authorizations of signatories.

g) Beginning and end of the company’s fiscal year.

h) Profits or losses distribution.

The researcher attempted a special study of the companies operating in the UAE. The sample analysis shows that four firms are “Partnerships” i.e., 7.7% of the total sample, which is comparatively low as compared to the “Limited Liability” type.

c) Private Shareholding Companies:

It is allowed for a number of founders, not less than three, to establish a private shareholding company but shares are not for public offering. Shareholders are to share a capital not less than two million UAE Dirhams. A private shareholding company may become a public shareholding company.

Studies and surveys attempted by the researcher show that 18 firms are “private shareholding companies” i.e., 34.6% of the total sample. Thus this form of organization ranks second after “Limited Liability Company”.

In this background on features and types of contracting companies in the UAE according to the Federal Law of Companies of 1984, the researcher raises the following imperative questions, “Are these laws and limited forms of companies able to cope with the international commercial laws which pave the way for the World Trade Organization (WTO) and the General Agreement on Tariffs and Trade (GATT)? The researcher
believes that new laws should be enacted to allow more choices and more flexibility for the construction sector and allow real interaction with the global business community and markets. The UAE as an oil producing country and an international trade hub, has begun to be active on the global economic arena. The young state joined both the WTO and GATT in 1996. It goes without saying that international economic agreements and pacts oblige their member states to open their markets for foreign companies and foreign products and enact more flexible and adequate laws and regulations.

On the other hand the researcher closely studied the laws and regulations controlling the contracting industry in the UAE in general besides the field study. Following are his findings and remarks regarding contracts, tenders, contractors, subcontractors, engineers, guarantees, alternation, rectification, maintenance and other aspects of the industry.

Rules and Regulations

a) Contracts: (1)

Contracts are divided in to two types:

(a) Public sector contracts (government)

(b) Private sector contracts (individuals and companies)

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The law has authorized the Ministry of Public Works and Housing to undertake Federal Government construction projects, e.g. public utility, road building, maintenance and improvements. This type of contract has got its own format and terms which are different from individual contracts. The public sector contracts always give the Ministry a kind of authority over the other contracting party.

Such contracts have some strict rules, which rarely exist in other contracts such as invalidation of contracts for the sake of public interests and imposing haphazard financial penalties as a kind of indemnity without considering losses, damages and their causes. The Ministry contracts undergo a series of administrative procedures. The most important of these complicated administrative procedures is the contract endorsement by the Permanent Committee for Projects.

These contracts are to be checked beforehand by the State Audit Institution if the project value amounts to or exceeds half a million UAE Dirhams. Contracts are usually signed after general tenders, limited tenders or negotiations. Negotiations allow the Ministry to negotiate the costs with contractors even after tenders have been opened. Generally speaking the three methods have to go through routine procedures prescribed under the Cabinet Decree No. 12 of 1976, which also provides for the appropriate authorities of the Permanent Committee for Projects. In addition, there is Order No. 14 of 1987 issued by the Ministry of Finance and Industry which provides for the system of purchasing materials, work contracts and the documents required for drawing up contracts.
The most important of them all could be the general and special terms because they reflect and prescribe the essence of the Ministry’s experience in the field of contracting and construction. They also specify the framework and content of work. They also include the penalties to be incurred by the contractor in case of delay of handover. The Ministry’s conditions also include contract invalidation for public interest and impediment due to force majeure and exceptional emergency circumstances.

b) Contract Termination and Work Retraction:

The Government Contracts Department is entitled to retract work from the contractor with a written notice without warning or legal proceedings. The following cases are examples:

a) Delay of starting, acute slowness or suspension of work for more than 15 days without excuse.

b) Withdrawal from work or leaving it or any breaching of the contract without putting things right again within fifteen days from the date of the warning notice.

c) Cheating or tricking the Department, if the contractor is bankrupt or goes through financial troubles.

d) In case of liquidation, should the delay amercement exceed the maximum limit.

e) Should the contractor ignore the engineers’ instructions.

f) In Case of partial or whole abandonment of the contract without permission from the Department.
Within 15 days from retracting work, the Department makes stocktaking of works, machinery and materials on the site and impose a delay amercement up to the date of retraction and execution of work. The contractor shall cover any rate difference plus 10% of the value.

The Department is entitled to dismiss the contractor from the site and detain whatever installations, materials and machines the contractor has got on the site in return for the department claims. The Department is also entitled to dispose of these things or sell them and is still entitled to claim compensation. The Department is also entitled to represent the contractor for any agreement related to the contract. The Department will encash bank guarantees and deposit the money in the Government account. The Department will also stop paying any of the contractor's dues until a final settlement is made.

After the final settlement, if the contractor is still indebted, the Department may deduct the amount from his dues. Without any prejudice to any other judgments, the Department will be entitled to write off the contractor's name from the contractor's register and suspend dealing with him for a period to be decided at their discretion.

For public interest, the Department may at any time terminate the contract with a registered letter of acknowledgment without any objection on the contractor's part. In this case all his dues will be settled up to the date of the contract termination. If the two parties fail to reach an agreement, Abu Dhabi courts have the jurisdiction to review any difference.
In this case the Department may terminate the contract or allow the heirs to continue the work. In case of more than one contractor, the Department may either terminate the contract or continue its execution with the other parties. The contract may be terminated with a registered acknowledged letter without further notice.

There is no doubt that the appropriate understanding of the contract and tender documents by the contracting parties and adhering to them would lead to the smooth and sound completion of work without any delay. The following are examples of cases that usually create misunderstanding and disputes between the two contracting parties.

Contract obligations commence as from the day when the contractor gains the tender. The implementation of the contract starts the moment both parties sign the contract. The contractor is not entitled to start any work before signing the contract and the project site is handed over to him. If the Department cancels the project, it will have to indemnify the contractor for all the expenses he has incurred since he tendered. But if the contractor revokes at that time, the bank guarantee will be confiscated and the Department will undertake the execution of the project. The contractor will then be liable for any extra expenses (1).

The contractor acknowledges that he has tested the soil and its suitability for building according to the plans he has already scrutinized. He is not allowed to start any work before official handover of the project site. Hence there is contradiction with the general content of Article 24 because a contractor is not allowed to test the soil before the site is handed over to him. Let us explain this contradiction as follows:

(1) Ibid – Page 10
A contractor can do site inspection to check how leveled and solid the soil is. He makes sure that it is free from trees and grass and that water and electric supplies are available. He may also test the durability of the soil of the nearby and enjoining buildings (if any). A contractor cannot verify the underground water level and the exact soil durability without making laboratory tests, and he cannot do so before the official handover of the site.

This means checking the tender and contract documents and the aim is to ensure appropriate materials and their sufficiency to the project. It is also assumed that the contractor should be experienced enough to find out any plan errors.

During the mobilization period the contractor should have a detailed action plan for contract execution. This plan is to be submitted to the engineer for checking and approval before it becomes binding to the contractor. For certain reasons beyond contractor's control, execution is temporarily hindered or confused and it fails to comply with the approved execution programme. In this case the programme has to be amended to avoid any delay. Examples of these circumstances are bad weather and unpredictable force-majeure.

In this case the contractor is accountable for planning and execution. Separation of the two stages is preferable. A time has to be set for checking to avoid overlapping of both stages, confusion or losses for both of the contracting parties.
Materials and equipment must be compliant with the technical specifications prescribed by the contract and tender. A contractor may fail to fulfill this on time for certain reasons. Some materials may be out of stock due to transport or manufacturing problems. In this case a contractor may – after the consent of the Department – supply alternative materials in compliance with specifications. In this case the contract is paid according to the actual price of the alternative materials and the price difference is to be deducted by the Department. A contractor is to bear any extra expenses if any.

Works should be executed in conformity with professional rules and contract technical specifications. The Department has the right to test works and materials during the execution at the expense of the contractor. If they are compliant, they will be accepted otherwise the contractor is obliged to substitute the noncompliant ones. A contractor may ask for retesting at his own expense. The Department will only accept the compliant works and materials or ask for another retest. If works and tests are compliant the retest fees will be at the expense of the Department.

Any alteration of the project that necessitates change in the size of work or specifications is deemed additional work that needs an alternation order to the contractor. Alteration or modification also includes any deletion and addition to the project even if such modifications do not affect the total expenses of the project. If the modification costs are more than 20% of the project costs, an agreement has to be reached with the contractor on the price and time of completion. It goes without saying that an agreement has to be reached with the contractor for works and prices which are not in agreement with the contract. The issuance of an alteration order usually requires
time extension for execution. In this case the order becomes a contract addendum. The terms of the original contract remain valid and obligatory.

Once the contractor has completed a project, the project site has to be cleared and cleaned before it is evacuated. He is to notify the engineer some time before this evacuation. The engineer will then inspect the site and the contractor's work. Then he notifies the Department for a preliminary handover committee, which will then test and examine the project before handover. A report is to be written if the project is well executed. The contractor will then get the completion certificate at the fixed time.

In the event of any defects (whose value is not more than 3% of the works value) which do not hinder the use of the project, the committee will include this defect in their report. The contractor is to rectify this defect within two months otherwise the Department will rectify it at the expense of the contractor. If the committee finds out that it was not rectified properly, they will postpone handover and the contractor will be notified.

The maintenance period begins from the date of last inspection. Sometimes the contractor delays the completion of such works until the end of the maintenance period. The Department completes the work at the contractor's expense; hence the final handover is delayed. These processes create many problems and the same procedure applies to maintenance work and consequently costs increase.

There is no doubt that it is for the benefit of the two contracting parties not to get into disputes during the execution of the project. The spirit of understanding should prevail.
However, problems unintentionally arise for certain reasons or due to misinterpretation of the contract terms; the following are some examples:

a) Sometimes the two parties have different interpretations of a certain term or its way of application. Some of these terms are concerned with site inspection, checking plans and designs.

b) Some special cases need alternatives and special accounting systems.

c) Justifications for extending execution time and responsibilities: For instance if the Department is responsible for delay, the contractor is exempt from delay related penalties and is even entitled to claim indemnity. If delay is due to casual or unexpected factors the two contracting parties are not responsible for this delay, and the execution time is extended without any compensation for the contractor. But if delay is attributed to the contractor alone, he will be penalized according to the contract. He may sustain a delay related penalties and pay for additional supervision. Sometimes delay is attributed to the contractor as a result of circumstances beyond his control and, in this case the Department may consider exempting the contractor from part or all the penalties out of good spirit of the relation that should always prevail during the two parties.

d) In case of disputes, the two parties try to settle them amicably assisted by the project consultant or by a special committee if necessary. Unless the dispute is settled all parties usually resort to local courts and applicable laws in the UAE. Disputes are usually settled as early as possible.
After preliminary handover of the executed work, the contractor is responsible for the safety of work during the maintenance period which is usually one year from the date of preliminary handover. A contractor is accountable for rectifying the works during that period. After the maintenance period, the project is finally handed over and all contract accounts are settled. However, the contractor remains responsible and committed to the safety of the building for 10 years after handover. He is accountable for any defect or noncompliance of the main parts of the building, namely foundations, walls, concrete structure, ceilings......etc. He is also accountable for any damage resulting from such defect or noncompliance. It goes without saying that reviewing the contractors' responsibility needs in depth investigation.

Moreover, a defect may be attributed to unseen force majeure, the misuse of the building, planning or execution errors. In this case various parties will be responsible for the damage. Sometimes independent investigators, arbitrators and legal proceedings will be needed to settle the dispute. By that time the contractor and consultant's accounts will have been settled and the contract period will have been finished.

The execution contract issued by the Ministry of Public Works provides that the contractor should check the building site and acknowledge that he has "personally" tested the soil and is sure of its suitability for building according to the proposed plans. This condition is absolutely unfair because it makes the contractor accountable for all plans and designs besides the soil test. They are all the accountabilities of the consultant. The contractor should only be responsible for the execution of work in compliance with specifications. The responsibilities of the consultant engineer should be defined clearly and separately from the contractor's responsibilities.
The building plot has to be leveled before the project is tendered for so as to decide early the level of building against the level of the surrounding streets. Sometimes economy building works carried out by the Ministry of Public Works are much lower than the street level. This takes place because building projects are carried out before levelling and paving the surrounding roads and streets.

The contracts of the Ministry of Public Works and most of the contracts of the ministries and government departments are nearly unilateral contracts i.e. government institutions impose their own conditions and terms on contractors even if they are unfair and unjust for the contractor. This is usually justified by what could be called "Public Interest".

These are the local laws and regulations controlling the construction industry in the UAE. It is clear that such laws and regulations need to be reviewed or replaced by more flexible ones that allow the construction sector to play its role and attain the intended objectives.

Construction contracts usually create problems to contracting and building companies. Table (41) shows different company’s opinions on construction contracts.

It shows that 28 companies comprising 58.3% of the total sample stated that construction contracts needed to be improved whereas 8 companies comprising 16.7% stated construction contracts as "Poor", 10 companies comprising 20.8% believed that construction contracts were "Good" but only two companies comprising 4.2% stated that construction contracts were "Excellent".
c) Tenders:

1. The value of a contract is calculated according to the total cost of the project or the value of the executed works. The contractor is paid by monthly installments during a set period according to a payment certificate. Usually 75% of the value of the project materials stored at the site is paid. 10% of their value is deducted to secure good performance and continuation of work. In the case of lump sum tenders, payments are estimated in proportion to the project works. After preliminary handover of the project the contractor gets the final payment and the retention money as well. The maintenance bond money is retained until the final handover and payment of the contractor's dues.

2. A government department is entitled to alter the works stated in the contract. The alternation value should be equal to about 20% of the contract value. The contractor's dues are then calculated as per the original prices of the contract\(^{(1)}\). For the newly added works, the two parties agree prices if the alternation costs exceed 20%. Alternations usually include deletion, additions or change of specifications or quantities.

3. Alterations and modification of work and quantities may exceed 20% of the total contract value. If this is due to the inaccurate tender estimations, the contractor will be entitled to extend the project execution period. He will be indemnified for any extra expenses he incurs. This will take place within 14 days after notification. Sometimes these alternations are upon the request of the government department and there is no mention of any extra expenses. In this case the contractor has the right to claim his dues and the government departments are entitled to estimate such dues.

4. Insurance includes tender preliminary and final insurance such as contract work insurance, labour insurance, and insurance for any other individuals or property that could be influenced by the execution of work.

Retention money and maintenance bonds, guarantee contractors accountability for the works they have completed for ten years after preliminary handover of the project and they usually cover the main parts of the project.

d) Work Execution

The findings of the study attempted by the researcher covers the following:

- Execution Plan: It is to be submitted by the contractor in two weeks time after signing the contract.

- Engineer’s instructions: The contractor must adhere to them. They include changing labourers, decisions on execution plans, designs and specifications - testing materials, checking and testing the executed works, rectifying defective and faulty works and excluding irrelevant unwanted materials and personnel. These instructions are issued verbally or in writing (1).
- Plans, designs, specifications and bills of quantity (according to which execution takes place) are to be handed over to the Department when handing over the final phase of the project.

- Building materials and manufactured goods: They should be in compliance with the specifications and standards. The contractor has to do the required tests and analysis for these materials as per the Consultant’s request.

- The contractor has to prepare daily reports on the executed work and its conditions, the labourers and the equipment existing at site. These reports have to be attested by the engineer.

- The contractor has to acknowledge that, he has inspected and investigated the site, the soil is convenient for construction according to the plans checked by the contractor beforehand, he is responsible for the execution of all these plans, and that he is fully aware of all their minute details.

- Materials, equipment and temporary installations on the site are to be kept on the site as a guarantee until work is finalised. The contractor is not allowed to transfer or dispose of them without the Consultant’s permission. The contractor has to guard and store materials in a safe place to be approved by the consultant.

- Regulating work and abiding by laws, regulations and instructions of the concerned regional authorities.

(1) Planning Department – ibid page 7
- Guarding the site and supplying it with water and electricity. Adhering to official work timing and in case the contractor wants to be on overtime, he has to get permission from the Department and overtime payment will be at his own expense.

- Contractor's engineers, employees and labourers: The contractor has to provide sufficient and proficient staff. Nationals should be employed whenever possible. The contractor should abide by the laws and regulations.

- Unaccepted works, materials and equipment: The department, at any time and before the preliminary handover, is entitled to examine work and alter any non-complying works. The Department also has got the right to reject the inappropriate materials and works and request substitution at the expense and responsibility of the contractor.

- The contractor has to inform the Department and the regional authorities of any accident that takes place at the site.

- The contractor is responsible for the transportation of materials and equipment across roads, bridges and waterways.

- Ownership of quarries and monuments are the property of the Department and the contractor has to keep them safe and carry out any of the Department's instructions on how to deal with them.
- The preliminary hand over of works, clearance and cleanliness of the site: The contractor undertakes these tasks and the Department has the right to keep the performance bond or retention money till the maintenance period is over and the final handover is completed.

- Subcontractors and sub-suppliers appointed by the Department are entrusted with the execution of specific works. The contractor draws contracts with them according to contracting terms. The contractor undertakes to pay their dues directly after receiving them from the Department (back-to-back) otherwise the Department will pay them directly on behalf of the contractor. Subcontractors and suppliers who are not chosen by the Department can work for the original contractor after the consent of the Department. Only the contractor is responsible for their work.

- The contractor is not entitled to assign or abandon all or parts of the contract or any of his dues without a written consent from the Department. The contractor remains jointly responsible with the abandonee for the execution of contract. The contractor's abandonment of his dues will not affect any of the rights of the Department.

- Delay Amercements are usually estimated on daily basis and will not exceed 10% of the contract value at maximum and this will not include the extension period agreed on. In case of delay, the contractor will bear extra supervision fees which should not exceed 4% of the contract value.
If a contractor breaches the contract, the Department will send a written notice warning him of any further breaches and the contractor has to put things right within seven days. If the breach is repeated for three times, the Department is entitled to terminate the contract and the contractor will be liable to losses.

Assessment of Laws and Regulations

In order to assess the laws and regulations controlling the construction industry, the researcher devised a special questionnaire as part of an opinion poll to find out what contracting companies think of the laws and regulations controlling the construction industry in the UAE.

The following are some of the main points yielded by the questionnaire devised by the researcher on the legal status of the construction sector during 1975 – 1995.

The questionnaire data analysed by the researcher in relation to laws and regulations during 1975 – 1995 yielded the following points:

In 1970: It was found that 28.7% of the sample thought that, in 1970 there were neither laws nor regulations to regulate and control work, but 19% of the group thought that there were laws and regulations at that time and they assessed them as “Poor” and insufficient. But 38.1% assessed them as “Fair” and 14.3% believed that the laws and regulations were “Excellent”.

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In 1990: 38.5% of the sample assessed laws and regulations of 1990 as “Poor”, 7.7% thought they were “Fair”, whereas 42.3% assessed them as “Excellent”. This evaluation indicated that laws and regulations underwent some improvement and amendment during 1970 and 1990. This helped the researcher to reach the following conclusions:

a) There were significant improvements in the laws in 1990 compared to 1970.

b) Sometimes things remained unchanged. Still more respondents assessed the situation as “Poor” and “Fair”.

c) Thus, the current laws and regulations are in need of review and amendment through improvements to cope with the economic developments and to meet the needs of the construction sector.

Table (42) indicates the responses of the companies about the laws and licence regulations during 1975 – 1995.

56.2% of the sample of companies thought that there were laws for companies or licence regulations in 1975. But 12.5% of respondents believed that these laws were “Poor” and 31.3% of respondents believed the laws were “Good”.

As for the year 1995 it seemed that the laws of companies and license regulations underwent changes and 20.8% of respondents assessed it as “Satisfactory”, and 25% assessed it as “Fair”.

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The researcher thinks that the 1995 law according to which these companies were licensed and registered is still in need of amendment because it has loopholes that need to be plugged. The following are some of the shortcomings of the 1995 law:

- The law deals with different sectors through the same provisions.

- Construction companies have their special technical nature that decides and specifies the type of company to be established and the volume of its activities i.e. the type and size of constructions to be executed.

- The current law does not meet all requirements of the sector. For example the technical check and approval are still granted and undertaken by the Municipality.

That is the reason why a sizeable percentage of the sample thought that there were no laws in 1975 while 54.2% assessed that there was a law and it was "Good".

The questionnaire devised by the researcher also assessed the Law of Companies and Permit Regulation (LCPR) No. 8 of 1984. The researcher noticed that construction companies suffered from the application of building permits regulations as well as the LCPR 8 of 1984. Table (43) reflects the respondent’s views about the LCPR 8 of 1984.

56.3% of contracting companies thought that there were no relevant laws in the seventies but 20.8% of the sample believed that there was a law but it was “Weak” as compared to the laws of the 1990’s.

20.8% assessed LCPR 8 of 1984 as “Fair” while 26 companies i.e., 54.2% assessed the law as “Good”. The analysis of this result also indicate that the law and the permits system still had some weaknesses that made the contractor complain. Some provisions
were still missing which caused some problems to contractors who always called for amending the law so as to meet the needs of contractors in the nineties.

Except for the LCPR 8 of 1984, there are no other laws to regulate or control the construction and building sector in the UAE and specify the official institution that should look after the sector. However, there are other regulations that regulate some aspects of construction activities such as the Classification of Companies in Abu Dhabi and the Federal Law of Licencing Trade Companies No. 8 of 1984.

All these laws indicate that the construction sector has been neglected despite the sector's achievement and the role it has played in economic development.

b) Building Permits Issued by Dubai Municipality

Table (44) shows the procedure to be followed to get a building permit from Dubai Municipality as an example. It takes not less than 120 days for any construction project to make a start provided that all plans are ready according to the Municipality laws and regulations.

In many cases plans are rejected by the Municipality departments or by other government departments. Transactions may sometimes take six months to be completed. This type of cumbersome procedures hinders work and delays execution of economic projects or may even withdraw the whole project.

Routine work procedures and red tape are not less dangerous than the other problems that face the construction sector. Such problems make any landlord or contractor hesitate to take part in any tender. The following are some of these common problems:
a) Long delays in decision-making on tenders make it possible for the prices of building materials to fluctuate. A project may cost more and subsequently a contractor pays more than he tendered for the project thus suffering heavy losses.

b) Delaying the project to start later than a tender allows, exposes a contractor to financial penalties.

c) Slow testing of building materials and execution plans submitted by a contractor or his subcontractors make things worse.

d) In case of government projects’ payment delays make the contractor suffer heavy losses, a matter which has negative influence on the whole work progress.

e) Delay in monthly payments on the landlord’s part: They are to paid within 45 days after the consultant has approved them. These payments sometime take a long time before they are settled for reasons beyond the contractor’s control.

f) The prolonged delay (can be a year or so) in the final payment after the preliminary handover of the project.

g) Sometimes a contractor is instructed to do some additional works. He usually hurries up to complete the work but his payment dues are usually delayed. The additional work fees are not paid in time. Consequently payments are delayed for a long time and a contractor continues to pay for consultancy work waiting for the contract provisions, period and costs to be adopted and modified.
h) Some landlords refuse to give preliminary and final handover certificates to a contractor until all payments and settlements are completed. A contractor has to sign an undertaking extinguishing his rights, compensations or dues and the result is prolonged payment delays.

i) Bank guarantees are retained and a contractor is never released due to delayed preliminary handover certificates from the landlord. This takes place even though the project has been handed over and has come into use by the owner. Delay may be attributed to very minor remarks or final touches that never affect the use of the project.

j) Delay of court judgments in the event of disputes or legal proceedings.

k) Slow transactions for getting migrant labour force from abroad.

l) Sudden modification of instructions to the contractor to effect alterations or additions to the project, cause more delays and consequently more losses for both the contractor and the landlord.

c) Classification of Companies

One of the problems that face the construction and building sector is the absence of a unified and standardized system for classification of companies for the whole country. The classification system currently adopted by the federal Ministry of Public Works is different from the classification system adopted by the Department of Public Works in Abu Dhabi and the classification system used by Abu Dhabi Municipality and the one used by Dubai Municipality. Some Emirates do not have any classifications at all.
Table (45) however, indicates the opinions of various contracting companies about the need for a unified and standardized classification system for the contracting companies operating in the UAE.

The table also indicates that many of the contracting companies were strongly calling for a new unified classification system because they felt a pressing need for it. 72% of the sample viewed it as “Good” to have a new unified classification system. 12% of the sample thought that it was “Excellent” to have a new unified classification system, however 16% thought the idea was “Not Bad”. In other words, most construction and building companies thought that a new classification system is one of the pressing requirements of the construction sector.

In most countries construction companies are classified according to their technical and financial capabilities. The volume of projects entrusted to these companies is decided according to this classification. Until this research was completed there had been no classification systems for the construction sector although many companies were seeking for it. The following are the summaries from Table (46) about the companies’ views on it:

8 companies i.e., 16% of the sample thought the proposal of new classification was “Not Bad”. This implies that they were not very much in favour of a classification system for one reason or another.

72% of the companies repeatedly called for the application of such a system.
12% of the sample assessed the proposal as “Excellent” and they emphasised the need for a classification of construction and building companies.

d) Rules and Terms of Tenders

Terms of tenders remained without amendment or modification for a long time. Many construction companies called for the continuous development of construction tenders with standardized terms and conditions. Table (47) indicated contractors’ responses about their hopes and ambitions.

One of the problematic areas of the construction sector is tenders and their terms. In table (48) the researcher tried to find out what companies think of tender rules and regulations.

The survey indicated that, 22 companies i.e. 55% of the total sample assessed tender rules and regulations as “Incomplete”, 25% of the sample assessed them as “Fair”, and 20% assessed them as “Good”. None thought they were excellent. Table (48) is indicative of the difficulties faced by the construction companies with regard to tender terms.

e) Construction Contracts

The nature of construction contracts is one of the key problems facing the construction sector that hinders its development and advancement. Table (49) indicates the survey response of the current contracts systems.
Experts from 28 companies comprising 58% of the sample thought that contracts were defective. 16.7% believed that the current contracts were "Weak" and needed improvement. 20.8% stated that the current contracts were "Good". On the other hand only 4.2% viewed that the current contracts were "Excellent". However, these views indicate that there were pressing contract problems.

f) Export and Import Policy

The UAE and some Arab countries have adopted a policy that allows for the importation of construction services – and here are some of the features of this policy:

- The desire for speedy execution of giant construction and industrial projects makes clients prefer foreign companies because they are well qualified.

- Adoption of a turnkey project policy deprives national and Arab contractors of acquiring better construction skills.

- Industrial engineering nearly includes all types of construction and building. That is why it is more complicated and more sophisticated than traditional civil engineering construction. Governments and laws do not oblige foreign contractor to co-operate with national contractors as partners or even subcontractors thus helping them to gain experience.

- There is growing awareness of the importance of exportation in general all over the Arab World. Many Arab countries have adopted development strategies and set up special banks, centers and funds to promote their exports. However, many of these Arab countries have not yet enacted any written laws or legislations for the exportation of construction services. There are similar regulations in support of
agricultural and industrial institutions involved in industrial and agricultural production. These institutions are allowed to keep part of their foreign currency revenues to meet their needs. A similar advantage should be available to local contractors.

- Many contracting companies face a lot of difficulties when exporting Arab labour force or equipment to other Arab countries, which has made the exchange of construction services very limited, and subsequently some Arab countries have resorted to Asian work force to carry out their projects. Arab workers usually find it difficult to get entrance and residence visas\(^{(1)}\) in some Arab and foreign countries.

g) Financing Problems

Construction works are characterised by long gestations. Construction companies need to be financed during execution of projects till they are completed. They need to wait for a long time and spend a lot of money before they can get their dues from landlords. In addition to that, contracting companies have to pay fees or submit bonds to take part in tenders. Landlords must get bank guarantees and keep retention money against contract value for proper execution of work. The bonds and retentions are to be kept under the landlord’s control till the project is completed. On the other hand there are no laws that make the landlord pay the contractors’ money when it falls due or at least add interests to the delayed payments.

Contractors have to resort to bank loans or overdraft plus the added bank interests in order to make up for postponed payments. It goes without saying that this adds to the costs of work. Compounding the problem is the fact that most Arab banks and financing companies tend to grant short-term loans of six months duration only.

Construction operations are only compatible with medium—terms loans. On the other hand foreign contractors are in a better condition because their technical and financial transactions are well integrated and in agreement with each other. They are usually well supported by their governmental, national or international financing companies, a situation which a UAE contractor desires. Hence, a national contractor is comparatively disadvantaged and unable to compete with foreign contractor whether inside or outside the country. That was the case with some big national contracting companies when they tried to operate outside the UAE. Although they gained big tenders and construction projects outside the UAE, namely the AGCC countries, their attempts were doomed to failure than succeed. There were many reasons behind the failure of such attempts that resulted in financial losses and hazards. One of the big UAE contractors who had a similar experience was quoted as saying: “Although there are ample chances for gaining big construction contracts from the Arab markets, the past experiences were risky enough”.

Some big national construction companies sustained big losses due to delay of their payment dues. Some contractors stated that although there were some ample chances for very promising construction deals in overseas markets and although some UAE and Gulf contracting companies possessed modern technical facilities and skilled staff, the lack of smooth financing facilities constituted one of the challenges hindering the expansion of these companies outside the local market.
In conclusion, the foregoing analysis indicates that financing laws and systems are the main obstacles facing the construction sector that limit its ability to expand outside the UAE. This has prompted those involved in the construction industry to recognize this barrier and try to overcome it in order to support the construction industry.

Competition

The construction sector in the UAE has been facing a lot of challenges. Among them is the internal and external competition which has made some national contracting companies retreat and give way due to their failure to compete with other companies. Here the researcher is trying to cast more light on the problem of competition as follows:

a) Competition With Local Companies

Table (50) shows the number of contracting companies in the UAE in 1995(1). In the early 1990’s the number of contracting companies in the UAE was beyond all expectations. In each emirate the number of the operating companies exceeded the volume of construction work available in the concerned emirate. This indicated that there was keen competition for gaining construction contracts or tenders. The problem was so complicated that the volume of projects available in the market were not matching with the number of competing companies. This weakened the companies, hindered their growth and made it difficult for them to become international companies competing at international levels.

b) Competition With Foreign Companies

Advancements in technology and growth of the global economy have brought us all more closer together. Thanks to modern technology, the world has become a global village. These advances in technology and the global economic orientation have enabled many building companies from developed countries and particularly the emerging countries to effectively cross international and state borders to successfully gain construction tenders on a large scale\(^{(1)}\).

The economic freedom in the UAE has left the door open for foreign contracting companies to operate freely in the country according to the Law No. 8 of 1984 which has allowed partnership on the basis of 51% to 49% of the share respectively to nationals and foreigners – or that a national partner could be the "Services' Agent" of the foreign company.

The Arab Contractors Federation managed to give due regard to the Arab contracting industry for its key role in the development of the Arab World. The Construction Sectors in the Arab World can attain this target independently without the negative influence of foreign interests only by employing local work force, encouraging Arab investments and promoting utilization of Arab human resources. However, foreign contracting companies carry out about 50% of the Arab contracting projects throughout the Arab World with a turnover of $70 million per year\(^{(2)}\).

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The Law No. 8 of 1984 has given foreign companies the chance to compete against national companies, which may not be their match (Foreign companies possess sophisticated technology, expertise, administration and financial capability, which enable them to execute projects professionally and skillfully in line with timetables required). National companies suffer from lack of modern technology, modern technical and administrative abilities, skills and expertise.

The researcher has dealt with the issue of competition at the regional level of the AGCC countries using the 1995 statistics which were indicative of foreign contractors' ability to compete, particularly in infrastructure, oil and gas projects\(^1\).

The foreign domination in the Gulf construction market could be attributed to the fact that only foreign companies possessing modern technology and equipment were invited to big tenders. These companies either had their foreign labour or got equally skilled labour from other foreign countries. Consequently nothing was left for the Gulf contractors other than minor supporting work.

Table (51) shows the volume of foreign contractors' market shares of the UAE contracting industry in 1995.

(1) Construction Sector in the AGCC Countries, Paper Presented to a Seminar Held in Dubai by the AGCC Chambers of Commerce & Industry in Coordination with the UAE Contractors' Association and Dubai Chamber of Commerce & Industry.
Foreign companies usually came to the area when they were fully supported by their governments with regard to bank credits and certificates and so on. Big financing houses in France and Germany usually supported them. Moreover, these foreign contracting companies got marketing facilities from their embassies and commercial attaches in the AGCC countries.

There is no doubt that the continued dependence on foreign construction companies has its shortcomings and drawbacks in the long run for the UAE economy. In a recent study conducted by the AGCC Chambers of Commerce & Industry Federation, it was found out that the acute competition of foreign companies against national companies has negatively influenced the capabilities of local construction companies in the local market. At the same time some national Gulf construction companies have developed enough and reached the stage of maturity in their operations.

This is not the end of the story. The matter has exceeded mere flow of money or wealth out of the country. Foreign companies that monopolize highly sophisticated equipment and technology will continue to gain big contracts and giant projects. This would mean the monopoly of expertise, modern technology, thus depriving the national companies of any possibility of technical, professional and technological development.

Moreover some foreign companies – with intent – plan highly complicated designs for our projects to force clients spend a lot of money. This is mainly for their own interest and their own benefit even though these projects do not meet our environmental or local needs. This will maintain their permanent technical existence in the region and force our countries to be dependent on them forever.
One of the reasons behind this state of affairs is that, we do not have a vast technological base in the country. We are short of reliable qualified technical national specialists because our dependence is always on migrant labour. Although there are highly efficient construction companies in the UAE, many local mediocre companies are operating in the country. This makes foreign companies more sought after at the expense of the national construction sector (1).

The survey by the researcher indicates that foreign companies have easily managed to penetrate the UAE and the Gulf Region through the Arab construction and building market. They have even gained most contracts. This penetration has split the Arab and Gulf construction market and weakened construction industry integration of the AGCC countries. This may one day dwarf the Construction Sector and minimize its role in the economic development and contribution to the GDP.

There is no doubt that the GATT will force the gate open for foreign countries to operate in local markets on equal footings thus weakening the competitive situation of local companies. Moreover, the foreign GATT members, the industrial countries, are seeking the introduction of what is called “the Social Term” which would mean the introduction of international standards for improving labour conditions and linking them to international trade. This will certainly have its impact on labour and production costs inside the UAE (2).

(1) ibid: pages 5, 6, 7
(2) The GATT and Labour force in the UAE, Afaq Al Mustaqbal Magazine, Published by the UAE Centre for Strategic Studies and Research, no.2, Sept. 1997.
c) Emiratization

The problem of competition during national contracting companies and their foreign counterparts has been acute. Table (52) shows how far the people involved in construction and building industry are in favour of the Emiratization of the companies operating in the construction sector in the UAE.

The survey attempted by the researcher indicates that 40.9% of the sample companies believe that Emiratization percentage should be 51% and the foreign companies percentage should be 49%. 22.7% of the sample viewed that the Emiratization percentage should only be 75% and the foreign companies percentage should be 25%. 36.4% of the sample is in favour of absolute Emiratization (100%). They think that UAE nationals should own all contracting companies.

It is worthy of note that the UAE current laws allow foreign companies to operate in the country on the basis of partnership with 51% of the shares for nationals and 49% for foreigners. However, some people are able to circumvent the law by applying some other regional government regulations in each emirate. A foreign company is allowed to operate in the country under the umbrella of a national who (in return for a sum of money) can be a “Services Agent”.

The researcher believes that such act of circumvention endangers the Construction Sector and especially national contracting companies, such as private shareholding companies and joint liability companies, which are 100%, owned by nationals. The researcher calls upon official institutions to take the necessary measures to control the
situation and set up rules for the “Services Agent” in addition to increasing the national's share in the event of a foreign partner.

d) Inadequate Pricing System

The current inadequate pricing system has made contracting companies unable to estimate the realistic costs of projects throughout execution stages. Many a times contracting companies are exposed to financial crises due to the delay in project execution and payments, which adds to their costs. The more these transactions take time, the more the chances are for prices of building materials to increase.

This particular problem makes contracting companies prefer short-term projects that can quickly be completed for quicker returns. Most of these projects are housing units and buildings that only require traditional construction technology. Through one of his questionnaires the researcher could draw a comparison between projects of high and low profitability from the viewpoints of contractors. Table (53) specifies projects and their feasibility according to contractors.

According to this table, projects are put in their order of profitability and feasibility, the most profitable projects rank first, and the less profitable projects rank second and so on. The figures given in the table are in percentages. The data shows that services projects ranked first according to contractors. Roads and schools projects ranked second. Some contractors preferred airport and electricity projects according to the company's specialization and its technical, administrative and financial capabilities.
6.(iii) Status of Technology In Use

In 2003 the Confederation of International Contractors published a survey of success factors in the European construction industry. The findings of the study were based on the responses of 80 companies from 9 different countries\(^{(1)}\). The study was initiated by Ronald Berger, Strategy Consultants to help the European Construction companies to survive in the different market conditions.

There is some similarity between the factors of success in Europe and those which the researcher is seeking in this study to recognize the problems and success factors of the construction sector in the UAE. Among the success factors in the European construction industry are the following:

- Effective risk management
- Innovation
- Cost-cutting
- Partnerships with subcontractors
- Organizational structure
- Establishing new contract models
- Partnerships with material suppliers
- Performance pay for management
- Diversification (e.g. adding new business areas)
- Growth through acquisition
- Expanding into new countries
- Specialization (e.g. business stream-lining)

In the course of his studies the researcher could classify the success factors and problematic areas of the construction sector in the UAE as follows:

- Management and organization
- New Technology
- Technical aspects
- Operation
- Legal aspects
- Financial aspects
- Competition:
  - a - competition against foreign companies
  - b - competition among national companies
- Government support:
  - a - planning for the sector
  - b - updated pricing system

In this section the researcher is discussing the technical problems, and new technology in the construction sector.

New Technology

New technology in the sense in which the term is used here refers to microelectronics, microprocessors, telecommunications and internet technologies, as applied in manufacturing processes, information sharing and processing, service provision and products.
The involvement of the firm in its entirety in technology is very useful and beneficial to all parties. The researcher conducted an oral survey of managers and worker representatives in the construction sector with a questionnaire in the UAE. The survey revealed that some of the respondents viewed that involvement of all the enterprise levels in all its entirety has a positive impact on the quality of the work. Many managers saw positive effects on production and less time taken to reach decisions.

The researcher concludes that workers' acquisition of new technology contributes to mutual understanding employees, receptivity to change, recognition of problems of workers by the managers, and the increased productivity of the enterprise. The researcher found seven main reasons why technical change has positive impact:

1) It is seen as a progress.
2) It has a concrete form and products.
3) The newer the technology, the better the workplace.
4) It represents investment in the future and improves job security.
5) It is familiar and valued in non-work context.
6) It tends to be incremental and continuous.
7) It means coping with civilization and progress.

One of the most essential areas of development in the construction sector in the UAE is to enhance its technical framework. It goes without saying that modern technology plays a vital role in the development of all the areas related to the construction and building industry. The construction officials in the UAE have been looking forward to a bright future by the adoption of the most up-to-date technological methods and
techniques. Outstanding among these aspects of progress and changes is the use of computers and adoption of information systems. Before computerization, most of the work was manually done or with simple calculators. Now the situation is much different as computerization has effected radical change in work systems and employment plans.

Due to the fact that construction works are always associated with other aspects of technical development, construction firms need to effect changes in their structures. Changes may include employment systems, work procedures, information systems and introduction of high technology. Usually any change is followed by the solution of various problems facing the enterprise. Examples of these changes are decision making, production, level of performance and control, assessing staff performance and finally the bonus system.\(^{(1)}\)

In general, the seventies era was just a beginning which gradually led to the enhancement and sophistication of modern technological applications in the nineties. The nineties were the prime age of construction technology, which coincided with overall planning, and execution of development projects all over the UAE. In that era the level of quality standards and codes of practice improved, too. This necessitated adoption of modern technology and employment of skilled workers to cope with that era. Unskilled workers were saved and new restrictions were imposed on the demand for foreign labour. The state began to be aware of the impact of foreign labour force on the UAE population.

\(^{(1)}\) Dr. Askar, Sameer Ahmad, Introduction to Business Administration, Dar Al Nahda Al Arabiyah Publishing House, Cairo, 1983.
It was no more easy to issue entry visas or work permits, which forced contracting companies to adopt mechanization and technology to save labour and reduce the number of unskilled workers. The researcher could identify the sector’s technical and administrative problems through a questionnaire that he prepared to survey some of the UAE contracting companies for this purpose.

The survey tried to assess the contracting companies performance during 1975 – 1995 as “Poor”, “Fair” or “Excellent” in the following areas:

- attainment of aims
- level of performance of the enterprise operations
- adoption of technology in the enterprise operations
- level of performance of the enterprise elements
- quality standard of production (buildings)
- assessment of the enterprise profitability

As detailed hereunder, the introduction of modern technology in the construction industry will make up for the dearth of national work force. The more technology the construction sector adopts the less physical manpower it needs.

Technical Aspects

Contracting companies faced a lot of technical challenges during 1975 – 1995 among which are the following:
a) Attainment of Intended Aims

Analysis of the data showed that some companies still suffered from various problems that hindered the attainment of their aims and goals. The reason was that they had not planned for their organizational needs which could have helped them to attain their objectives. With regard to the attainment of aims, the owners of some contracting companies expressed the following views:

**In 1975:** 28.6% in the sample stated that their goal attainment was “Poor”, 38.3% assessed it as “Fair”, and 33.5% believed it was “Excellent”.

**In 1995:** The companies’ owners no longer thought that their attainment of aims and goals was “Poor”, but “Fair” and “Excellent”. 37.5% viewed their attainment of aims as “Fair”, while 62.5% believed that it was “Excellent”. This development is indicative of the construction officials’ awareness of their conditions and their attempts to technically upgrade their companies.

b) Performance of Operations

During 1975-1995 performance improved in general but that improvement was not reasonable enough because the contractors continued to suffer from mediocre performance of the enterprise. Operating the enterprise required practical experience and cognitive skills.

c) Level of Technology
Table (29) shows the views of contractors and building officials about the level and development of the technology applied in the construction sector during 1970 – 1990.

The findings indicate that the technical framework had its positive reflections in the construction sector. The table indicates the following reflections:

- Most of the sample assessed technological development as poor and fair in the seventies. 31.6% of the sample thought that technological applications were poor, while 42.1% of the sample believed they were fair. Only 26.3% of the sample believed that technological applications in the area of organization were excellent.

On the other hand the picture radically changed in the nineties when contracting companies began to adopt technological methods and applications on a larger scale. 20.8% of the sample thought that technological applications were “Fair”, while a majority of 79.2% assessed them as “Excellent”. Nobody believed they were “Poor”.

- During 1970-1990, contracting companies began to adopt modern technological building methods and techniques. They also employed skilled labour. This is directly reflected in the construction industry i.e. it markedly improved as can be seen from the following:

In the seventies, only 13% of the sample assessed production quality as” Poor” and 26% believed it was “Fair” due to the low level of technology. On the other hand 60.9% of the sample thought the level was “Excellent”.

In the nineties, the scene was markedly different. Only 4.8% in the sample believed that the quality level of production was “poor” and 14.3% thought it was
On the other hand a majority of 80.9% believed that the quality level was “excellent”. This was attributed to the improvement and enhancement of the construction sector in the nineties.

- It is worthy of note that in the seventies the construction sector in the UAE depended heavily on manpower i.e. great numbers of workers were employed to carry out the projects entrusted to it by the other economic sectors. The massive employment of labour could be attributed to the following:

a) In the early seventies there were no restrictions on the demand of labour force from other countries. When the UAE was beginning to enjoy a boom, procedures for demanding and employing workers were fairly easy. This was necessary to enable the country to carry out the so many infrastructure projects needed at that time. Moreover migrant labour force was rather cheap.

b) The construction sector had to respond quickly to meet the needs of the market without consideration of quality performance or quality production.

c) Adoption of high technology at that time required highly skilled and costly labour force, which was not always available inside the UAE.

Analysis of the questionnaire data showed improvement in the technology adopted by contracting companies in the nineties. Most of them — in terms of technology — were assessed as “Excellent”.

There was evidence that the construction sector actually improved and developed, thanks to the modern technology existing in the world market at that time. However, we
can claim that the adoption of technological applications was not advanced enough although 73% of the companies assessed it as "Excellent". The advice given then was to apply modern technology to all construction work domains in order to resolve most related problems and reduce manpower.

d) Level of Performance

In 1990, 75% of the sample assessed level of performance as "Excellent", while it was 25% in 1975. This comparative improvement was due to the employment of highly qualified experts to manage and direct the work force and other components of the enterprise. Despite this advancement more promotion and more modernization were needed to reduce the burden of problems and enable the sector to go ahead and shoulder its responsibilities efficiently.

e) Level of Production

In 1995 the level of production markedly improved as compared to 1975. The percentage of high quality companies was 80.9% in 1990, while it was only 60.98% in 1975. This is indicative of the advancement and growth of the construction sector in terms of quality. It was expected that after overcoming the challenges that faced the construction and building companies the standard of their production would increase through adoption of modern technology.

f) Enterprise Profitability

The data showed that profitability of the enterprise did not improve to the desired standard. 45% of the sample responded that the profitability was "excellent" in 1975,
while it was 41.7% in 1995. These figures are indicative of the pressing need for improvement in the level of profit performance.

g) Enterprise Organization

Many companies adopted the project team model which did not allow for the acquisition of administrative and technical experience necessary for developing work technologies as we mentioned before. The project team organizational model required certain quality competencies and experience which were not available locally.

h) Employment

A large number of workers in national contracting companies was either unskilled or semi-skilled laborers whose percentage increased to 80% of the total workforce. On the other hand, foreign contracting companies operating in the UAE never employed unskilled labour.

Contracting companies regarded construction as a pure engineering process. Consequently they had a tendency towards hiring engineers at the expense of other important human elements of work. There was a plenty of engineers and a shortage of directors, accountants, quantity engineers, programmers and system analysts. Moreover, these companies heavily depended on unskilled foreign labour. Chapter VI tackles in detail the issue of labour force and the problems of local and foreign workforce and their influence on the Sector and the society in general.

i) Training

Although construction companies suffered from a lack of skilled labour, they rarely invested their money in training and developing their own migrant workers. Most
contractors thought that training only meant additional expenses rather than development of productivity and profitability.

In fact, construction companies and institutions in the Arab World give more importance to training. For instance, in Egypt there are 29 training centres that belong to various public construction institutions. During the eighties 140,000 workers were trained in these centres but training was only meant for producing semi-skilled workers.

In Algeria there are 350 training centres where 110,000 of skilled workers were trained in the eighties. Moreover, hands-on training at sites is still rather poor. Training programmes failed to train workers in operating, repairing and maintaining equipment. They failed to train foremen and supervisors. These programmes lacked quality training materials to develop workers skills in building and construction (1).

The rapidly changing global environment requires on-going education. We must respond by adopting a culture that seeks on-going training at an international level. The merging of the GATT and ISO have made quality production the ultimate aim of any organization or individual. Therefore, we all must continually seek better knowledge, skills and efficiency (2).

j) Lack of Research and Development Systems

The construction industry in the UAE lacks research and development centres as compared to some Arab countries like Egypt and Algeria which have specialized centres run by public institutions. Nearly all big construction companies in the UAE do not have departments or sections that undertake research and training. Only a few companies have set up these departments or sections but without financial resources although there are about 35 centres for research and development in the Arab World.
6.(iv) Building Control Systems

In the first Chapter the researcher explained in detail how the Construction Sector developed in the United Arab Emirates. Before the establishment of the UAE in 1971 the sector then was very small and began to develop when the Gulf area was still suffering under foreign colonialisation. There were laws relating to construction and building but they were not as effective as they are nowadays.

With the establishment of the UAE in 1971 and the soaring oil prices, the state began to draw up development plans, which helped the Construction Sector to flourish, grow and cope with the construction boom in the country. The state gave importance to this Sector and enacted laws and regulations to control construction and building in cities, towns and villages so as to meet the requirements of economic development. In this section the researcher concentrates on the laws and regulations that control the building and contracting industry in the UAE. To begin with, the researcher is trying to throw some light on some of the rules and regulations provided for by the Local Orders issued in 1970\(^{(1)}\) by the Dubai Municipal Council as an example of the UAE laws and regulations.

a) Building Plots and Sites

A plot of land has to have the following specifications before the landlord can get a building permit before a building operation starts:

1. In some areas building is only allowed within certain limits and borders shown on special cadastral maps available at the Municipality offices.

\(^{(1)}\) Local Building Orders for the Year 1970, Dubai Municipality, UAE.
2. Generally, it is not allowed to issue building permits if the area of the building plot is less than:

   a) 1050 square feet in the old areas of Deira and Dubai
   b) 1600 square feet in the new areas of Deira and Dubai

   In very special cases and after the consent of the concerned Committee it is possible to issue building permits for a building plot which is less than the stipulated area if the landlord shows evidence that he/she is needy or poor.

3. It is not allowed to issue building permits if the building plot does not make a net area of 30 x 30 square feet excluding the surrounding space. In some cases, and after the approval of the Committee it is possible to issue a building permit for a disfigured plot of land which does not provide a net area of 30 x 30 square feet excluding the surrounding space.

4. Every building plot must have a front side not less than 30 feet overlooking a public road or street.

5. The building permit will only be issued when the landlord allows for the fitting and installation of telephone and electricity cables in a safe way. In this case, the concerned companies will bear expenses.

6. Projection of sunshades at the building entrance are not included in elevations and entrance permits are to be separately considered.

7. Special consideration has to be given to the construction of roofed corridors, porticoes, porches or passageways on suitable sites. Their plans must be submitted to the Engineer and the Committee afterwards.
8. The maximum number of storeys (apart from the mezzanine) permitted for new buildings are determined according to the classification of areas and maps.

9. The Committee may permit the construction of a limited number of high-rise buildings that exceed the permissible height in certain areas as specified by maps. In this case special importance must be given to the space surrounding the building plot and a special space of land must be left as a car-park (or parking-lot).

10. Buildings should not be higher than what is permissible by the airport authorities and maps.

11. The lowest floor of any building should be 12 inches higher than the highest ground level on which the building is constructed. If any building is close to a street, then the lowest floor must be 6 inches higher than the pedestrian passage level or 16 inches above the street level if there is no pedestrian passage. If the building is in an area liable to floods, the consultant is to decide the level of the ground floor.

12. The height of each floor should be as follows:
   a. housing units - 8 or 6 feet
   b. commercial, shops, offices - 10 feet
   b. educational, entertainment and public buildings - 8 or 6 feet
   c. light industries and wholesale stores }
   d. heavy industries }
   e. industries that give off unpleasant odours }
   14 feet

13. Height less than 6 feet and 9 inches is not allowed without a permit.
14. Any shop may have a showroom or a mezzanine that exceeds half of the total area of the shop. In this case, the height of the floor of the shop and the ceiling of the showroom or mezzanine should not be less than 8 feet and the net height of the showroom or mezzanine is not less than 7 feet and 6 inches.

15. Dimensions should be as follows:

<table>
<thead>
<tr>
<th></th>
<th>Minimum area</th>
<th>Minimum length of any side</th>
</tr>
</thead>
<tbody>
<tr>
<td>- shop</td>
<td>120 sq. feet</td>
<td>7 sq. feet</td>
</tr>
<tr>
<td>- office</td>
<td>100 &quot; &quot;</td>
<td>7 &quot; &quot;</td>
</tr>
<tr>
<td>- accommodation room</td>
<td>80 sq. feet</td>
<td>7 sq. feet</td>
</tr>
<tr>
<td>- (exception) kitchen in one-room flat</td>
<td>40 &quot; &quot;</td>
<td>5 &quot; &quot;</td>
</tr>
<tr>
<td>- bathroom</td>
<td>30 &quot; &quot;</td>
<td>5 &quot; &quot;</td>
</tr>
<tr>
<td>- toilet</td>
<td>12 &quot; &quot;</td>
<td>2.6 sq. feet</td>
</tr>
</tbody>
</table>

b) Documents and Plans

A landlord should abide by the following remarks:

- Every landlord who intends to construct or demolish a building should apply to the concerned Manager specifying the site, purpose of construction or demolition, number of storeys, plan and building materials.

The following documents and plans should be enclosed with the permit application and submitted to the Municipality:
The following are explanatory rules for issuance of building permits and execution of any building operation.

1. Plans must show the location and size of doorways and windows.

2. For more details about specifications of building and construction, please see the rules and regulations.

3. In case of minor changes there is no need for special plans.

4. Specifications could be written on the maps.

5. The official-in-charge must sign a copy of the plans and specifications:
a. Every applicant for a demolition permit must submit the specifications of demolition and equipment.

b. Before issuing such permits a certificate from Water, Electricity and Telephone Departments should be issued ensuring that cables and supplies will not be exposed to any danger due to the demolition.

c. If the building overlooks a road that appears on the town map, a certificate needs to be issued stating that the concerned traffic department has been notified of the demolition date.

6. On issuing a building permit, the official in charge is entitled to add any special conditions he considers convenient.

7. Work should never start before a building permit is issued and after the Consultant has checked the site. Work must go on according to the approved plan and the terms of the building permit.

8. Any deviation from the approved plans or conditions prescribed by the permit is not allowed without a written consent from the Consultant in case of minor amendments – or permission from the Committee in case of major amendments or radical changes in the plan, materials or equipment.

9. In the event of amendments or substitutions in the property deed of the building plot, the building permit may be transferred to the new landlord.

10. The duration of a building permit is six months from the date of issuance. If the construction work is not completed within this time, the permit will be extended
provided that a reasonable part of the work has been completed and work is still, and has been, in progress since it started.

11. According to the Consultant’s proposal and the Manager’s approval, a building permit may be cancelled when:
   - the main permit terms are breached
   - the permit is issued on the basis of false information submitted by the landlord or his proxy

12. A landlord or his proxy has to give a 24-hour notice about the following:
   a. completion of excavation work for foundations
   b. completion of foundations up to ground level
   c. readiness of sewage facilities

13. Checking plans, statistical work or follow-up work should not add more responsibility to the Consultant, the Manager or the Council. The landlord and his proxy remain fully responsible for all planning errors, execution and safety of the building so long as work is in progress or when completed.

14. It is not allowed to occupy or use any other building without a special certificate.

15. All complaints and disputes related to building permits and construction are to be submitted to the Committee.
16. Anybody, breaching any of these regulations will be liable to a fine not more than Dhs. 500 for the first offense and not more than Dhs. 2000 for the second offense and more. The Council is entitled to take any further measures in case of major breaches to demolish any or all-noncompliant parts of the building. The offender will pay the demolition expenses in addition to other fines.

17. The Consultant will be entitled to get into the site at any time without any impediment.

c) Building Plans and Building Processes

Long ago before the economic boom, nearly all buildings were one-storeyed but after the economic boom buildings changed markedly to cope with growing population, which required multi-storey buildings. Therefore, the Municipality prepared models of building plans and every landlord had to consider these models and the terms of planning before starting any construction work. These terms are as follows:

1. Any two-storey building has to be planned by a qualified person approved by the Committee and recommended by the Engineer.

2. Any two-storey building should be planned by a qualified person approved by the Committee and recommended by the Engineer. Three copies of the construction plans besides their bills of quantity and specifications should be submitted to the Engineer for approval.

3. If the construction of a building consisting of one or two storeys includes concrete pillars, concrete must be calculated by a qualified person approved by the Committee. Three copies of the plan showing all parts and specifications
and details of concrete structures – should be submitted to the Consultant for approval. Planning calculations should also be submitted when needed.

The Municipality has also made basic regulations for construction and building. People have to abide by the following:

1. All construction works should be within the fences and enclosure walls of the building plot.

2. If a building permit is issued for a building plot close to a road shown on the town map, the building operation may be expanded up to the road after getting the Consultant’s permission as follows:

10 feet - a road 60 feet wide or more
8 feet - a road 40 feet wide or more
5 feet - a road 34 feet wide or more

If the building plot is close to a street or a lane, construction can be expanded up to half of the width or up to 10 feet across. This should be after the Consultant’s approval.

3. If building works are allowed to extend to an adjacent plot, an enclosure fence must be built to border the new area and the fence must be approved by the Consultant. This fence should not be less than 4 feet high. After the building process is finished, the fence is to be demolished and the place should be left clean and the original fence should be set up again.
4. Excavation on any road or street is not allowed without the written consent of the Consultant. Any application for excavation should be enclosed with maps and plans prescribing location and depth of the proposed excavations at the Consultant’s request. Every application for excavation permit must - at the request of the Consultant – be enclosed with certificates prescribing all the required precautions.

These certificates are issued by the following departments:-

a. Traffic Dept.

b. Water Supply Dept.

c. Electric Supply Dept.

d. Telephone Dept.

d) The Organizational Structure of Dubai Municipality

The role played by Dubai Municipality is only an example of the roles and authorities of other municipalities in the other emirates. Figures (16) and (17) show the organizational structure of Dubai Municipality in 1995 with authorities and responsibilities relevant to all building, permits and other services.

The Building and Housing Directorate is responsible for ensuring strict compliance with building regulations and safety standards. It also offers government support for public housing according to certain directives and criteria. In addition to this, it is responsible for the coordination and classification of the licensed consultants and contractors.
The following are the various departments of Dubai Municipality and their role as the main authority controlling the Construction Sector:

a) Building Permits Department

- Checking, classifying and providing applications for building permits.
- Ensuring complete coordination among the concerned departments such as Planning Dept., Roads Dept., and Sewage Services Dept.
- Ensuring complete coordination with external institutions like Etisalat and Dubai Electricity and Water Authority regarding building permits.

b) Building Control Department

- Controlling the approved building and constructing projects to ensure compliance with the attested plans and specifications.
- Paying inspection visits all over Dubai Emirate to prevent the construction of any unpermitted buildings, applying regulations and penalizing law-breakers.

c) Government Housing Department

- Receiving, attesting and classifying applications for government housing and land.
- Carrying out the directives and regulations with regard to granting government houses and land to nationals.
- Giving advice and information to the public with regard to their housing and construction plans.
• Controlling consultants’ and contractors’ offices engaging in the construction of government houses

d) Construction Research and Quality Control Section

- Examining and testing building materials.
- Conducting studies and research on specifications, standards of building materials, methods and construction problems.
- Controlling the quality standards of materials and issuing certificates needed for marketing and use of these materials.
- Quality Standardization of equipment and machines for factories and laboratories.
- Accrediting laboratories with the help of external institutions if necessary.
- Controlling factories of building materials like bricks and concrete.
- Checking the specifications of the Municipality projects’ making necessary recommendations and defining quality standards.
- Offering consultation and data pertaining to technical matters.
- Drawing up technical specifications of building materials and methods of testing them.
e) Remarks on UAE Building Control and Regulations

1. In spite of the economic boom achieved by the UAE, the construction regulations and systems adopted are no longer able to cope with the development of the construction sector.

2. The administrative procedures needed to take out building permits for any project and other routine work continue to be tough. On the other hand it is noticed that in some developed countries like Britain there are attempts to get rid of some of the impeding routine or red tape to help finalize such matters within a short period. The issuance of a building permit for example in Dubai would need the following:

<table>
<thead>
<tr>
<th>No.</th>
<th>Department</th>
<th>Required Work</th>
<th>Required Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Town Planning</td>
<td>Approval of area, height &amp; car parks etc.</td>
<td>7 - 14 days</td>
</tr>
<tr>
<td>2</td>
<td>Planning Dept.</td>
<td>Preliminary approval</td>
<td>7 - 14 days</td>
</tr>
<tr>
<td>3</td>
<td>Survey Dept.</td>
<td>Fixing landmarks to guide surveyors</td>
<td>7 - 14 days</td>
</tr>
<tr>
<td>4</td>
<td>Civil Defence Dept.</td>
<td>----</td>
<td>7 - 14 days</td>
</tr>
<tr>
<td>5</td>
<td>Sewage Service Dept.</td>
<td>----</td>
<td>7 - 14 days</td>
</tr>
<tr>
<td>6</td>
<td>Road Dept.</td>
<td>Car parks, exits and entrances</td>
<td>14 - 21 days</td>
</tr>
<tr>
<td>7</td>
<td>Electricity &amp; Water Dept.</td>
<td>Electricity &amp; Water supplies</td>
<td>21 - 28 days</td>
</tr>
<tr>
<td>8</td>
<td>The Committee</td>
<td>If all the above matters are finalized, submission to the Committee for approval is possible</td>
<td>10 - 15 days</td>
</tr>
</tbody>
</table>
This is the only procedure to be followed in Dubai before building work can start. This procedure needs not less than 120 days before a landlord can start construction work. This routine procedure impedes building processes as well, which in its turn leads to delay of execution or even cancellation of some projects.

3. The construction regulations and rules are still dominated by the municipalities of the UAE because they are the concerned official institutions which undertake the enactment of laws and regulations and putting them into effect. On the other hand it is noticed that in some Arab and foreign countries there are relevant ministries that supervise and control the Construction Sector and resolve related problems if any.

4. Because the UAE is a Federation some of the responsibilities are undertaken by the Federal and Regional Authorities. Sometimes there is lack of coordination in the fields of construction and urbanization during the Federal Government and the Regional Departments whether in terms of control, organization, planning or supervision. This usually creates contradicting policies on construction and building.

Finally the researcher raises the following pressing question: Is the Gulf an earthquake-prone region?

Available seismic studies do not point to this part of the world as a disaster-in-waiting. Yet, there have been disastrous earthquakes in neighbouring Iran as well as in the not-so-distant India. Precaution is called for. Unfortunately, an
overwhelming majority of buildings in the UAE and other GCC countries have not been built to withstand a major tremor\(^{(1)}\).

What precaution can be taken? Should the UAE construction and building control laws and systems take this matter into account?

\(\text{(1) Precautions Against Earthquake, Contractors News Journal, the Official Journal of UAE Contractors' Association and the Federation of Islamic Countries, vol.9, no.5, May 1996.}\)
Building Control Systems of Some Arab and Foreign Countries

In order to draw a comparison between construction laws and regulations enforced in the UAE and in some other countries, the researcher has found it useful to refer to the Hashimite Kingdom of Jordan Temporary Law No. 79 of 1966.

Building Control System in the Hashimite Kingdom of Jordan

According to the Jordanian Law No. 79 of 1966, the construction and contracting industry in the whole country is controlled by the Higher Regulation Council which is formed as follows:

a. The Minister as Chairman of the Council
b. The Director General of the Capital Municipality
c. The Secretary General of the Jordanian Construction Council
d. The Director of the Housing Establishment
e. The Director of Town and Village Regulation
f. The Head of Public Prosecution
g. The Chairman of Engineers’ Association
h. The Undersecretary of the Ministry of Health

There are other specialized committees and departments which look after the industry in towns and villages.

Figure (18) shows Town Regulation Authorities and their charts.
After a detailed study of the construction laws and systems of the Hashimite Kingdom of Jordan, the researcher has the following remarks in comparison with those of the UAE.

1. The law underwent amendments to bridge some gaps and to cope with the building and construction works in the Hashimite Kingdom of Jordan, despite the fact that it was still a temporary law.

2. The higher authority that undertakes construction control is at a ministerial level and the concerned Higher Council for Regulation subdivides into specialized committees.

3. The Law demands detailed regulation plans and series of measures have to be taken before regulating a housing area.

The Construction Law has got many positive points, however, the existence of too many committees slows down the application of the Law at the set time. The follow-up procedures may be time consuming and this impedes building and construction works.

On the other hand, when the Organizational Authority which controls building and construction in Jordan is compared with its counterpart in Dubai we notice the following:

1. The building and construction control in the Hashimite Kingdom of Jordan is at a ministerial level whereas in Dubai it is undertaken by the Housing Department, which is just a department in Dubai Municipality. The researcher sees that the Jordanian system is more effective and more decisive in solving problems and overcoming challenges because it is handled at a ministerial level which is not the
case in Dubai. Such problems may be referred to the Head of the Municipality and probably to higher levels of authority where they could be resolved.

2. The Organizational Structure in Jordan is represented by the Higher Regulation Council, which is subdivided into departments and committees. But in Dubai the Building Department is subdivided into sections (Government Housing Section – Building Control Section – Building Permits Section).

3. The Higher Regulation Council consists of the Minister as Chairman, Head of Capital's Municipality representing all municipalities, Council Secretary General, Manager of Housing Establishment, Town and Village Regulation Manager, Public Prosecutor, Head of Engineers Association and the Health Undersecretary.

In Dubai, there is no higher council but a Housing and Building Organization is headed by a Director and Heads of sections within the Municipality structure without the representation of any other institution as seen in the Jordanian Organizational Structure. The Jordanian organization allows for the resolution of problems and overcoming difficulties in coordination with other concerned institutions.

3. However, the Jordanian Organization is subdivided into Higher Council, Departments and Sections, which make transactions slow and time consuming. Whereas, in Dubai the finalization of such kind of transactions takes place within the Municipality departments and sections. However, this type of work namely building permits consumes a lot of time as stated earlier by the researcher.
Building Control in Hong Kong

Building control in Hong Kong has evolved considerably in the last 50 years in parallel with various aspects of urban development. The proliferation of high-rise buildings since the 1960's has a profound and far-reaching effect on building control. The formal introduction of registered structural engineer system under the Buildings Ordinance in 1974 marked the beginning of the new role of the authorized person as a coordinator rather than the single expert in building. This trend is further accentuated by the introduction of more formal geo-technical control mechanisms since 1976 which were prompted by several disastrous landslides. Industrial relocation to the Mainland in the 1980's made it possible to address environmental qualities posed by the industrial residential interface. Town planning became to be a significant direct factor in building control through comprehensive development. More recently, urban redevelopment has necessitated demolition of more high-rise buildings resulting in the need for more systematic safety management of all building works including demolition.

The evolution of building control in Hong Kong was shaped by the social and economic development through the urban development process and the technological advances. Exercising of building control in turn helped to shape development in these fields. According to the applicable laws in Hong Kong, building control is very strict and sophisticated. Tables (55) and (56) show the number of government departments involved in the matter. They also have the detailed procedures to be followed for examination and approval of land plots, designs and other elements and stages of construction.

(1) Building Control in Hong Kong, Paper Presented to the Fourth Congress of the World Organization of Building Officials (WOBO), held in Hong Kong on November 28, 1996.
Examination and approval are required both in the decision phase (Table 55) and in the preliminary design phase (Table 56). In addition, after feasibility study or some other related documents have been approved by local construction competent authorities, all construction projects should be declared to local construction competent authorities. Otherwise, formalities of bidding & tendering, construction permission certification could not be gone through; and any design institutes and construction companies could not carry on design and construction task.

The researcher closely studied building systems and control in Hong Kong. He drew a comparison during the systems and laws of the UAE and those of Hong Kong. Here are his findings in comparison with those of the UAE.

1. Building control and building development in both countries evolved interactively. Rapid economic growth and rapid population growth are the primary determinants in this evolutionary process. Hence, progressively higher standards in building safety and environmental quality have become economically viable and socially enforceable. Population and GDP growth together pushed up land prices, which provided the incentive for tall buildings. This necessitated more stringent control of the various aspects of building engineering and construction.

2. Prior to the starting of the approved building works, consent has to be obtained from the Building Authority. In granting either approval or consent, the Building Authority may impose conditions to ensure that the works are carried out in a safe manner, the works are carried out without endangering adjoining properties or the public, the works are carried out in compliance with the
approved plans and regulations, and the structural elements are verified with regard to their strength and suitability.

3. The building owner also has to appoint a registered contractor to provide continuous supervision to carrying out of the building works to ensure compliance with the regulations and with the approved plans and any conditions imposed. Although it is the responsibility of the building professionals to ensure and certify that the completed works are structurally safe and in compliance with the regulations, government officials also monitor the building works by carrying out site checks during all stages of works and a final check upon completion prior to the issue of an occupation permit.

4. The control system provides for the sanctions of prosecution and disciplinary action against non-compliance. The offences include, inter-alia, carrying out of building works without approval and consent, incorporating defective materials, deviation from the approved plans, misrepresentation, and carrying out of works in such manner that it causes injury or damage.

5. The organizational structure of Hong Kong includes a planning department, building department, legal department and other departments including fire services. As for Dubai, the Municipality organizational structure does not include fire services, which have always been the responsibility of the Civil Defence Department. Moreover, the construction systems in Hong Kong also include “Land Department”, but in Dubai the “Land Department” is an entity on its own.
Building Control in China

There are 41 different Ministries & Commissions responsible for the Chinese construction industry. State Planning Commission, State Science and Technology Commission, Ministry of Finance are government bodies closely related to the Chinese construction industry. Some other ministries possess their own design and construction force. These ministries include the Ministry of Energy Resources, Ministry of Railways, the Ministry of Communications, the Ministry of Machine-Building and Electronics Industry, the Ministry of Aeronautics and Astronautics Industry, the Ministry of Metallurgical Industry, the Ministry of Chemical Industry, the Ministry of Light Industry, the Ministry of Textile Industry and the Ministry of Water Resources, etc.

The construction sector in China is under the direct and close supervision of a special ministry called the Ministry of Construction. This government body establishes contact with relevant departments of other ministries cross-wise. This ministry nearly controls and follows up the minor and major affairs in the construction and building industry. This has been closely observed through the link association of the construction laws.

a) Functions of the Ministry of Construction

The Functions of the Ministry of Construction are to:

- draw up policies, laws and regulations, technical norms, development strategy, etc.

(i) WOBO Fourth World Congress, Hong Kong - ibid
- draw-up standard quota, economic appraisal method and economic parameter of feasibility study
- draw-up laws and regulations of bidding & tendering
- draw-up state or local land planning
- management of real estate industry
- other items handed over by the State Council, etc

Figures (19 & 20) show the organization chart for the Chinese Ministry of Construction and the procedure for capital construction project. The organization of the Chinese construction industry has got a good number of positive areas which may be compatible with the researchers' proposed model for the development of institutions within the industry in the UAE.

Outstanding among these points is that there are 41 different ministries and commissions responsible for the construction industry in China. However, the industry is under the direct and close supervision of a special ministry called the Ministry of Construction. The organizational chart of this ministry shows a variety of specialized departments, which look after all the aspects of construction and contracting. The functions of the Ministry are wide and watertight. The procedure for capital construction projects is cared for. They undergo careful studies and approvals in two phases; the decision phase and the implementation phase. China has succeeded in maintaining quality construction and safety for this industry where 90,000 qualified companies are involved.
Building Control System in Japan

Japan is an earthquake-prone country lying to the west of the circum-Pacific earthquake belt. Approximately, 70% of the land is either hilly or mountainous and the remaining 30% is alluvial land that contains most of the urban areas, and is subject to the impact of earthquakes.

Japan is also situated in the path of typhoons and many buildings are damaged by typhoons every year. Most of the urban areas in Japan can be regarded as a continuation of old towns where wooden buildings are densely packed. In such areas, dry air in winter, seasonal strong winds and foehn phenomena combine to produce many conflagrations.

The building control system in Japan is represented by the Ministry of Construction\(^{(1)}\) assisted by:

1. The governors of prefectures

2. The Head of the Municipality assisted by:
   a) The Municipal Council
   b) The Local Building Controller
   c) The Local Building Official

3. The Zone Manager who is assisted by:
   a) The Building Controller
   b) The Building Official

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\(^{(1)}\) WOBO Fourth World Congress – Hong Kong - ibid
The Law of Building Systems consists of:

a) Building Systems (codes)
b) Zone Systems (codes)

The purpose of the Building Standard Law of 1950 is to protect the lives and property of the public from disasters such as earthquakes, typhoons and fires.

The researcher again raises the question about earthquakes: Does the UAE lie in an earthquake-prone region? He hopes that the proposed model for the development of laws, and institutions within the construction sector in the UAE too will take the earthquake issue into account.

The researcher noticed that the building laws in Japan are favorably different from building laws in other countries he dealt with before. In addition to the earthquake issue, the Japanese laws give importance to modern technological advancements pertaining to the construction sector. The building laws of the UAE do not consider some other issues. Some of these issues are:

1. The protection against earthquakes and other disasters.
2. The protection of environment.
3. The balance struck in the administrative organization by the Minister of Construction and the governor of the prefecture who is assisted by:
   a) The Council for testing buildings
   b) The local council for Town Planning
4. In amending the law of building control there are good points such as:

a) Rationalization of energy in factories and houses.

b) Rationalization of building-related energy use.

c) The use of more efficient equipment and machinery.

d) Hygienic safety.

e) Fire safety.
Building Control in the United Kingdom

The laws governing the three building control systems in the United Kingdom are:

a) for England and Wales - the Building Act 1984
b) for Scotland - the Building (Scotland) Act 1959
c) for Northern Ireland - the Building Regulations (Northern Ireland) Order 1979

The Main purpose of the legislation is to enable regulations for securing the health, welfare, safety and convenience of persons in or about buildings and others who may be influenced by buildings or matters connected with buildings, and for furthering the conservation of fuel and power.

In projects other than small domestic ones, plans and specifications are usually prepared by an architect or chartered building surveyor, structural calculations being prepared by structural engineers. Other professionals may be engaged for specific work such as heating and ventilation and other services.

An architect's liability is restricted to actions arising from the lack of skill and care which may be reasonably expected by a client from a competent professional. In the housing market, owners of houses which have been inspected by the National House-Building Council receive a ten year warranty. This gives full protection against any defects in the first two years and against major structural defects for ten years.

(1) WOBO Fourth World Congress, Hong Kong – ibid.
The owner has the responsibility of ensuring that the building complies with the building regulations. If a contravention occurs, the local authority takes persecutions against the owner. The owner, of course, may seek redressal from the architect, and/or the builder.

The European Construction Products Directive was implemented in the United Kingdom by the Construction Products Regulations 1991 which came into force in December 1991. The building regulations in England and Wales require the use of proper materials which are appropriate for the circumstances in which they are used and the definition of “proper materials” includes materials which –

a) bear an appropriate EC Mark in accordance with the Construction Products Directive;

b) conform to an appropriate hormonised standard or European technical approval;

or

c) conform to an appropriate British Standard or British Board of Agreement Certificate;

or

d) conform to some other national technical specification of any member State which provides, in use, an equivalent level of protection and performance, with respect to the relevant requirements of the regulations, as an appropriate British Standard or British Board of Agreement Certificate.
The technical requirements of the Building Regulations for England and Wales are set out in functional terms in Parts A - N (see Table 57). For each Part there is an Approved Document giving guidance on how the requirements may be met. There is a separate approved document relating to materials and workmanship.

On 11 March 1996, the Prime Minister of the UK addressed representatives of small business. Among the matters he touched on in his speech were development planning and building control. "We shall start with planning and Building Regulations. You all know the story. You are expanding; but you and your builders are frustrated beyond belief as you have to talk to the planning inspector one day, the building control officer the next, then you find that the fire and health and safety officers want to know what's going on. And Heaven only can help you if it's a listed building!

So we intend to pilot a single "one-stop-shop". This will bring together all the different enforcers, including fire safety, environmental standards, listing, planning and building control, and coordinated approvals for all local authority rules on planning and development. After gaining experience from this pilot, we plan to adopt this approach more widely. I believe that, pretty soon, we can make this whole process a great deal simpler" said the Prime Minister of the UK.

The researcher closely studied the UK construction laws and system and tried to compare them to those applicable in the UAE, and here are his findings:

1. Routine work is required to finalise building transactions. This was clearly stated in the Prime Minister's speech referred to above.
2. The UK laws concentrate mainly on the common building designs in the country e.g. detached and semidetached properties and low raise flats.

3. In the UK a landlord has to refer to many departments in order to get a licence permit. It is also the case in Dubai where a building permit requires 120 days to be issued. This is evidence of routine work in both countries. It is worthy to note that the British system and code of practice are applied in some other countries.

4. The British are trying to change the administrative and legal frameworks to cope with the new construction laws so as to catch up with the European Community.

5. The system cares for quality of walls, blocks, thermal insulation, sheeting, coating... etc.

6. The construction industry is cared for at the highest official levels besides local authorities and committees.

7. The project owner shares compliance liabilities.
Building Control System in Singapore

In Singapore, the commencement or carrying out of building works is regulated by the Building Control Act (Cap 29) and the Building Control Regulations which are administered by the Building Control Division (BCD) of the Public works Department.

While the building plans are being processed by the BCD for compliance with the Building Control Regulations, additional copies of the building plans are submitted to the relevant technical departments or authorities for clearances. The typical technical authorities involved are as follows:

a) Fire Safety Bureau (FSB) regulating fire safety measures;
b) Central Building Plan Unit (CBPU) regulating sewerage, drainage, environmental health and pollution control matters;
c) Land Transport Authority (LTA) regulating street works and vehicle parking; and
d) National Parks Board (NParks) regulating tree planting, parks and open spaces.

The purpose of these clearances is to ensure that the technical authorities’ requirements are complied with in the building design.

The building and construction industry in Singapore is controlled by legislations of the following official authorities and departments:

(1) WOBO - ibid
Legislation Administered By The Various Authorities

<table>
<thead>
<tr>
<th>Authority</th>
<th>Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Building Control Division</td>
<td>Building Control Act</td>
</tr>
<tr>
<td></td>
<td>Building Control Regulations</td>
</tr>
<tr>
<td></td>
<td>Building Control (Accredited Checkers) Regulations</td>
</tr>
<tr>
<td>2 Central Building Plans Unit</td>
<td>Environmental Health Act</td>
</tr>
<tr>
<td>3 Fire Safety Bureau</td>
<td>Fire Safety Act and Fire Safety Regulations</td>
</tr>
<tr>
<td>4 Land Transport Authority</td>
<td>Street Works Act</td>
</tr>
<tr>
<td>5 National Parks Board</td>
<td>Park &amp; Trees Act</td>
</tr>
</tbody>
</table>

Conclusion

1. The building and construction system in Singapore is controlled by the Building Control Division of the Public Works Department.

2. Anyone who intends to carry out any building works must first submit building plans to the Building Authority for approval and thereafter to obtain a permit.

3. A qualified person must be appointed to prepare plans of the building and to be responsible for the supervision of building works during construction.

4. Additional copies of the building plans are submitted by the qualified person to the following concerned departments or authorities for clearance:
The building control systems in Singapore are comprehensive enough to cover environmental health, fire safety, parks and other aspects of modern building and construction industry.

After studying the building control systems in Singapore, the researcher has come to the following conclusions:

1. The Building Control Division in Singapore belongs to the Public Works Department whereas in Dubai the building control process is the responsibility of Dubai Municipality.

2. In Singapore a licence permit is issued by one department, the Building Authority but in Dubai a licence needs eight offices. This reminds the researcher of what the UK would like to adopt in the new system “One-Stop-Shop”.

3. It seems that the building laws in Singapore have overlooked the problems resulting from earthquakes common in East Asian Countries.
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6.(v) Work force Issues

In the seventies the construction sector mainly depended on unskilled work force. The Sector also adopted traditional building methods and techniques. This was due to the low wages of unskilled workers on the one hand and the high costs of modern equipment and high technology on the other hand. It was not easy to acquire modern equipment and technology or even manage them. Spare parts were not available and professional specialists were scarce. The result was poor maintenance for machines and equipment.

There was a fluctuating demand for labour force in all phases of work execution. This obliged construction and building companies to keep their work force in case any changes took place. Table (58) shows the fluctuating number of workers in the construction and building sector during 1975 – 1995.

The Construction Sector employed most of the work force hired by all the sectors of the country. The number of workers involved in the Construction Sector in 1975 was 93,800 and increased to 155,000 in 1980 due to the increasing number of construction projects in all the other economic sectors which flourished during the economic boom. This encouraged the contracting companies to employ plenty of labourers to execute many projects emerging at that time. As a result of this the rate of labour increase was 10.7% in 1980.

During 1980 – 1985 the rate decreased by 6.1%. In 1985 the number of workers was increased to 113,100. The number continued to fluctuate until 1990 when it increased to 119,230 and 125,934 in 1995.
The construction sector ranked above all the other sectors in terms of labour volume. This was attributed to the great volume of construction and building projects executed at the time. In addition to this, many companies — during the seventies — imported a lot of unskilled workers (for their low wages) to make up for lack of machinery and skilled workers who comparatively were to be paid higher wages. It is noteworthy that the decrease in labour volume especially in 1985, compared to the preceding years was attributed to the shrinkage in the construction business. In addition to this, contracting companies inclined towards application of modern technology, a matter that resulted in decrease of unskilled labour. On the other hand some new measures such as restricting importing migrant labour were taken by the government to curb the problem of unemployment in the Sector at that time, due to the existence of redundant workers in the country.

The construction sector showed remarkable development by employing a sizeable number of workers and the rate of increase was rising as shown in tables (59) and (60).

During 1968 – 1975 demand for labour by the construction sector markedly increased. The growth rate was 24.8% but demand for workers decreased during 1975 – 1980 due to the above-mentioned reasons.

During 1980- 1985 the rate of growth began to slow down until it reached 6.1%. There was absolute dependence on manpower at that time. After the adoption of modern technology the number of workers — especially unskilled workers — decreased. During 1985-1990 and the rate of growth began to rise a little until it became 1.1% and
remained stable during 1990–1995. Inspite of that, the Construction Sector ranked above all the other sectors with its labour force and work volumes.

Table (61) yields important insights. Work force was distributed among all sectors including the construction and building sector. The Construction Sector ranked above the other sectors in terms of labour employment.

Table (62) shows the percentage of the construction labour force versus the total work force in the country.

The Construction Sector continued to employ more labour and the percentage increased to 30.4% in 1975, then it fell to 28% in 1980 and began to slow down to 17.2% in 1990, and 15.6% in 1990. In spite of this fluctuation the Construction Sector employed a lot of unskilled workers in absolute terms but when development and prosperity prevailed, companies became more aware of workmanship and began to realize the value and merits of skilled labour who could apply modern technology. Consequently, the need for unskilled labour began to decrease.

The construction sector and all the other economic sectors began to employ more and more labour and this is reflected in the other sectors namely the government services, trade, hotels, restaurants, transport and storing. The rate of labour force employment fluctuated from time to time due to economic plans and projects. This is clearly seen in table (63).
Comparing the percentage of labour force employed in the Construction Sector to the percentage of labour force in all the other sectors, it is clear that the Construction Sector was very active and contributed effectively to all the economic aspects of the country. This percentage grew less in 1980 to be 28% of the total number of workers employed by all the other sectors compared to 30.4% in 1975. It grew lesser and lesser to reach a rate of 10.6% in 1985.

As for the other sectors, the wholesale and retail trade sectors ranked third in labour employment. The demand for work force increased by 1.2%, 7.5% and 1.4% in years 1980, 1985 and 1995 respectively.

We also notice that in transport and storing sectors demand for labour force increased in 1980 by 5.8%, then it decreased by 3.6% in 1985, and by 1.3% in 1990. The labour composition in this sector was 9.7% in 1995 compared to 10.4% in 1990.

As for the Government Services Sector, the demand for labour was reduced by 2% in 1980, increased by 5% in 1985 and 36% in 1990.

Before we finish this analytical study of labour volume and rate of labour growth and demand and comparing them to the other economic sectors, let’s sum up or pinpoint the above mentioned findings.

- The construction sector has ranked first in labour force employment since 1990 but in 1995 the government’s services sector ranked higher but with a slight difference of 0.1%.
Labour demand began to grow less after the seventies especially after the adoption of modern technology which reduced the absolute dependence on manpower as it was the case in the seventies when there was heavy dependence on unskilled labour.

The construction and building sector began to depend on modern machinery and equipment besides some skilled labourers.

The construction sector contributed sizably to the economic development and growth in the country at both the levels of labour employment and gross domestic product level.

Table (64) shows the distribution of labour force employed by the Construction Sector in each of the seven emirates during 1985 – 1995, as follows:

Abu Dhabi:

The percentage of work force employed in the Construction Sector in 1985 was 25.2% of the total work force in Abu Dhabi but declined to 24% in 1990, and 22.7% in 1995. Despite this decrease, the volume of labour force in the Construction Sector in Abu Dhabi was still the largest compared to the other emirates.

Dubai:

Between 1985 and 1995 the work force employed in the construction sector in Dubai gradually declined as a percentage of the total work force, from 14.1% in 1985 to 12% by 1995.
Sharjah:

Sharjah ranked third after Abu Dhabi and Dubai. In 1985 the labour composition in construction was 10.6% of total labour force in the emirate and continued to decline to 9% in 1990 and 7.6% in 1995.

Ajman:

The labour force employed by the Construction Sector 1985 was 16.6% of the total work force employed by other sectors in the emirate. Ajman was not an exception in terms of labour fluctuation. In 1990 the percentage was 12.3% but in 1995 it declined to 12.1%.

Um Al Quwain:

The situation here was similar as compared to other emirates. In 1985 the percentage of construction work force was 24.1% of the total work force in the emirate but this percentage decreased to 23.1% in 1990 and slightly increased to 23.7% in 1995.

Ras Al Khaimah:

In 1985 the sector employed 6891 workers i.e. a percentage of 15.6% of the total work force in the emirate. Like other emirates the percentage fluctuated until it reached 11.3% in 1990 and decreased to 8.1% in 1995.
Fujairah:

In 1985 the construction work force was 23.2% of the total work force employed in Fujairah. In 1990 this figure declined to 18.5% and 14.8% in 1995.

The proportion of the construction work force to the total work force in any of the seven emirates was never stable. It always fluctuated according to the economic conditions in the country and the whole area in general.

Despite this fluctuation, the construction sector always employed the biggest proportion of work force and played a vital part in the economic development of the country. It also contributed to the employment of labour and consequently it contributed to the gross domestic product of the country.
UAE National Work force within the Construction Sector

Guided by the available economic indicators and statistics, the researcher could cast some light on labour force of all sectors in the UAE. In this section he is going to deal with the UAE national work force, its volume and to what extent it has contributed to the growth of the Construction Sector. It is worthy to note that despite the painstaking and lengthy studies, it was too difficult for the researcher to find direct resources that provided information about the UAE national work force. The researcher had to refer to the population census through which he could obtain some figures and information about the volume of the national work force involved in the Construction Sector.

The Federal Law Number (8) of 1980 regulates labour relations in the private sector in the UAE\(^{(1)}\). Article 9 of this law stipulates, “work shall be inherent right of nationals of the United Arab Emirates. Non-nationals may not perform work within the state otherwise than subject to the conditions specified in this law and the orders made thereunder”. Article 10 specifies that “where national employees are not available, preference in employment shall be given to (1) Arab workers belonging to an Arab country by nationality and (2) workers of other nationalities”. However, the law didn’t provide for any regulations to respect these priorities.

Analysing the data on nationalities the researcher, however, found that most of the workers employed were migrant workers and the national work force in the Construction Sector constituted a small minority.

Table (65) indicates the percentages of the national work force and its proportion to the total work force of the UAE as follows:

In 1968 the national work force involved in the Construction Sector constituted 10% of the whole work force of the sector. During the economic boom there was economic prosperity for both the private and public construction sectors. This encouraged many nationals to become owners of construction companies instead of being mere skilled or unskilled workers in other companies. The percentage of the national labour force began to decrease as compared to the total labour volume in the construction and building sector as follows:

- In 1975 the percentage of the national labour in the Construction Sector was 2.4% of the total work force involved in the Sector.
- In 1977 the percentage of the national labour in the Sector decreased to 2%.
- The percentage continued to decrease until in 1990 it became only 0.4%.
- The number of national work force in the Construction Sector was 212 workers i.e. 0.2% of the total work force.

The foregoing analysis reveals the following:-

a) The number of labourers involved in the sector fluctuated according to the economic and political conditions (e.g. oil prices), which were influenced by similar conditions
in the Gulf region. Sometimes, they had their negative impact on economic growth and development.

b) The number of national labourers was very small during 1975 – 1995, however it continued to decrease due to following reasons:

- The availability of employment chances in other economic sectors encouraged many national workers to join those economic sectors especially the public sector. Just as in Britain, the construction industry is seen as a dirty and somewhat dangerous place to work and few young Emiratis choose a career within it. This image problem and the practices, which have created it, need to change if Emiratisation is to spread into the construction industry.

- Many of those national workers became owners of construction and building companies and consequently they no longer worked as labourers in the sector.

- Many of the national workers joined the construction and building sector in the years that preceded the economic boom.

- Now-a-days a few national workers are still involved in the Sector.

- The increase of expatriate work force in 1968 had its impact on the rates of work force at that time.

(1) The UAE Construction Industry: Lessons to be Learned from the UK, Britain in Business (The magazine of the British Business Group) Dubai, Spring 2002.
According to the statistics released by the Ministry of Planning and the UAE Central Bank the performance of the Construction Sector continued to be active during 1995 – 2000 as well.

Table (66) shows the value of construction, its contribution to the GDP and the size of the work force involved in the construction sector during 1995 - 2000 (1).

The table shows that the number of workers increased from 154,600 in 1995 to 160,700 in 1996 registering a growth rate of 3.95%. The proportion of work force was 15.3% of the total size of the UAE entire work force, thus ranking second after the Retail and Wholesale Trading Sector. In 1997 the number of workers involved in the Construction Sector increased to 251,600 constituting 18% of the total gross work force, thus ranking first of the country’s sectors in terms of work force size. The number continued to rise until it reached 257,300 in 1998 with a growth rate of 2.2%. The Construction Sector continued to rank first in 1999 as well. The composition of its work force size was 18% of the total gross number of workers, with a growth rate of 2.1% compared to 1989. In the year 2000 the number of workers was 267,300. The Construction Sector thus ranked second with 16.5% of the total work force of the country.

However, the two big questions the researcher is still raising are (1) What is the percentage of the national work force employed by the Construction Sector so far? (2) What is the effect of migrant labour force on the Sector in terms of productivity?

Influence of Work Force on the Construction Sector

As discussed in earlier chapters, the researcher designed a questionnaire featuring a sample of 52 contracting companies operating in the seven emirates of Abu Dhabi, Dubai, Sharjah, Ajman, Ras Al Khaimah, Um Al Quwain and Fujairah. The analysis of this survey has shown that there are three main categories of work force involved in the construction sector, the Arab work force, Asian work force and other foreign work force. They are all involved in the construction sector in different degrees. In terms of size, the Asian work force ranks first, followed by the Arab work force, then the other foreign work force. Table (67) shows the percentage of each work force category in the UAE during 19975 – 1995.

The survey findings and Table 67 convey the following:

a) The Arab work force comparatively decreased during the seventies and nineties by 19%. The Asian work force on the other hand increased by 5.6% - compared to the base year. The other foreign work force was a small portion in the two periods.

b) The Asian labour was mainly concentrated in the Construction Sector and consisted mainly of unskilled workers therefore, the Sector faced some difficulties in terms of productivity and increase of the Asian workers when compared to the Arab or Foreign workers.
One of the common problems the contracting sector used to suffer from was the productivity problem. Table (68) shows survey analysis of productivity. The Construction Sector in the UAE still suffers from poor productivity.

a) 50% of the owners of construction companies viewed the productivity level of the Arab labour as “Fair”, while 50% viewed it as “Excellent”.

b) 19.2% of the sample believed that the Asian work force was “Poor” in terms of productivity. 61.5% of the employers believed that the level was “Fair”. On the other hand 19.2% believed the level was “Excellent”. This means that most employers believed that Asian workers were “Fair” in terms of productivity.

c) 70% of the sample (i.e. a majority) believed that the level of productivity of the other foreign work force was “Fair” while 20% of the sample believed that the level was “Excellent”. Only 10% of the sample believed that the level of productivity was just “Poor”.

The productivity issue from the contractors point of view can be evaluated as follows:

- The productivity of the Asian work force is still below the required level. Although, it is considered “Fair”, it fails to promote or benefit the Construction Sector. The construction sector is always in pressing need of quick and professional completion of work to hand it over at the set time.
- The Arab work force is considered a type of active labour despite its decreased existence in the sector.
- The other foreign work force is regarded as fair but the number of its workers is small as compared to the number of Asian workers.
The problem of productivity is one of the main problems that the Construction Sector continues to suffer from.

The foregoing analysis shows that most of the labour force in general and most of the Asian workforce in particular has poor or fair levels of productivity. The implication is that contracting companies usually fail to hand over buildings in time.

Table (69) shows the level of labour skills in the Construction Sector and following are the survey findings:

a) Arab Workforce

According to the contracting officials the Arab work force enjoys “Fair”, “Good” or “Excellent” levels of skill. 40% of the total sample believed that the level of the Arab work force is “Fair”. 30% think that it is “Good” or “Excellent”.

b) Asian Workforce

42.9% of employers believe that Asian work force skills are only fair and cannot be considered high. Asian workers are not competent enough to meet the current requirements of the contracting industry. This is a real problem for employers who would like to promote their business through adoption of modern technology. Due to the lack of skilled Arab and other foreign workers, construction companies are obliged to hire workers with lower skills and competencies in order to execute the projects entrusted to them.
c) Other Foreign Workforce

50% of the total sample believes that other foreign workers have the required skills and competencies. The level is evaluated as "Good". On the other hand 40% of the total sample believe that their level is "Excellent" in terms of skills, while 10% of the sample evaluated the level as "Fair".

In addition to the problems of productivity and skills, the Construction Sector faces some other labour problems. One of them is the negative impact of migrant labour on the demographic structure and security of the country. (1) There are also tens of thousands of unemployed people, either illegal residents or construction workers who have lost their jobs as a result of recession.

The Director General of the Dubai Immigration Department has recently stated that around 200,000 people are illegally residing in the UAE. Most of them are unskilled workers (construction and service sector labourers) overstaying on their residence visas or who have illegally entered the country. To resolve this problem the official called for granting those illegal residents a new grace period like what happened in 1997, when around 250,000 trespassers were allowed to leave the country without being penalized.

The influence of migrant work force on the demographic structure is indicated in table (70) and the following are the survey findings:

a) Arab Labour

53.8% of the sample believe that the impact of Arab labour on the demographic structure is "Little", 42.3% of the sample think it is "Fair". This might be attributed to the fact that both the Arab workers employed in the country and the UAE nationals nearly have the same culture, but it is not the case for Asians or other foreigners whose customs and traditions are very different.

b) Asian Labour

Many employers agree that Asian labour has its high impact on the demographic structure and creates a sort of inconvenience to the Construction Sector. 88% of the sample respondents think that the construction sector should find a solution to this problem. Something has to be done to enable the sector to overcome such drawbacks and become an effective sector that can operate hand in hand with the other economic sectors without any negative influence on the society.

c) Other Migrant Labour

The survey showed a little impact of other migrant labour on the demographic structure. 61.9% of the sample thinks it has a "Little" impact while 33.3% think it has a "Fair" impact.

Stability and security are very essential for any society so as to be able to attain the aims of its development plans. The security of any country in its turn provides a congenial environment for local investments and allows other sectors to grow and flourish under a safe and secured political umbrella.
The researcher is evaluating the impact of foreign work force on security in the light of his own experience and that of other similar employers of the UAE. Table (71) indicates the researcher’s findings in this connection and the data provided in the table reveals the following:

a) Arab Labour

32% of the sample believe that the Arab labour has no negative impact on security. On the other hand 56% of the sample believe that it has a “Little” impact; only 4% believe that its negative impact is “High” and 8% think it is “Fair”.

b) Asian Labour

75% of the sample believes that the negative impact of Asian labour on security is “High” while 20.8% of sample believes its impact is “Fair”.

c) Other Foreign Labour

24% of the sample believes that other foreign labour has no negative impact on security. On the other hand 28% of the sample believes that it has a “Little” negative impact while 4% of the believe that its negative impact is “High”.

The foregoing analysis indicates that the Arab and other foreign workers are more skilled than Asian workers in all the areas covered so far. However, due to the shortage or lack of national, Arab and other foreign workers and due to their high wages, contracting companies are in favour of Asian labour force despite the problems and drawbacks it creates.
In the light of his detailed studies as well as his own experience as the owner of a contracting company, the researcher has reached the following conclusions as far as the negative effects of foreign labour force is concerned:

- Foreign work force absolutely predominates over the contracting sector in the UAE.
- Migrant work force mainly includes unskilled workers who can only use low technology, which necessitates the employment of a large number of workers.
- Contracting companies because of their low wages prefers migrant workers.
- It is not easy to measure the unskilled worker's productivity, which allows some companies to import exaggerated numbers of workers who exceed their needs and who may not be involved in the industry at all.
- The increasing number of unskilled and unemployed foreign workers puts more pressure on public utilities and services like healthcare, means of transport, water and electricity supplies.
- The foreign work force predominance in middle level jobs has restricted the UAE national work force to administrative jobs thus alienating them from production and handicraft areas.
- Hiring of unskilled workers results in early deterioration and collapse of buildings due to poor quality workmanship and the need for frequent maintenance, which further adds to the need for more work force and more expenses.
- The lack of mechanization, standardized technical codes, labour qualification programmes, labour assessment systems and labour classification has made it difficult for contractors to enforce quality codes of practice.
- Migrant work force has its negative impact on security and causes demographic imbalance in the country.
Chapter 7

Discussion of Findings
7.(i) Planning and Coordination

Planning plays a vital role in the development of any sector. It helps in reducing losses and increasing profits. Planning for the Construction Sector, as well, is very essential. It goes without saying that the sector plays an effective and dynamic role by contributing to the gross domestic product of the country, enhancing the other sectors and ensuring employment for the country's workforce.

The researcher believes that any construction process should depend on planning, research work and study. This will gradually lead to real enhancement of the industry in the long run. The golden advice is that serious contracting companies that desire to export their services should adopt advanced planning methods to draw up their strategies, policies, exportation plans and objectives. The success of this strategy depends on the careful study and analysis of the available opportunities and the hazards existing in the local, regional and international external environment. It needs even more accurate analysis of the weak and strong points of the internal structure of the administrative system and human resources of the enterprise. Exportation strategies should be drawn up in the light of all these variables to enable the enterprise to compete successfully in overseas markets.

What is planning? Planning could be defined as follows: "It is a set of economic expectations and aims to be attained by means of certain aids within practical harmonious frameworks."(1) According to this definition a plan can be drawn up partially or wholly.

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Charle Benlheim defines a plan as follows: “A set of procedures to carry out a certain project”. This definition implies the general – not only the economic – concept of a plan with the following two basic points:

- The project (aim) we strive to attain or fulfill.
- The corporate actions directed to the attainment of aim i.e. defining the means.

Charle Benlheim again defines the economic plan as follows: “It is a group or set of measures to carry out a project of importance for the economic activity”. Thus, we can conclude that there can be production plans, distribution plans, investment plans and so on.(1)

Guided by the above definitions, the researcher is trying to draw a plan for the Construction Sector to attain an ultimate goal which is the development of the construction and building industry in the UAE. It is worthy of note that one of the components of a plan is the time element, which is usually estimated according to the problem under consideration. In a macro sense, plans are of three levels:

a) A Short Term Plan

It is a plan aiming at the realization of a financial and cash balance in the national economy. Its duration is usually one year.

(1) Dr. Bakry Jamil Al Nasser – ibid.
b) A Medium Term Plan

It is basically an economic development plan. The attainment of its aims is greatly affected by the volume of the national product allocated for investment. The duration of this type of plan is from two to seven years which, in most cases, is usually better than four or five years.\(^1\)

c) Long Term Programmes or Plans

If we need five years to calculate the economic expenses of development or growth and the volume of investment, the time needed to recognize the output of this investment and its social outcome will – no doubt – be much longer. In fact the moment the plan is approved, its domains are automatically outlined by capital allocation to place it inside the economic circle in the form of investments until there is a need for alternation.

For some fixed capitals especially buildings and infrastructure/service investments (dams, roads, bridges – airports and sea ports) duration may exceed 50 or even 100 years. On the other hand most of the directly manufactured equipment should be outside the economic circle before a period of 20 – 25 years. Generally speaking, the expectations of such plans are liable to face the problem of inaccuracy and uncertainty.

The longer the time duration, the more the hazards are, because these expectations are affected by the external variables which play a greater role in this respect and the planner would not be able to draw a plan with a very long duration.\(^1\)

\(^1\) Dr. Bakry Jamil Al Nasser – ibid.
It goes without saying that the preparation of the above three types of plans on special technical bases does not mean that they can replace one another. In other words these plans are not to be placed before the planner or the economic expert to choose one of them.

The relationship between them is a matter of integration rather than replacement. They are all important elements of sound planning. Each of the three types is necessary and should be planned to complement each other because each one has a distinguished function in the planning process as follows:

- A long-term plan defines the general orientation of the economy. In other words it is indicative of the direction of the economy.
- A medium-term plan defines the investments needed to translate the general orientation of the economy defined in the long-term plan.
- The short-term plan defines the means needed to overcome the impediments resulting from unexpected changes and to direct the national economy towards the areas of development as defined by the long-term and short-term plans.

On the other hand medium-term and short-term plans are regarded as practical ones because they include instant applicable procedures whereas long-term plans are regarded as a means and a guide on planning medium-term plans. That is why some planning specialists call the long-term plan "the long-term" programme.

To benefit from these types of plans, the researcher started by drawing a short-term plan through which he could overcome the obstacles and problems facing the construction sector. He prefers to draw a medium-term plan of no more than ten years.
It is even divided into short phases to be easy for the planner to follow-up and assess the achievements of the Construction Sector in the UAE.

The researcher has adopted the following procedure and phases:

1. Identifying the needs and resources available in the country.
2. Stating the general aims of the plan.
3. Preparation of the plan.
4. Approval of the plan and submitting it for implementation.
5. Implementation, amendment and assessment of the plan.

The following are the five phases in detail.

Phase 1: Identifying Available Needs and Resources

Identifying the needs and resources available allows for the recognition of the national economic activities in the field of construction and building. This stage usually ends with a very detailed report prepared by the planner and to be submitted to the Economic Authority\(^{(1)}\). This detailed report usually includes the following:

- A detailed study supported by accurate statistics of the most suitable option for the national economy for the future period and within the geographical aspects required by the Construction Sector. This study describes the economic plan of the state, its options and its variables.
- It also includes the tools, which should be adopted to attain the aims at the required speed. It also includes a detailed analysis of the expected results and their influence on the welfare of the society.

\(^{(1)}\) The Economic Official is the proposed model to take over the affairs of the construction and building sector.
Phase 2: Stating the General Aims of the Plan

The planning authority usually sends the first phase report to the executive authorities to negotiate with them about this report and the dialogue ends with stating the general aims of the plan.

Phase 3: Drawing Up the Plan

The decisions taken by the Economic Authority gives the planner a general idea about the intended aims. After that the planner starts to match these aims and expectations with the available resources taking into consideration the available technical capabilities and facilities.

Phase 4: Approval and Final Endorsement of the Plan by the Economic Authority

It goes without saying that the role of planning departments should be exclusively technical. They are usually asked to propose decisions for the Economic Authority on scientific and practical basis. A plan will not become a project unless it is approved and endorsed by the Economic Authority.

Phase 5: Plan Implementation

Application or implementation is an essential step in the planning process which is greatly affected by the nature of the prevailing economic system. The phase of application and implementation is usually easy where there is a well planned economic system for all the state economic activities and where all means are put to good use for implementing the plan. It is in this phase that there is matching between the economic
circumstances and conditions on the one hand (booms, slumps, stagnation, prosperity) and the plan on the other hand. The economic conditions are a set of unconventional changes of the economic activity in a geographical domain in a period of time\(^{(1)}\). It is then the actual movement of the economic events after excluding conventional changes.

We can then say that there is a reciprocal relationship between a plan and the economic conditions. A plan affects the economic conditions and tries to control them a matter that once again impacts the economic conditions leading to amendments in the plan. The result is something that represents economic conditions and the planned development together.

Before embarking on a plan to develop the construction sector in the UAE the researcher would like to cast some light on the UAE strategy in the field of construction and building.

\(^{(1)}\) Dr. Bakry, Jamil Nasser, Models of Economic Development Plans, Dubai Printing Press, 1982
7.(ii) Follow-up and Assessment

Follow-up

At present the Construction Sector is divided among ministries and municipalities. There is no one specific institution to deal with, as far as construction and building transactions are concerned. This fact has made it impossible to make a comprehensive plan or a follow-up schedule to make sure that the plan is implemented smoothly.

We should not forget that follow-up also includes how far the laws and regulations are applied and how much of the plan has been carried out without any delay. We can safely say that follow-up work provides enough data about work, reduces the element of risk and covers rules and taxes, procedures of public tenders, sponsorships, labour, wages, building equipment and international competitions. This will also help the Contractors' Association to contribute to the enhancement of the construction industry to prepare contractors for international competition. The Contractors' Association or any concerned institution can put the available data to good use to encourage the state to accept new forms and levels of competition. It can also submit reports on new policies and strategies.

The Contractors' Association, the Ministry or any concerned institution should conduct research and development work to enhance construction technology. That is why the researcher recommends that official institutions that look after the construction sector should select and specify the aspects that need improvement and upgrading. These aspects could be construction economy, administration systems, quality control, labour education and equipment management and manipulation. These areas could cover all aspects of civil engineering, electrical and mechanical work which would enhance
contractors' capabilities in these technical domains and improve their competition skills in local and international markets.\(^{(1)}\)

It is imperative to differentiate between the term “Follow-up” and the term “Control” which is one of the most common terms in scientific applications. However, the term “Control” remained without a clear definition for some time. One of the definitions of the term “Control” is that “It is the verification of work execution in accordance with plans and instructions, objectives and rules to find out errors and correct them to avoid their repetition.\(^{(2)}\)”

On the other hand there is the very common term “Follow-up” which could be defined as “The permanent and continuous recognition of the enterprises activity, the progression of its work, estimating its success or failure and comparing it with the proposed criteria. To define the basic function of “Follow-up”, we can say, “It is the administrative function through which we can evaluate the status of management, compare it with what should be existing and bridge the gap between the two cases as far possible as we can.”

Dr. Ali Al Silmi also tried to sum up the main difference between “Follow-up” and “Control” as follows: The difference between “Follow-up” and “Control” is a difference in time on the one hand and a difference in aim on the other hand. “Follow-up” aims to find out errors before they take place and prevent them. But “Control” aims to recognise the mistakes that have taken place and correct them.” \(^{(3)}\)

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\(^{(1)}\) Developing the Arab Contraction Sector, a Study Attempted by the Arab Contractors' Federation (Casablanca) and the Arab Fund for Economic Development – (Kuwait), Sept.1991,p.418


\(^{(3)}\) Dr. Qubaissi, Amir – ibid, pages 149-150
It goes without saying that “Follow-up” is a means to an end but it is a daily administrative function adopted by not only managers as some people think, but also by all employees. A good employee follows up his own work and achievements and those of his seniors and subordinates owing to the interdependence and interrelation of all the administrative levels of the enterprise. It is like a mirror which people look at not only to see themselves and check the quality of their work but also to review others’ opinions about their own performance and achievements.

To put an end to the prevailing traditional techniques and practices of control in work and in order to avoid losses, to reduce production costs and to avoid deviation from what is right we propose the following aims for follow-up and assessment in the construction sector: (1)

a) Collecting data and compiling facts and statistics on the activities of public firms and their achievements in order to draw a comparison between what has been achieved on the one hand and what is expected to be achieved on the other hand and to draw more realistic future plans and programmes.

b) Avoiding errors and exerting efforts to reduce amercements, strangulation and matters that widen the gulf between what is there and what should be there.

c) Analysis of problems, finding out points of weakness, and areas of congestion, identifying points of inconvenience and the reason behind them and proposing solutions and remedy.

(1) Dr. Amir Al Qubaisi – ibid, pages 149-150
d) Making sure that laws, regulations, instructions and by-laws are in harmony with the surrounding circumstances and facilities available and that they are complied with for public interest.

e) Investing available efforts, energy, capabilities and mobilizing them to attain aims efficiently and effectively.

For fruitful follow-up of the performance of all the enterprise elements, due regard should be given to all the above aims and the following points:

a) Lack of follow-up and absence of control to the extent that cause confusion and mess are always for the interest of lazy and unindustrious employees. On the other hand strict (perhaps exaggerated) follow-up that does not adopt scientific techniques does not work in favour of loyal efficient employees and minimizes their innovative creative abilities.

b) The more the branches of an enterprise expand and subdivide and the more levels of management and employees they have, the more follow-up the enterprise needs. In this case the relation between employees and the central authorities weakens, thus the need to follow them up becomes pressing.

c) Effective follow-up work takes place only through qualitative and quantitative measures and criteria. But follow-up work through descriptive and guessing details may be beneficial in some cases if those who experience it have got enough experience.
d) Since the planning process is concerned with future and prediction, the follow-up of plan implementation is an on-going process. It must be closely associated with the planning process. Most of planning institutions all over the world are linked and connected with follow-up institutions. Many a times the follow-up process ensures accurate data, which help planners to draw better plans. It is well known that a plan by itself cannot force people to implement it unless it is put under effective follow-up.

Whatever follow-up methods there are, still they all need answers to the following questions:

a) Who is to do the follow-up? In other words which institutions should shoulder this responsibility?

b) What is to be followed up? The answer to this question should cover all types of activities to be followed up.

c) How to follow-up? (What are the methods and techniques?)

d) Why do we follow-up? I mean what is the purpose of and rationale behind any follow-up process?

e) When to follow-up? It is imperative to have a schedule for follow-up work.

This is the sort of follow-up activity that should be adopted by the construction and building sector. Some follow-up tasks could be entrusted to the Contractors' Association or a special institution for the Construction Sector in the country. This follow-up work should aim at finding out any disorder, problems or points of weakness and try to overcome these shortcomings. Its ultimate goal should be making a plan run
its course. Planning whether at the private sector level or the public sector level needs follow-up work. This has enabled the researcher, to speculate for some time searching for the best follow-up methods and how to apply them to the construction and building sector in the UAE which is really in need of a public institution to put it under supervision.

Assessment

The Construction Sector is the foundation of overall development of the country. It plays an essential role in the execution of construction, production and service projects and all other projects. It shoulders the heaviest responsibility of the infrastructure and public utility projects.

In the UAE, the Construction Sector is leading the construction boom. It has always been one of the pillars of civilization in the country. The sector has dramatically developed enough to shoulder its historic responsibilities represented in the construction of all the country's public utility projects such as bridges, roads, service buildings, residential units, factories, electricity networks and many other construction projects.

The total number of construction companies in the UAE in 1995 was about 5355 companies – a matter that invites us to follow-up and assess the construction sector in relation to the following:
a) The Public Sector

b) The institution that looks after the sector

c) Contracting companies

a) The Public Sector

The public sector, represented by the government, undertakes the assessment of all the economic sectors including the Construction Sector. This usually takes place before drawing an overall development plan for the whole country. The concerned institution, namely the Ministry of Planning undertakes the evaluation of the Construction Sector in the following issues:

- contributing to the gross domestic product
- ensuring employment
- enhancing other sectors

By the word “achievements” we also mean all the projects executed by the construction sector according to the plans of the government and the public sectors. We also mean its ability to adopt modern technology, employment of skilled labour, labour productivity and organizational status. In the seventies, the number of the newly established national contracting companies was beyond expectations. Each company was vying for its share in the construction and building Gulf region market in general and the UAE market in particular.\(^{(1)}\)

It was not a surprise then to notice the hazards resulting from this conflict. The result was:

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\(^{(1)}\) Project Preparation and Assessment, Paper Presented to a Seminar held by the Omani Chamber of Commerce and Industry in 1993, p.1
• high internal competition
• low tender offers to attain out-bidding
• lack of development through modern technology

As far as modern technology is concerned national contracting companies began to introduce technical applications only in the nineties.

After the assessment of the Construction Sector in the country and in the light of the data yielded by related studies it was found out that employment of skilled labour was below expectations. The contracting companies all over the UAE were employing unskilled workers. One of the questionnaires devised by the researcher showed that the skills of most workers were estimated as “Fair”. Only foreign workers were estimated as “Good” and their percentage was only 5%. It is worthy of reconsideration to assess the employment of skilled labour in the Construction Sector again. This might be undertaken by the concerned institution proposed by the researcher.

On the other hand it is very important to assess labour productivity because it is essential for the following issues:

• handover dates
• quality of work
• ability to gain more contracts and tenders
The work conditions of any contracting company heavily depend on its organizational structure and how far this type of organization can cope with the tasks entrusted to it. It also depends on the skills and expertise of managers, chief administrators and other employees.

The assessment of this area aims at ensuring the main posts needed for construction work and that the official-in-charge of each sector is efficient and qualified enough for the job.

To carry out this type of assessment each contractor will be given a questionnaire and an attached form to be filled out. A contractor fills out the form detailing information about himself, the organizational structure of his company and the departments, divisions and sections responsible for the following tasks and activities (as a few examples):

- Planning and strategies
- Marketing and exportation
- Preparation for technical offers
- Quotations
- Reviewing and managing contracts
- Purchases
- Execution timetables
- Preparation of claims
- Clients’ bill
- Costs control
- Quality control
- Employment (engineers and managers)
- Engineering plans and solving technical problems
- Managing equipment
- Managing stores
- Managing field operations
- Safety

b) Institution Looking after the Construction Sector

The institution looking after the Construction Sector should undertake the assessment of the sector to find out the levels of contractors and classify them as follows:

- General Contractors
- First Class Contractors
- Second Class Contractors

The assessment process may include some other technological skills like the use of computers. A successful contractor must be able to make use of computer programmes in an effective way in many tasks and activities. To show how far computers are put to good use the following list of areas may be considered (1):

- Word processing
- Office publishing
- Accountancy
- General ledger
- Salaries

(1) Arab Contractors Federation – Casablanca – the Arab Socio-Economic Fund – Kuwait – ibid, page 328
- Costs
- Budgets
- Issuance of bills
- Work scheduling
- Quantity calculation
- Engineering calculation
- Designs and plans
- Store control
- Equipment management
- Personnel management
- Archive and correspondence

There should be a Project Management Board consisting of permanent project managers. It is considered the crux of the matter and the basis of success of a contracting company. This board may not include a large number of people because the number of project managers should not exceed the number of the existing projects. This board should include a full-time engineer.

On the other hand there should be a Central Unit for Work Programming and Follow-up. It should assess the whole work of the company including professional units of each project. It also provides computer programming systems. The assessment of this area should cover the following:

- qualifications of the officials in charge
- permanent staff
- computer systems
In the case of a general contractor, the staff should include an engineer with a long experience not less than 10 years; 3 years at least in the field of contracting and another 3 years in scheduling besides another engineer working under him with an experience of 3 years as a system analyst. As for the computer system, it should consist of a set of upgradable computer programmes.

Assessment should also cover the contractors' aptitude in general. By "aptitude" we mean the set of characteristics that evidence the contractors' reliability, credibility and achievement capabilities. To measure these characteristics, assessment should review the contractors' years of actual practice, the firm experience and the ability to execute projects in accordance with contract time, technical specifications and terms.

However, assessment leaves a lot to be desired because physical achievements should be taken into consideration. This type of assessment depends on the following:

- annual average number of executed projects.
- number and volume of executed projects, (this is also evidence of productivity and ability to bear financial risks)

The following is a summary of the assessment criteria:

1 - Status of the Enterprise:

The chart of the organizational structure mentioned before should include specific responsibilities and duties of managers.

2 - Specifications of expertise of the principal posts.

3 - Technical engineering competencies:
- Number of permanent qualified staff.
- Average years of experience for university graduates.
- Average years of experience for non-university graduates.
- Studies office, staff number, years of experience, central unit for work programming and progression follow-up.
- Engineer-in-charge, whose experience in construction should not be less than his experience in programming.
- System analyst and his ability to use programs and computer systems mentioned before.

4 - Aptitude

- actual years of experience
- total years of experience of 10 managers working for the company during the past 10 years.
- total years of experience of 5 managers working for the company during the past 8 years.
- total years of experience of 2 managers working for the company during the past 4 years.
- achievement according to specification and time.

5 - Achievement:

Ensuring that the standard of annual achievement is never less than before.

6 - Financial Status:

- proportion of cash
- proportion of receivables to assets
7 - Qualitative Assessment

It includes visiting offices and sister building companies and assessing any other information provided by the contractor. In addition to this the institution that looks after the construction and building sector would assess the following aspects:

- coordination and its effectiveness
- laws and legislations
- tenders
- care by the government to the sector

c) Contracting Companies

The researcher has so far shown how the Public Sector or Institution looking after the Construction Sector should be able to assess the Sector's achievements and the resulting outcomes of these achievements as well as the contractors' levels and standards. In addition to that, he discussed the importance of assessment for the contracting companies themselves in that it enables a company to assess its construction projects so as to streamline and improve its work. It also enables a company to assess its tenders and offers in terms of ability to finalize work and hand it over in a favourable professional condition.

In order for any contractor to fulfill a task according to the above mentioned criteria assessment should include the following aspects: (1)

1. Administrative Abilities: they enable a contractor to manage and execute a project within the allotted time.
2. **Financial Planning:** it helps a contractor to get the financial support needed for projects.

3. **Project Management:** it means the organization needed for building sites and ensuring quality.

4. **Office Management:** it is the convenient technical management including public relations that enables a company to ensure competitive prices.

If these abilities, resources and services are lacking, project evaluation will delay due to the shortage of labourforce and building materials required for the project.

The Administrative abilities could be defined as the abilities to manage all the resources available inside and outside a company. In order for a contractor to be successful, he has to know the quality and volume of the different resources available whether they are local or external ones. It is worthwhile to identify and count the local assets and resources such as the company’s labourforce, equipment, machinery, stores, etc.

Local resources could also be defined as the resources and facilities available inside the country but not possessed by the company including subcontracts, suppliers of raw materials, engineers, consultants……etc.

(1) Omani Chamber of Commerce and Industry – ibid.
In the light of the above we can define external resources as the resources which are fetched from abroad.

In order to execute a project within the allotted time, a contractor has to keep well-organized records and data about the above-mentioned resources. His records and registers should include all the necessary details of salaries, wages, price lists, quotations ....etc. This information should be updated according to the current market prices. The person in charge of keeping these records and registers should be technically qualified and should be efficient at business administration.

The lack of financial planning in a company may lead to labour problems, bad debts and property mortgage and in some cases projects may remain uncompleted.

Financial planning may be ensured by a well-qualified accountant who is specialized in accountancy, costs and business administration and to ensure all these qualities the concerned accountant should know enough about the following areas:

a) capital investment and control
b) auditing profits and losses of each project
c) advising the company owner on making financial reserves for the company and how to manage these reserves to meet any emergency
d) checking financial aspects of offers and tenders
e) registration and affiliation of financial enterprises with banks and other enterprises to ensure the required cash flow
Contractors have sustained losses as a result of the mismanagement of projects when they fail to achieve the ideal proficiency of their companies. The ability to manage projects is required to get the utmost possible benefits from the least resources to operate a project and sustain quality standards. Project management can be ensured by engineers, supervisors and qualified efficient foremen.

It is noteworthy that project management does not only mean site management but it also includes ensuring the materials needed and delivering them onto the site. It also includes gaining the required credits from clients or consultant engineers and coordination with subcontractors ....etc.

It is also necessary for contractors to organize their office work as orderly and accurately as possible. Any disorder in this respect will negatively affect the mechanism of project management and this will necessarily lead to ineffectiveness or even hinder the whole management process.

The office management process is mainly reflected in all other aspects of management shown in the following list:

a) transportation facilities
b) passport and immigration transactions
c) public relations
d) records and documents
e) ensuring reserves (export and import)
f) getting permits and approval of official institutions
g) promotion and support for work
7.(iii) Organization and Division of Work

In this section we are focusing on the internal organization of contracting and building companies and the division of work in these companies. The aim is to make a flexible organizational model that can be a criterion for assessing the structure and management of contracting companies as a step towards streamlining the performance of the Construction Sector in the UAE in general.

It is noteworthy that a large number of construction companies in the UAE have a work volume and power nearly equal to what international large companies have. However, volume alone does not make a company adopt a developed and a reasonable organizational structure. The reason is that providing companies with highly sophisticated specialized administrative technical frameworks and setting up huge organizational structures require an outlay of fixed costs. Only large companies operating in stable markets supported by public policies can afford to have such frameworks and structures. The Arab contracting companies lack such stable markets and supporting policies \(^{(1)}\).

Contractors employ a large number of workers. Controlling this large volume of work force and meeting training needs require effective organization. This in its turn necessitates the acquisition of technology skills and consequently leads to quality work. In highly developed industrial countries the enhancement of the organizational structures of construction companies comes as a result of scientific research. Research work is conducted by the faculties of business administration, research centres and industrial companies as mentioned early in this chapter.

\(^{(1)}\) The Arab Contractors Federation – Casablanca – Arab Socio-Economic Fund – Kuwait, ibid – page 69
Let us take the US contractors as an example in this respect. High competitiveness and the sophistication of hi-tech projects motivated American contractors to seek the necessary organizational form and technical knowledge. This has resulted in the enhancement of planning and budgeting for construction projects. Great progress has been achieved in the fields of planning, scheduling, managing and controlling the execution of giant sophisticated projects. These advances have impacted the organization of companies.

In his study, the researcher tackled the organizational structures of some general contracting companies operating in the UAE. He also presented four case studies in Chapter III. He conducted his study through survey-questionnaires that could show how far the organizational structures of some companies could manage to develop while others suffered due to their poor organizational structures. In order to assess the level of the UAE contracting companies, the researcher preferred to focus on the organizational form in general since the organization of any company is a tool for making people productive in working together. As such, a given organizational structure fits certain tasks in certain conditions at certain times.

To start with, the organizational structure of any enterprise provides for the following:

a) economic and efficient performance
b) monitoring activities
c) accountability for work undertaken by members of the organization
d) coordination of different parts of the organization
e) flexibility in order to respond to future demands
f) social satisfaction of members working in the organization
Since the early 1960s researchers in the USA and Britain have been trying to explore the relationships between organizations and the contexts within which they operate. They have tried to develop typologies of organizations in terms of differences in their management and structure. Industrial sociologists in general look at the enterprise as a social system or a working community(1).

Contracting companies in the UAE like any other business organizations have social commitments towards others who may be known as the organizational stakeholders i.e., the individuals or groups who have an interest in or affected by the goals, operations or activities of the organization or the behaviour of its members. Stakeholders include a wide variety of interests and may be considered under six main headings of:

- employees
- providers of finance
- consumers
- community and environment
- government
- other institutions or groups

The issue of organizational structures has been the preoccupation of many researchers in the twentieth century:

In the 1960 the “Social Action Approach” was given prominence by the work of Goldthrope and his colleagues in the “Affluent Worker Project”. This approach argues that analysis of organizations should begin with the expectations and priorities, the “orientations to work”, of organizational members and see “structural features of organizations as the consequence of the resulting patterns of action. Their research work was intended to develop basic knowledge of industrial institutions and behaviour⁴.

Some recent researches have developed three main aspects of social structure, formal structure, occupation structure and informal structure; all of which are interrelated and constitute an interdependent system. In their research, Scott and his group talked about the notion of occupational structure which was perhaps the most significant. The occupational structure is the division of labour force into categories on the basis of differences of function and skill⁵.

They also talked about the formal structure which comprises those elements in social relations which are explicit though not necessarily embodied in written documents and intentionally created to serve particular purposes which are recognized in common by the persons involved (Scott et al.1956). In conventional terms it includes the formal organization of management, the allocation of responsibility and authority, conditions of employment, working arrangements on the shop floor, and the organization of trade unions within the enterprise and the machinery of management-union relations. The third aspect of the social structure of a firm is the informal structure which comprises the aspects of face-to-face relations which are structured or patterned but which are not regarded as, achieving a particular objective. They are relations based on congeniality or friendship.

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(1) Scott, W.H. (1958) The Factory as a Social System Amsterdam, North Holland
(2) Scott et al (1956) - Technical Change and Industrial Relations – Liverpool University Press
In the course of time Woodward and Burns developed explanations of the structure of industrial organizations and the nature of social relations within them which drew attention to the differences in the "context" or "environment" within which the organizations operated. What has come to be known as "contingency theory" attempts to provide an explanation of organizational structure and functioning as largely contingent upon such contextual factors as its factor and product markets, technology ownership, and so on. The approach will be tackled later in detail as a tool for work division.

The term "the Flexible Firm" gained considerable prominence in the 1980s and has been used in a variety of ways. A flexible firm according to Atkinson and Meager (1986) is one, which has attempted to secure three sorts of flexibility: numerical flexibility, the ability to change the size of the workforce quickly and easily in response to changes in demand; functional flexibility, the ease with which workers can be redeployed to different tasks to meet changes in market demand, technology or company policy; and pay flexibility, the extent to which the structure of pay encourages and supports the other two sorts of flexibility, and the level of pay which reflects individual performance and the market rate for the skill in question (Atkinson 1985)(1). Numerical and functional flexibilities are achieved primarily by dividing the workforce between core with a real degree of security in exchange for willingness, and skills, to move between tasks: and peripheral categories of workers without long term security of employment: part-time and fixed term contract workers, and sub-contractors, self-employed specialists, home workers and agency temporary workers outside the firm.

Although the flexible firm theoretically looks ideal, it cannot be applied or adopted in the UAE context for many reasons. To secure numerical flexibility, workers should always be available inside the country at the finger tips of the contractor which is impossible in the UAE for two main reasons. The first is that nearly the whole construction and building workforce is a foreign one as stated in detail in Chapter VI. The second is that the UAE laws, namely labour permits and residence visas, would not allow the sort of flexibility that enables a contracting company to change the size of workforce quickly and easily in response to changes in demand, or divide the workforce between core and peripheral categories of workers.

As for functional flexibility, it needs highly developed and skilled type of workforce and the introduction of technology in all construction and building domains. The problems of unskilled workers and lack of training and technology have been discussed in detail in Chapter VI, too. How would workers be redeployed to different tasks, if they are similarly unskilled and not trained beforehand? This area is one of the researchers main concerns throughout the thesis.

The third type of flexibility is feasible. The structure of pay especially in large contracting firms is flexible and rewarding enough. The pay flexibility would certainly support and encourage the other two sorts of flexibility only if the labour and residence laws were changed. These three types of flexibility may be possible when the national workforce has developed enough which is one of the ambitions of the researcher and the whole political leadership of the UAE. However, we cannot claim that we now have an agreed and coherent approach to the sociological analysis of organizations, which somehow transcends the difference between these various perspectives.
Over the last two decades both academics and practitioners have been searching for new methods of organizational success. The result is that three main approaches to managing and structuring organizations have dominated Western thinking and practice. The proponents of these approaches claim that these new models contradict the other aforementioned ones, despite the similarity between them. So far, the clear message that has emerged is to beware of any theory, which claims that it is the “one best way” for all situations and all organizations. The following is a brief summary of the three approaches and the Postmodernism approach.

a) Culture - Excellence

The Culture - Excellence approach has had a major impact on the thinking of Western business especially in the USA and the UK. This approach emerged and became very popular where old certainties had disappeared and where more dangerous competitors seemed to appear every day. It introduced a recipe for success that was in tune with free market liberalism, with its stress.

The culture Excellence highlights brain power rather than muscle power i.e. the ability to make intelligent use of information to create ideas that add value and sustain competitiveness. More important is that this approach claims to be sounding the death knell of heirarchical organizations and the concept of promotion through ranks. Careers are taking on new meanings.
In future, it is argued, careers are likely to depend on the individual and his/her ability to remain employable\(^{(1)}\). In turn, the skills needed for ‘employability’ will tend to be generic and broad-based rather than organization – or function/specialism-specific. Likewise, career paths and promotion will no longer be shaped by the particular employing organization and its structures and criteria, but will be driven more by individuals creating their own opportunities by taking on new roles and responsibilities, either in one organization or, more likely, by moving from company to company. As for pay, it seems that this will take the form not so much of a wage related to the particular post occupied, but more that of a fee paid for actual performance.

b) Organizational Learning

This approach came to the fore in the early 1990s. Its proponents claim that it is a universal approach which draws on and is consistent with both Western and Japanese organizational traditions.

Organizational learning refers to the process of improving actions through better knowledge and understanding (Fiol and Lyles, 1985: 803)\(^{(1)}\). An entity learns if, through its processing of information, the range of its potential behaviors is changed (Hubar, 1991: 89). Organizational learning occurs through shared insight, knowledge and mental models and builds on past knowledge and experience, that is, on memory (Stata, 1989:64). It is the process by which the organization’s knowledge and value base changes, leading to improved problem-solving ability and capacity of action.

c) The Japanese Approach

Since the 1950s, the Japanese have been developing an alternative approach to structuring and managing organizations that has proven a track record of success. This approach can be characterized by three factors: teamwork, quality consciousness and flexibility. The Japanese Approach socializes and binds employees to the organization and promotes their long-term development and commitment. Employees spend all their working lives with the same organization due to the security ensured by the approach. Most positions are filled from inside the company. Employees are ranked and rewarded primarily but not exclusively on their length of service.

A group in the company comprises a single entity which takes collective responsibility for its performance. Extensive and continuous training and education form an integral part of Japanese personnel policies to enable employees to carry out their work better and to prepare them for promotion. The Japanese Approach has more advantages in terms of trade unions and welfare benefits for employees.

d) Postmodernism

But the world and global economies are rapidly changing and we are entering a new era. It may be called the information Era, the Innovation Era, the Post Industrial Era or the Postmodern Era. What worked in the past will not work in the future and organizations, like society at large, will have to change their philosophies and methods if they are to survive.
All the aforementioned theories and models of organization are aimed at giving practical and coherent advice to the contracting companies of the construction sector on how to structure and manage their work. Large companies should cope with modern theories and philosophies if they are to survive in this age of globalization.

All the above theories and models cannot be the answer to all organizational ills that is why they have been open to criticism. For example none of these theories gives serious consideration to the role of power and politics in influencing decision making in organizations.

The drawbacks of the Culture – Excellence school, the Organisational Learning and Japanese approaches have led to the emerging concept of postmodernism in organization and management. This new movement has become increasingly influential over the last 20 years. It concentrates on the ways in which human beings attempt to shape reality and invent their world. In organizational terms, it draws special attention to the role of culture, power and politics. It has been found that many organizations lack a cohesive culture, with clear organizational goals, which bonds them to a common purpose.

Organizational life in many cases is dominated by political-power battles, which may be more influential than culture in shaping key decisions. This view of organization means that organizations are in fact political entities whose decisions, actions and major developments are influenced and determined by shifting coalition of individuals attempting to protect or enhance their own interest.
In general, organizational learning should become a collective and not just an individual learning. It should be a fundamental shift towards systems thinking by an organization’s members. This gives the organization the ability to adapt, to influence and even create its environment.

**Division of Work**

The division of work and the grouping together of people should be organized by reference to some common characteristic, which forms a logical link between the activities involved. There should be a balance between emphasis on function at higher levels of the organization, and specialization and concern for staff at the operational level.

Work can be divided, and activities linked together, in a variety of different ways. The most common way is to group activities according to: (a) specialization, (b) the use of the same set of resources, (c) the shared expertise of members of staff. It is a matter of decision in each organization as to which activities are important enough to be organized into separate functions, departments or sections.

In the following section the researcher is demonstrating briefly the most outstanding types of modern and practical organization and ways of work division. The researcher is also trying to draw comparisons between some of the structures related to the contracting industry and commenting on some others.
a) Division by Major Purposes

A common way of dividing work is division according to the major purpose or function where people doing the same task work together and nearly doing the same thing to integrate one another. Figure (21) is an organizational chart that reflects division of work by major purpose or function.

b) Division by Product or Service

Another basis for grouping activities is division by product or service where the contribution of different specialists are integrated into separate, semi-autonomous units with collective responsibility for a major part of the business process or for a complete cycle of work. This form of grouping is more common in larger diversified organizations and may be used as a means of subdividing departments into sections. With grouping by product or service there is a danger that the divisions may attempt to become too autonomous, presenting management with a problem of coordination and control. Figure (22) is an organizational chart showing division of work by product or service.

c) Division by Location

Another common way of dividing work is division by location where different services are provided by area or geographical boundaries according to particular needs or demands, the convenience of consumers, or for ease of administration. Figure (23) shows division of work by location.
d) Line and Staff Organization

Work becomes more complex as companies grow larger. Employees with specialist knowledge need to be more integrated into the managerial structure. Then companies need to make full use of specialists while maintaining the line of authority i.e. they need the line and staff organization which can create a type of informal matrix structure. The line organization relates to the jobs concerned with specific responsibilities and those in the direct chain of command while the staff organization relates to the provision of specialist and support jobs for the line organization and creates an advisory relationship. In other words the line organization is usually responsible for all activities within one department and has direct authority relationship through the hierarchical chain of command. The staff organization on the other hand renders specialist and support services for a common activity throughout all departments. It has a kind of advisory relationship with line managers and their staff. Figure (24) is a representation of an example of line and staff organization.

In general, the organization of construction and contracting companies is closely dependent on their size and their administrative development. Large contracting companies in the UAE adopt three traditional organizational forms, the overall, operation and project level. Some medium-sized establishments combine the overall and operation levels together.

The enterprise overall and operation levels are considered permanent forms of the companies, which manage their own labour and equipment. But the project level is a short-term organization usually associated with the execution of a certain project. It expires once the project is completed then the companies resources are reorganised.
differently to start another project. The combination of the overall level and the operation level on the one hand and the project level on the other hand usually adopts one of the following two forms:

e) Project Teams

The division of work and methods of grouping tend to be relatively permanent forms of structure. With the growth in newer, complex and technologically advanced systems it has become necessary for organizations to adopt traditional structures in order to provide greater integration of a wide range of functional activities. Attention has been given, therefore, to the creation of groupings based on project teams and matrix organization. Members of staff from different departments or sections are assigned to the team for the duration of a particular project.

A project team may be set up as a separate unit on a temporary basis for the attainment of a particular task. When this task is completed the project team is disbandened or members of the unit are reassigned to a new task. Project teams may be used for people working together on a common task or to co-ordinate work on a specific project such as the design and development, production and testing of a new product; or the design and implementation of a new system or procedure. For example, project teams have been used in many military systems, aeronautics and space programmes. A project team is more likely to be effective when it has a clear objective, a well-defined task, and a definite end-result to be achieved, and the composition of the team is chosen with care. Figure (25) is a typical organization of a project team of a construction and building company.
On executing a project through the project team organization as shown before, the resources required for the project are provided by the functional departments. The project team works independently of the enterprise organization. The project manager is granted both independence and authorisation. He can temporarily be supported by resources from outside the company. The project team organization, however, has its advantages and disadvantages as follows.

a) Advantages

- The project manager has all responsibilities and authorities, so there is a special authority for giving orders; hence decisions and reactions are quick in terms of project execution. This may even be more effective for remote area projects, which are far from headquarters, or when decisions are inhibited due to the existence of other partners as it is the case with joint ventures.

- Relations are clearer among team members and specialists who are responsible to the manager only. Better team work could be achieved without any conflict or misunderstanding.

- Each team member can acquire work techniques, which may not necessarily be related to his area of specialisation. Engineers also acquire valuable knowledge without depending on the support and guidance of the overall organizational level of the enterprise.
b) Disadvantages

The weak points of the project team organization are as follows:

- Experience accumulation fails to take place because organising the project team needs a large number of project managers and experts who depend on their own experience a matter, which is missing in the developing Arab countries.

- The project may employ a large number of employees for a long period of time without being in connection with the enterprise overall organization. Consequently they will be excluded from the enterprise's future long-term plans. They will be employed for a certain project and then terminated or disbanded once the project is completed. This policy fails to develop any sense of affiliation with the enterprise.

- The project manager is usually accountable for the general performance of the project. He is usually supported by the functional departments. The success of the project absolutely depends on the project manager. The functional departments become mere "controllers" thus a feeling of enmity – instead of a feeling of cooperation - is developed. The project team organization is considered the typical model of the Arab contracting companies. The UAE companies are not an exception. In Chapter III, Section 1, the researcher gave some examples of companies operating in the construction sector in the UAE, which adopt the project team organization. The researcher also threw some light on the early beginnings of the organizational structures in 1975 and how
they developed over time in order to catch up with modern construction technology. The researcher found out how those structures were changed and enhanced in that era. New jobs and assignments were added to the sample companies included in the study. However, those companies continued to adopt the project team organization.

- The resident engineer gets instructions from two main sources; the project manager (concerning the project) and the functional manager (concerning work techniques). Therefore the two managers should have common instructions thus avoiding any confusion.

- The project manager and the functional managers share authority and responsibility; therefore, they have to communicate together. Both parties must possess a high level of understanding, which requires a great effort.

The researcher has so far demonstrated the most common ways of organization and division of work in the UAE contracting companies. Most companies have adopted the overall and the project levels and this took the form of the project team organization with more emphasis on:

- The responsibility and authority of the project manager
- The relation between the project manager and the general manager

The above findings can be reflected in the following table of authorities and tasks of various ranks and posts of three contracting companies, which the researcher dealt with in his study.
<table>
<thead>
<tr>
<th></th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Manager</strong></td>
<td>His tasks were only financial and managerial ones. He reported to the</td>
<td>Overall responsibility for departments, and reporting to the Chairman</td>
<td>Overall responsibility for the whole senior management, and reporting to</td>
</tr>
<tr>
<td></td>
<td>Managing Director</td>
<td>Directly</td>
<td>Vice Chairman</td>
</tr>
<tr>
<td><strong>Managing Director</strong></td>
<td>The structure included a Managing Director</td>
<td>No Managing Director</td>
<td>No Managing Director</td>
</tr>
<tr>
<td><strong>Responsibility</strong></td>
<td>The Managing Director is responsible for technical management</td>
<td>The Commercial Manager is responsible for technical management</td>
<td>The General Manager</td>
</tr>
<tr>
<td><strong>Departments</strong></td>
<td>Only two departments</td>
<td>Numerous departments</td>
<td>Numerous departments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* Technical Dept.</td>
<td>* Administration Dept.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* Planning Dept.</td>
<td>* Purchase Dept.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* Administration Dept.</td>
<td>* Financial Dept.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>* Contracts Dept.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>* Operating Dept.</td>
</tr>
</tbody>
</table>

The organizational structures of the construction sector in the UAE has limited itself to the project team organization which vests authority and responsibility to the project manager which resulted in the following:

- Employees fail to have their experience accumulated
- The staff and workers appointed for a certain project are terminated or disbandened once the project is completed. When workers are terminated they are appointed again when a new contract is bagged.

- The performance of any project depends on the project manager. The researcher believes that the matrix organization is better than the project team organization despite its drawbacks. The following is what the researcher thinks of the matrix organization:

f) Matrix Organization

The matrix organization is a combination of:

1. functional departments which provide a stable base for specialized activities and a permanent location for members of staff; and
2. units that integrate various activities of different functional departments on a project team, product, programme, geographical or systems basis.

A matrix structure might be adopted in a university or college, for example, with grouping both by common subject specialism, and by association with particular courses or programmes of study. The matrix organization therefore establishes a grid, or matrix, with a two-way flow of authority and responsibility. Within the functional departments, authority and responsibility flow vertically down the line, but the authority and responsibility of the project manager flow horizontally across the organization structure.(1) Figure (26) is an example of the matrix organization.

A look at the figure shows that the line authority is exercised over departmental staff through a direct chain of command and that the project authority is exercised over selected staff assigned from departments as appropriate.

Developing an effective matrix organization, however, takes time, and a willingness to learn new roles and behaviour; this means that matrix structures are often difficult for management to implement effectively.

Matrix organization offers the advantages of flexibility; greater security and control of project information; and opportunities for staff development\(^{(1)}\).

- This organization is fairly effective in terms of accumulating field experience and technical skills in the functional departments of the enterprise. Employees will be able to catch up with up-to-date quality engineering standards.

- Young engineers can be employed. Their lack of experience can be compensated by the functional department through guidance and support.

- Responsibility and authority are shared by functional departments and the project manager. The project engineer can devote more time to coordinate the project elements. He can seriously participate in controlling costs, time schedules and quality.

\(^{(1)}\) Laurie J. Mullins, Management and Organizational Behaviour - ibid
There are, however, a number of potential difficulties and problematic areas in the matrix organization.

- There may be a limited number of staff reporting directly to the project manager with extra staff assigned as required by departmental managers. This may result in a feeling of ambiguity. Staff may be reluctant to accept constant change and prefer the organizational stability of their own functional grouping.

- Matrix organization can result in a more complex structure. By using two methods of grouping, it compromises the unity of command and may create problems of coordination.

- There may be a problem of defining the extent of the project manager’s authority over staff from other departments and of gaining the support of other functional managers.

- Functional groups may tend to neglect their normal duties and responsibilities.

- Matrix structures are sometimes not manageable. Dual reporting leads to conflict and confusion; the proliferation of channels of communication creates informational log-jams; and overlapping responsibilities result in a loss of accountability.

- Matrix organization makes the best use of the workforce of the company. Nobody is employed to work for the company unless needed. Thus the number of workers and work-hours are minimized. Consequently the management of the company’s human resources becomes more effective.
g) Contingency Organization

The contingency approach takes the view that there is no one best, universal structure\(^{(1)}\). There are a large number of variables, or situational factors, which influence organizational design and performance. The contingency approach emphasizes the need for flexibility. It is clear that this approach does not seek rigid or static rules or principles that are applicable in all situations or contexts. It seeks to state that one characteristic depends upon another. The most feasible organizational structure depends upon the contingencies of the situation for each individual enterprise.

The contingency organization can be seen as a form of “if-then” matrix relationship\(^{(2)}\). In other words if a certain factor exists, then another variable in the organization or management pattern is more appropriate. Figure (27) is a simplified illustration of contingency relationships.

The researcher believes that although the contingency organization looks flexible in the way it rejects classical ideas, the approach has been subject to a number of criticisms or doubts about its practical value to management. Some large contracting companies cannot change their formal structure at too frequent intervals. They need some time to change their structure. By then the situational change will have taken place. Companies may face multiple contingencies and different contingencies may result in the need for different patterns of structure.

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\(^{(1)}\) Laurie J. Mullins, Management and Organizational Behaviour - Pearson Education - Sixth Edition 2002
\(^{(2)}\) ibid (page 565)
On the other hand, in the light of the researcher’s experience and his knowledge as a contractor, the contingency structure has proved to be suitable for some small contracting companies. The contracting industry in the UAE is subject to many variables and factors like the sudden change of labour laws, the unsteady flow of foreign workforce, the various regional municipal regulations and so on. Consequently some small contracting companies may be able to adopt a contingency structure, while the large companies would find it infeasible for the above-mentioned drawbacks.

As mentioned before, large contracting companies usually adopt three organizational structures, the overall, operation and project level. The following is a brief account of the three levels.

h) Enterprise Overall Level Organization

The management of any organization undertakes and shoulders financial and business responsibilities, i.e. it is responsible to the owners. Figure (28) is an example of the organizational structure at the enterprise overall level.

The enterprise overall chart shows the structure and formation of the management team as follows:

* Senior Management:
  - Chairman
  - General Manager

* Senior Functional Departments:
  - Personnel
- Finance
- Marketing
- Administrative Services

* Supporting Staff:
- Public Relations
- Legal Affairs
- Personal Assistance

i) Operation Unit Level

On the other hand the typical organizational structure of the operation unit level is also common in contracting companies. The operation unit organization adopts another system different from other organizational structures. Its main focus is on how a project is managed. A whole department is set aside for each project. The project manager keeps in direct touch with the manager of the operations unit. In this department there is the project engineer and the functional manager for work procedure and techniques.

The operation unit organization usually includes the following:

Senior Management i.e. General Manager, Operation Management, Personnel Department, Supply and Purchase (Marketing) Department, Financial Affairs Department and Legal Affairs Department.

Figure (29) is a typical chart of the Operations Unit, whereas figure (28) is the chart of the whole enterprise with the operation units which includes the following:
- Project services (construction, engineering, purchase)
- Marketing and supplying equipment
- Operations Manager

It is worth of note that the operation unit is linked to the enterprise overall structure in two ways:

- Selling as much as possible at profitable prices.
- Adapting project requirements to the available resources.
- Combination of foreign and local personnel.
- Allowing for local techniques in work execution and ensuring international quality standards.
- Setting aside a specified geographical market for the operation unit.
- Geographical division of local and international markets, geographical responsibilities covering a country or a specific geographical area.
- The operation unit may legally differ from the enterprise. Circumstances prevailing in a certain country or area may lead to the establishment of local subordinate companies or other forms of partnership with local companies or partners.

The main concern of the company is how far an operation unit can use the resources of the overall organizational structure of the enterprise and how far this organizational structure is responsible for performance of operation units.
j) Project Level

The project manager is responsible for the execution of certain tasks specified quantitatively (range) and qualitatively (standards) within specific financial limitations (budgets) in a specified period of time. At the project level, the contracting company has two execution options, either the Project Team form or the Matrix form. Figure (30) is a chart showing a project matrix.

The operations unit adopts another system different from other organizational structures. Its main focus is on how a project is managed. A whole department is set aside for each project. The project manager keeps in direct touch with the manager of the operations unit. In this department there is the project engineer and the functional manager for work procedure and techniques. The researcher, however, prefers the Matrix System, which ensures better use of the following:

a) company resources

b) expertise

c) attainment of long term aims

The researcher thinks that the Matrix System is more convenient to the stable business environment of a country like the UAE. Generally speaking the Matrix System is better than the Project Team System. It makes the best use of the company's resources and its workforce. However, it is less efficient at the projects level. The Matrix System is able to attain long-term aims. Although this is for the interest of the company, it requires more investment at the enterprise overall level. Companies, which operate in stable markets tend to set up an overall strong structure and prefer the Matrix System.
Contrary to this, companies which are not sure of their future, prefer the Project Team System, which is usually associated with work environment and government policy.

In the Matrix System experts are assigned for the project. They are usually called "resident engineers". Their relation with their functional departments continues. The functional departments are associated with projects in the form of a matrix. In this type of system engineers and experts get their instructions from the project manager as to what should be done and when work should be completed.

The researcher, however, prefers the Matrix System which ensures better use of the company resources, expertise and attainment of long-term aims.

The convenient atmosphere and business environment for the Matrix System are in tune with the atmosphere of a stable country like the UAE.
Chapter 8

Proposals
Introduction

To develop the Construction Sector in the UAE, concerned institutions at the official or national levels, have to be specified. Therefore, the researcher is proposing the establishment of a Higher Council for Building and Construction as well as a Federation for the UAE Contractors to combine these concerned institutions.

The following are the institutions the researcher proposes to constitute the aforementioned council to look after the Construction Sector in the UAE. The researcher also proposes a sort of coordination between the proposed council and the following institutions: (1)

1) Ministry of Public Works and Housing
2) Ministry of Finance and Industry (Public Authority for Specifications)
3) Ministry of Planning
4) Ministry of Electricity and Water
5) Ministry of Labour and Social Affairs
6) Federal Authority for Environment
7) Abu Dhabi Department of Public Works
8) Abu Dhabi Planning Department
9) The General Secretariat for Municipalities
10) Representatives of the UAE Municipalities
11) Contractors' Association
12) Engineers' Association

(1) Study on Controlling Labourforce in the Construction Sector to be raised the Cabinet of Minsters, Ministry of Public Works and Housing, UAE, December 2002.
Higher Council for Building and Construction

The proposed Council aims at the development of the Construction Sector, protecting it against any drawbacks and market fluctuations, raising the standard of performance and attainment of quality fulfillment so as to contribute more effectively to the overall economic development of the UAE. To attain these general aims the proposed Council may look after the following:

a) Drawing up general policies and strategies for developing the Construction Sector.
b) Ensuring enough support for the Sector to attain the state’s intended aims.
c) General supervision of the Construction Sector.
d) Coordination among the institutions concerned about the Sector.
e) Finding convenient means of promoting the UAE national workforce and personnel within the building and construction industry by qualifying and training nationals in all construction domains.
f) Standardization of building and construction codes of practice in the UAE.
g) Standardization of technical building and construction specifications throughout the UAE.
h) Standardization of building regulations throughout the UAE.
i) Enacting standardized laws and regulations for drawing up contracts between employees, building contractors, consultants and other parties within the sector throughout the UAE.
j) Standardization of systems for qualifying and classifying contractors, consultants, suppliers and other officials within the sector.
k) Controlling and regulating entry of building materials into the UAE according to specified standards and criteria.

l) Considering and studying problems and impediments hindering development of the Sector and suggesting convenient solutions.

m) Ensuring modern technology and information technology to enhance the Sector.

n) Cooperation and coordination with international specialized institutions for selection and approval of building materials suitable for the UAE’s local environment.

o) Publishing special periodicals and booklets for the Sector.

p) Setting up a database pertaining to the sector’s activities to facilitate exchange of data between the various concerned parties of the Sector.

A General Secretariat may be formed to regulate the Council’s work with the following duties and roles:

a) Considering proposals for developing the Sector and submitting them to the Council.

b) Making necessary studies related to the Sector in response to the Council.

c) Making a bi-annual report on the Council contributions to the development and enhancement of the Sector’s performance.

d) Publishing documents and publications issued by the Council.

e) Secretarial work and keeping documents and records of the Council’s meetings.
The Council may have an executive bureau to consider and undertake urgent matters to be submitted to the Council at their earliest. In order to shoulder the responsibilities of the Sector and draw up its policies and plans it is necessary to develop its national institutions e.g. the Contractors Associations. The role of the official institution (Higher Council for Construction and Building) and the role of the national institutions (Contractors Associations) should be integrated with each other.

Figure (31) shows the proposed formation of the Higher Council for Building & Construction and figure (32) is a proposed functional and organizational structure for the proposed Higher Council for Building and Construction.

The UAE Contractors’ Federation

There is no doubt that the UAE Contractors Association has exerted a great effort to attain its main aim of highlighting contractors causes at all levels. However, there is a pressing need to change the Society into a Contractors’ Federation and amend its articles of association, too. The proposed Contractor’s Federation membership should include all the Contractors’ Societies of the seven emirates, thus linking all these societies to each other. It will officially be the only national institution that represents the Construction Sector at local and external levels. It will also represent the Private Sector in the proposed Higher Council for Construction and Building.

The researcher proposes that the Board of Directors of Contractors’ Societies will consist of not more than seven and not less than five members. The more the number of members, there are more quorum problems when a meeting is to be held. On the other hand when the number is less than five members, the Board will be dominated
and managed by two or three members and consequently the whole society. As for electing the Board of Directors and writing the Articles of Association, we can refer to Law No. 6 of 1974 concerning public utility societies issued by the Ministry of Public Works.

The proposed UAE Contractor's Federation should consist of representatives of the contractors' societies, one for each society. The Board of Directors should not consist of more than seven and not less than 5 members. Some of the seven emirates may be unwilling to set up a contractors' society due to the low turnover of their contracting activities which may affect their representation in the Federation.

The rationale behind the establishment of a federation is to promote the contracting industry and uplift its standard of performance with the aim of promoting and supporting national economy as follows:

a) Developing the building industry and improving its products.

b) Coordination among contractors, protecting their interests and improving their companies' performance.

c) Strengthening relations and cooperation between federal and local government departments.

d) Cooperation between Arab and foreign contractors' societies and institutions and the proposed Federation in accordance with the Law of Public Utility Societies of 1979.

e) Organization of conferences, seminars and exhibitions that may help promote technical and administrative work within contracting companies.
f) Introduction of modern scientific means and techniques that enhance and improve performance of the contracting companies and supporting their national role in economic and civilizational development.

g) Cooperation with other concerned parties to tackle and solve the problems hindering the work of contracting companies and helping them for better achievement and better performance.

h) Representation of the Construction Sector inside the country.

As for the organizational structure, the proposed UAE Contractors’ Federation may consist of the following:

a) General Assembly

It will be divided into a general assembly, a usual assembly, and an extraordinary general assembly.

The usual General Assembly may shoulder the following responsibilities:

- Election of Board of Directors.
- Approval of the Board’s report on its finalized works, programmes and new year’s work plan.
- Specification of membership and annual financial subscription.
- Endorsement of closing accounts of the ending financial year and the new financial year balance sheet.
- Studying and discussing proposals submitted by members for the period prescribed by internal statute.
- Appointment of a financial controller and specifying his salary.
The extraordinary General Assembly may shoulder the following responsibilities:

- Considering resignations of all or some members of the Board of Directors and filling existing vacancies.
- Considering resignation submitted by the Board Chairman.
- Amending Articles of Association of the Federation.
- Dissolution of the Federation optionally.
- Nullification of any of the Boards decisions.

b) Board of Directors

The Board of Directors would manage and look after the Federation so as to attain its aims by shouldering the following responsibilities:

- Drawing and following-up policies that lead to attainment of the Federation’s aims.
- Execution and follow-up of the General Assembly’s decisions.
- Drawing up internal statutes, which ensure members’ interest and smooth management of the Federation.
- Management of the Federations funds.
- Receipt and consideration of applications for membership.
- Delegating members to represent the Federation at symposia and conferences.
- Representing the Federation at regional, Arab, Islamic and international institutions.
- Any other responsibilities assigned by the General Assembly.
- Approving appointment of a manager for the Federation and its branches.
c) Committees

There should be two sorts of committees; permanent and ad hoc committees.

- **Permanent Committees**

A number of committees should be appointed to carry out the directives and decisions of the Board of Directors for the benefit of the national contracting industry and attainment of the Federation targets. Membership duration for these committees should be the same as the Board membership. The most important of these committees are:

- **Technical Committee** to undertake the following:
  - Controlling the contracting profession
  - Drawing up scientific and professional programmes and activities
  - Reviewing technical and professional cases entrusted to it
  - Arbitration of disputes and providing legal consultation

- **General Activities Committee** to undertake the following:
  - Overseas conferences and international relations
  - Financial affairs and financing activities

- **Ad-Hoc Committees**

Ad-hoc committees are to be appointed for special tasks or purposes and be dissolved as soon as the tasks entrusted to them are completed. The Board of Directors would be entitled to appoint ad hoc committees as the need arises. It will also be entitled to dissolve any committee when deemed necessary.
Interweaving Roles of the Construction Sector

Economic development in the UAE depends on two main sources, governmental and private expenditures. The government, whether federal or regional, spends on the infrastructure projects like education, health care, ports, airports and other public utilities or projects. The main resources are usually oil revenues, some strategic manufacturing projects owned by the state as well as the service charges collected by the government from the Private Sector. This has enabled the Construction Sector to grow and flourish.

Furthermore, the private sector plays a vital role in financing and investing in most economic sectors, which have recently experienced boom/growth in all fields. The private sector has thus ensured greater opportunities for the Construction Sector to grow and flourish through the many private projects executed by contracting companies.

Figure (33) shows the cycle of government and private investment expenditure and its impact on the Construction Sector. It also shows how this expenditure is closely associated with all systems and policies related to the Construction Sector, its contribution to the enhancement of all economic sectors as well as its reflection in the UAE comprehensive economic development.

Generally speaking, development aims at meeting basic needs of the public. On top of these needs are convenient housing and day-to-day requirements thus ensuring private investment opportunities in projects. This has been the case in the UAE. The Private Sector usually contributes to the execution of different economic projects whereas the
government undertakes the infrastructure projects. The rise of investment expenditure means flourishing economic sectors and a rising gross domestic product. Table (72) shows the UAE population in the years 1998, 1999 & 2000 and the volume of the gross domestic product and the per capita GDP.

Table (72) indicates that during 1998 – 2000 the GDP increased at a growth rate of 16.8%, while the UAE population increased from 2,776 million in 1998 to 3,108 in 2000 registering a growth rate of 5.8%. The per capita income increased by 10.3%.

The growth of the economic sectors through their projects led to the increase of the Construction Sector contribution to the GDP. This contribution increased from Dhs. 16.6 million in 1999 to Dhs. 17.2 million in 2000.

The UAE has given great importance to investment. Substantial amounts of public revenues have been allocated to finance development projects. The government has also provided a lot of facilities in support of the Private Sector in the hope of enhancing its efficiency and proficiency to execute investment projects. Table (73) shows the volume of fixed investments in the years 1996 & 1997 as an example.

It is worthy of note that government investments registered a growth rate of 28% of the total investments in 1997, by completing a good number of projects in the fields of public services, health care, education, public utility, transport, communication and housing. Such projects usually had their positive influence on the Construction Sector since they ensured more work for contracting companies.
There is no doubt that the Private Sector has become one of the corner stones of the state economic performance. Its contribution to investments in 1997 amounted to 42% of the gross investments in the fields of transport, communication, housing and other infrastructure projects.
Chapter 9

Conclusions
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Conclusions

After analysing the various aspects and roles of the Construction Sector in the preceding chapters, the researcher has come to a set of findings that provide invaluable bases for developing the Sector all over the UAE. It is noteworthy that this study has dealt with the contracting sector during 1975 – 1995 with brief references to the years 2000 and 2001 through two main approaches. The researcher on the one hand based his findings on data collected from references and resource books, magazines, newspapers and other related publications. On the other hand he depended on the field studies he conducted as a researcher and as an eminent figure in the contracting industry in the UAE and the Arab World in general. He surveyed a good number of officials, professionals and contracting companies operating in the UAE. The following are some of his findings:

- The first contracting company established in the UAE was in 1934 for the purpose of carrying out the British forces’ projects in the region.

- Construction activities continued slowly until the sixties when the Gulf region witnessed the oil era in the early sixties when Britain set up what was called the Development Council whose Dhs. 72 million budget was allocated for expenditure during 1966 – 1971.

- The real drive of the Sector coincided with the economic boom. At that time the Sector was still adopting poor methods and techniques in terms of organization, administration and modern technology. Gradually the Sector shifted to highly
sophisticated modern technology, employed skilled personnel and effected radical organizational changes.

- The Construction Sector played a vital role in enhancing the other sectors by carrying out various economic projects. Over the past years specifically during 1966 - 1971 the Construction Sector began to flourish until it effected qualitative change in its organizational, legal, administrative and technical frameworks.

- The early beginning of the sector was short of systemization. Gradually the sector began to develop its systems which were finally able to control all aspects of work.

- The Construction Sector played an effective role. It is still so effective that the execution of most projects still depends on it, which helps investments to flourish.

- The Construction Sector is always active in terms of comprehensive development and infrastructure programmes.

- The Construction Sector has always been esteemed for its dynamic roles and its positive contribution to the gross domestic product. Over the past years the sector always ranked second after oil in this connection.

- The sector has always faced various difficulties e.g. the primitive building techniques that created lots of problems. Only when the sector began to adopt modern technology and attract skilled workers, could these problems gradually reduced. Giving due importance to organizational, administrative and technical aspects and building codes of practice could also improve the status of the sector in general.
• The Construction Sector was able to employ 93,870 workers in 1975, 125,934 workers in 1995 i.e. 16% of the total volume of manpower in the UAE. The Arab workers are 15% while the national workers are only 0.02% of the total workforce within the Sector. Migrant workforce has had a lot of negative impact on the UAE society, demographic structure, security and on the Construction Sector itself in terms of productivity and profitability.

The UAE gave due importance to increased allocation of bank credit to all economic sectors. The Construction Sector’s share of credit fluctuated during 1975 – 1995. The credit volume was then closely associated with the general economic conditions.

Recommendations

In Chapter VIII, the researcher presented a proposal for the development of the Sector’s institutions. He also pinpointed the components of his proposal as follows:


ii. Restructuring the national side of the Sector by forming a special UAE Contractors Federation.

Through survey questionnaires and the current trends, the researcher has reached the following conclusions:
1. Classification Systems and Contract and Tender Terms

It is necessary to standardize classification systems, tender terms and building contracts. A standardised classification of contracting companies should be based on standardized criteria since the contracting practice is the same everywhere and there are no real differences that may justify several classification systems.

- Codes of practice for building materials and construction should be standardized, unified and applied to ensure safe constructions and compliance with international and local requirements.

- Codes of practice for internal construction elements should be applied and dimensions of such elements should be standardized (e.g. piles, columns, doors, widows, bridges). This will make it easy to get them pre-fabricated or pre-cast at mechanized plants that do not require a lot of labour. This will also direct the construction sector towards mass and standardised production.

- The construction industry should depend mainly on mechanization i.e. the use of equipment, automatic concrete casting and mixing, tower cranes, steel cutters and iron cutters rather than simple tools that require more labour.
2. Reviewing Educational Policies and Output

Reviewing educational systems and their output in the hope of making them relevant to the demands, needs and requirements of the Construction Sector, thus enabling our educational organizations to produce qualified technical and administrative personnel.

- Educational programmes should address the country’s need for engineers, architects and other specialists in designing, planning, surveying and construction control.
- Technical institutes and schools specialising in building, construction and contracting should be set up.
- National school dropouts interested in the construction industry should be qualified and trained. They may join specialist workshops for training in steel-work, carpentry and building to be qualified to join large contracting companies.

3. Development of Administrative, Organizational and Technical Aspects

In the early years of the economic boom, the Construction Sector lacked updating and modernization in many areas. The survey data showed great improvement and enhancement of these aspects in the nineties. However, we cannot conclude that the expected aims have been attained; therefore the improvement of legal, organizational and technical frameworks is becoming more important.

As far as the technical aspect is concerned, the researcher believes in the importance of raising performance level and the introduction of modern systems and techniques that
can develop and update the Sector as a whole. At the organizational level the researcher believes that it has become necessary to enhance the Sector by introducing new organizational structures compatible with contracting companies and their market volume to enable them to compete with foreign companies.

The establishment of the proposed Higher Council for Building and Construction will improve the organizational framework of the construction industry. It will incorporate representatives from public and private institutions, which are supposed to be looking after the Sector.

The researcher also focuses on technical aspects and calls for the setting up of technical institutes whose main target should be training personnel, updating their knowledge, ensuring modern technology and introduction of up-to-date working techniques.

4. Enhancement of Productivity Standards

In the early seventies the level of labour productivity was remarkably low because most workers were unskilled. In the nineties, productivity improved although not to the expected level. According to the survey data, the researcher found out that productivity levels fluctuated somewhere between “Poor, Medium and Excellent”. In order to raise the productivity level, the researcher calls for serious work to train technical personnel and adopt all possible means to improve productivity. This will have its good reflection on the completed projects qualitatively and quantitatively.
5. Employment of Arab Workforce

The survey attempted by the researcher showed that 70% of the workforce in the seventies, and 80% in the nineties within the sector were Asians. Drawing a comparison between the two periods, the Arab workforce maintained a downward line thus making way for the increase of Asian workforce in the country. The questionnaire polled a good number of contracting companies. Most of the survey respondents preferred the employment of Arab workforce in the Construction Sector to the employment of Asian workforce.

The researcher believes that the existence of Asian and other foreign workforce at such a high rate poses real threat and creates a demographic imbalance in the country where the number of locals is comparatively small.

Due to the loopholes existing in licencing laws, the researcher calls for urgent review of these laws so as to make them consistent with the nature of the contracting practice and contracting companies. The current laws deal indiscriminately with all categories of companies with the same rules without any special rules for licencing contracting companies.
6. Enhancement of Organizational Framework

The organizational framework shows how overlapping are matters in the Construction Sector. Furthermore, this sector has its own characteristics that make it different from other economic sectors. It is closely associated with official institutions and departments. The researcher again calls for updating the organizational framework to facilitate its performance and enable it to cope with the aforementioned institutions and other related economic sectors. The researcher dealt with the organizational aspects in the seventies and nineties where he recognised the gradual improvement taking place. The researcher therefore recommends and supports any measures taken to solve problems pertaining to the organizational framework.

7. Curbing Number of Contracting Companies

The economic boom in the UAE made the government authorities grant licences to unlimited numbers of national contracting companies. At that time these companies were badly needed to carry out many development and infrastructure projects initiated by the government. The researcher has shown that the number of contracting companies has exceeded the volume of the UAE construction market. The researcher calls for enforcing laws to control these companies, their roles and the quality of their activities.
Licences for new contracting and maintenance companies should be under control and only issued in accordance with the actual market needs. On renewal of old licences, the concerned companies should be actually existing and engaging in the Construction Sector. Their achievements, turnover and final accounts should be monitored.

8. Dependence on Locally Produced Materials

Dependence on locally produced building materials is a pressing need for any ambitious economy to support development. Minimizing imports from abroad would save hard currency for development. Therefore, the researcher thinks that such economic measures would encourage local industries which would consequently contribute to the gross domestic product.

All measures should be taken to ensure imported quality building materials that are in compliance with the local laws and in agreement with the atmosphere and environment.

Materials that do not need site processing should be used e.g. precast concrete, processed plaster and ready cut to order and bent steel.

Steel structures should be given preference for certain construction works.

Local industries should be promoted and encouraged in both public and private sectors and local products should be used for public and private projects provided such products are able to compete with their equivalent foreign counterparts at least during the contract validity period, otherwise the contractor should be compensated.
Concerned authorities should be invited to make standardised specifications for locally manufactured building materials. These specifications should be monitored by contracting engineers and consultants thus ensuring quality building materials for local projects.

9. Locally Oriented Measures and Specifications

The researcher also recommends that new codes of practice and building material specifications should be enforced in the UAE. These codes should be binding for all consultants, engineers, contractors and manufacturers involving in the construction and building industry to ensure good quality building materials.

10. Modern Technology

In the seventies modern technology was first introduced in all economic domains in general and the Construction Sector in particular. The adoption of modern technology certainly saves a lot of time and effort and consequently a lot of workforce and expenses. Modern equipment and machinery enable contractors to carry out giant projects faster than before.

The researcher recommends the introduction of modern technology into the construction practice provided that the workforce is well trained. This results in professionally developed personnel to match international standards since the UAE has signed the General Agreement on Tariffs and Trade (GATT) which means real involvement in global competition.
11. Official Follow-up, Supervision and Laws

Ministries and local departments should have standardised rules for contracts, tenders, classification systems, project supervision and follow-up. New laws and control systems should be enacted. Standardised codes and statutes will minimize red tape and excessive bureaucracy in the contracting industry. Thus public as well as private projects can be completed at the set time as a result of the laws and systems regulating construction industry in the country.

12. Labour Rationalisation

As a researcher in the contracting industry for a long time and in the light of his survey findings, the researcher advocates minimizing unskilled labour which has recently become a real burden for project owners, landlords and the national income in particular. Unskilled workers employed in the UAE constitute a heavy burden due to the health, social and safety care provided to them and the poor services they render.

- Plans should be drawn-up to Emiratise all engineering and technical jobs in federal ministries, regional governments and semi-governmental institutions that need lot of technical workers.
- Companies involved in specialist construction installations should be classified and controlled. For example there should be special licensed companies for construction, steel, or wood works. There should be special rules for granting such licences by obliging these companies to mechanise their work and comply with Emiratisation rules.
• Foreign workers should be hired on work permits basis only for a specific period of time.

• Large contracting companies should employ UAE nationals for some financial, administrative and technical jobs.

• A new system should be adopted to hire the best Arab and foreign workers to cope with the adoption of modern technology.

• Labour laws, regulations and rules should be reviewed periodically to curb misuse of labour permits and residence visas.

• The National Human Resource Authority should be supported to train and employ national workforce as follows:

   a) Setting up a special salary scale for national technicians engaging in the construction sector.

   b) Making a periodic survey of contracting and construction workforce every month.

   c) Linking the Human Resources Authority with the concerned Ministries, departments, universities and institutions by means of a database for national and foreign workforce to help the concerned authorities with Emiratisation plans.

Files and registers for foreign workforce should be kept, controlled, checked and updated by public authorities. The researcher did his best to get enough details of the national workforce to draw comparison between foreign workforce and local workforce. With this data, he could have found out how positively or negatively the foreign workforce affected national economy. In order for researchers to assess the economic status of the country, there should be a correct updated census and statistics based on special government sources and records.
• A law should be enacted to address the problem of concealment.

• A law should be enacted to allow for workers to be transferred from one company to another thus avoiding importation of new labour.

• A new system for migrant workforce importation should be drawn up allowing foreign workers into the country on project-by-project basis. A worker’s residence visa should automatically expire once the project is completed.

• The volume of labour for contracting projects should be controlled and the concerned companies should acquire modern technology and machinery.

• Contracting companies employing more national workforce should be granted financial incentives.

• Marginal projects of little use to the national economy, carried out by foreign contracting companies, should be minimized.

13. Supporting National Contracting Companies

• One of the ways to support the national contracting companies is that the public authorities should take practical steps to consolidate national contracting establishments by merging small companies together.

• The researcher believes that local contracting companies have attained promising levels of proficiency that qualify them to undertake giant projects and operate in markets outside the UAE. He also suggests that the concerned authorities granting loans and aids to foreign countries urge the aided ones to invite local UAE companies to undertake some of the projects. This will certainly be in the interest of both the local economy and the local contracting companies.
Due to the differing number of contracting companies operating in the UAE that are not in possession of enough equipment and machinery, the researcher suggests the establishment of equipment rental agencies. It so happens that a contractor needs some equipment or a machine only for a short period. In this case the contractor may hire it instead of buying it.

In addition to this, concerned government departments may divide their huge project tenders into smaller ones to enable national companies to bid for these projects. National companies will then be able to compete with foreign companies possessing large capitals, sophisticated equipment and modern technology. The public authorities should at least make it obligatory for foreign companies to cooperate with local ones through tie-ups when carrying out such large projects. For example national companies may be allowed to undertake projects such as reinforced concrete and the like. The researcher also suggests that the government gives priority to national contracting companies whenever there are tenders for government projects.

Periodical meetings and gatherings should be held by the authorities and the concerned parties involved in the contracting sector e.g. the Contractors' Association, Chambers of Commerce and Industry, Municipal Departments; the Ministry of Public Works and Housing, and government building establishments. Through such meetings and gatherings many problems and difficulties can be addressed.
• Administrative, technical and financial transactions and dealings should be improved especially while carrying out a project (detailed before).

• Administrative and technical personnel within the Construction Sector should be Emiratised. This can only happen when the Ministry of Labour and the other concerned departments work together for this purpose. The aim is to help nationals to take part in the management of contracting companies.

• A national contractor involved in government projects should be granted 25% of the contract value (Dhs. 25 million at least) since the authorities rights are ensured by bank guarantees submitted by the national contractor. This rule will encourage and support national contractors. The concerned ministries and departments should pay the contractor’s periodical and final dues during the period stated in the contract and compensate the contractor in case of any delay.

• Preliminary bank guarantees should be reduced to 2.5% instead of 5% and retention money of performance bonds to 5%. Tender preliminary guarantees should be released to the third bidder thirty days after opening tenders unless the employer desires to grant the tender to the third bidder. In this case the employer may retain the third tender guarantee.

• The contractor should be fairly compensated in the event of any emergency that would make the job too costly or too troublesome. He should be compensated in the case of force majeure that makes compliance with the contract terms impossible according to international laws.
• To encourage local companies, the researcher recommends giving priority to local companies on tendering for government projects. National companies may be allowed 10% more in the event of quotations and tenders. This recommendation is currently adopted by the oil companies operating in Abu Dhabi where national companies are given priority and preference whenever they tender and bid at the same level with foreign companies.

• National contracting companies should be invited to take part in the projects being carried out by the government outside the UAE as government aid to other countries.

• National contracting companies should be provided enough liquidity needed to meet their liabilities towards the projects entrusted to them. This requires that, national companies be granted financial facilities to enable them to cover their expenditure and overheads.

• All contract terms applied by ministries and regional departments should be reviewed and reformulated to put an end to or minimize disputes that take place between the contract parties. On reviewing the said contracts all concerned parties should be considered or at least invited to take part.

• A new federal law for tenders and contractors’ classification should be enforced to fill the existing legislative gaps and loopholes.
• Variation and rectification orders addressed to contractors during work execution should be considered as early as possible to avoid any work delay and impediment. A contractor should be compensated if work is delayed or impeded due to such matters.

• Plans, designs and specifications proposed by consulting engineers should be put under strict control.

• The infrastructure and utility amenities and facilities necessary for the contracting industry (e.g. car parks, sanitary utilities ... etc) should be available.

• Regulations obliging contractors not to claim any additional dues during the execution of the project should be cancelled.

• Due importance should be given to tender analysis by monitoring the volume of works entrusted to the contractor. Additional projects beyond his financial, administrative and technical capacity should not be assigned to him even though his tender is the lowest. This measure will be in the interest of the contractor who may not be able to complete work to the satisfaction of his employers.

• Last but not the least, the concerned authorities should keep records and registers to ensure details of national workforce and number of workers in all economic sectors all over the country. This will facilitate research work and help researchers to get the information necessary and develop reliable results. This certainly would pave the way for economic research, recommendations and decision making with
respect to the construction and building (contracting) industry, the economic sectors and the UAE national workforce.

- The role of associations like the Contractors' Association and the Engineers' Association should be activated. Laws should be enacted to organize the engineering professions. All contracting companies should be registered at the Contractors' Association while consultants and engineers should be registered at the Engineers Association.
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Appendix 1

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(1) Percentages calculated by the researcher.
(2) Numbers of contractors collected by the researcher from the UAE's municipalities and Annual Statistical Book Issued by Dubai Municipality in 1991.
### Table (1-B)
Number of Contracting Companies & Annual Change Rate
By Emirate (1983-1995)

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1. Percentages calculated by the researcher.
2. Numbers of contractors collected by the researcher from the UAE's municipalities and Annual Statistical Books issued by Dubai Municipality in 1991.
Table No. (2)


(in thousands)

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*Source: Ministry of Planning Annual Statistical Abstract, Seventeenth Edition - 1992 p.27, estimations were made by the researcher on the basis of growth rates of years proceeding 1993-1994.*

Table No. (3)

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*Source: Average growth rates calculated by researcher.*
Table (4)
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(Million Dirhams)

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<td>1981 - 1985</td>
<td>147568</td>
<td>25.8</td>
<td>73308</td>
</tr>
<tr>
<td>1986 - 1990</td>
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<td>19.4</td>
<td>49696</td>
</tr>
<tr>
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<td>394294</td>
<td>69.9</td>
<td>201429</td>
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<tr>
<td>1991 - 1995</td>
<td>177130</td>
<td>31.1</td>
<td>61153</td>
</tr>
<tr>
<td>TOTAL:</td>
<td>571424</td>
<td>100</td>
<td>262582</td>
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</table>

(2) Approximate Percentages were calculated by the researched for 1991 – 1995 & 1975 – 1995.
### Table (5)

**Indicators Relating To The Building & Construction Industry (1975-1995)**

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<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
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<td>Production Value</td>
<td>Million Dirhams</td>
<td>8115</td>
<td>18700</td>
<td>15100</td>
<td>18.2%</td>
<td>6.4%</td>
<td>16735</td>
<td>17086</td>
<td>17445</td>
<td>17812</td>
<td>18186</td>
<td>18568</td>
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<tr>
<td>Added Value in Current Prices</td>
<td></td>
<td>4308</td>
<td>9834</td>
<td>8882</td>
<td>18%</td>
<td>(2)%</td>
<td>9687</td>
<td>1.8</td>
<td>9397</td>
<td>9595</td>
<td>9797</td>
<td>10002</td>
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<tr>
<td>Added Value in Fixed Prices</td>
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<td>4770</td>
<td>9834</td>
<td>9022</td>
<td>15.6%</td>
<td>(1.7)%</td>
<td>-</td>
<td>-</td>
<td>9739</td>
<td>9944</td>
<td>10153</td>
<td>10366</td>
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<td>Workers' Number</td>
<td>1000 Workers</td>
<td>74</td>
<td>143</td>
<td>117</td>
<td>14.1%</td>
<td>(3.9)%</td>
<td>119.2</td>
<td>1.1</td>
<td>126.2</td>
<td>133.3</td>
<td>140.1</td>
<td>147.1</td>
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</tbody>
</table>

**Sources:**
(3) Approximate figures for 1995 were calculated by the researcher.
Table (6)

<table>
<thead>
<tr>
<th>Year</th>
<th>Construction Value (Billion)</th>
<th>Contribution to GDP</th>
<th>Number of Workers (Thousand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>AED 13.572</td>
<td>9 %</td>
<td>154.6</td>
</tr>
<tr>
<td>1996</td>
<td>AED 14.142</td>
<td>8 %</td>
<td>160.7</td>
</tr>
<tr>
<td>1997</td>
<td>AED 14.000</td>
<td>8 %</td>
<td>251.6</td>
</tr>
<tr>
<td>1998</td>
<td>AED 16.392</td>
<td>9 %</td>
<td>257.3</td>
</tr>
<tr>
<td>1999</td>
<td>AED 16.621</td>
<td>8 %</td>
<td>262</td>
</tr>
<tr>
<td>2000</td>
<td>AED 17.247</td>
<td>7 %</td>
<td>267.3</td>
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</table>

Table (7)
GDP Contribution Percentage of The Building & Construction Sector 1989 - 1995

<table>
<thead>
<tr>
<th>YEAR</th>
<th>CONTRIBUTION PERCENTAGE %</th>
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</thead>
<tbody>
<tr>
<td>1989</td>
<td>9.3</td>
</tr>
<tr>
<td>1990</td>
<td>7.7</td>
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<tr>
<td>1991</td>
<td>8.2</td>
</tr>
<tr>
<td>1992</td>
<td>8.6</td>
</tr>
<tr>
<td>1993</td>
<td>9.3</td>
</tr>
<tr>
<td>1994</td>
<td>9.8</td>
</tr>
<tr>
<td>1995</td>
<td>9.5</td>
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</table>

Source: Percentages have been calculated by the researcher.
### Table (8)

<table>
<thead>
<tr>
<th>YEAR</th>
<th>PRODUCTION COST VALUE (Million Dirhams)</th>
<th>ANNUAL INCREASE %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>9,570</td>
<td>-</td>
</tr>
<tr>
<td>1990</td>
<td>9,687</td>
<td>1.2%</td>
</tr>
<tr>
<td>1991</td>
<td>10,365</td>
<td>8.2%</td>
</tr>
<tr>
<td>1992</td>
<td>11,125</td>
<td>7.3%</td>
</tr>
<tr>
<td>1993</td>
<td>12,200</td>
<td>10.9%</td>
</tr>
<tr>
<td>1994</td>
<td>13,210</td>
<td>8.3%</td>
</tr>
<tr>
<td>1995</td>
<td>13,936</td>
<td>5.5%</td>
</tr>
</tbody>
</table>

Source: Percentages have been calculated by the researcher.

### Table (9)
Growth Percentages of Various Economic Sectors in 1993

<table>
<thead>
<tr>
<th>SECTOR</th>
<th>GROWTH PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>10.2%</td>
</tr>
<tr>
<td>Building &amp; Construction</td>
<td>10%</td>
</tr>
<tr>
<td>Water &amp; Electricity</td>
<td>2.7%</td>
</tr>
<tr>
<td>Manufacturing &amp; Industries</td>
<td>1%</td>
</tr>
<tr>
<td>Trade</td>
<td>5.2</td>
</tr>
<tr>
<td>Transportation &amp; Communications</td>
<td>9%</td>
</tr>
<tr>
<td>Finance &amp; Insurance</td>
<td>13%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>11%</td>
</tr>
</tbody>
</table>

Source: Annual Economic Report for 1994- Ministry of Planning pp. 15, 16,
Table (10)
Indicators of the Development of Education
Between 1974/75 and 1994/1995

<table>
<thead>
<tr>
<th>Statement</th>
<th>74/75</th>
<th>79/80</th>
<th>84/85</th>
<th>89/90</th>
<th>90/91</th>
<th>91/92</th>
<th>92/93</th>
<th>93/94</th>
<th>94/95</th>
<th>Average Annual Growth %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>60254</td>
<td>124019</td>
<td>229759</td>
<td>362314</td>
<td>388115</td>
<td>398749</td>
<td>420037</td>
<td>452280</td>
<td>475799</td>
<td>25.8%</td>
</tr>
<tr>
<td>Class Rooms</td>
<td>2067</td>
<td>4544</td>
<td>8830</td>
<td>14226</td>
<td>15028</td>
<td>15700</td>
<td>16847</td>
<td>18203</td>
<td>19404</td>
<td>28.3%</td>
</tr>
<tr>
<td>Teachers</td>
<td>3681</td>
<td>7812</td>
<td>14088</td>
<td>21733</td>
<td>28922</td>
<td>30257</td>
<td>32661</td>
<td>35049</td>
<td>37362</td>
<td>29.4%</td>
</tr>
<tr>
<td>Schools</td>
<td>198</td>
<td>322</td>
<td>540</td>
<td>713</td>
<td>782</td>
<td>810</td>
<td>861</td>
<td>919</td>
<td>969</td>
<td>19.3%</td>
</tr>
<tr>
<td>Students / classroom</td>
<td>29</td>
<td>27</td>
<td>26</td>
<td>25.5</td>
<td>25.8</td>
<td>25.4</td>
<td>25</td>
<td>24.8</td>
<td>24.5</td>
<td>-</td>
</tr>
<tr>
<td>Students / teacher</td>
<td>16</td>
<td>16</td>
<td>13</td>
<td>16.7</td>
<td>13.4</td>
<td>13.2</td>
<td>12.9</td>
<td>12.9</td>
<td>12.7</td>
<td>-</td>
</tr>
<tr>
<td>Students of Adult Education</td>
<td>11017</td>
<td>14089</td>
<td>20886</td>
<td>21159</td>
<td>19209</td>
<td>17194</td>
<td>18946</td>
<td>17756</td>
<td>17294</td>
<td>5.1%</td>
</tr>
<tr>
<td>Adult Education Centers</td>
<td>98</td>
<td>112</td>
<td>115</td>
<td>126</td>
<td>135</td>
<td>136</td>
<td>147</td>
<td>143</td>
<td>146</td>
<td>4.5%</td>
</tr>
<tr>
<td>University Students</td>
<td>-</td>
<td>1011</td>
<td>6326</td>
<td>7918</td>
<td>8496</td>
<td>8668</td>
<td>9793</td>
<td>11388</td>
<td>12561</td>
<td>32.3%</td>
</tr>
<tr>
<td>Teaching Staff</td>
<td>-</td>
<td>224</td>
<td>469</td>
<td>634</td>
<td>772</td>
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<td>934</td>
<td>977</td>
<td>1057</td>
<td>21.4%</td>
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Source:
(2) Ministry of Planning Annual Statistical Abstract 1994
(3) Average growth rate calculated by the researcher.
Table (11)
Indicators of the Development of Education
Growth Rates Between 1974/75 and 1984/85

<table>
<thead>
<tr>
<th>Statement</th>
<th>74/75</th>
<th>79/80</th>
<th>84/85</th>
<th>Volume of Increase</th>
<th>% Annual Growth Rates</th>
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<td></td>
<td></td>
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<tr>
<td>Students</td>
<td>60254</td>
<td>124019</td>
<td>229759</td>
<td>229759</td>
<td>15.1</td>
</tr>
<tr>
<td>Classrooms</td>
<td>2067</td>
<td>4524</td>
<td>8830</td>
<td>6763</td>
<td>17</td>
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<tr>
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<td>7812</td>
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<td>322</td>
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<td>353</td>
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<tr>
<td>Students / classroom</td>
<td>29</td>
<td>27</td>
<td>26</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Students / teacher</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Students of Adult Ed-Centres</td>
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<td>20886</td>
<td>2869</td>
<td>5</td>
</tr>
<tr>
<td>Adult Ed-Centres</td>
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<td>112</td>
<td>115</td>
<td>17</td>
<td>2.7</td>
</tr>
<tr>
<td>University Students</td>
<td>-</td>
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<td>5374</td>
<td>4363</td>
<td>-</td>
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<tr>
<td>Technical Staff</td>
<td>-</td>
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<td>469</td>
<td>245</td>
<td>-</td>
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</table>

Source: Socio-Economic Development in the UAE for Years 1975-1985, Ministry of Planning – page 143
### Table (12)


<table>
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<th>Volume of Increase</th>
<th>Rate of Dev. %</th>
<th>90/91</th>
<th>Volume of Increase</th>
<th>Rate of Dev. %</th>
<th>91/92</th>
<th>Volume of Increase</th>
<th>Rate of Dev. %</th>
<th>92/93</th>
<th>Volume of Increase</th>
<th>Rate of Dev. %</th>
<th>93/94</th>
<th>Volume of Increase</th>
<th>Rate of Dev. %</th>
<th>94/95</th>
<th>Volume of Increase</th>
<th>Rate of Dev. %</th>
<th>95/96</th>
<th>Volume of Increase</th>
<th>Rate of Dev. %</th>
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<tbody>
<tr>
<td>Students</td>
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<td>362314</td>
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<td>15700</td>
<td>672</td>
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<td>25.4</td>
<td>-</td>
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</tr>
<tr>
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<td>634</td>
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<td>138</td>
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<td>170</td>
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<td>1057</td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Teaching Staff</td>
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<td>21159</td>
<td>373</td>
<td>-</td>
<td>19209</td>
<td>(1950)</td>
<td>17194</td>
<td>(2015)</td>
<td>18946</td>
<td>1752</td>
<td>17756</td>
<td>(1190)</td>
<td>17294</td>
<td>(462)</td>
<td>(2.6)</td>
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<td></td>
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</tr>
<tr>
<td>No. of Centres</td>
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<td>126</td>
<td>11</td>
<td>-</td>
<td>135</td>
<td>9</td>
<td>136</td>
<td>1</td>
<td>147</td>
<td>11</td>
<td>143</td>
<td>(4)</td>
<td>146</td>
<td>3</td>
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</table>

Table (13)
Increases In Number of Government-Owned Hospitals
(1972 – 1995)

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Public</th>
<th>Specialized</th>
<th>General</th>
<th>Dental</th>
<th>School Health</th>
<th>Mother &amp; Child Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>9</td>
<td>3</td>
<td>11</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>1973</td>
<td>9</td>
<td>3</td>
<td>14</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>1974</td>
<td>9</td>
<td>3</td>
<td>19</td>
<td>3</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>1975</td>
<td>9</td>
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<td>1976</td>
<td>9</td>
<td>5</td>
<td>33</td>
<td>7</td>
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</tr>
<tr>
<td>1977</td>
<td>11</td>
<td>5</td>
<td>46</td>
<td>10</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>1978</td>
<td>12</td>
<td>5</td>
<td>48</td>
<td>13</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>1979</td>
<td>13</td>
<td>5</td>
<td>49</td>
<td>13</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>1980</td>
<td>14</td>
<td>6</td>
<td>49</td>
<td>12</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>1981</td>
<td>15</td>
<td>6</td>
<td>50</td>
<td>12</td>
<td>9</td>
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</tr>
<tr>
<td>1982</td>
<td>16</td>
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<td>20</td>
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<td>53</td>
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<td>9</td>
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<td>1990</td>
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<td>9</td>
<td>10</td>
<td>10</td>
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<tr>
<td>1992</td>
<td>33</td>
<td>12</td>
<td>55</td>
<td>9</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>1993</td>
<td>35</td>
<td>13</td>
<td>56</td>
<td>8</td>
<td>10</td>
<td>10</td>
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<td>1994</td>
<td>38</td>
<td>14</td>
<td>57</td>
<td>8</td>
<td>10</td>
<td>10</td>
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<tr>
<td>1995</td>
<td>41</td>
<td>15</td>
<td>57</td>
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(1) Approximate figures calculated by the researcher from 1980 to 1993.
### Table (14-A)

#### Health Service Indicators / (1985-1990)

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<tr>
<th>STATEMENT</th>
<th>1985 Government</th>
<th>Private</th>
<th>Total</th>
<th>1990 Government</th>
<th>Private</th>
<th>Total</th>
<th>Increase Rate</th>
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<td>40</td>
<td>33</td>
<td>9</td>
<td>42</td>
<td>2</td>
</tr>
<tr>
<td>Beds Number</td>
<td>5428</td>
<td>384</td>
<td>5812</td>
<td>6010</td>
<td>387</td>
<td>6397</td>
<td>582</td>
</tr>
<tr>
<td>Physicians</td>
<td>1699</td>
<td>662</td>
<td>2361</td>
<td>1939</td>
<td>1052</td>
<td>2991</td>
<td>240</td>
</tr>
<tr>
<td>Dentists</td>
<td>119</td>
<td>140</td>
<td>259</td>
<td>141</td>
<td>242</td>
<td>383</td>
<td>22</td>
</tr>
<tr>
<td>Nursing Staff</td>
<td>5564</td>
<td>763</td>
<td>6327</td>
<td>6170</td>
<td>960</td>
<td>7130</td>
<td>606</td>
</tr>
<tr>
<td>Pharmacists &amp; Their Assistants</td>
<td>449</td>
<td>304</td>
<td>753</td>
<td>655</td>
<td>442</td>
<td>1097</td>
<td>206</td>
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<tr>
<td>Pharmacies</td>
<td>168</td>
<td>218</td>
<td>386</td>
<td>181</td>
<td>320</td>
<td>501</td>
<td>13</td>
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### Table (14-B) Continued / (1991-1995)

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</tr>
</thead>
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<td>Government</td>
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<td>10</td>
<td>44</td>
<td>34</td>
<td>11</td>
<td>45</td>
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<td>Private</td>
<td>5989</td>
<td>426</td>
<td>6415</td>
<td>5967</td>
<td>468</td>
<td>6345</td>
<td>(22)</td>
</tr>
<tr>
<td>Total</td>
<td>1890</td>
<td>1122</td>
<td>3012</td>
<td>1843</td>
<td>1198</td>
<td>3041</td>
<td>(30)</td>
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<tr>
<td>Government</td>
<td>168</td>
<td>416</td>
<td>6079</td>
<td>1063</td>
<td>7142</td>
<td>7166</td>
<td>168</td>
</tr>
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<td>Private</td>
<td>739</td>
<td>448</td>
<td>1187</td>
<td>833</td>
<td>454</td>
<td>1287</td>
<td>(92)</td>
</tr>
<tr>
<td>Total</td>
<td>183</td>
<td>346</td>
<td>529</td>
<td>186</td>
<td>374</td>
<td>560</td>
<td>189</td>
</tr>
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</table>

3) Approximate – Figure for 1991, 1992, 1994, 1995 calculated by the researcher.
### Table (15)

Production and Consumption of Electrical Energy

*(1975 - 1995)*

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<tr>
<th></th>
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<th></th>
<th></th>
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<th></th>
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<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Generated Energy</td>
<td>Million K.W.H</td>
<td>1336</td>
<td>11957</td>
<td>16966</td>
<td>5009</td>
<td>18.5</td>
<td>17351</td>
<td>18689</td>
<td>21730</td>
<td>23599</td>
<td>25628</td>
<td>8277</td>
<td>10.2%</td>
</tr>
<tr>
<td>Consumed Energy</td>
<td>Million K.W.H</td>
<td>1177</td>
<td>11321</td>
<td>15889</td>
<td>4568</td>
<td>18.9</td>
<td>17001</td>
<td>18191</td>
<td>19465</td>
<td>20826</td>
<td>22285</td>
<td>5283</td>
<td>7%</td>
</tr>
<tr>
<td>Consumed As % Generated</td>
<td>%</td>
<td>88.1</td>
<td>94.4%</td>
<td>93.7%</td>
<td>-</td>
<td>-</td>
<td>97.9%</td>
<td>97.3%</td>
<td>89.6%</td>
<td>88.2%</td>
<td>87%</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

(1) Ministry of Planning, op. cit., p.89.
(3) Approximate – figures for 1994-1995 calculated by the researcher.
Table (16)
Water Production & Consumption
(1975-1995)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Produced Quantities</td>
<td>Billion Gallons</td>
<td>10.7</td>
<td>47</td>
<td>60.4</td>
<td>49.7</td>
<td>18.9</td>
<td>93.8</td>
<td>9.2</td>
<td>100.6</td>
<td>102.3</td>
<td>105.6</td>
<td>108.7</td>
<td>3841</td>
<td>3%</td>
</tr>
<tr>
<td>2- Consumed Quantities</td>
<td>**     **</td>
<td>8.9</td>
<td>35.1</td>
<td>54.6</td>
<td>45.7</td>
<td>19.9</td>
<td>90.9</td>
<td>9.4</td>
<td>99.4</td>
<td>108.8</td>
<td>129.7</td>
<td>141.7</td>
<td>42.3</td>
<td>9.3%</td>
</tr>
<tr>
<td>Percentage 2:1</td>
<td>%</td>
<td>83.2</td>
<td>74.7</td>
<td>90.4</td>
<td>-</td>
<td>-</td>
<td>96.9</td>
<td>-</td>
<td>98.8</td>
<td>(6%)</td>
<td>(18.6%)</td>
<td>(23.3%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Per Capita Consumption</td>
<td>1000 Gallon</td>
<td>16.7</td>
<td>33.7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>52</td>
<td>54.4</td>
<td>58.9</td>
<td>61.6</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Average/year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per Capita Consumption</td>
<td>Gallon</td>
<td>43.9</td>
<td>92.2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>142.5</td>
<td>149.1</td>
<td>161.4</td>
<td>169.6</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Average/year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

(3) Approximate – figures for 1994-1995 calculated by the researcher.
## Table (17)

### Indicators of Land Transportation Growth / (1975- 1995)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Roads</td>
<td>KM.</td>
<td>700</td>
<td>2000</td>
<td>2200</td>
<td>1500</td>
<td>12.1%</td>
<td>2200</td>
<td>-</td>
<td>2247</td>
<td>2294</td>
<td>2341</td>
<td>2388</td>
<td>2435</td>
<td>2%</td>
</tr>
<tr>
<td>Car’s Number</td>
<td>1000 Cars</td>
<td>72</td>
<td>188</td>
<td>241</td>
<td>169</td>
<td>12.8%</td>
<td>303.3</td>
<td>3.7</td>
<td>332.1</td>
<td>363.7</td>
<td>398.7</td>
<td>436.6</td>
<td>478</td>
<td>9.5%</td>
</tr>
<tr>
<td>Oil &amp; Gas Pipelines</td>
<td>KM</td>
<td>704</td>
<td>989</td>
<td>2120</td>
<td>1416</td>
<td>11.7%</td>
<td>2120</td>
<td>-</td>
<td>2281</td>
<td>2454</td>
<td>2641</td>
<td>2842</td>
<td>3058</td>
<td>7.6%</td>
</tr>
</tbody>
</table>

(1) Ministry of Planning, op cit., pp. 126,104.  
(3) Approximate-figures for 1991-1995 calculated by the researcher.
## Table (18)
### Indicators of Maritime Transportation Growth (1975-1995)

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>Measurement</th>
<th>1975</th>
<th>1980</th>
<th>1985</th>
<th>1990</th>
<th>Annual Growth Rate %*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Ports</td>
<td>In number</td>
<td>3</td>
<td>10</td>
<td>14</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Quay’s Number</td>
<td>“”</td>
<td>29</td>
<td>15</td>
<td>312</td>
<td>283</td>
<td>-</td>
</tr>
<tr>
<td>Quay’s Length</td>
<td>KM</td>
<td>6</td>
<td>36</td>
<td>46</td>
<td>40</td>
<td>48</td>
</tr>
<tr>
<td>Oil Ports</td>
<td>Number</td>
<td>6</td>
<td>10</td>
<td>12</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>National Oil</td>
<td>Number</td>
<td>2</td>
<td>3</td>
<td>16</td>
<td>14</td>
<td>29</td>
</tr>
<tr>
<td>Tankers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Source: Ministry of Planning, ibid, p. 105, 126

* Annual average growth rate for each period added together and divided by 4
Table (19)

Five-Year Plan (1981 – 1985)

Investment By Sector / By Emirate

(in Million Dirhams)

<table>
<thead>
<tr>
<th>Emirates Activities</th>
<th>Emirates</th>
<th>Abu Dhabi</th>
<th>Dubai</th>
<th>Sharjah</th>
<th>Ajman</th>
<th>UAQ</th>
<th>RAK</th>
<th>Fujairah</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture &amp; Livestock</td>
<td></td>
<td>1033.1</td>
<td>323.4</td>
<td>547.2</td>
<td>70.6</td>
<td>129.3</td>
<td>592.7</td>
<td>459.6</td>
<td>3155.9</td>
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<tr>
<td>Crude Oil</td>
<td></td>
<td>18110.0</td>
<td>2500.0</td>
<td>2390.0</td>
<td>50.0</td>
<td>100.0</td>
<td>150.0</td>
<td>50.0</td>
<td>23350.0</td>
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<tr>
<td>Extractive Industries</td>
<td></td>
<td>125.0</td>
<td>75.1</td>
<td>49.9</td>
<td>44.8</td>
<td>30.1</td>
<td>100.0</td>
<td>75.1</td>
<td>500.0</td>
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<td>20000.0</td>
<td>13260.0</td>
<td>5000.0</td>
<td>1460.0</td>
<td>2020.0</td>
<td>5800.0</td>
<td>2470.0</td>
<td>50000.0</td>
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<td>Electricity &amp; Water</td>
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<td>8645.9</td>
<td>3536.1</td>
<td>1458.0</td>
<td>254.4</td>
<td>816.9</td>
<td>1251.1</td>
<td>672.2</td>
<td>16634.6</td>
</tr>
<tr>
<td>Construction &amp; Building</td>
<td></td>
<td>2814.4</td>
<td>919.7</td>
<td>510.2</td>
<td>136.4</td>
<td>112.5</td>
<td>320.1</td>
<td>186.7</td>
<td>5000.0</td>
</tr>
<tr>
<td>Trade, Restaurants &amp; Hotels</td>
<td></td>
<td>1443.4</td>
<td>1047.7</td>
<td>513.1</td>
<td>50.9</td>
<td>17.1</td>
<td>123.8</td>
<td>83.6</td>
<td>3279.6</td>
</tr>
<tr>
<td>Transport, Storing &amp; Communication</td>
<td></td>
<td>18249.4</td>
<td>6165.7</td>
<td>1064.7</td>
<td>356.7</td>
<td>222.2</td>
<td>751.8</td>
<td>723.2</td>
<td>27533.7</td>
</tr>
<tr>
<td>Catering &amp; Insurance</td>
<td></td>
<td>320.8</td>
<td>258.8</td>
<td>89.4</td>
<td>5.5</td>
<td>5.5</td>
<td>38.5</td>
<td>5.5</td>
<td>724.0</td>
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<td>5690.0</td>
<td>3395.0</td>
<td>2145.0</td>
<td>540.0</td>
<td>220.0</td>
<td>1555.0</td>
<td>455.0</td>
<td>14000.0</td>
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<td>Other Services</td>
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<td>80.0</td>
<td>50.0</td>
<td>35.0</td>
<td>6.0</td>
<td>5.0</td>
<td>16.0</td>
<td>8.0</td>
<td>200.0</td>
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<td>Gov. Services</td>
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<td>286.0</td>
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<td>607.3</td>
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<td>16500.0</td>
</tr>
<tr>
<td>Total</td>
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<td>14887.4</td>
<td>3261.3</td>
<td>3866.7</td>
<td>11306.3</td>
<td>5726.3</td>
<td>160877.8</td>
</tr>
</tbody>
</table>

Table (20)
Investment In the Construction Sector According to the (First) Five-Year Plan (1981-1985)
By Federal/Regional Government, Regional Government Business & The Private Sector
(In Million Dirhams)

<table>
<thead>
<tr>
<th>Emirates</th>
<th>Abu Dhabi</th>
<th>Dubai</th>
<th>Sharjah</th>
<th>Ajman</th>
<th>UAQ</th>
<th>RAK</th>
<th>Fujairah</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Government</td>
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<td>1.5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.5</td>
</tr>
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<td>Regional</td>
<td>11</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>Government</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional Gov. Business</td>
<td>600</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>600</td>
</tr>
<tr>
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<td>2203.4</td>
<td>918.2</td>
<td>510.2</td>
<td>136.4</td>
<td>112.5</td>
<td>320.1</td>
<td>186.7</td>
<td>4387.5</td>
</tr>
<tr>
<td>Total</td>
<td>2814.4</td>
<td>919.7</td>
<td>510.2</td>
<td>136.4</td>
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Table (21)
Investment In The Construction Sector Between 1975 and 1990
Analysed Between Civil and Non Civil Work*

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Sources: Economic and Social Development Report for the UAE (1975 to 1985)
Economic and Social Development Report for the UAE (1985 to 1990)

* Plant and equipment: generating equipment, air conditioning equipment, lifts, etc
Table (22)

Distribution of Gross Domestic Product Between Oil and Non Oil Sectors

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<th>1980</th>
<th>% of Total GDP</th>
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<th>1985</th>
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<th>1990</th>
<th>% of Total GDP</th>
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Source
(1) ibid – Socio-economic development of the UAE during 1975 – 1990, Ministry of Planning, Pages 32, 55
### Table (23)

GDP Analysed by Economic Sector (1975 – 1984) (Million Dirhams)

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<td>TOTAL</td>
<td>102549</td>
<td>100</td>
<td>125266</td>
<td>100</td>
<td>126264</td>
<td>100</td>
<td>130163</td>
</tr>
<tr>
<td>Sectors Total (Crude Oil Excluded)</td>
<td>63757</td>
<td>62.2</td>
<td>67634</td>
<td>54</td>
<td>72004</td>
<td>57</td>
<td>77047</td>
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</tbody>
</table>

3) Percentages for 1994 and 1995 along with the 1995 estimation calculated by the researcher.
Table (26)
Investment In The Construction & Building Industry As %
of Total Investment: (1975 - 1995)
(Million Dirhams)

<table>
<thead>
<tr>
<th>Statement</th>
<th>(1) Total Investment</th>
<th>(2) Construction &amp; Building Investment</th>
<th>Construction &amp; Building As % Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Investment</td>
<td>Investment</td>
<td></td>
</tr>
<tr>
<td>1975 - 1980</td>
<td>135706</td>
<td>78425</td>
<td>57.8</td>
</tr>
<tr>
<td>1981 - 1985</td>
<td>147568</td>
<td>73308</td>
<td>49.7</td>
</tr>
<tr>
<td>1986 - 1990</td>
<td>111020</td>
<td>49696</td>
<td>44.8</td>
</tr>
<tr>
<td>TOTAL:</td>
<td>394294</td>
<td>201429</td>
<td>51.1</td>
</tr>
<tr>
<td>1991 - 1995</td>
<td>177130</td>
<td>61153</td>
<td>34.5</td>
</tr>
<tr>
<td>TOTAL:</td>
<td>571424</td>
<td>262582</td>
<td>45.9</td>
</tr>
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</table>

Table (27)

<table>
<thead>
<tr>
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<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Value</td>
<td>Million Dirhams</td>
<td>8115</td>
<td>18700</td>
<td>15100</td>
<td>18.2% (4.2%) % 6.4%</td>
<td>16735</td>
<td>2.1</td>
<td>17086</td>
<td>17445</td>
<td>17812</td>
<td>18186</td>
<td>18568</td>
<td>2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Added Value in Current Prices</td>
<td></td>
<td>4308</td>
<td>9834</td>
<td>8882</td>
<td>18% (2%) % 7.5%</td>
<td>9687</td>
<td>1.8</td>
<td>9397</td>
<td>9595</td>
<td>9797</td>
<td>10002</td>
<td>10212</td>
<td>2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Added Value in Fixed Prices</td>
<td></td>
<td>4770</td>
<td>9834</td>
<td>9022</td>
<td>15.6% (1.7%) % 6.6%</td>
<td>-</td>
<td>-</td>
<td>9739</td>
<td>9944</td>
<td>10153</td>
<td>10366</td>
<td>10584</td>
<td>2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worker’s Number</td>
<td>1000 Workers</td>
<td>74</td>
<td>143</td>
<td>117</td>
<td>14.1% (3.9%) % 4.7%</td>
<td>119.2</td>
<td>1.1</td>
<td>126.2</td>
<td>133.3</td>
<td>140.1</td>
<td>147.1</td>
<td>152.8</td>
<td>4.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wages</td>
<td>Million Dirhams</td>
<td>-</td>
<td>-</td>
<td>3765</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4068</td>
<td>-</td>
<td>4133</td>
<td>4199</td>
<td>4266</td>
<td>4335</td>
<td>4404</td>
<td>1.6</td>
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</tbody>
</table>

(3) Approximate – figures calculated by the researcher – workers’ number for 1995
Table (28)
Indicators Relating To The Real Estate Industry (1975 – 1995)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Value</td>
<td>Million Dirhams</td>
<td>1760</td>
<td>4425</td>
<td>5850</td>
<td>7713</td>
<td>20.2</td>
<td>5.7</td>
<td>12.8</td>
<td>5.7</td>
<td>8153</td>
<td>8617</td>
<td>9109</td>
<td>9628</td>
<td>10176</td>
<td>5.7%</td>
</tr>
<tr>
<td>Added Value in Current Prices</td>
<td>&quot;&quot;&quot;&quot;</td>
<td>1092</td>
<td>4006</td>
<td>5176</td>
<td>6764</td>
<td>20.3</td>
<td>5.3</td>
<td>12.5</td>
<td>5.8</td>
<td>7262</td>
<td>7683</td>
<td>8129</td>
<td>8600</td>
<td>9099</td>
<td>5.8%</td>
</tr>
<tr>
<td>Fixed Capital Formation</td>
<td>&quot;&quot;&quot;&quot;</td>
<td>2549</td>
<td>2390</td>
<td>897</td>
<td>986</td>
<td>24.7</td>
<td>4.6</td>
<td>14.2</td>
<td>-</td>
<td>1005</td>
<td>1024</td>
<td>1043</td>
<td>1063</td>
<td>1083</td>
<td>1.9%</td>
</tr>
<tr>
<td>Labour</td>
<td>Workers</td>
<td>185</td>
<td>900</td>
<td>2589</td>
<td>3100</td>
<td>37.2</td>
<td>23.5</td>
<td>30.2</td>
<td>3.7</td>
<td>3215</td>
<td>33.17</td>
<td>3424</td>
<td>3533</td>
<td>3646</td>
<td>3.7%</td>
</tr>
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</table>

Sources: 1. Ibid, Ministry of Planning pages 118, 137
2. Statistics of 1990 – 1991 calculated by the researcher

322
Table (29)

Residential Unit Statistics By Type of Dwelling
(1975 – 1995)

<table>
<thead>
<tr>
<th>Statement</th>
<th>1975</th>
<th>1980</th>
<th>1985</th>
<th>Increase In Volume 1975/85</th>
<th>Average Annual Growth Rate</th>
<th>1990 (1)</th>
<th>Increase In Volume 1985/90</th>
<th>Average Annual Growth Rate</th>
<th>1995 (3)</th>
<th>Increase In Volume 1990/95</th>
<th>Average Annual Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Housing Units</td>
<td>%</td>
<td>Housing Units</td>
<td>%</td>
<td></td>
<td>Housing Units</td>
<td>%</td>
<td></td>
<td>Housing Units</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Low Cost House</td>
<td>74700</td>
<td>79.1</td>
<td>113661</td>
<td>59.8</td>
<td>139400</td>
<td>51.1</td>
<td>64700</td>
<td>6.4</td>
<td>148920</td>
<td>48.7</td>
<td>9520</td>
</tr>
<tr>
<td>Economy House</td>
<td>13975</td>
<td>14.8</td>
<td>74304</td>
<td>39.0</td>
<td>104531</td>
<td>38.3</td>
<td>90376</td>
<td>22.3</td>
<td>122275</td>
<td>40</td>
<td>17924</td>
</tr>
<tr>
<td>Average House</td>
<td>5705</td>
<td>6.1</td>
<td>2112</td>
<td>1.2</td>
<td>29040</td>
<td>10.6</td>
<td>23335</td>
<td>17.6</td>
<td>34725</td>
<td>11.3</td>
<td>5685</td>
</tr>
<tr>
<td>Total</td>
<td>94380</td>
<td>100</td>
<td>190077</td>
<td>100</td>
<td>272971</td>
<td>100</td>
<td>178411</td>
<td>11.2</td>
<td>305920</td>
<td>100</td>
<td>33129</td>
</tr>
</tbody>
</table>

Sources: 1. Ibid – Ministry of Planning, pages 117, 135 (1975 – 1990)
3. Details of housing units of 1995 calculated by the researcher.

‘Economy House’ - Next upward in scale of cost after Low Cost House. Built privately.
‘Average House’ - Next up again in scale of cost after Economy House.
Table (30)
Bank Credits by Economic Sector
(1985 and 1990) (Million Dirhams)

<table>
<thead>
<tr>
<th>Statement</th>
<th>1985</th>
<th></th>
<th>1990</th>
<th></th>
<th>Annual Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>%</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>150</td>
<td>0.3</td>
<td>192</td>
<td>0.3</td>
<td>5.1</td>
</tr>
<tr>
<td>Strategic Industries</td>
<td>416</td>
<td>0.9</td>
<td>361</td>
<td>0.6</td>
<td>(2.8)</td>
</tr>
<tr>
<td>Manufacturing Industries</td>
<td>2017</td>
<td>4.5</td>
<td>2786</td>
<td>4.8</td>
<td>6.7</td>
</tr>
<tr>
<td>Electricity &amp; Water</td>
<td>18</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Construction &amp; Building</td>
<td>10596</td>
<td>23.4</td>
<td>11352</td>
<td>19.5</td>
<td>1.4</td>
</tr>
<tr>
<td>Trade</td>
<td>13253</td>
<td>29.3</td>
<td>19208</td>
<td>32.9</td>
<td>7.7</td>
</tr>
<tr>
<td>Transport, Storage &amp; Contracting</td>
<td>942</td>
<td>2.1</td>
<td>1622</td>
<td>2.8</td>
<td>11.5</td>
</tr>
<tr>
<td>Government</td>
<td>9491</td>
<td>21.0</td>
<td>8251</td>
<td>14.1</td>
<td>(2.8)</td>
</tr>
<tr>
<td>Other Activities</td>
<td>8356</td>
<td>18.5</td>
<td>14564</td>
<td>25.0</td>
<td>11.8</td>
</tr>
<tr>
<td>Total</td>
<td>45239</td>
<td>100</td>
<td>58338</td>
<td>100</td>
<td>5.2</td>
</tr>
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</table>

Table (31)

Percentages of Bank Credits by Economic Sector (1975 – 1995)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>0.11</td>
<td>0.35</td>
<td>26</td>
<td>0.33</td>
<td>(1.2)</td>
<td>0.3</td>
<td>5.1</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>5.1</td>
</tr>
<tr>
<td>Mining</td>
<td>0.32</td>
<td>0.78</td>
<td>19.5</td>
<td>0.92</td>
<td>1.1</td>
<td>0.6</td>
<td>(2.8)</td>
<td>0.6</td>
<td>0.5</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>(2.8)</td>
</tr>
<tr>
<td>Industry</td>
<td>5.8</td>
<td>6.64</td>
<td>2.7</td>
<td>4.46</td>
<td>(7.7)</td>
<td>4.8</td>
<td>6.7</td>
<td>5.3</td>
<td>5.4</td>
<td>5.4</td>
<td>5.4</td>
<td>5.4</td>
<td>6.7</td>
</tr>
<tr>
<td>Electricity, Water</td>
<td>2.05</td>
<td>-</td>
<td>-</td>
<td>0.04</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>and Gas</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>24.60</td>
<td>32.07</td>
<td>5.4</td>
<td>23.42</td>
<td>(6.1)</td>
<td>19.5</td>
<td>1.4</td>
<td>18.5</td>
<td>16.8</td>
<td>16.0</td>
<td>15.2</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Trade</td>
<td>51.12</td>
<td>38.25</td>
<td>(5.6)</td>
<td>29.30</td>
<td>(5.3)</td>
<td>32.9</td>
<td>7.7</td>
<td>33.2</td>
<td>34.1</td>
<td>34.4</td>
<td>34.4</td>
<td>34.7</td>
<td>7.7</td>
</tr>
<tr>
<td>Transport &amp; Storing</td>
<td>1.4</td>
<td>2.26</td>
<td>10</td>
<td>2.08</td>
<td>(1.6)</td>
<td>2.8</td>
<td>11.5</td>
<td>2.9</td>
<td>3.2</td>
<td>3.3</td>
<td>3.3</td>
<td>3.5</td>
<td>11.5</td>
</tr>
<tr>
<td>Government</td>
<td>5.74</td>
<td>8.09</td>
<td>6.9</td>
<td>20.98</td>
<td>2.1</td>
<td>14.1</td>
<td>(2.8)</td>
<td>12.9</td>
<td>10.8</td>
<td>9.8</td>
<td>9.8</td>
<td>8.9</td>
<td>(2.8)</td>
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<tr>
<td>Other Activities</td>
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<td>11.56</td>
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<td>18.47</td>
<td>9.8</td>
<td>25</td>
<td>11.8</td>
<td>26.3</td>
<td>28.9</td>
<td>30.4</td>
<td>30.4</td>
<td>31.6</td>
<td>11.8</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>-</td>
<td>100</td>
<td>-</td>
<td>100</td>
<td>5.2</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>-</td>
</tr>
</tbody>
</table>

Sources:  
1) Socio-Economic Developments in the UAE during 1975 – 1990, Ministry of Planning, Pages 80 & 55  
2) Statistics of 1991 – 1995 calculated by the researcher
Table (32)

Most Outstanding Changes in 1970 & 1990

<table>
<thead>
<tr>
<th>Level</th>
<th>Percentage</th>
<th>1970</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Poor</td>
<td>Fair</td>
</tr>
<tr>
<td>Performance of Operation</td>
<td>of</td>
<td>13.6%</td>
<td>40.9%</td>
</tr>
<tr>
<td>Performance of Elements</td>
<td>of</td>
<td>15%</td>
<td>55%</td>
</tr>
<tr>
<td>Profit</td>
<td></td>
<td>10%</td>
<td>45%</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher through collection of questionnaire data

Table (33)

Most Important Developments of Organizational Framework

<table>
<thead>
<tr>
<th>Class\Level</th>
<th>1975</th>
<th>1995</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None %</td>
<td>Poor %</td>
</tr>
<tr>
<td>Attaining Planned Goals</td>
<td>-</td>
<td>28.6</td>
</tr>
<tr>
<td>Assessing Laws &amp; Systems of Work.</td>
<td>28.6</td>
<td>19</td>
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</table>

Source: Calculated by the researcher on basis of questionnaire data.
### Table (34)

**Belhasa Engineering & Contracting LLC During 1977 – 1990**

<table>
<thead>
<tr>
<th>Year</th>
<th>1977</th>
<th>1990</th>
<th>1995</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Turnover</td>
<td>Dhs. 200,000</td>
<td>Dhs. 5,000,000</td>
<td>Dhs. 10,000,000</td>
</tr>
<tr>
<td>Number of Engineers</td>
<td>2</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Number of Labourers</td>
<td>35</td>
<td>700</td>
<td>1500</td>
</tr>
<tr>
<td>Value of Annual Projects</td>
<td>Dhs. 500,000</td>
<td>Dhs. 1000,000,000</td>
<td>Dhs. 3000,000,000</td>
</tr>
<tr>
<td>Number of Completed Projects</td>
<td>3 Projects</td>
<td>9 Projects</td>
<td>12 Projects</td>
</tr>
</tbody>
</table>

### Table (35)


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Activity</td>
<td>Contracting</td>
<td>Contracting</td>
<td>Contracting</td>
<td>Contracting</td>
</tr>
<tr>
<td>Company Capital</td>
<td>Dhs. 10 million</td>
<td>Dhs. 13 million</td>
<td>Dhs. 15 million</td>
<td>Dhs. 20 million</td>
</tr>
<tr>
<td>Number of Engineers</td>
<td>13</td>
<td>17</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>Number of labors</td>
<td>400</td>
<td>800</td>
<td>1200</td>
<td>1476</td>
</tr>
<tr>
<td>Annual project value</td>
<td>Dhs. 110 million</td>
<td>Dhs. 190 million</td>
<td>Dhs. 270 million</td>
<td>Dhs. 324 million</td>
</tr>
<tr>
<td>Number of executed projects</td>
<td>Roads and Civil Works. 4 Road projects</td>
<td>Roads and Civil Works. 7 Road projects</td>
<td>Roads and Civil Works. 5 Road projects</td>
<td>Roads and Civil Works. 4 Road projects</td>
</tr>
</tbody>
</table>
### Table (36)
Organizational Structures of Belhasa Projects LLC in Different Periods

<table>
<thead>
<tr>
<th>1975 Department &amp; Sections</th>
<th>1981 Department &amp; Sections</th>
<th>1990 Department &amp; Sections</th>
<th>1995 Department &amp; Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managing Director &amp; Production Development</td>
<td>Development Manager- Factory</td>
<td>Financial &amp; Administrative Manager</td>
<td>Financial &amp; Administrative Manager</td>
</tr>
<tr>
<td>Local Affairs.</td>
<td>Administrative &amp; Developing Manager</td>
<td>Commercial Manager (Liaison office, Factory Manager and Transport)</td>
<td>Commercial Manager (Liaison office &amp; Factory and transport Manager)</td>
</tr>
<tr>
<td>Immigration</td>
<td>Chief Engineer</td>
<td>Chief Engineers</td>
<td>Chief Engineer</td>
</tr>
<tr>
<td></td>
<td>Local Public Relation</td>
<td>Chief Estimators</td>
<td>Chief Estimators</td>
</tr>
<tr>
<td></td>
<td>Chief Estimators</td>
<td>Technical Manager</td>
<td>Technical Manager</td>
</tr>
</tbody>
</table>

### Table (37)
Six Construct LLC in Different Periods

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Activity</td>
<td>Contracting</td>
<td>Contracting</td>
<td>Contracting</td>
<td>Contracting</td>
</tr>
<tr>
<td>Company Capital</td>
<td>Dhs. 15 million</td>
<td>Dhs. 30 million</td>
<td>Dhs. 40 million</td>
<td>Dhs. 46 million</td>
</tr>
<tr>
<td>Number of Engineers</td>
<td>20</td>
<td>33</td>
<td>45</td>
<td>52</td>
</tr>
<tr>
<td>Number of laborers</td>
<td>300</td>
<td>800</td>
<td>1300</td>
<td>1656</td>
</tr>
<tr>
<td>Value of Annual Projects</td>
<td>Dhs. 160 million</td>
<td>Dhs. 270 million</td>
<td>Dhs. 360 million</td>
<td>Dhs. 416 million</td>
</tr>
<tr>
<td>Number of executed projects</td>
<td>11 Projects</td>
<td>17 Projects</td>
<td>20 Projects</td>
<td>22 Projects</td>
</tr>
</tbody>
</table>
Table (38)
Comparison of the Organizational Structures of Six Construct LLC

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Department</td>
<td>Operating Department</td>
<td>Operating Department</td>
<td>Operating Department</td>
<td></td>
</tr>
<tr>
<td>Technical Department</td>
<td>Technical Department</td>
<td>Technical Department</td>
<td>Technical Department</td>
<td></td>
</tr>
<tr>
<td>Administrative Department</td>
<td>Financial &amp; Administrative Department</td>
<td>Financial &amp; Administrative Department</td>
<td>Financial &amp; Administrative Department</td>
<td></td>
</tr>
</tbody>
</table>

Table (39)
Comparing the Organizational Structures of Al Aref Contractors LLC
During 1970 – 1995

<table>
<thead>
<tr>
<th>Year</th>
<th>1970</th>
<th>1990</th>
<th>1995</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Activity</td>
<td>Contracting</td>
<td>Contracting</td>
<td>Contracting</td>
</tr>
<tr>
<td>Company Capital</td>
<td>Dhs. 200,000</td>
<td>Dhs. 6 million</td>
<td>Dhs. 10 million</td>
</tr>
<tr>
<td>Number of Engineers</td>
<td>--</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Number of laborers</td>
<td>30</td>
<td>350</td>
<td>500</td>
</tr>
<tr>
<td>Value of Annual Projects</td>
<td>Dhs. 500,000</td>
<td>Dhs. 55,000,000</td>
<td>Dhs. 100,000,000</td>
</tr>
<tr>
<td>Number of executed projects</td>
<td>3 Different Projects</td>
<td>7 Different Projects</td>
<td>3 Different Projects</td>
</tr>
</tbody>
</table>
Table (40)

Comparison of the Organizational Structures of Al Aref Contractors LLC During 1970 – 1990

<table>
<thead>
<tr>
<th>1970</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver</td>
<td>Manufacturing Dept.</td>
</tr>
<tr>
<td>Clerk</td>
<td>Operating Dept.</td>
</tr>
<tr>
<td>Supervisor</td>
<td>Contracts Dept.</td>
</tr>
<tr>
<td></td>
<td>Financial Dept.</td>
</tr>
<tr>
<td></td>
<td>Purchases Dept.</td>
</tr>
<tr>
<td></td>
<td>Administrative Dept.</td>
</tr>
<tr>
<td></td>
<td>Planning Dept.</td>
</tr>
<tr>
<td></td>
<td>Research Dept.</td>
</tr>
</tbody>
</table>

Table (41)

Companies Opinion of Construction Contracts

<table>
<thead>
<tr>
<th>Level</th>
<th>Incomplete</th>
<th>%</th>
<th>Poor</th>
<th>%</th>
<th>Good</th>
<th>%</th>
<th>Excellent</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>28</td>
<td>58.3</td>
<td>8</td>
<td>16.7</td>
<td>10</td>
<td>20.8</td>
<td>2</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher through questionnaire data

Table (42)

Companies Opinions About Companies Law and License Regulations During 1975 - 1995

<table>
<thead>
<tr>
<th>Category</th>
<th>1975</th>
<th>1995</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>Poor</td>
<td>10</td>
<td>31.3</td>
</tr>
<tr>
<td>Good</td>
<td>4</td>
<td>12.5</td>
</tr>
<tr>
<td>No Laws</td>
<td>18</td>
<td>56.2</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data
### Table (43)
Law of Companies and Permits Regulations

<table>
<thead>
<tr>
<th>Year</th>
<th>No %</th>
<th>Weak %</th>
<th>Satisfactory %</th>
<th>Fair %</th>
<th>Good %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>56.3</td>
<td>31.2</td>
<td>-</td>
<td>-</td>
<td>12.5</td>
</tr>
<tr>
<td>1990</td>
<td>-</td>
<td>-</td>
<td>25</td>
<td>20.8</td>
<td>54.5</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data

### Table (44)
Building Permit Procedures in Dubai

<table>
<thead>
<tr>
<th>Institution</th>
<th>Transaction</th>
<th>Time needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Town Planning</td>
<td>Approval of the area, height, parks, etc.</td>
<td>7 – 14 days</td>
</tr>
<tr>
<td>2 Planning Dept.</td>
<td>Preliminary approval</td>
<td>7 – 14 days</td>
</tr>
<tr>
<td>3 Survey Dept.</td>
<td>Fixing Marks to Guide Surveyors</td>
<td>7 – 14 days</td>
</tr>
<tr>
<td>4 Civil Defence</td>
<td>Approval</td>
<td>7 – 14 Days</td>
</tr>
<tr>
<td>5 Drainage</td>
<td>Approval</td>
<td>7 – 14 Days</td>
</tr>
<tr>
<td>6 Roads Dept.</td>
<td>Car Parks, Exits, and Entrances</td>
<td>14 – 21 Days</td>
</tr>
<tr>
<td>7 Water &amp; Electricity Dept.</td>
<td>Water and Electric Supplies</td>
<td>21 – 28 Days</td>
</tr>
<tr>
<td>8 Committee</td>
<td>If all transaction are finalised – they go to the Committee for final approval</td>
<td>10 – 15 Days</td>
</tr>
</tbody>
</table>

Source: Dubai Municipality
Table (45)
Opinions About Unified Classification System of Companies

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not bad %</th>
<th>Weak %</th>
<th>Good %</th>
<th>Excellent %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>16</td>
<td>-</td>
<td>72</td>
<td>12</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data.

Table (46)
Companies Opinions of a New Classification System

<table>
<thead>
<tr>
<th>Level</th>
<th>Not bad</th>
<th>Fair</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number &amp; No.</td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
</tr>
<tr>
<td>Percentage</td>
<td>8 16</td>
<td>-</td>
<td>36</td>
<td>72 6 12</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data.

Table (47)
Opinions of Terms of Tenders

<table>
<thead>
<tr>
<th>Statement</th>
<th>Defective %</th>
<th>Not bad %</th>
<th>Fair %</th>
<th>Good %</th>
<th>Excellent %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>55</td>
<td>-</td>
<td>25</td>
<td>20</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data.

Table (48)
Opinions of Tender Conditions

<table>
<thead>
<tr>
<th>Level</th>
<th>Incomplete %</th>
<th>Not bad %</th>
<th>Fair %</th>
<th>Good %</th>
<th>Excellent %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number and %</td>
<td>22</td>
<td>55</td>
<td>10</td>
<td>8</td>
<td>20</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data.
Table (49)

Opinions About Construction Contracts

<table>
<thead>
<tr>
<th>Statement</th>
<th>Incomplete %</th>
<th>Weak %</th>
<th>Good %</th>
<th>Excellent %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>58.3</td>
<td>16.7</td>
<td>20.8</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data.

Table (50)

Contracting Companies in the UAE in 1995

<table>
<thead>
<tr>
<th>Emirate</th>
<th>In 1995</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abu Dhabi</td>
<td>2111</td>
</tr>
<tr>
<td>Dubai</td>
<td>977</td>
</tr>
<tr>
<td>Sharjah</td>
<td>1326</td>
</tr>
<tr>
<td>Ajman</td>
<td>142</td>
</tr>
<tr>
<td>Ras Al Khaimah</td>
<td>375</td>
</tr>
<tr>
<td>Um Al Quwain</td>
<td>202</td>
</tr>
<tr>
<td>Fujairah</td>
<td>222</td>
</tr>
</tbody>
</table>
Table (51)

Volume of Local and Foreign Contractors Market Shares in 1995

(Million Dollars)

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Contract Value</th>
<th>Gulf Contractors Share</th>
<th>Foreign Contractors Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure &amp; buildings</td>
<td>1818.5</td>
<td>623.5</td>
<td>1195</td>
</tr>
<tr>
<td>Oil, Gas &amp; Basic Industries</td>
<td>6184</td>
<td>140</td>
<td>6054</td>
</tr>
<tr>
<td>Total</td>
<td>8012.5</td>
<td>763.5</td>
<td>7249</td>
</tr>
</tbody>
</table>

Table (52)

Opinions About Emiratization of the Construction Sector in the UAE

<table>
<thead>
<tr>
<th>Proposed %</th>
<th>Companies for Emiratization</th>
<th>Sample rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>18</td>
<td>40.9</td>
</tr>
<tr>
<td>75</td>
<td>10</td>
<td>22.7</td>
</tr>
<tr>
<td>100</td>
<td>16</td>
<td>36.4</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data and field study.
Table (53)

Projects in Order of Feasibility According to Contractors’ Opinions

<table>
<thead>
<tr>
<th>Projects</th>
<th>Rank 1</th>
<th>Rank 2</th>
<th>Rank 3</th>
<th>Rank 4</th>
<th>Rank 5</th>
<th>Rank 6</th>
<th>Rank 7</th>
<th>Rank 8</th>
<th>Rank 9</th>
<th>Rank 10</th>
<th>Rank 11</th>
<th>Rank 12</th>
<th>Rank 13</th>
<th>Rank 14</th>
<th>Rank 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services</td>
<td>26.9</td>
<td>3.8</td>
<td>-</td>
<td>-</td>
<td>7.7</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
<td>7.7</td>
<td>3.8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Airports</td>
<td>3.8</td>
<td>-</td>
<td>3.8</td>
<td>7.7</td>
<td>-</td>
<td>7.7</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
<td>7.7</td>
<td>3.8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Roads</td>
<td>7.7</td>
<td>23</td>
<td>3.8</td>
<td>-</td>
<td>11.5</td>
<td>7.7</td>
<td>-</td>
<td>11.5</td>
<td>3.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Electricity</td>
<td>11.5</td>
<td>7.7</td>
<td>19.2</td>
<td>3.8</td>
<td>-</td>
<td>11.5</td>
<td>-</td>
<td>3.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Schools</td>
<td>7.7</td>
<td>23</td>
<td>15.4</td>
<td>15.4</td>
<td>3.8</td>
<td>-</td>
<td>-</td>
<td>3.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ports</td>
<td>3.8</td>
<td>-</td>
<td>11.5</td>
<td>3.8</td>
<td>7.7</td>
<td>11.5</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
<td>8.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Drainage</td>
<td>3.8</td>
<td>3.8</td>
<td>15.4</td>
<td>7.7</td>
<td>11.5</td>
<td>-</td>
<td>11.5</td>
<td>7.7</td>
<td>-</td>
<td>3.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hospitals</td>
<td>-</td>
<td>3.8</td>
<td>11.5</td>
<td>15.4</td>
<td>26.9</td>
<td>11.5</td>
<td>3.8</td>
<td>11.6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Water</td>
<td>-</td>
<td>19.5</td>
<td>19.5</td>
<td>15.4</td>
<td>19.5</td>
<td>3.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Landscape</td>
<td>-</td>
<td>3.8</td>
<td>3.8</td>
<td>-</td>
<td>7.7</td>
<td>-</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
<td>7.7</td>
<td>15.4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data

Table (54)

Level and Development of Technology in the Construction Sector During 1970 – 1990

<table>
<thead>
<tr>
<th>Category</th>
<th>1970</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor %</td>
<td>Fair %</td>
</tr>
<tr>
<td>Organisational Technology</td>
<td>31.6</td>
<td>42.1</td>
</tr>
<tr>
<td>Building Quality</td>
<td>13</td>
<td>26</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher – based on questionnaire data
Table (55)
Examination and Approval in Decision Phase

<table>
<thead>
<tr>
<th>Ordinal</th>
<th>Content</th>
<th>Responsibility department</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>License of land planning</td>
<td>Program department</td>
</tr>
<tr>
<td>2</td>
<td>Application of construction site</td>
<td>Government</td>
</tr>
<tr>
<td>3</td>
<td>License of land use</td>
<td>Land use administration department</td>
</tr>
<tr>
<td>4</td>
<td>License of construction project planning</td>
<td>Program department</td>
</tr>
<tr>
<td>5</td>
<td>License of investment</td>
<td>Planning council</td>
</tr>
<tr>
<td>6</td>
<td>Project proposal</td>
<td>Planning council</td>
</tr>
<tr>
<td>7</td>
<td>Report of construction site selection</td>
<td>Ministry of Construction or local construction committee</td>
</tr>
<tr>
<td>8</td>
<td>Report of environment influence</td>
<td>Environment protection department</td>
</tr>
<tr>
<td>9</td>
<td>Civil air defense</td>
<td>Civil air defense office</td>
</tr>
<tr>
<td>10</td>
<td>Feasibility study report</td>
<td>Planning council</td>
</tr>
</tbody>
</table>
Table (56)
Examination and Approval of Preliminary Design

<table>
<thead>
<tr>
<th>Participant</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction committee, environment protection, civil air defense, telecommunication, water supply, electricity supply, gas supply, municipal works, traffic, sanitation, fire fighting, public security and other related government bodies.</td>
<td>Design document conform to feasibility study.</td>
</tr>
<tr>
<td></td>
<td>Judge whether technological process, mold-making and disposition of equipment are reasonable.</td>
</tr>
<tr>
<td></td>
<td>Examine whether overall design, design documents of individual project, design specification and other related data meet the requirements of client and related government bodies.</td>
</tr>
</tbody>
</table>

Table (57)
Technical Requirements – Approved Documents – England and Wales

<table>
<thead>
<tr>
<th>Part A</th>
<th>Structure</th>
<th>Part H</th>
<th>Drainage and waste disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part B</td>
<td>Fire Safety</td>
<td>Part J</td>
<td>Heat producing appliances</td>
</tr>
<tr>
<td>Part C</td>
<td>Site preparation and resistance to moisture</td>
<td>Part K</td>
<td>Stairs, ramps and guards</td>
</tr>
<tr>
<td>Part D</td>
<td>Toxic substances</td>
<td>Part L</td>
<td>Conservation of fuel and power</td>
</tr>
<tr>
<td>Part E</td>
<td>Resistance to the passage of sound</td>
<td>Part M</td>
<td>Access and facilities for disabled people</td>
</tr>
<tr>
<td>Part F</td>
<td>Ventilation</td>
<td>Part N</td>
<td>Glazing – materials and protection</td>
</tr>
<tr>
<td>Part G</td>
<td>Hygiene</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Table (58)

**Workforce within the Construction Sector During 1975 – 1990**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No.</strong></td>
<td>93870</td>
<td>107150</td>
<td>154978</td>
<td>(4.6)</td>
<td>113100</td>
<td>(6.1)</td>
<td>108000</td>
<td>(4.5)</td>
<td>104000</td>
</tr>
<tr>
<td><strong>Rate %</strong></td>
<td>24.8</td>
<td>13.7</td>
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<td>559960</td>
<td>-</td>
<td>683825</td>
<td>-</td>
<td>621822</td>
<td>-</td>
<td>624746</td>
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</table>

Source: The UAE papers and discussions at a seminar conducted by the Arab Unity Centre for Studies p-469. Ministry of Planning, Central Dept. of Statistics.

Number of workers and growth rate and percentage of workers in the construction sector compared to the total workforce calculated by the researcher.

## Rate of Annual Growth %

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338
Table (59)
Labour Annual Increase in the Construction Sector During 1975 – 1990

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Table (60)
Labour Growth Rates During 1975 - 1995%

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<td>6.1%</td>
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(1) Source: ibid, The Arab Unity Studies Centre P. 469, Ministry of Planning
(2) Volume of labour in 1995 and rate of growth during 1990-1995 calculated by the researcher.
### Table (61)
**Number of Workers in Each Economic Sector During 1975 – 1990**

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Table (62)

Construction Workforce Compared to Total Workforce During 1975 – 1995

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<td>28</td>
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<td>1985</td>
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<td>1990</td>
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<td>1995</td>
<td>15.6</td>
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Source: Calculated by the researcher, Ministry of Planning – ibid, p.98 & 185

Table (63)

Percentage of Workforce in Economic Sectors
During 1975 – 1995

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<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Agriculture, livestock &amp; fisheries</td>
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<td>5.7</td>
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<td>6.2</td>
<td>6.1</td>
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<tr>
<td>Crude oil</td>
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<td>10.9</td>
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<tr>
<td>Construction &amp; building</td>
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<td>14.9</td>
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Source: Ibid, Ministry of Planning, p.98 & 185. Calculated by the researcher
<table>
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<td>260352</td>
<td>260473</td>
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<td>69260</td>
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<td>16.5%</td>
<td>16.2%</td>
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Source: 1. Statistics Dept., Ministry of Planning, UAE
2. Percentages calculated by the researcher based on statistics released by the Dept. Ministry of Planning.
### National Workforce within the Construction Sector During 1968 - 1995

<table>
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<tr>
<th>Year</th>
<th>Number of Labourers in Construction Sector</th>
<th>Rate of Annual Increase %</th>
<th>Number of National Workers</th>
<th>Percentage %</th>
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<td>-</td>
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<td>10</td>
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<td>1991</td>
<td>120542</td>
<td>1.1</td>
<td>405</td>
<td>0.3</td>
</tr>
<tr>
<td>1992</td>
<td>121867</td>
<td>1.1</td>
<td>345</td>
<td>0.28</td>
</tr>
<tr>
<td>1993</td>
<td>123208</td>
<td>1.1</td>
<td>293</td>
<td>0.23</td>
</tr>
<tr>
<td>1994</td>
<td>124563</td>
<td>1.1</td>
<td>249</td>
<td>0.2</td>
</tr>
<tr>
<td>1995</td>
<td>125934</td>
<td>1.1</td>
<td>212</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Source: * Percentage calculated by the researcher
* Estimations of 1991 – 1995 calculated by the researcher
Table (66)

Construction Value, Contribution to GDP and Size of Workforce Involved in Construction Sector During 1995—2000

<table>
<thead>
<tr>
<th>Year</th>
<th>Construction Value (Million)</th>
<th>Contribution to GDP</th>
<th>Number of Workers (Thousand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>AED 13.572</td>
<td>9 per cent</td>
<td>154.6</td>
</tr>
<tr>
<td>1996</td>
<td>AED 14.142</td>
<td>8 per cent</td>
<td>160.7</td>
</tr>
<tr>
<td>1997</td>
<td>AED 14.000</td>
<td>8 per cent</td>
<td>251.6</td>
</tr>
<tr>
<td>1998</td>
<td>AED 16.392</td>
<td>9 per cent</td>
<td>257.3</td>
</tr>
<tr>
<td>1999</td>
<td>AED 16.621</td>
<td>8 per cent</td>
<td>262</td>
</tr>
<tr>
<td>2000</td>
<td>AED 17.247</td>
<td>7 per cent</td>
<td>267.3</td>
</tr>
</tbody>
</table>

Table (67)

Workforce within the Construction Sector in 1975 and 1995

<table>
<thead>
<tr>
<th>Years</th>
<th>Workforce</th>
<th>Arabs</th>
<th>Asians</th>
<th>Other Foreigners</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td></td>
<td>22.3%</td>
<td>70.2%</td>
<td>7.5%</td>
</tr>
<tr>
<td>1995</td>
<td></td>
<td>15.2%</td>
<td>78.5%</td>
<td>6.3%</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data
### Table (68)
Level of Labour Productivity

<table>
<thead>
<tr>
<th>Labour Force</th>
<th>Level</th>
<th>Poor</th>
<th>Fair</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arab Labour</td>
<td>-</td>
<td>50%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Asian Labour</td>
<td>19.2%</td>
<td>61.5%</td>
<td>19.2%</td>
<td></td>
</tr>
<tr>
<td>Other Foreign Labour</td>
<td>10%</td>
<td>70%</td>
<td>20%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data.

### Table (69)
Level of Labour Skills in the Construction Sector
According to Nationalities

<table>
<thead>
<tr>
<th>Labour Force</th>
<th>Level</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arab Labour</td>
<td>-</td>
<td>40%</td>
<td>30%</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>Asian Labour</td>
<td>14.3%</td>
<td>42.9%</td>
<td>23.8%</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>Other Foreign Labour</td>
<td>-</td>
<td>10%</td>
<td>50%</td>
<td>40%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data.
### Table (70)

**Influence of Migrant Labour on Demographic Structure**

<table>
<thead>
<tr>
<th>Labour</th>
<th>Level</th>
<th>A Little</th>
<th>Fair</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arab Labour</td>
<td></td>
<td>53.8%</td>
<td>42.3%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Asian Labour</td>
<td></td>
<td>3.8%</td>
<td>7.7%</td>
<td>88.5%</td>
</tr>
<tr>
<td>Other Labour</td>
<td></td>
<td>61.9%</td>
<td>33.3%</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data.

### Table (71)

**Impact of Foreign Workforce on Security**

<table>
<thead>
<tr>
<th>Labour</th>
<th>Level</th>
<th>Nil</th>
<th>Poor</th>
<th>Fair</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arab Labour</td>
<td></td>
<td>32%</td>
<td>56%</td>
<td>8%</td>
<td>4%</td>
</tr>
<tr>
<td>Asian Labour</td>
<td></td>
<td>-</td>
<td>4.2%</td>
<td>20.8%</td>
<td>75%</td>
</tr>
<tr>
<td>Other Foreign</td>
<td></td>
<td>24%</td>
<td>28%</td>
<td>44%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Source: Calculated by the researcher on basis of questionnaire data.
### Table (72)
Volume of GDP and Per Capita GDP in 1998, 1999 & 2000

<table>
<thead>
<tr>
<th>Year</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP  (in millions)</td>
<td>177360</td>
<td>200835</td>
<td>241888</td>
</tr>
<tr>
<td>Population (in thousands)</td>
<td>22776</td>
<td>2938</td>
<td>3108</td>
</tr>
<tr>
<td>Per Capita (in dirhams)</td>
<td>63890</td>
<td>68392</td>
<td>77828</td>
</tr>
</tbody>
</table>

Source: Standard of Living in the UAE, Al Khaleej (Daily newspaper), No. 8129, Dubai, UAE (2000).

### Table (73)
Volume of Fixed Investments in 1996 & 1997
(in milliard dirhams)

<table>
<thead>
<tr>
<th>Year</th>
<th>1996</th>
<th>1997</th>
<th>+/- %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment Volume</td>
<td>47.4</td>
<td>48.7</td>
<td>2.7</td>
</tr>
</tbody>
</table>

Source: UAE, Ministry of Planning, Annual Economic Report for the year 1999
Appendix 2

Figures
BLANK IN ORIGINAL
Figure (1)
Organizational Chart for Official and Non Official Institutions
Looking After the Construction Sector

Source: Organizational framework prepared by the researcher.
Figure (2)

Organizational Chart of Belhasa Engineering & Contracting LLC in 1977

Board of Directors

General Manager

Workshop  Transport  Chief Engineer  Accounts

Purchasing

Project A  Project B  Project C

Source: Prepared by the Researcher
Figure (3)

Organizational Chart of Belhasa Engineering & Contracting LLC in 1990
Figure (4)

Organizational Chart of Belhasa Engineering & Contracing LLC in 1995
Organizational Chart for Belhasa Projects LLC in 1975

Figure (5)
Figure (6)
Organizational Chart of Belhasa Projects LLC in 1981
Figure (7)

Organizational Chart of Belhasa Projects LLC in 1990

Board of Directors
- Chairman
  - Vice Chairman
    - General Manager

Financial & Administrative Manager
- Stores
- Typing
- Purchase
- Accounting

Chief Estimators
- Quantity Engineer
  - Assistant

Chief Engineer
- Contract Manager (Rocks)
  - Engineers
    - Surveyors
      - Supervisors
        - Technicians
          - Laboratories

Contract Manager (Buildings)
- Engineers
  - Surveyors
    - Supervisors
      - Technicians
        - Laboratories

Commercial Manager
- Factory & Transport Manager
  - Technical Manager
    - Quantity Surveyor
    - Transport
      - Factory Control
        - Operating
          - Mechanic
            - Travelling
              - Immigration
                - Camp
Figure (9)
Organizational Chart of Six Construct LLC in 1984

Board of Directors

Chairman
Managing Director
Managers

Factory

Technical Manager

Tenders

Commercial Development

Administrative Manager

External Affairs and Legal Consultations

Purchases

Accounting

Employment

Project Managers
Figure (10)
The Organizational Chart of Six Construct LLC in 1988
Organizational Chart of Six Construct LLC in year 1990

Board of Directors
  Chairman
  Managing Directors
  Managers

Managing Director

Technical Manager

Operating Manager
  Project Managers
  Operating Coordinator
  Manufacturing Department

Technical Manager
  Commercial Development
  Assistants

General Manager
  Finance & Administration
    Accounting
    Employment
    Insurance
    Purchases & Stores
    External Affairs
Figure (12)

Organizational Chart of Six Construct LLC in Year 1995

Board of Directors
- Chairman
- Managing Directors
- Managers

Managing Director

Technical Manager

Operation Manager

Project Managers 4

Manufacturing Department

Operating Coordinator

Assistants

Commercial Development

General Manager

Finance & Administration

Accounting

Purchases & Stores

Employment

Transport

External Affairs

Insurance
Figure (13)
Organizational Chart for Al Aref Contractors LLC in 1970
Figure (14)

Organizational Chart for Head Office – Higher and Middle Management of Al Aref Contractors LLC in 1990

Chairman

Vice Chairman

General Manager

Factory Manager  Operating Manager  Contract Manager  Financial Manager  Purchases Manager  Administrative Manager  Planning Manager  Research Department
Figure (15)

Organizational Chart for Head Office – Higher and Middle Management of Al Aref Contractors LLC in 1995

Chairman

Vice Chairman

General Manager

Factory Manager  Operation Manager  Contract Manager  Financial Manager  Purchases Manager  Executive Manager  Planning Manager  Research Department
Figure (16)

General Organisational Structure of Dubai Municipality in 1995
Figure (17)

Authorities & Responsibilities For All Building Phases

Building & Housing Directorate

- Building Permits
- Architectural Checks
- Engineering Checks
- Building Control
- Architectural Building Supervision
- Building Inspection Dept.
- Security & Demolition Dept.
- Government Housing Dept.
- Administrative Services for Gov. Housing Sec.
- Planning Gov. Houses & Consultancy Services
- Execution Supervision of Gov. Houses

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Figure (18)

Town Regulation Authorities Chart

The Minister

Higher Regulation Council

Regulation Committee for Regional Towns

Joint Regulation Committee

Regulation Department for Central Towns & Villages

Regulation Committee for Regional Town & Village Buildings

Figure (19)
Organisation Chart for the Ministry of Construction

- general administration office
- planning finance department
- laws & regulations department
- scientific technology department
- construction industry department
- exploration & design department
- project administration & management department
- standard quota department
- city planning department
- real estate department
- urban construction department
- villages and small towns department
- foreign affairs department
- personnel and education department
- party committee
- survey and drawing department
- China State Construction Engineering Company
Figure (20)
Procedure for Capital Construction Project

1. Prepare project proposal
2. Prepare feasibility study
3. Project evaluation
4. Prepare design program
5. Schematic design
6. Approval of schematic design
7. Preliminary design
8. Approval of preliminary design
9. Design development
10. Construction document design
11. Bidding and tendering
12. Construction
13. Pre-opening
14. Completion acceptance
15. Delivery & use
16. Defects liability period
Figure (21)
Division of Work by Major Purpose or Function

Managing Director

Human resource management (HRM)

Research and development (R&D)

Production (P)

Marketing (M)

Finance (F)

Product 1

Product 2

Product 3
Figure (22)

Division of Work by Product or Service

Managing Director

HRM

Product 1

D&R P M F

Product 2

R&D P M F

Product 3

R&D P M F

Figure (23)

Division of Work by Location

Managing Director

HRM

Area A

R&D P M F

Area B

R&D P M F

Area C

R&D P M F
Figure (24)

Line and Staff Organisation

Research and Development Manager

Production Manager

Marketing Manager

Finance Manager

Line Organisation

Personnel

Computer services

Public relations

Management accounting
Figure (25)

Typical Organization of Project Team

- Operations Unit
- Project Manager
  - Regional Office
    - Engineering
    - Supply
    - Control
    - Administration
  - Site
    - Site Office
      - Technical Services
      - Supply Control
      - Project Control
      - Administration
    - Construction
      - Areas
      - Labour
      - Areas
Figure (26)

An Example of Matrix Organisation

Managing Director

- Line authority: 
- Project authority: 

Project A manager

Project B manager

Project C manager

Research and Development

Purchasing

Production

Quality control

[Diagram of matrix organisation with arrows indicating line and project authority]
Figure (27)

The "if-then" Contingency Relationship

THEN:
Variables in organizations structure and systems of management

IF:
Situational factors – for example, size, technology or environment
Figure (28)
Enterprise overall Level Organisation

Chairman of Board of Directors

Higher Management

Chairman

Board

Supporting Services

Public Relation

Personnel

Financial

Higher Functional Depts.

Personal Assistance

Administrative

Marketing

Legal

Higher Operation Management

Operation Unit 4

Operation Unit 3

Operation Unit 2

Operation Unit 1

Figure (29)
Chart for Operation Units

The Enterprise Level

General Management
Administration & Personnel
Marketing
Operation Management

Personnel
Financial
Legal
Logistics

Project Services
Project 4
Project 3
Project 2
Project 1

Source: ibid
Figure (30)

Chart of Project Matrix
Figure (31)

Formation of Higher Council For Building & Construction

- Ministry of Public Works
  - Higher Council for Construction & Building Sector
    - Contractors' Association
    - Engineers' Association
  - Ministry of Public Works & Housing
  - Ministry of Planning
  - Ministry of Finance (Specification & Measurement)
  - Ministry of Electricity & Water
  - Ministry of Interior (Civil Defence Dept.)
  - Ministry of PWH (Safety & Security)
  - Federal Environment Authority
  - Municipalities Secretariat
    - Municipalities
    - Public Works Dept.
    - Planning Dept.

Office Branches Dept.
- Umm Al Quwain
- Ras Al Khaimah
- Fujairah
- Ajman
- Sharjah
- Dubai
- Abu Dhabi
- Public Works Dept.
- Data Dept.
- Follow up Dept.
- Planning Dept.
- Technical Dept.
- Ministry of Public Works
Figure (32)
HIGHER COUNCIL FOR BUILDING & CONSTRUCTION
Functional and Organisational Structure

Chairman

Office Manager

Vice Chairman

Secretary

Secretary General

Secretary

Legislation

Contract Standardisation

Categorization

Building Codes

Research Dept.

Analysis of Economic Development Plans

Administrative Organisation

Construction Equipment Related

Developing corporate administrative systems

Technology

Training & qualifying workers

Developing Contractors skills

Coordination

Designing national products

Financing & insurance services

Computer

IT Processing Support

Encouraging better use of energy

Policy Formulation & Planning

Drawing up public & private construction policies

Follow up & assessment

Acquiring & transferring technology

Encouragement of Construction Exports

Project scheduling

Manpower control
INTERWEAVING ROLES OF THE CONSTRUCTION & BUILDING SECTOR IN ECONOMIC DEVELOPMENT

Figure (33)
Appendix 3

Questionnaires
Dear Sir,

I am currently conducting a study on the Construction Sector in the UAE. Therefore, I am collecting relevant data and opinions on the present and future of the Sector.

You are kindly requested to complete and return the enclosed questionnaire. I hope you will give kind consideration to it. It goes without saying that any information given will be highly confidential.

Thank you in anticipation.

Ahmed Saif Belhasa.
**Questionnaire:**

- **Company Name:** ________________________________
- **Address in UAE:** ________________________________
- **Branches in UAE:** ________________________________
- **Offices Abroad:** ________________________________
- **Date of Establishment in UAE:** ____________________
- **Date of Establishment Abroad (if any):** ______________
- **Category According to Municipal Licence:** ____________
- **Number of Employees:**
  - more than 1000 □
  - more than 500 □
  - more than 300 □
  - more than 100 □
  - more than 50 □
  - more than 20 □
- **Legal Status:**
  - Public □
  - Limited □
  - Private □
  - Joint □
- **Nationality**
  - Local □
  - Mixed (49%) □
  - Foreign □

1. **What is the volume of turnover?**
   - In the first year: ________
   - In 1970: ________
   - In 1990: ________

2. **Are you capable of carrying out projects abroad?**
   - Yes □
   - No □
   - Jointly □

3. **Do you carry out any projects abroad?**
   - Yes □
   - No □
4. If the answer is “No”, what are the reasons?
   - Lack of desire to expand abroad
   - Inability
   - Other reasons

5. Which of the following projects do you prefer to carrying out?
   - Governmental □
   - Federal □
   - Private □
   - Sole □

6. Are you for contracting companies alliance for carrying out giant projects?
   - Yes □
   - No □

7. Do you think that your company should join the UAE Contractors’ Association?
   - Yes □
   - No □

   If the answer is “Yes”, please state your reasons.
8. Which of the following UAE Contractors’ Association activities would you like to participate in?

- Seminars
- Conferences
- Exhibitions
- General Committees
- Visits

9. The UAE Contractors’ Association publishes a monthly magazine (Arabic/English) called Contractors’ News. Would you like to:

- Write for it
- Publish your company’s news
- Publish your advertisements

Organisational Form of Contracting Companies

(Please mark (v) in the suitable box)

<table>
<thead>
<tr>
<th>Levels &amp; Areas</th>
<th>1970</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nil</td>
<td>Poor</td>
</tr>
<tr>
<td>Attainment of Objects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Organisation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology used for</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisation Techniques</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance of Organisation Elements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product Quality (Buildings)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisation’s Profitability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laws &amp; Systems of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. What is your opinion of the Law of Companies & System of Trade Licences?

In 1970: ________________________________

In 1990: ________________________________
11. What is your opinion of:
   Companies Categorisation?
   Tender Terms?
   Contracting Agreements?

12. What was the percentage of building materials used:

   **In 1970?**
   - Local: Less than 25% □  50% □  75% □ Other □
   - Foreign: Less than 25% □  50% □  75% □ Other □

   **In 1990?**
   - Local: Less than 25% □  50% □  75% □ Other □
   - Foreign: Less than 25% □  50% □  75% □ Other □

13. Do you like to invest or engage in the following areas of the Construction Sector?
   a) Work in the Sector: Yes □ No □ maybe □
   b) Deal in building and real estate: Yes □ No □ maybe □

14. In your opinion which projects are more important?
   - Federal □ Regional government □ Private □ Sole □

15. In your opinion, which of the following projects are more profitable?
   (Please write 1 – 15 according to importance)
   - Services □ Roads □ Seaports □ Hospitals □ Airports □
   - Schools □ Drainage □ Water □ Electricity □ Landscape areas □
   - Commercial compounds □ Houses □ Villas □ Shopping centres □
   - Other utilities □
16. How far does the Construction Sector contribute to the Gross National Product of the UAE?

Poor □  Medium □  Excellent □

17. Is there any sort of inter-relation between the Construction Sector and other sectors?

Yes □  No □  Sometimes □

18. Is there a national economic inter-relation with the production of the following building materials?

Steel Yes □  No □
Cement Yes □  No □
Sand Yes □  No □
Rocks Yes □  No □
Wood Yes □  No □
Electricity Yes □  No □
Paints Yes □  No □
Aluminium Yes □  No □
Air conditioning Yes □  No □
Insulators Yes □  No □
Sanitary ware Yes □  No □
Decoration items Yes □  No □

19. Is there any sort of interrelation between the Construction Sector and the following sectors?

Banks Yes □  No □
Insurance Yes □  No □
Digging for oil Yes □  No □
Mining Yes □  No □
Shipping and transport Yes □  No □
Customs Yes □  No □
Imports & exports | Yes | No
--- | --- | ---
Market movement | Yes | No
Local industries | Yes | No

20. Was there any skilled workforce available for the Construction Sector?
   In 1970: Yes | No
   In 1990: Yes | No

21. What are the nationality percentages in the Construction Sector?
   In 1970: Asian | Arab | Foreign
   In 1990: Asian | Arab | Foreign

22. What are the expenditure and financing proportions for foreign workforce?
   Local expenditure | External expenditure (remittance)

23. Do you think there should be restrictions on work permits for migrant workforce?
   Arabs: Yes | No | Sometimes
   Asians: Yes | No | Sometimes
   Others: Yes | No | Sometimes

24. How far does migrant workforce affect the UAE demography?
   Arabs: A little | Average | High
   Asian: A little | Average | High
   Others: A little | Average | High

25. What is the impact of migrant workforce on security?
   Arabs: Nil | Poor | Medium | Great
   Asian: Nil | Poor | Medium | Great
   Others: Nil | Poor | Medium | Great
26. What is the level of workforce productivity?

<table>
<thead>
<tr>
<th></th>
<th>Poor</th>
<th>Average</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

27. What is your opinion of the level of workforce skills? (Please write)

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
</table>
| Arabs    :  
| Asian    :  
| Others   :  

28. What was the impact of the Construction Sector on the country's foreign trade in the following years?

<table>
<thead>
<tr>
<th>Year</th>
<th>Poor</th>
<th>Average</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>In 1970</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In 1980</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In 1990</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

29. What is the impact of the UAE contracting activity on attracting investors?

<table>
<thead>
<tr>
<th></th>
<th>Poor</th>
<th>Average</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Local investors:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Gulf investors:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Arab investors:</td>
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<td>d) International investors:</td>
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30. What are your expectations for the contracting industry in the UAE up to the year 2000?

<table>
<thead>
<tr>
<th></th>
<th>Poor</th>
<th>Average</th>
<th>Excellent</th>
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31. Do you think it is necessary to develop the Construction Sector in the following areas?

<table>
<thead>
<tr>
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<th>Yes</th>
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<tr>
<td>a) Administrative aspects:</td>
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<td>b) Organisational aspects:</td>
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<tr>
<td>c) Technical aspects:</td>
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</table>
32. How far are you for the Emiratization of the Construction Sector in the future?
   51% □  75% □  100% □

33. Do you think it is necessary to seek the help of foreign companies for carrying out giant projects?
   Yes □  No □  Sometimes □

34. Do you think it is necessary to set up giant national contracting companies?
   Yes □  No □  If necessary □

35. Do you think it is necessary to consolidate the contractors' efforts through the UAE Contractors' Association or any other government institutions? Write them if any.
   Yes □  No □

36. Do you think it is necessary to standardise the following?
   a) Categorisation system: Yes □  No □
   b) Tender terms: Yes □  No □
   c) Contract agreements: Yes □  No □

37. Do you think it is necessary to set up technical institutes to educate those engaged in the building and construction industry?
   Yes □  No □

38. Do you think it is necessary to depend on the following sources for building materials?
   Local: Yes □  No □  To some extent □
   Foreign: Yes □  No □  To some extent □

39. How far do consultants affect the building and construction industry?
   Poor □  Average □  Great □
40. How can the contracting sector be developed?
   By limiting the number of companies ☐
   By increasing the number of companies ☐
   By cooperation between local and foreign companies ☐
   By reducing the number of projects assigned to each company ☐
   By working inside the country ☐
   By working outside the country ☐
   Other suggestions: ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

Note:
Please write down other ideas or proposals, if any:

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

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Appendix 4

List of Sample Contracting Companies
List of (Sample) Contracting Companies:

A - Abu Dhabi

1. Ittihad Al Khaleej General Contracting Company
2. Sedco Contracting
3. Dar Al Bena Contracting Company
4. Bin Harmal Contracting & Irrigation Est.
5. Al Tharwat General Contracting Est.
6. Rapco Road Projects & General Contracting Est.
7. Al Salmeen Group Transport & Contracting
8. Al Omran Al Khaleeji Engineering & Contracting
9. Al Qantara General Contracting Co.
11. Abdul Rahman Abdullah Al Hebaishi Contracting
12. Al Mehwar Engineering & Contracting
14. Universal Centre Services
15. Al Soufi Contracting Est.
16. Universal Contractors’ Federation
17. Bin Hafeez Contracting
18. Diyeh Contracting
19. Al Madar General Contracting
20. Al Jaber Transport & Contracting
21. Al Adeed Contracting & Transport
B - Dubai:

1. Belhasa Actioncrete
2. Belhasa Antony Pools
3. Al Shams Engineering & Contracting
4. Al Ashram Contracting
5. Al Nakhrah Contracting
6. Saeed Sultan Contracting Co.
7. Sultan Abdul Rahman Contracting
8. Belhasa Engineering & Contracting
9. Khansaheb Civil Engineering
10. Al Habtoor Engineering Projects
11. Al Arif Contracting Co.
12. Masharee Ibrahim Lootah
13. Al Ittihad Transport and Contracting
14. Al Moosa General Engineering & Contracting
15. Al Mulla Contracting
16. Al Naboodah Contracting
17. Al Futtain Wimpy Private Co.
18. Al Ahmadiyah Contracting & Trading
19. Emirates Contracting Company
20. Saleh Contracting & Building
21. Golden Gulf Establishment
C - Sharjah

1. Six Construct LLC
2. Gepca LLC
3. The Eastern Co. LLC
4. Al Salehi Contracting
5. Al Demas & Al Farhan Engineering
6. General Enterprise Contracting
7. Al Marwan General Contracting
8. Intermas Engineering & Contracting

D - Ras Al Khaimah

1. Al Tatweer Trading & Contracting
2. Al Kolaib General Contracting
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Appendix – 5

The List of UAE Contractors’ Association Member Companies
<table>
<thead>
<tr>
<th>No.</th>
<th>Company Name</th>
<th>Location</th>
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<tr>
<td>1.</td>
<td>Belhasa Engineering &amp; Construction</td>
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<tr>
<td>2.</td>
<td>Universal Service Centre</td>
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<td>3.</td>
<td>Al Moosa General Contracting</td>
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<td>4.</td>
<td>Gibca LLC</td>
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<td>137.</td>
<td>Al Qamish National Contracting</td>
<td>Dubai</td>
</tr>
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<td>138.</td>
<td>Ali Bin Salim &amp; Herati</td>
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