Implementation Through Governmental Bureaucracy

A Study of the Factors that Cause Projects Implementation Delay

In Egypt

by

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Submitted to

The Department of Urban Studies and Planning
in partial fulfillment of the requirements
for the degree of

MASTER OF CITY PLANNING

FOR DEVELOPING AREAS

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

December 1984

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December 22, 1984

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بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

IN THE NAME OF ALLAH

THE MERCIFUL, THE COMPASSIONATE

This thesis is dedicated to my very dear father

and to my country, Egypt.

ABSTRACT

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For a long time now, construction planning and project implementation processes in Egypt have reached a stage that calls for problem-solving methods. Projects implementation, always, substantially falls behind their original scheduled timetables. Moreover, in some other cases projects might be confronted with sudden cancellation regardless of the stage they have reached in their implementation process.

This deteriorated situation perturbs the Egyptian national budget cycle and causes enormous economic loss especially with regard to the very limited national capital resources. This is in addition to some other interrelated important consequences. This situation necessitates paying a great deal of attention to thoroughly investigating and analyzing the factors that vitally affect and result in projects development and implementation processes delay.

This thesis will be an attempt to underlie these vital factors on its different pertinent levels (the government, the agencies involved in the implementation process and the implementors levels).

It is the contention of this study that the projects development and implementation processes factors of delay result from: 1 - The output of the organizational process and procedures through the inevitable institutional bureaucracy which governs the general structure of the Egyptian government. This situation necessitates paying bureaucracy serious attention to study its heavy impact on the government's policies and strategies. 2 - Various interrelated factors such as the politics of the Middle East; the national political process; the budget cycle; the links to foreign economic process and the relationships among the various agencies and organizations involved in the projects development and implementation processes. This is in addition to two major factors (out of the scope of this thesis) that operate on the overall planning level:

1 - The unclear definition of the policy goals according to the amount of resources available in the country and the strategy to allocate these resources through a well organized administration structure, a fact that may call for restructuring the government's administrative system to serve the broad goals of the country. 2 - The general absence of an agreed methodological planning framework and the shifting and the multiple institutional roles throughout the planning process period.

The results and recommendations provided in this study suggest: 1 - The use of the PERT/CPM techniques to control the overall management of construction projects. 2 -It suggests paths for change and correction on the three different levels (government, public agencies involved, and the implementors levels). At the government level: develop an efficient strategy for fund allocation, study projects initially to assure their legitimization and annual allocations, identify the roles of the different agencies and organizations involved in project development and implementation processes, facilitate import of construction materials, pursue a policy that limits the technical and labor manpower emigration, encourage the factories to work at full capacity or arrange the budget to include building others and encourage technical education. At the agency level: develop promotion features to be on a competitve basis within the same personnel specialized sector with priority to higher educational degrees, push decisions down to lower levels, allow additional work on a free-lance basis, encourage innovation, solve the professionals problems to keep them in the country, develop coordination within the agency and among the various agencies when dealing with the agency, facilitate rules to be flexible, establish a system to examine project possibilities for execution initially, adjust the estimated time-tables to include reasonable delays, and develop the follow-up system. At the implementor level: If the previous suggestions would be well carried out, the implementor's problems would be much helped. 3 - At the same time the study reveals problems which are basically uncorrectable, such as the uncertainty issue, yet suggests the best possible ways to deal with them.

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ACKNOWLEDGEMENT

If this thesis is to be dedicated to anyone, this person must be my academic advisor, professor Ralph Gakenheimer, of the Department of Urban Studies and Planning and Civil Engineering at M.I.T.

Whatever words I try to write, nothing will really express my gratitude, respect and appreciation for his careful guidence, patience, and continued support. I will ever be grateful to his devoting so much time and effort in stearing my research in the right direction that enhanced my professional skills.

My Masters Degree is only a reflection of the outcome of my overall significant experience in the United States of America, with all its tears and loving moments. I will always associate and credit that to my great advisor:

Professor Gakenheimer, thank you very much for everything.

I am also very grateful to professor William Doebele, of the Graduate School of Design at Harvard University, for reading my thesis and helping me to realize and learn new techniques in the management of construction projects.

I am also indebted to professor Biswapriya Sanyal, of the Department of Urban Studies and Planning at M.I.T. for reading my thesis and devoting so much time in supporting my efforts whenever the pressure of my work became intolerable.

Bish, thank you very much.

My deepest thanks go also to professor Gary Hack, Head of the Department of Urban Studies and Planning at M.I.T. for his support in offering me a chance for a new profession and pedagogy.

Last but not a bit least, my gratitude, love and deepest thanks to my father, Ahmed Gamiee, Ex-Under Secretary of State for the Ministry of Social Affairs in Cairo, Egypt, without whose support, morally and financially, I would not have been able to continue my educational studies at M.I.T. in the first place.

BABA, I love you very, very much.

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I - INTRODUCTION

This thesis analyzes the factors that exercise different types of influence on projects' development and implementation processes in Egypt. Politics, budget cycle, relationships among the various agencies and organizations involved in implementing any project, etc. are examples of these vital factors. A major one is the inevitable bureaucracy.

Bureaucracy, as a hierarchical system, is established to carry out projects through decision-making bureaucrats. Yet, its hierarchical nature becomes a hindrance to any project to be implemented, resulting in a lot of pitfalls. This happens because the Egyptian government does not adequately set implementation policies in relation to the characteristics of the institutional bureaucracy.

Therefore, this study will analyze the effects of bureaucracy on projects' development and implementation processes using the "Egyptian International Hotel" project as a case study.

A - RATIONALE OF THE THESIS

As I previously emphasized, bureaucracy is an institutional system that governs the general structure of the Egyptian government and significantly affects the government's policies and strategies.

This situation makes it very important to speak for a while about bureaucracy, as a device and a system, through providing a brief general overview about its nature to see the rationale behind its existance and to recognize its different applicable models (frames of reference).

This is to proceed to see, when bureaucracy has first established in Egypt? How it has always been applied? and how its hierarchical nature has performed with characteristics that becomes a hindrance to any project to be implemented resulting in a lot of pitfalls.

The case study of the "Egyptian International Hotel" project will help great deal to recognize and identify the pitfalls of the Egyptian institutional bureaucracy in addition to the other important interrelated factors of its different types of influence. This will help suggest paths and policies for change and correction to deal with bureaucracy according to its institutional characteristics

as well as with the other types and kinds of projects' development and implementation processes factors of delay.

Its my hope that such a study may be considered by the Egyptian government, organizations and agencies so as to avoid similar pitfalls in the future when developing and implementing any project.

B - METHODOLOGY

The aim of this study is to analyze and to demonstrate the factors that exercise different types of influence on projects' development and implementation processes in Egypt. The best approach for such an analysis is to trace the movement of projects from idea to completion within any governmental sector (here the study concentrates on the construction sector as its being the field of experience of the author).

This approach is especially because it has always been observed and proved that projects in Egypt constitute the unifying elements that link together the large number of agencies that involved in the construction planning and projects development and implementation processes.

The analysis will present the scope of the problem manifesting the output of the organizational process through the institutional bureaucracy as well as the output of the other political interrelated factors.

The study will not be a review of the case study from the design technical aspects but rather from the institutional and political context.

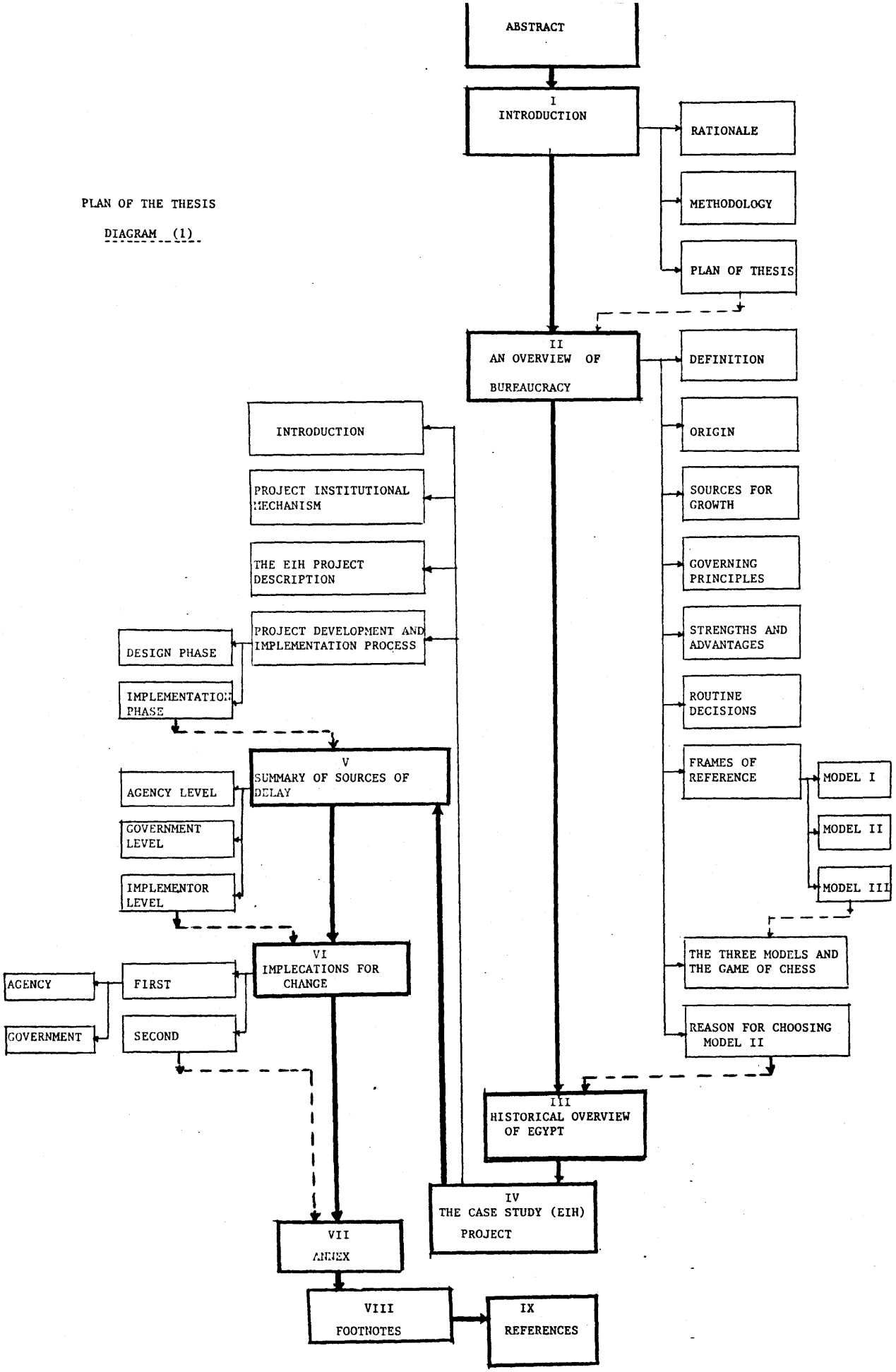
The methodology of this approach, the attitude and the points of reference for this sort of study are based on:
(1) The personal observation reflected in the background of the author. This includes eleven years of experience from 1/1973 - 9/1983 working for the Ministry of Housing in Egypt as a designer and a site supervisor for both the public and the private sectors.
(2) Reviewing the relevant litrature on the subject.
(3) The outcome of the author's participation in the Special Program for Urban and Regional Studies (SPURS) at the Department of Urban Studies and Planning at M.I.T. from 9/1983 - 7/1984.

C - PLAN OF THE THESIS

The thesis will be divided into five major sections (refer to diagram 1). The first section will include a

PLAN OF THE THESIS

DIAGRAM (1)



general overview of bureaucracy. This will be a theoretical discussion about the nature of bureaucracy: its definition, origins, sources of growth, governing principles, strengths and advantages and routine decisions. This will help recognize the rationale behind its existance and the way it should perform. Then the section will proceed by providing a presentation of three applicable frames of reference or models for bureaucracy, suggesting the "Organizational Behavior Model" as the most appropriate one to the case study. That model will help, efficiently, to speculate about the consequences of the organizational operations, procedures, etc. which affects projects implementation process.

The second section will present a historical overview about bureaucracy in Egypt to realize how bureaucracy has always been governing the structure of the Egyptian government throughout the history until now.

The third section will present the case study, in detail, providing analysis of the output of organizational processes through the institutional bureaucracy and the other interrelated factors. These analysis will be highlighted all along the way.

The fourth section will provide a summary that underlies the major issues analyzed and highlighted through the case study, as to be the factors that influence project' development and implementation processes on the various levels (agency, government and implementor levels).

Finally, the fifth section will suggest some paths and implications for change and correction, on these various levels demonstrating, at the same time, the problems that are basically uncorrectable.

II - A GENERAL OVERVIEW OF BUREAUCRACY

A - DEFINITION OF BUREAUCRACY:

The natural history of bureaucracy suggests that bureaucracy is far more than a complex social organization pursuing its goals. It has a special form within a social function that shapes its characteristics. Seitz tried to define bureaucracy as follows:

> "Bureaucracy is a special form of social organizations that provides procedures to elaborate and administer substantive guidelines for structuring political action through the delegation and specialization of authority."[1]

In other words, Seitz sees bureaucracy as a procedural device. Another opinion about bureaucracy that amazed me is Max Weber's opinion which is ambiguous. Sometimes he describes bureaucracy by saying that it is an animated machine, activated only by specific orders. At other times he sees it as possessing a considerable power of its own, a power deriving from its expertise and specialized knowledge.

However, Fredrick C. Dyer suggested the following definition, which is an adaptation from "The American

Encyclopedia", for both bureaucracy and bureaucrats:

> "Bureaucracy is a form of organization through which government is carried on by means of bureau, each of which manages a particular branch of business.... each bureau is heirarchially organized with a chief at its head on whom rests the final responsibility, whereas as in the collegial or board system a number of persons of coequal authority divide responsibility."
>
> "The bureaucrats are usually trained and experienced administrators. They are little affected by outsiders they exhibit tendency toward a caste spirit; they overemphasize routine ("red tape") and formalities."[2]

In fact, that definition recognizes that bureaucracy has admirable elements. Recognizing such elements is the first step toward enhancing the good features and controlling the bad features of bureaucrats (if such can ever be done).

However, bureaucrats have always been hated because they try to push people around. This due to the nature of

bureaucracy which tends to provide authoritarian persons with opportunities to be bullies. The structure of bureaucracy and the types of people it retains or promotes tend toward a rigidity that is offensive to outsiders.

B - ORIGIN OF BUREAUCRACY (Birth):

A GENERAL OVERVIEW

Bureaucracy comes into being when more people are subject to the direction of the leader than can fall within his personal span of control. As an organization grows in size, it becomes imperative that some of the tasks of direction be delegated. This is the first condition for the rise of a bureaucracy, the body of functionaries who play the administrative role.

Bureaucratic organizations emerge from social conditions and political organizations. Bureaucracy appeared in many societies throughout recorded history. It is a social device which can be used when certain problems require solutions that other social devices can not effectively provide. Its function is to help coordinate people's behavior for controlling social conflict, to struggle against nature, and to govern the relations among societies.

Although all societies face basic social problems, the scope, intensity and frequency of these problems vary considerably from one society to another. One reason for these differences is the relative complexity of a society.

One of the theoretical conditions behind the rise of bureaucratic-authoritarianism in developing countries is the increasing popularity of the idea that strict discipline and a technocratic government are essential for third world countries development.

C - SOURCES OR CONDITIONS FOR THE GROWTH OF BUREAUCRACY:

The following points present Fredrick C. Dyer's opinion concerning the sources and conditions for the growth of bureaucracy:[3]

- The division of labour and the development of machinary lead to impersonalized lines of authority and communication.
- The growth of large armies and large governmental apparatuses leads to hierarchies which tend to specialize to institutionalize to formalize to become bureaucracies.
- The society in which reverance of traditions and customs is paramount will probably help the growth

of bureaucrats, who will then seek security through controlling their environment by regulations and procedures.

- Bureaucracy can not flourish unless certain requirements are met such as:

  a-**Money and Taxes:** bureaucratization presupposes the existance of a steady income for the maintenance of the administrative apperatus. This of course requires a stable system of taxation.

  b-**Law and Orders:** people will not obey rules and procedures of bureaucracy unless they respect law and orders. The society must be a law-abiding one, otherwise it will neither support nor produce bureaucrats.

D - PRINCIPLES THAT GOVERN A BUREAUCRATIC ORGANIZATION:

Max Weber explained certain principles that govern a bureaucratic organization as follows:[4]

1- The business is continuous.

2- It is conducted in accordance with rules, and each official is assigned a specific area; he has authority only in that area; and he must exercise his authority under clearly defined conditions.

3- Responsibilities and authority are part of a hierarchy; the higher personage supervise the lower, but the lower have the right of appeal.

4- Officials and other employees do not own the resources with which they deal, but can be held accountable for them. Official jobs and revenue are separated from private affairs and private income.

5- Offices (positions, jobs) can not be sold or inherited; they do not become private property.

6- Official business is conducted on the basis of written documents.

The bureaucrat therefore:

- Is personally free and has his position by contract.
- He exercises authority in accordance with impersonal rules.
- He is appointed and assigned on the basis of his technical qualifications.
- He works full time in his job.
- He is rewarded by regular salary advancement in a lifetime career pattern.

E - STRENGTHS AND ADVANTAGES OF BUREAUCRACY:

Weber describes the strengths and advantages of bureaucracy thusly:

> "The decisive reason for the advance of a bureaucratic organization has always been its purely technical superiority over any other form of organizations. The fully developed bureaucratic mechanism compares with other organizations exactly as does the machine with the nonmechanical modes of production:precision, speed, ambiguity, knowledge of the files, continuity, discretion, unity, strict subordination, reduction of friction and of material and personnel costs - these becomes optimum in strictly bureaucratic organization."[5]

F - ROUTINE DECISIONS:

There are four interactions in complex power channels that are particularly important:

- The interactions among bureaucracies and the excutive branch of government;
- The interactions among the bureaucracies and the legislative branch of government;

- The interactions among bureaucracies and the judiciary;
- The interactions among the bureaucracies and the public.

In fact it is important to examine these interactions to help determine how power is shaped and shared among bureaucracies, policy makers, and the public, and how these interactions affect public policy.

G - FRAMES OF REFERENCE:

Bureaucracy applys in the form of different models (frames of reference). These models are used by most people when thinking about the foreign affairs and the organizational process. Each frame of reference is, in effect, a "conceptual lens" which, may lead one to see, emphasize and worry about quite different aspects of events.

In the following part, I will demonstrate a brief analysis about the nature of each of these frames of referance.[6] My aim is to show, when we proceed to the case study of the "Egyptian International Hotel" project, how the analysis surrounding the case study has been applied

according to these different models, especially the "Organizational Process Model", and what was the outcome of the interactions among bureaucracies and any of the different power channels.

However,we may assume that governmental behavior can be most satisfactory understood by analogy with the purposive acts of individuals. In many cases this is a fruitful assumption. Treating the governments as if they are centrally coordinated, purposive individuals provides a useful shorthand for understanding problems of policy. But this simplification obscures as well as reveals. In particular, it obscures the persistantly neglected fact of bureaucracy: the "maker" of government policy is not one calculating decision maker but is rather conglomerate of large organizations and political actors.

1 - MODEL I: THE RATIONAL ACTOR OR "CLASSICAL MODEL":

Most analysts explain (and predict) the behavior of government , primarilly concerning foreign affairs, in terms of one basic conceptual model, here entiteled "Rational Actor" or "Classical Model". Although the Rational Actor Model has proved useful for many purposes, there is powerful evidence that it must be supplemented, if

not supplented, by frames of reference that focus on the governmental machine - the organizations and political actors involved in the policy process.

Model I's implication is that important events have important causes - large acts result from innumerable and often conflicting smaller actions by individuals at various levels of bureaucratic organizations in the service of a variety of only partially compatible conceptions of national goals, organizational goals, and political objectives. The sense of national purposes and the pressure created by problems in international relations, under Model I , conflicts with the intra-national mechanisms from which governmental actions emerge.

Model I , gives an explaination for and show how the nation or government could have chosen to act as it did, given the strategic problems it faced. It frames the puzzle: why do nations decide to do what to whom? It then fixes the unit of analysis: **Governmental Choice.** Next it focuses attention on certain concepts: **goals and objectives** of the nation or government. And finally it invokes certain patterns of inference: if the nation performed an action of any sort, it must have had a goal of this type. The

analysts has explained this event by showing how carrying out this certain events is a reasonable action, given specified objectives. The attempt to explain international events by recounting the aims and calculation of nations or governments is the trademark of the Rational Actor Model.

Thomas Schelling's opinion concerning the foundation of this strategic theory (of Model I), is the assumption of rational behavior - not just of intelligent behavior, but of behavior motivated by a conscious calculation of advantages, a calculation that in turn is based on an explicit and internally consistant value system.

Analysts assume that what must be explained is an action, ie., behavior that reflects purpose or intention. They assume that the "actor" is a national government and that the "action" is chosen as a calculated solution to a strategic problem. The explaination for each (actor and action) consist of showing what goals the government was pursuing when it acted and how the action was a reasonable choice, given the nation's objectives. This cluster of assumptions characterizes the "Rational Actor Model".

To explain an occurrence in foreign policy means to show how the government could have rationally chosen that

action. In this sense the frame of referance can be called the **"Classical Model"**. One advantage of the Rational Actor Model is that it provides an inexpensive approximation by letting the analyst think about what he would do if he were the other part. One can make a logical assessment of desired goals and available means as being implemented in a manner calculated, to make the gains out-weigh the costs. The less information about the international affairs of a nation or government, the greater the tendency to rely on the classical model.

What rationality adds to the concept of purpose is "consistancy": consistancy among goals and objectives relatives to a particular action; consistancy in the application of principles in order to select the optimal alternative. So the basic concepts of these models of rational action are: **goals and objectives ; alternatives; consequences; and choice.**

2 - MODEL II: THE ORGANIZATIONAL PROCESS MODEL:

Recent developments in organization theory provide the foundation for the second model which emphasizes the processes and procedures of the large organizations that constitute a government. According to this organizational

process, what Model I analysts characterized as "acts" and "choices" are thought of instead as "output" of large organizations functioning according to regular standard patterns of behavior.

Model II analysts frame the puzzle: From what organizational context and pressure did any decision emerge? He then fixes the unit of analysis: "organizational output". Next he focuses attantion on certain concepts: the strength, standard operating procedures (SOP), and repertoires of organizations. Finally, he invokes certain patterns of inference: if organizations produced an output of this kind today, that behavior would result from existing organizational features, procedures, and repertoires.

To be responsive to a wide spectrum of problems, governments consist of large organizations, among which primary responsibility for particular tasks is divided. Each organization attends to a special set of problems and acts in quasi-independence on these problems. But few important issues fall exclusively within the domain of a single organization. Thus, government behavior relevant to any important problem reflects the independant output of

several organizations, partially coordinated by government leaders (who can substantially disturb but not substantially control the behavior of these organizations).

To perform complex routines, the behavior of large numbers of individuals must be coordinated. Coordination requires standard operating procedures "rules" according to which things are done. Reliable performance of action that depends upon the behavior of hundreds of persons requires established "programs".

At any given time, a government consists of existing organizations, each with a fixed set of standard operating procedures and programs. The behavior of these organizations, and consequently of the government, relevant to an issue in any particular instance is, therefore, determined primarily by routines established in these organizations prior to that instance. Explanation of a government action starts from this base line, noting incremental deviations.

The probability of an action is reduced not by the balance but rather by the stability of the balance. "Balance" and "stability" are believed to be the critical determinants of the occurrence. If the undesired event

occurs, it will be as a consequence of organizational activity. Output of routine organizational procedures sets the chessboard at which government leaders look when they confront the problem of choice. Organizations are happy to find any needle in a haystack rather than search for the sharpest needle in the haystack. Human beings do not consider all alternatives, but pick the action that is "good enough," that satisfies. People in organizations are quite reluctant to base actions on estimates of an uncertain future.

3 - MODEL III: THE GOVERNMENTAL (BUREAUCRATIC) POLITICS MODEL:

The third model focuses on politics of a government. Events in foreign affairs are understood, according to this model, neither as choices nor as outputs. Rather, what happens is characterized as a **"resultant"** of various bargaining games among players in the national government. Model III analysts frames the puzzle: which results of what kinds of bargaining among which players yield the critical decisions and actions? He then fixes the unit of analysis: **political resultant.** Next he focusses attention on certain concepts: **the perceptions, motivations, positions, power,**

and maneuvers of the players. Finally he invokes certain patterns of inference: if a government performd an action, that action was the resultant of bargaining among players in games.

The differences among these three frames of reference will be explicitely explained in the following item.

H - THE THREE MODELS AND THE GAME OF CHESS:

Graham T. Allison provided an interesting central metaphor that illuminates the differences among the three models. He believes that foreign policy has often been compared to the moves and sequences of moves in a game of chess. He describes his metaphor as follows:

> "Imagine a chess game in which the observer could see only a screen upon which moves in the game were projected with no information about how the pieces came to be moved. Initially, most observers would assume -- as model I does -- that an individual chess player was moving the pieces with reference to plans and tactics toward the goals of winning the game (rational action). But a pattern of moves can be imagined that would lead some observers, after watching several

games, to consider a Model II assumption: the chess player might not be a sigle individual but rather a loose alliance of semi-independent organizations, each of which moved its set of pieces according to (SOP), standard operating procedures. It is conceivable, furthermore, that the patter of play might suggest to an observer a Model III assumption: a number of distinct players, with distinct objectives but shared resultant of collegial bargaining."[7]

H - REASON FOR CHOOSING MODEL II:

After this long discussion about these three frames of referance of bureaucracy, I chose model II, the "Organizational Process Model", to apply it for the case study of the "Egyptian International Hotel" project (EIH).

I have chosen that model because, of the three, it is the one that can best help me to demonstrate, as an architect having practiced in both the fields of projects design and implementation, the output of the organizational process and procedures on the projects development and implementation processes in Egypt in general.

III - A HISTORICAL OVERVIEW OF BUREAUCRACY IN EGYPT

A - INTRODUCTION:

AS a river civilization, Ancient Egypt had a highly centeralized state and a well-developed professional bureaucracy. Indeed, although it functioned under subsistence rather than monetary economy, the civil service of the New Kingdom 1,500 years before the Christian era was, according to Max Weber, **"the historical model of all later bureaucracies."** The prestige of this bureaucracy was as high as it has been in the recent past.

The most significant influence on contemporary Egypt was the Arab-Islamic conquest in the seventh century A.D., which imposed a form of political absolutism based upon religious dectorine that discouraged popular initiative in political life. The country was ruled by Islamic regimes. Several hundred years later, much of the administration was in the hands of a special class recruited from abroad by the Mameluke sultans. The Ottoman conquest of Egypt in the early sixteenth century perpetuated foreign administration of a servile character. Yet, many Egyptians, all through these centuries, had managed to enter the government service and to maintain their position by transmitting

their skills from generation to generation. Yet the tone of administration was always the tone of Ottoman political control whose principle instrument was fear than hope.

When Napoleon invaded Egypt (the French occupation lasted from 1798 to 1801), causing a Western penetration, he raised the banner of nationalism in Egypt, as he had done in Europe. This injection of European nationalism influence had an immediate effect, for only four years after the French were forced to evacuate, Egypt was ruled by Mohamed Aly, the Turkish sultan, who pursued an independent policy that set the stage for the emergence of modern nationalism.

Then during the British occupation of Egypt, nearly a century after the French invasion, Cromer in 1891 commented that British control was exercised by exactly 39 officials, who formed the "backbone of the Egyptian Administration".[8] In fact, little was done to develop the capacity for self-government. The growing nationalist movement and the accompanying grants of autonomy meant the steady elimination of foreigners from the civil service and its "Egyptianization". This process was accelerated by the British declaration of Egypt's independance in 1922.

Then in 1952, after many extraordinary changes, the army carried out a revolution against the king and started an era of "Democracy", which Seitz defined as follows:

> "Democracy is a procedural device for establishing substantive guidelines for structuring political actions through the free, periodic election of officials, competition for office, regular turnover of official, and constitutionally limited authority."[9]

However, the environment of democracy exists in Egypt is extremely bureaucratic. Since the July 23rd Revolution, the political control was, all the time, by a limited group of persons. It is true that there has been a public assembly for several years now, but half of its representatives are farmers and labors who understand nothing or very little about the political affairs. Consequently, the real control of the country is in the hands of the political elite.

The increased centralization of authority created problems related to the relationship among different levels of government. So, issues of decentralization of power and functions among different levels of government and the

allocation of resources for each level have become important areas of concern for our nation.

In fact, it is important to study the inter-agency relations and the extent to which increased centralization of political power can constraint the autonomy of these agencies, particularly in the implementation of projects involving several sectors and local governments. Besides, it is important to realize the problems of power and resources sharing involved in the relationships among various levels of administrative and planning bodies of the government.

VI - THE CASE STUDY

THE EGYPTIAN INTERNATIONAL HOTEL PROJECT (EIH)

A - INTRODUCTION

This case study demonstrates the effect of the organizational process and procedures (Model II) which influence the movement of a project along its trajectory from idea to completion. I will demonstrate that through a study of the case of the so-called "The Egyptian International Hotel" project. This project was awarded by the Ministry of Agriculture to the "Egyptian Designers and Consultants Company" (EDCC), a public sector firm related to the Ministry of Housing and Construction in Egypt, to set its designs and to carry out the responsibility of its implementation.

Through this case study, I will manifest the effect of the organizational processes behavior, within the EDCC and with the various pertinant organizations or agencies involved, to show how the interrelations are affected by formal hierarchies and contacts between individuals working in the field. Also, I will show how the bureaucractic system, which exists in Egypt, affects project development and implementation processes significantly. In addition, I will demonstrate some other important factors that leave heavy marks on projects development and implementation

processes, such as the political leadership changes and the uncertainty issue.

In other words, I will analyze the factors that underlie projects implementation delay, including the execution of some parts of a project's components a situation that affects the decision of wheather or not to construct such a project.

This is to help suggest paths to deal with these factors of delay, as possible, when developing or implementing other projects in the future.

NOTE:

Most of the events in this case study are real. The dates I present for the project's events occurence are not real. This is because I cannot remember the precise dates of the events occurence and also the date when that project first arrived at the EDCC. Yet, it is a first hand experience.

I would also like to mention that the names I use for the different agencies are not real. My aim here is to demonstrate, as much as I can, the different factors that

may affect project development and implementation processes in Egypt in general rather than to criticise precise agencies.

My belief is that all these factors of projects delay exist in any of the Egyptian governmental structure levels. It exist on the central governmental level, the agencies level as well as the implementors level.

So, my aim for this study, as I previously mentioned, will not be to review the project from the design technical aspect but rather from the institutional and political context.

Also, I would like to mention that the EDCC has started recently to pursue some of the suggestions I am presenting. Yet, because these suggestion are not pursued every where, I am trying to cover, as many as I can, of the applicable paths for change and correction.

B - PROJECTS INSTITUTIONAL MECHANISM (WITHIN THE EDCC):

To demonstrate our case study maybe it is appropriate to present the general framework for the departments involved in the project development and implementation processes within the EDCC (see diagram 2).

However, most of the projects in Egypt arise independently as contributions sposored by individual governmental agencies. Most of these projects had mainly to be carried out by public sector companies such as the EDCC.

In fact, the EDCC's clients are exclusively governmental agencies who sign contracts with the EDCC to carry out the responsibility for designing their projects, individually or jointly with other subcontractors, then to award contracts to the most suitable bidders, according to terms of reference, on behalf of the clients. Then, the EDCC's excutive staff has to supervise the projects' excution process throughout the projects implementation periods.

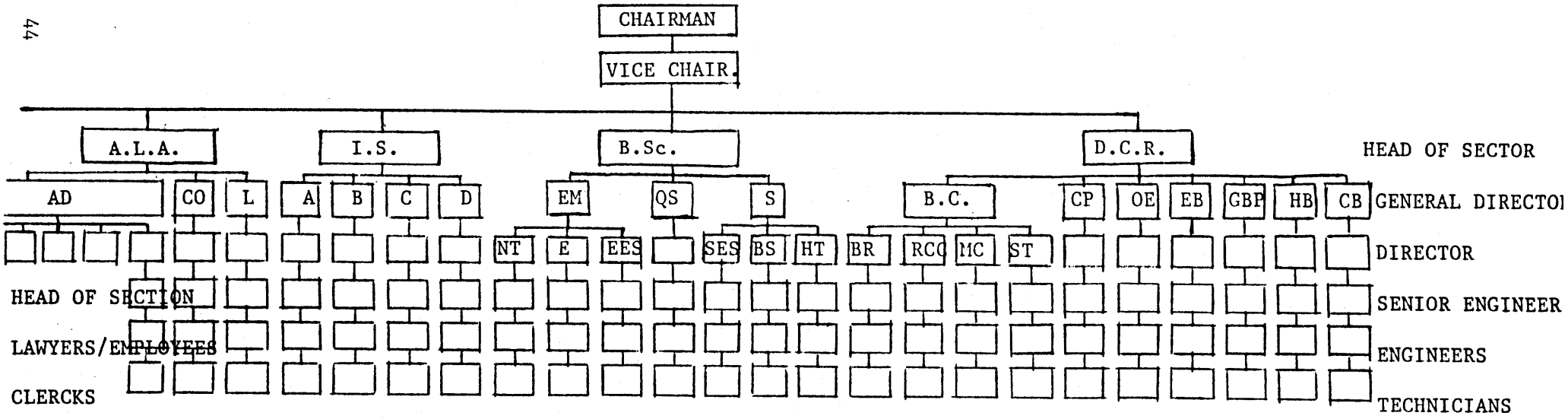
This movement, of any project, from idea to completion can simply be presented as shown in diagram 3.The general processes for projects development and implementation in

DCR : Sector of Design, Construction, and Roads:
GB : General Building Projects Dept.
HB : Health Building Project Dept.
JBP : Judiciary Building Project Dept.
EB : Educational Building Project Dept.
OE : Out-of-Egypt project Department.
CP : City Planning Dept.
BC : Building Construction Dept.
ST : Soil Tests and Foundations Dept.
MC : Metalic Construction Dept.
RCC : Reinforced Concrete Projects Dept.
BR : Bridges and Roads Dept.

BSC : Sector of Building Services:
S : Sanitary Works Department.
QS : Quantitative and Specifications Dept.
EM : Electricity and Mechanics Dept.
BS : Building Sanitary Works Engineers.
NT : Networks Design Engineers.
SES: Sanitation Execution Supervisors Eng.
EES: Electric Execution Supervisors Eng.
E : Elevators Designers.

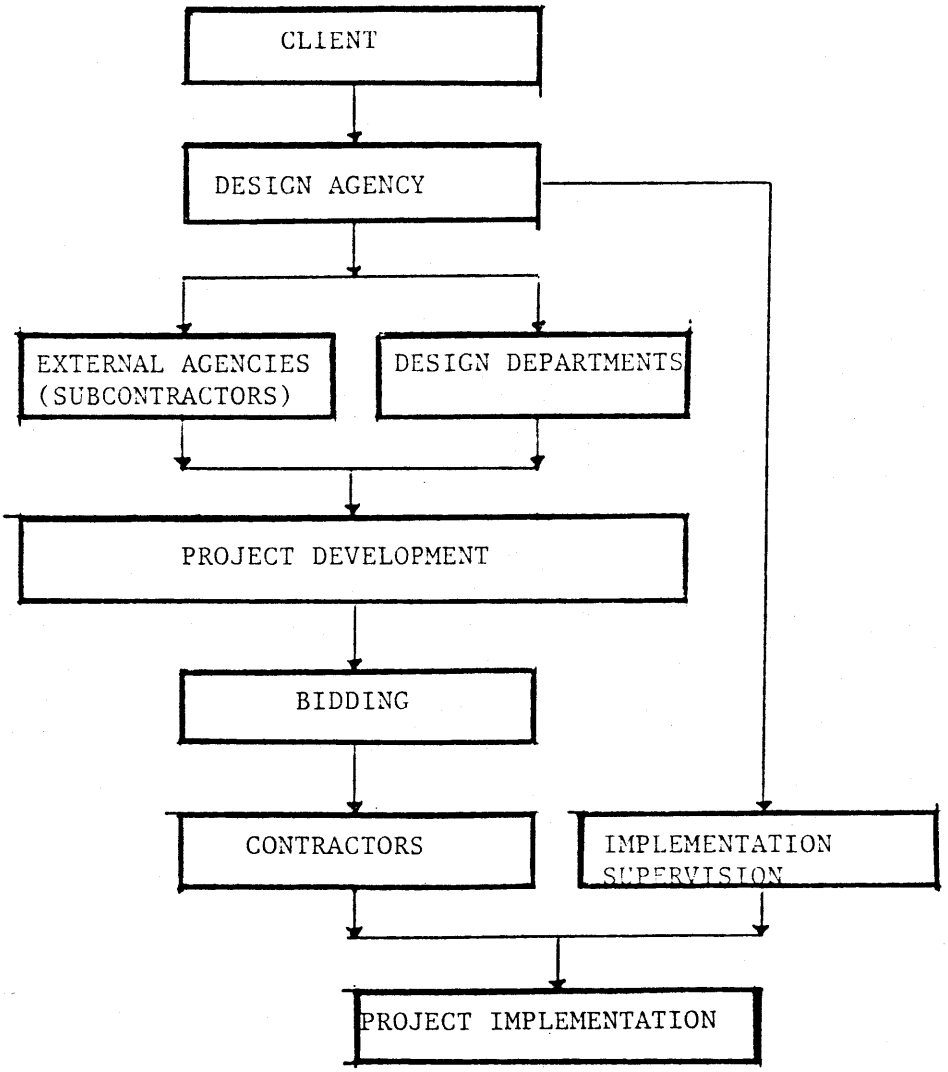
ALA :Administration and Legislation Sector:
L :Legislative Dept.
CO :Contracts and Bids Dept.
AD :Administration Dept.

IS :Implementation Supervision Sector:
A :North Cairo District.
B :East Cairo District.
C :South Cairo District.
D :West Cairo District.



THE GENERAL FRAMEWORK OF THE DEPARTENTS INVOLVED IN THE PROJECT DEVELOPMENT AND IMPLEMENTATION PROCESSES WITHIN THE EDCC.

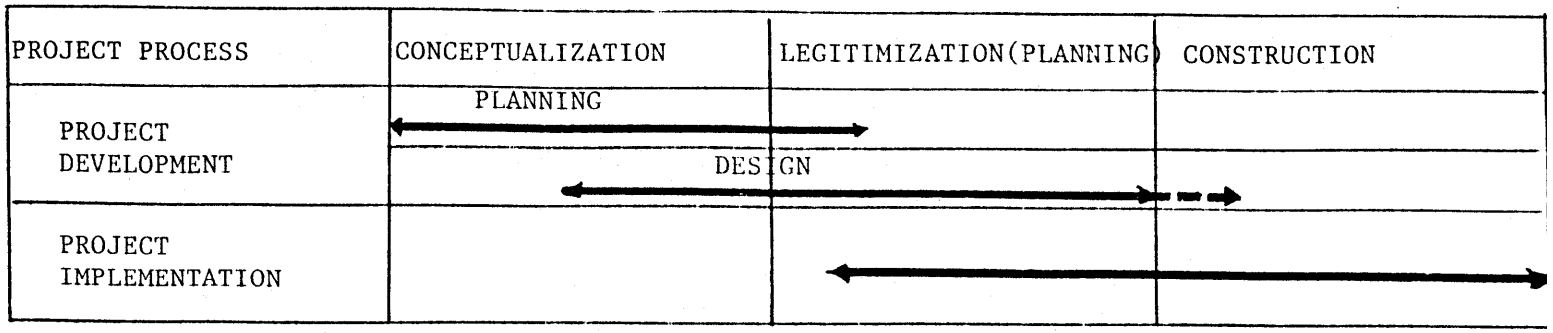
DIAGRAM (2)



PROJECT MECHANISM WITHIN THE EDCC

DIAGRAM (3)

Egypt is as shown in chart 1 . I adapted this chart from the paper of Transportation Projects in Cairo, Egypt.



PROJECT DEVELOPMENT AND IMPLEMENTATION GENERAL PROCESS IN EGYPT

CHART (1)

C - THE EGYPTIAN INTERNATIONAL HOTEL PROJECT DESCRIPTION:

- CLIENT : The Ministry of Agriculture (MA).
- IDEA : The idea of constructing this project occured as a result of the difficulties that the foreign participants of the MA encounter in finding rooms at Cairo hotels during the MA conferences periods.
- OBJECTIVES : The MA aims were to provide its foreign participants with comfortable places to reside in during the conferences' time periods; to provide areas that facilitate holding conferences, for any business purpose; and to gain foreign currency.
- LOCATION : A site belongs to the MA at El-Dokki neigborhood in El-Guiza governorate, in Egypt.
- DESIGNER : The Eegyptian Designers and Consultants Company (EDCC), a public sector firm related to the Ministry of Housing and Construction in Egypt.
- PRELIMINARY COSTS : Five million Egyptian pounds (including design and construction costs). Design fees were counted according to the total

costs of constructing the building as follows:

3% for setting out the designs;

2% for projects excution supervision during its implementation time period.

- SUBCONTRACTORS: The EDCC signed contracts with:
  - The Decoration and Architecture Bureau (DAB), a private sector agency.
  - The Egyptian Solar Energy Company (ESEC), a private sector agency (to carry out the building heating system).
  - The Engineering Office of Dr. El-Areph, (EO) a private sector agency (to carry out the soil bearing tests).
  - The Building Foundation Company (BFC), a private sector agency (to set the designs for building foundations and to execute them after getting the EDCC's engineers approval for the design.
- PROJECT components : The project program submitted by the MA was conceptualized by the EDCC's engineers to be consisting of two major parts:

1 - Part "A" the swimming pools area to contain the following elements:

- The ground floor contains two swimming pools, one of them to be designed for children, cabins and a vast garden.
- The basement includes the swimming pools facilities (lockers, showers, toilets, etc.) machines for operating the building (two huge underground water reservoir, machines necessary for pumping the water up to supply the building, some other pumps to serve for fire protection purpose, and the machines necessary for operating the swimming pools).

2 - Part "B" the hotel to contain the following elements:

- The basement includes the parking area, laundry, air conditioning machines, a boiler, and the floor facilities.
- The ground floor includes the reception area, bank, travel agency, shops, heardressers, and cafiteria that serves

also the swimming pools area.

- The first floor contains the dining hall, kitchen, halls for private meetings, conference hall, smoking area and lounges.
- Duct floor [a level that is primerly given over to the concentration of the mechanical systems for the building (pipes for sewrage, water supply, and air conditioning)]. This floor includes also the facilities for the working staff (dining hall, sleeping wards, floor facilities).
- From the second to the tenth floors, each floor contains the hotel rooms with private baths for each, common lounges, and the floor services area.
- From the eleventh to the fourteenth floor, each floor contains the hotel suites, common lounges, and the floor services area.

D - PROJECT DEVELOPMENT AND IMPLEMENTATION PROCESSES:

The contract between the MA and the EDCC states that the work would start with the study phase for thirteen months from the tenth of September 1980 to the tenth of October 1981. The preliminary design had to be submitted to the client to give his approval within the first three months (before the end of the fiscal* year to benifit from the project allocation for that year). The final working drawings had to be submitted to the client by the tenth of October 1981. The project bidding process had to be ended by the tenth of November 1981 when the implementation period was to start.

The implementation phase would last for thirty months starting with the hotel (part B) for twenty months then the swimming pools area (part A) for ten months until the tenth of February 1984.

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* The fiscal year started in the month of January and ended in the month of December (at that time).

NOTE:

To follow the project process during its development and implementation phases, it will be helpful to refer to both matrixs (1) and (2).

1 - THE DESIGN PHASE PROCESS

I was working as an architect in the Department of "General Projects" at the EDCC when the EIH project arrived at the department. I started working in the project with another colleague. Both the director and the general director of the department were helpful and tended to encourage the engineers to carry out their responsibilities bravely offering them complete support.

Thus, we kept working with the project keeping a direct contact with the client's staff, when necessary, until we finished the project's preliminary design on time. So, by December 1, 1980, we sent the designs to the client to be reviewed and approved.

The client gave his approval after a full month despite his being on a constant contact with the EDCC's designers throughout the conceptualization period.

PROJECT ACTUALL DEVELOPMENT AND IMPLEMENTATION TIME-TABLES
MATRIX (2)
PROJECT ORIGINAL TIME-TABLE
MATRIX (1)
DESIGN PHASE 22 MONTHS
BIDDING OF CONSTRUCTION
TO BE CONTIUED
13 months
6 months
3 months
7 months
10 moths desihn phase
30 moths implementation phase
3 months
9 months
1
20 months
10 months
WORK STARTED (9/10/80)
PRELIMINARY PROJECT SUBMITTED (12/1/80)
PRELIMINARY PROJECT APPROVAL (1/1/81)
NEW MINISTER (2/1/81)
NEW PROJECT ARRIVED (3/15/81)
WORK ON EIH CONTINUED (5/1/81)
NEW GENERAL DIRECTOR (7/1/81)
END OF ORIGINAL DESIGN PHASE PERIOD (10/10/81)
EIH ARRIVAL AT THE BUILDING SERVICE DEPARTMENT (2/10/82)
WORK ON EIH STARTED (4/10/82)
END OF THE FIRST EXTENSION FOR THE DESIGN PHASE
NEW HEAD FOR THE BUILDING SERVICES SECTOR (6/10/82)
END OF THE SECOND EXTENSION FOR THE DESIGN PHASE (7/10/82)
BIDDING
NEW MINISTER (12/10/82)
FINAL WORKING DRAWINGS SUBMITTED (2/15/83)
WORK STARTED (9/10/80)
PRELIMINARY PROJECT SUBMITTED (12/1/80)
PRELIMINARY PROJECT APPROVAL (1/1/81)
END OF DESIGN PHASE AND BIDDING STARTED (10/10/81)
IMPLEMENTATION START (11/10/81)
IMPLEMENTATION OF PART MAN START (7/10/82)
END OF IMPLEMENTATION PHASE (2/10/84)

We started to set the working drawings for the project, taking into consideration the additional recommendations requested by the client.

After work on the project had continued for about a month, for some political considerations a change of the government ministers occured. Then the minister of the Minstry of Agriculture was changed. The new minister carried out some changes in his ministry including, as usual, transfering those who worked with the previous minister whom we used to contact during the project's preliminary design. Now, we were obliged to deal with a completely new staff who were less familiar with the project's requirements and process. Thus, a lot of other modifications to the design were made.

Most importantly, the minister (and his staff) decided to exclude five floors of the hotel and some other components to meet the budget allocated for the project for that year (1981). That was due to the reduction in the Ministry of Agriculture's appropriation for that year. The minister justified his decision saying that there were some other projects which he believed deserved "prioritization".

These changes in the design obliged us to stop working on the project's working drawings untill we modified the preliminary design.

Here, it is very important to emphasize three main points:

1- It is a fact that both political leadership change and the governmental budget cycle may be sources for potential opposition to a project.

2- The absence of an agreed upon methodological "National Planning" framework combined with the unclear definition of the national policy goals, accordingly with the amount of resources available, gives a complete chance to any new minister to set his Ministry's projects priorities according to his own judgement, which is might be affected by a lot of different kinds of contacts and relationships or maybe by some personal political affairs.

3- The overlap between both the planning and the design activities is a phenomenon that always occurs. Yet, this sort of "loop-back" in the design process, undoubtedly, caused much delay to the project

study phase and caused the development time-table to be extended.

Then after work had continued for another month and a half, a new project arrived at the department. The department's engineers were to set the preliminary design for one of the El-Basra University buildings in Iraq. That project was urgent and the chairman of the EDCC gave it special concern because he expected that that project might bring the firm some other business with El-Basra University (which is what really happend). However, I was asked to work in that project and to leave the EIH project for a while. That situation delayed the EIH project design phase for about one and a half month.

In fact, these situations poses some important points to be considered for the projects delay factors:

1- Work in any project may be interrupted by another project in any stage of its development and each of the two projects is on a separate trajectory.

2- Projects always influence each other because each one of them requires fulfiling related commitments by the same source (which might not be able to perform all the tasks required).

3- The number of the professional technical staff is gradually getting limited. This is due to the higher wage opportunities in private firms and in the other Arab countries in particular. That deficit in the professional manpower causes considerable impact on the development and implementation activities of the firm (and of any other agency in general).

4- The firm's decision concerning projects priorities is often made on the basis of high expectations for a new project compared to older projects. Such decisions will cause delay for older projects which the firm tries to holds back to make room for the new one.

The work in the EIH project started again for about two months when a promotion inside the EDCC firm occured. As a result, a director from the "Implementation Supervision" Sector was promoted and assigned as a general director for the "Sanitary Works" Department (I will mention his effect later). At the same time, the director of the "Sanitary Works" Department was promoted and assigned as a general director for the "General Projects" Department.

Here, it is necessary to mention that promotion within the bureaucratic system is usually linked to employees length of service and the achievement of two continuous excelent annual secret reports. Then the promotion procedures will take place semi-automatically regardless of wheather or not the person promoted will be in the position which suits his or her experience.

The new general director tried for two months to make full use of his bureaucratic position by participating in the project development. He insisted on making some major changes in the design characteristics, regardless of the consequences to the other related departments' designs.

My sincere effort to control and to limit these endless changes by explaining their effect on the project's development time and costs, were rewarded by transfering me to the "Sanitary Works" Department (for the reason of "lack of collaboration with my boss"). In fact, I expected the same fate for my colleague, yet it seemed that he learned the lesson well and so he made up his mind to obey the boss' directions and to carry out the unlimited modifications patiently avoiding any sort of opposition.

However, a month after my transfer was the time for the project's deadline. So the EDCC asked the client his approval to extend the design phase period for an extra six months (untill the tenth of April 1982). The firm's argument was that the delay occured was due completely to the client's frequent changes in the design components and characteristics. The client agreed very easily especially because he knew that he was really the one responsible for the project's delay. Thus, the work on the EIH project continued with no worry concerning the delay.

Here, I would like to emphasize the effect of using the inter-departmental transfer as a tool for punishment and its consequences on the decision-making personnel on the top as well as on the rest of the employees.

In fact, the organization and the decision-making personnnel within it are highly centeralized and top heavy. The information flows are always from bottom to top. Those who oppose their posses or carry bad news to them have traditionally been disfavored. Therefore, subordinate bureaucrats neither pass on displeasing information to their superiors nor try to oppose them at all. This is especially because the junior and middle level employees do not have the decision-making authority in their own hands.

So, the real decisions are made by people at the top who have the least information and the least sincere advice and who are the most removed actors from the project's real problems. An adverse report from a superior may hurt a bureaucrat but a good report will not yield any rewards.

Therefore, the tendency to "pass the buck" is very evident in a general reluctance to make decisions at juniors and middle levels.

Going back to the EIH project, As I was working seriously in the "Sanitary Works" Department, after five months I was capable for handling the designs for large size buildings when the EIH project arrived at the "Building Survices" Department. At once, I asked the general director to give it to me to set its design, especially because I was completely familiar with its architectural design.

Thus, I carried the responsibility of the project, yet I could not start working on its design for about two months. I was working on another project which was tied to a design time-table. Besides, the point that there was a deficit of the experienced technical manpower applies to this situation.

However, the time when I started working on the EIH project was the time of the dead-line for the extension period permitted by the client. So, the EDCC requested from the client an additional three-month period, on condition that it had to include the bidding process period.

The firm's argument this time was that there were a lot of technical problems that appeared during the design process which required a great deal of time to be solved.

Again, the client agreed and the work continued under pressure from the chairman himself and from all the head-directors of the three technical sectors in the firm.

At this point, I would like to give a brief comment about what is going on:

1 - In general, the firm tends to underestimate a project's design and implementation time-tables to give the client good impression about the best possible case for implementing his project (yet the authorities recognize quite well that the time-tables they propose are unreliable). This is why there is no consideration for the unanticipated

time delay factors which, by nature, will cause these time-tables to be extended frequently in order to fulfill the requirements of the project's development and implementation phases.

2 - The client's approval to accept offering a second extension period was due to the client's lowered enthusiastism towards the project in general. This is mainly due to several reasons:

a - The ministers in general, for some political considerations, tend to think of new projects, and they slate them very fast, rather than trying to push the existing projects towards completion.

b - The long delay occures to any project, like the case of the EIH project, might encourage the new minister to use part of its appropriation for another project he favours.

c - Unfortunately, there is less consideration, by some authorities, concerning the time cost. A fact that makes the situation worse.

However, the EDCC sent a copy of the building-loads plan, done by the "Construction Department" engineers, to the "Building Foundations Company" (BFC) to prepare the foundations design. The EDCC informed the BFC to keep in

touch with Dr. El-Areph's Office to obtain the soil-bearing test results necessary for setting the foundation design.

On the other hand, the head of the "Building Services" Sector of the EDCC tried to understand the reasons behind the project's delay within his sector so as to facilitate the project development completion. That man has a revolutionary character. His aim was always to achieve high quality designed projects regardless of any opposition from the members of the bureaucratic system. He supervised my work himself, especially because his main specialization is in the sanitation works field.

When I suggested to him trying to use the solar energy system, which had never been used in the department, for the purpose of heating that large-sized building, instead of the conventional system of using the boiler, he agreed at once encouraging me to try to contact the appropriate agency in that field.

Consequently, the firm signed a contract with the "Egyptian Energy Company" (ESEC). That agency worked enthusiastically with the project (on the hope of having some other business with the EDCC in the future). They provided the department with good information in the field.

Of course that kind of work affected the designs for the other related departments. Yet, that was mainly due to the lack of coordination among the EDCC's departments. However, the periodic meetings for all the designers involved in the project development process helped a great deal to resolve the coordination problem as well as to resolve the project's technical problems.

Anyhow, the work on project development continued for about two more months, when the head of the "Building Services" Department retired and a new person, from another agency was assigned for that position (someone who enjoyed good connections rather than good qualifications for the job). That man caused additional pain to both the project development process and to the staff working on that project. He was a true bureaucrat. He started by refusing the idea of using solar energy to heat the building, saying that it was a new technique. He could not risk trying new techniques during his era and he said that we must wait for a year and a half when he also would retire, then we could try whatever we liked.

That man, as a bureacrat, was uncomfortable if he did not stick to the least controversial system or to the one that showed results the most easily. That is why he

insisted on returning to the conventional system by using a boiler for the building, regardless of the money given to the ESEC to design the solar energy system, and regardless of the time and effort spent to amend the design to fit the solar system. Also, regardless of the time constraint to finish the design phase by the tenth of July (a period of less than one month), then to prepare the project for the implementation phase. That sort of loop-back all the time was one of the major factors of delay for the project's development process.

Here, I would like to emphasize three important facts reflected in this situation:

1 - This situation shows how bureaucrats are closed to new ideas in technology, management, etc. It reflects their general tendency to shrink away from innovation to avoid being accused by their bosses for any mistake. This attitude can influence projects development process significantly.

2 - The most dangerous fact in Egypt is the lack of awarness of the precious value of time (even by those who are on the decision-making level, which make the situation worse).

3 - The bureaucratic system guarantees that every

person gets his salary by the end of the month. This kills the spirit of competition which motivate any person to care about his/her work and to exert ones best to finish the work on time. Only the motive of conscience is left. Besides, everyone is aware that promotion is linked to ones length of service. This awarness is enhanced by the Egyptian general attitude of sympathy toward each other that prevents any general director from giving bad evaluations in the employees' annual secret report [which allows promotion for the employee who achieves two continuous good years of an "A" level (91% or up)]. As long as every one is sure about getting this excellent evaluation, so why there should be any "worry" that motivates working hard?.

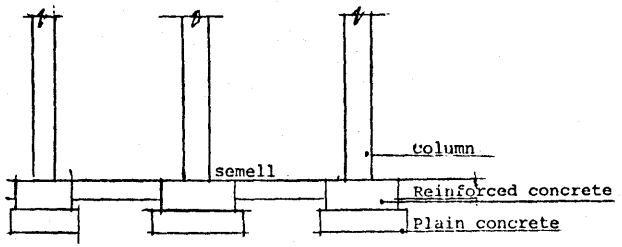
Seitz provided a model which he called the "Lethargy Model" and explained it to be:

> "A personal system characterized by emphasis on job classifications rather than the individual holding that position. Besides, advancement is not systematically encouraged, and minimal job performance is sufficient to guarantee tenure."[10]

However, not only did the system within the EDCC (as a public sector agency) affect the EIH project development processes but also the private agencies systems did the same. For example:

- The "Decoration and Architecture Bureau" (DAB) staff played their role in causing delay by bringing modifications to the design after frequent long periods. That caused the design details to be amended many times. The DAB's staff did not work on the project continuously (due to their prioritization evaluation). Also, the lack of intrest to coordinate the work between them and the EDCC team group ,from both sides, plays its role.
- The Engineering Office of Dr. El-Areph (EO) staff brought the results for the soil-bearing tests very late (after the BFC's staff almost had prepared the preliminary footing design following the traditional system of the Footing and Semelles system to save time) refer to sketch (1).

The soil-bearing results showed that the underground water-table for that site is very high and consequently, the suitable system to be followed would be the "Raft Foundation" system (refer to sketch 2).



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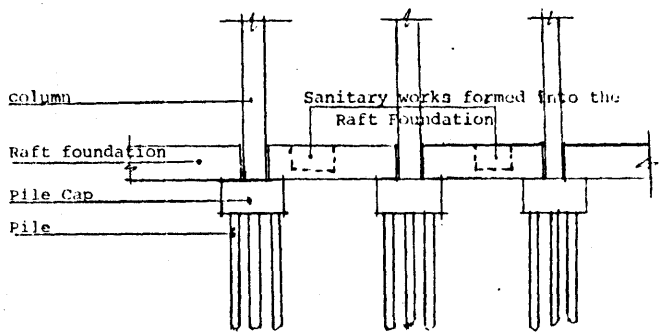

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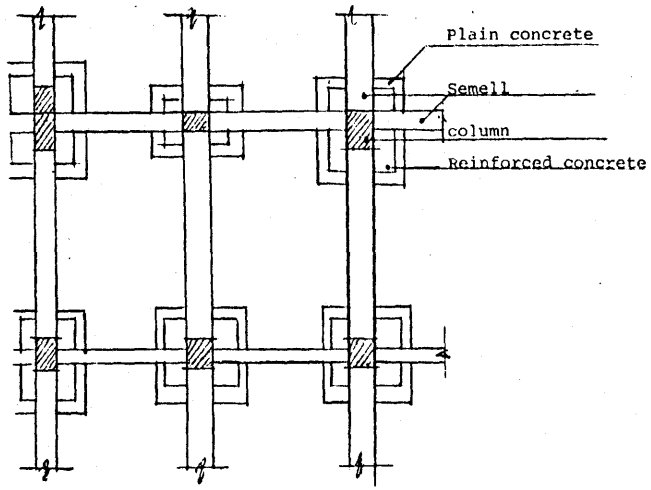
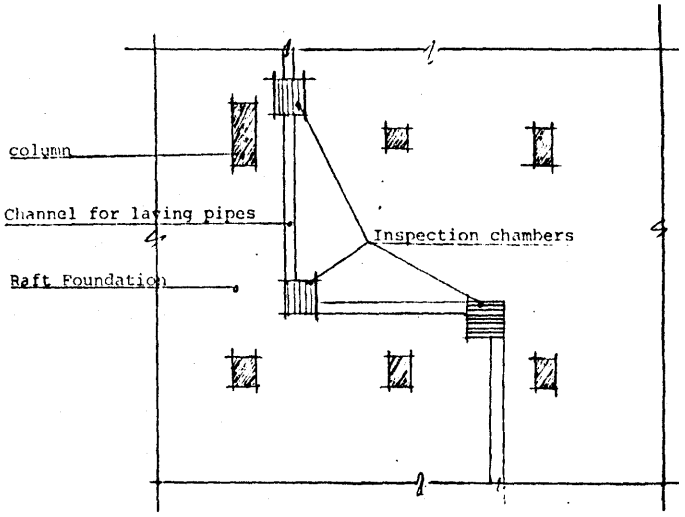


Plan

SKECH (2)



Plan

SKETCH (1)

The sanitation works (the inspection chambers, sedimintation chambers, pipes' channels, etc.) had to be formed into the raft foundation platform when pouring its concrete.

Now, the BFC had to change its preliminary design and that would require more time, which simply means more delay and another expansion of both the development and the implementation time-tables. This happened mainly because of the factor of the lack of coordination between Dr. El-Areph' staff and the BFC's staff.

In fact, the lack of coordination for the project development activities among the different agencies and organizations involved is, unfortunately, the common case in Egypt that causes projects development and implementation processes to be delayed. Yet, it may be appropriate here to mention that the delay in getting the results for the soil-bearing test by Dr. El-Areph's staff was due to two other reasons:

1 - As that office is one of the most trustworthy ones in this field, it carries out a huge amount of the soil-bearing tests throyghout Egypt.

2 - Dr. El-Areph had to arrange his work in a way that

could meet his contractor's circumstances and problems.

Here, I believe that it is worthwhile to speak, in some details, about Dr. El-Areph's contractor's problems, which are generally the problems that any other contractor or implementor in the field of construction encounters and which cause delays to project development and implementation phases. These problems are:

1 - Shortage in the construction labor manpower. That is because most of the laborers now emigrate to the Arab countries seeking higher wages for limited (or even non-) experienced skills. This large scale of emigration has affected not only employment and wages in the construction sector itself, but in the economy as a whole. Besides, the new enterants in the construction sector are less skilled than those they are replacing, and therefore affecting quality and productivity.

2 - The problem to assure getting the amount required of the construction materials, for a project, and to deliver it to the site, on time, according to the implementation schedual. This problem is mainly due to the market inability, in general, to provide

sufficient quantities of the construction elements, especially cement and steel [11] [refer to charts (2) and (3)].

3 - The government policy is to provide building materials at subsidized prices, with preferential treatement to the public sector (about 50 firms in Egypt) and to the large private sector builders and companies with building permit.[12] In fact, the government regulation of cement and rebars and the system of allocation through building permits and artificially keeping prices low has stimulated a strong black market [refer to chart (4)]. However, the inflation rate, for the general construction costs, has reached 15% annually.[13] So, in order to control inflation in prices of cement and rebars and to assure their availability for the public sector projects in the development plan, the Egyptian government, in 1961, began to control the importation, distribution and pricing of cement and rebars. The government currently imports more than 50% of the current construction reqirements of cement and rebars.[14] Concerning bricks, the price of

CONSTRUCTION MATERIALS PROJECTIONS

CEMENT PROJECTIONS

Local production goal in 1980	3.6 million tons
Actual production in 1979	3.0 million tons
Requirements for 1980	7.5 million tons

CHART 2

STEEL PROJECTION

Local production goal in 1980	300,000 tons
Requirements for 1980	900,000 tons

CHART 3

ALTERNATIVE MATERIAL PRICES 1976-1978

Material	World Price	Official Price	Average Black Market
Cement	LE 34/ton	LE 18/ton	LE 45/ton
Steel	LE 180/ton	LE 150/ton	LE 190/ton

CHART 4

bricks has risen rapidly from LE 7.5 per thousand in 1970 to LE 20 per thousand in 1977.[15] However, the government is encouraging the substitution of red bricks by the sand bricks at a subsidized price. Yet, except for government production of sand brick (2% of brick production in 1976), pricing and trading are open market.[16] In fact, the production of sand bricks is very low [refer to chart (5)].[17] In fact, even brick transfere became a problem.

4 - Problems in purchasing construction equipment necessary to finish the job (such as tower cranes, excavators, boring machines, wood necessary for construction, etc.). This problem is due either to the lack of the availability of these equipment in the local market (in other words, import companies have not brought enough to the market), or to importation problems. For example, the problem of import may be due to the lack of foreign currency available for purchases. Yet, if the foreign currency is available the routine to import these equipment will be a problem.

5 - The client may cause a dely if he does not pay the

SAND BRICKS PROJECTION

Local production in 1980	200 m/year
Requirements in 1980	2,400m/year

CHART 5

monthly invoices* to the contractor on time.

Up to here, these different kinds and types of relationships that affect the project development and implementation processes were illustrated by professor Gakenheimer as follows:

> "Each of the participating individuals and organizations exercises different types and degrees of influence over project implementation, and their roles are dynamically linked so that there exists a continually changing pattern of relationships".[18]

Going back to the EIH project, by the beginning of July 1982, the EDCC Department of "Contracts and Bids" asked us, the engineers of the Building Services Department involved in the project development, to prepare the bills of quantities, items, specifications and costs "very fast" because they had to start the bidding process among the

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* Invoice is a chart in which the contractor spells-out and list the different kinds, quantities and costs for each task's items which he had already finished, and which was approved by the site supervisor engineer to be submitted to the client for rembursement.

bidders of both the public and private sectors to avoid the penalty for the delay (the second extension period permitted by the client would end one month after that time). The firm's strategy was to benefit from the overlap between the contractor's work on the site (the beginning of the construction phase) and the working drawings completion (the design phase).

The firm's strategy to benefit from the overlap between both the construction and the design activities, urge me to mention two important points:

1 - In many cases the overlap between the design and the implementation activities can occur and save time, especially because while working in the site some technical problems may arise which require changing the design details.

2 - Within the firm, it is well known that the more the project costs, the more the profit will be and consequently, the more incentives will be awarded to the employees. This fact creates a powerful incentive for some engineers to keep projects costs estimate to a maximum. Their argument is always that it is necessary to guarantee minimum errors in

cost estimation to cover inflation afterwards throughout the implementation period. Yet, in some few cases, the inflation ratio fluctuated to a degree that even the overestimated projects became underestimated, especially when the periods of the projects development and implementation phases were extended for considerably long times.

Another thing I would like to mention is that when I joined the Sanitary Services Department, I realized that the way to prepare the bills of quantities for typing is wasteful of the engineers time. It requires that the engineers write the items' specifications every time they prepare a new bill of quantities. So, I adopted an easy and fast way to prepare these bills of quantities by keeping a copy of each item, to be used whenever I prepare a new one, and to leave the columns for the serial number, the item number and the quantity calculated free. The only point is that these papers for each item are of a half page length. The department of Typists-pool did not like typing from half pages. So, they opposed the idea and asked my general director to prevent me from using it, despite it does not cause them any additional time or effort. Unfortunately, my department general director tried to please them by

ordering me to use the conventional way. I refused to do that until they got fed up with me. Now, all the engineers in the sanitary Services Department are following my way.

However, after the bidding conference was over, primarily, the staff of the department of "Contracts and Bids" declared that there was a real competition among five bidders' proposals because their estimates were very close to each others. Yet, their estimates were much higher than the estimates calculated by the EDCC's engineers.

In such a case, the Contracts Department could either reannounce for another bidding conference or could go into a "Negotiation Conference" among the three bidders who proposed the least estimates. The second alternative was agreed upon and the three bidders were informed of the date of the second round conference. That conference ended with an agreement to award two contracts to two bidders. Each bidder would be responsible for one part of the project's two parts (parts A and B).

Consequently, the Contracts and Bids Department asked us, the responsible engineers, to recalculate the bills of quantities and costs to separate the quantities and costs of part "A" from those of part "B" and to define clearly

the line on which the responsibilities of each contractor were to meet.

This situation naturally caused additional delay time but now the design was taking time from the implementation period (which consequently had to be extended, resulting in project completion delay).

Here, I would like to mention that the overlap between the design and the construction activities, was contrary to the EDCC's expected strategy. The recalculations were done in a hurry to save the situation, consequently, some items were missed and not added to the bills of quantities.

On the other hand, by the time the different kinds of service designs were completed, some items were deleted and some others were added (as a result of some design changes, errors,or even for some bureaucratic decisions).

This situation required hot negotiations with the contractors to add the missed items to their contract's tasks.

2 - THE IMPLEMENTATION PHASE PROCESS

Now the Building Foundations Company (BFC) had prepared the plans for the building foundations and was ready to start working. The BFC asked the EDCC to send an executive engineer to hand the site to them. Only then when the EDCC's engineers realized that the dimensions of the site in nature was less than its dimensions on drawings. This late discovery affected the readjustment of the design drawings for some time.

However, the BFC started working on planting the "piles" and the "pile-caps" for part "B" of the building. While planting a pile, the laborers were confronted with a lot of water flushing out. When they investigated that, they recognized that there was a very old water-supply pipe line which for some reason was laid at an unusual depth underground. That line was feeding two very old buildings belonging to the MA. Consequently, work on the site was delayed for long time untill the BFC fixed that line and relocated it.

The point here which I feel like to mention, is that most of the water supply and sewrage net-works in Egypt are very old (since the time when Egypt was a British Colony) and the maps that define the locations for these utilities either do not exist anymore or are incomplete. This situation confronts many implementors during their construction works. However, implementors in Egypt became fully aware that the situation of unknown underground utilities interference might occure, and that they had to prepare themselves to deal with it (especially from the cost readjustment point of view).

However, in some cases, it is not easy to relocate the utility line which interferes with the construction work. In such a case, an essential change in the design details had to occur. Also, such a technical obstruction may causes a continuous refinement of the planning through the design and construction phases (a loop-back process).

Furthermore, when the BFC reached the stage of pouring the raft foundation concrete, into which the sanitary works had to be formed, the task of the contractor of part "B" had to start. The contractors had problems in adjusting and forming the places of the inspection chambers and the sewer

pipe lines, etc. when pouring the raft foundation slab. This was mainly because the drawings had so many critical dimensions, which were hard to implement in nature of the system of using raft foundation.

So, the designer was apt either to redesign that part to suit the situation in nature or to cancel that part from the design. In other words, the designer had to make some modifications to the design details.

In fact, I would like to emphasize the fact that the overlapping uses of the land by different contractors required additional time to negotiate their intrrelated problems, especially when it appeared that the lack of coordination between them started to mark its impact on the project implementation period causing additional time delay.

Moreover, the client sent a note to the "General Sanitary Works" Organization requesting them to approve providing the building with its necessary connections of water supply, water for irrigation, and sewer disposal to the main city nets. Only then, when we were confronted with a real surprise. The total quantity of sewers disposed from the building would exceed the capacity of the existing

sewerage net. Consequently, the only solution was either to cancel one of the two swimming pools or to eliminate another five stories from the hotel. The EDCC adviced the client to accept the first alternative.

However, there were no rush to make the decision by that time because the execution of part "A" (the swimming pools) was not supposed to start yet. Besides, work on the final designs was also not finished yet (the design phase was still extending).

In fact, I had to mention that the engineer who went to the "General Sanitary Works" Organization to bring the data concerning the location, diameter, and depth of the existing sewerage nets close to the site under study, forgot about checking the point of capacity for the existing city main sewerage net. He did not realize the importance of considering such data. So, he did not tell me the truth when I asked him about this point for two reasons:

1 - He thought that it might not be an important or critical one because it was unusual that we would find that the capacity of the city sewerage net could not accept the amount of sewerage disposed from the building under study.

2 - The engineer was not ready to go on another official assignment because he had to use the public transportations, as he was in a position less than a director. Otherwise, he had to request the department general director to allow him use a car from the firm's fleet (according to the SOP). However, this is another problem due to the less cooperation from the firm's "Automobil Services Department" especially with the limited number of the firm's fleet cars.

However, the work went on very slowly because of the technical problems that arose every now and then and also because both of the two contractors were not concentrating completely on pushing ahead the EIH project execution process. Both of the two contractors were implementing some other projects, at the same time, in other different locations. This is why they distributed their equipment, manpower, and funds among these projects so as to maintain some level of stability in these projects implementation processes. In case that an implementor faces a problem with any of his clients, because of his sloweness in carrying out certain project, then the implementor strategy will be to concentrat, only for some time, untill his pressing

problem with that client be solved.

In fact, this attitude from the implementors remind me with the Egyptian government general attitude concerning projects completion. The government is concerned about starting new projects and they tend to slat them very fast, maybe during their conceptualization period. Yet, once these projects are started the government begin to relax and think of other new projects rather than encouraging the movement of the current ones towards completion. However, this attitude in some cases might be a reflection of some political concerns).

This situation reflects a very important fact to be considered. The government uncertainty concerning the annual allocation of any project from one year to another causes continuous adjustment to projects' priorities. This gives an indication of the uncertainty concerning the government commitment towards the projects' completion on schedule. Consequently, that situation encourages the implementors to give less priority to the first phase of construction and to concentrate on the following phase. A situation that usually causes the construction to be unusable through all the implementation phases untill the completion of the last phase.

Here, professor Gakenheimer commented saying:

> "In fact, uncertainty is a critical factor of the environment in which organizations live. They seek to avoid uncertainty by trying to solve pressing problems rather than developing long-run strategies. The requirement that events in the distant future be anticipated is avoided by using decision rules that emphasize short-run feedback."[19]

Going back to the EIH project, the work continued, monotonously, for about five months untill the middle of the month of December when another political leadership change occured. Unfortunately, the minister for the MA was changed again. After two months the new minister asked for a conference with the engineers who designed the EIH project to discuss some important issues with them.

According to the bureaucratic system, the directors and general directors, for all the departments involved in the project, went to the minister's conference. With great pain and severe shock I recieved the news that the minister asked the EDCC's engineers their opinion concerning

changing the concept of the EIH project and replace it with another design for an "office building".

The minister's opinion was based on his belief that the EIH project had already lost its concept by excluding some major parts of its components. Consequently, the "consensus building activities" were changed. Besides, he added that the proportion estimated for just one of the building's various items which is purchssing the equipment necessary for operating the building's different activities was substantially high.

Another reason he added, was that the idea of that building was a luxurious one, inspired by a minister who did not realize that such a building would hardly recover its costs in the long-run. The minister kept justifying his opinion by saying that the new policy in Egypt, the open-door policy, encourages the different agencies to seek additional areas for office purposes. Consequently, the minister believed that the market would absorb, very fast, the extra office spaces, a situation that would assure a cost recovery for the building in the short-run, if it were constructed as an office building project.

Here, I must emphasize what this point reveals. It is a fact that the continuous changes in the project design details and components may affect and change the consensus building activities. In this case the governmental organization may begin to hesitate concerning whether or not to construct that building. This is another source of oposition which a project may encounters and it is a very strong one.

However, our firm's bureaucrats did not get angry at the minister's opinion, on the contrary, they mentioned to him that his idea was worth study. They asked us, the engineers of that poor project, to finish the working drawings as fast as possible to submit them to the minister, so the firm could ask for the rest of its fees before he made up his mind concerning the project's idea alteration. Thus, the final working drawings were submitted by the middle of the month of February 1983 (yet with no adequate consideration for its specifics).

Now I feel I should explain the general attitude of our firm's bureaucrats. As they represent the firm's concern as to achieving more profit, it does not matter for the firm's authorities which project has to be implemented on a

precise site, as long as they are going to have their fees. The firms operate with perfect knowledge about the market demand as well as the political interacting considerations.

It is a fact, unfortunately, that the firm's authorities have no loyalty or commitment towards the effort, the time, and the money spent for setting the designs for any project. They care only about achieving more profit for the firm as well as achieving the annual targeted plan* for the firm and even to exceed it.

Up to this point I have no idea about what happened to that poor project because I came to the U.S.A.

Yet, I believe that the factors that affected the EIH project's design and implementation process (up to this situation) were mostly personal from both political leaderships and the firm's bureaucrats. Let aside, the general inadequencies of the Egyptian bureaucratic system.

In fact, the frequent changes of the government, and the different goals and opinions of each new minister concerning the budget cycle and the project priorities,

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* The annual targeted plan is agreed upon with the Ministry of Housing and Construction in Egypt.

make a heavy impact on the project's completion. That is mainly due to two points:

1 - The unclear difinition of the policy goals with regard to the available national resources.

2 - The absence of an agreed methodological planning framework.

V - SUMMARY OF

PROJECTS DEVELOPMENT AND IMPLEMENTATION

SOURCES OF DELAY

V - SUMMARY OF PROJECTS DEVELOPMENT AND IMPLEMENTATION SOURCES OF DELAY

The previous paradigm and the case study analysis already covers the most important sources of external impact on project development and implementation in Egypt. These sources are illustrated in **diagram 4.**

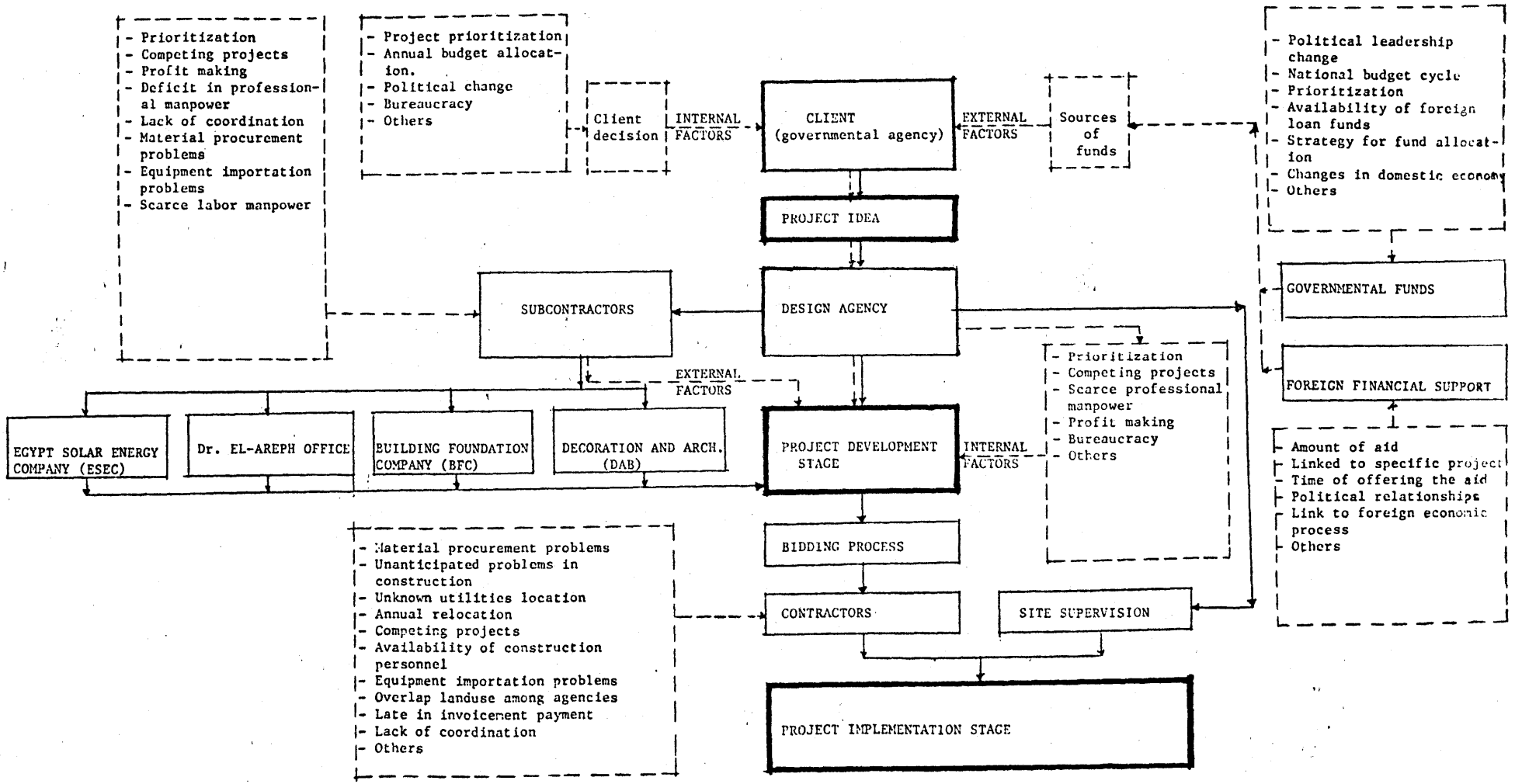
The diagram presents the three major sequential stages a project had to go through from idea to completion under the effect of such external sources as follows:

FIRST : Project Idea:

There are several factors that influence the decision of the client (a governmental agency) concerning carrying out a project. These factors are both external and internal ones, represented as follows:

a- The external factors refer to the sources of funds. These sources are either governmental or foreign financial support.

i - The governmental funds are affected by several factors such as: political leadership changes, national budget cycle, strategy for funds allocation, project prioritization, availability of foreign loan funds, etc.



AN ILLUSTRATION OF THE FACTORS THAT AFFECT PROJECTS DEVELOPMENT AND IMPLEMENTATION PROCESSES IN EGYPT

DIAGRAM (4)

ii- The foreign financial support is affected by several factors such as: political relationship, amount of aid, time of offering the aid, the aid link to specific projects, etc.

b- The internal factors refer to the bureaucratic effect, project prioritization, annual budget allocation, political leadership changes, etc.

All these factors determine when and with what intensity the project will be undertaken. Then the client awards the project to a design agency (like the EDCC).

SECOND: Project Development Stage:

The project development process is affected by both external and internal factors that are represented as follows:

a- The external factors refer to the subcontractors impact on the project development process. Such impact is affected by several factors such as: competing projects, deficit in professional manpower, scarce labor manpower, project prioritization, lack of coordination, profit making, material procurement problems, equipment importation problems, etc.

b- The internal factors refer to the design agency's policies and strategies. These strategies are affected by several factors such as: project prioritization, competing projects, bureaucracy, scarce professional manpower, profit making, etc.

All these factors affect the project development process significantly. Following this stage, the agency announces the bidding and finally awards the contract(s) to the most suitable bidder(s) according to terms of reference.

THIRD : Project Implementation Stage:

The project implementation process is affected by the contractor's policies and problems. These policies are affected by several factors such as: competing projects, annual reallocation, equipment importation problems, availability of construction personnel, materials procurement problems, unknown utilities locations, unanticipated problems in construction, late invoice payment, overlapping land use among agencies, lack of coordination, etc.

All these factors affect project development and implementation processes significantly.

However, in order to move toward measures that will improve the project developmemnt process, the issues are best categorized by levels of the responsible agency, the government, and the implementor.

FIRST :THE AGENCY LEVEL:

Possible sources of project delay at an agency level were presented through the case study of the EIH project. They can be summarized as follows:

A - Features of Organizational Practice that Repress Initiative:

These features are due to both the bureaucratic system of the agency and the promotion system within it. They have many negative effects on project development and implementation processes and result in project delay.

1 - The hierarchical system involves power by leadership over employees. This power led to the following in our study case:

a- Authorities too often use their power for punishment rather than for reward. They use it in different ways, such as: inter-departmental transfer; giving bad evaluation to employees in their secret annual report which prevents

their promotion; the cutting down of the employee's periodic bonus.

b- The fear of punishment encourages employees to supress bad information from their bosses. As a result, supervisors often make decisions based on false or inadequate information.

c- Authorities may shift a professional from one project to another with no concern for the intrest and experience of that person. This causes inefficiencies in project development.

2 - The promotional system in our case study has certain negative features:

a- It is linked to the employee's length of sevice rather than to his/her qualifications and productivity.

b- A person can be promoted from one sector to another within the same firm where a new job must be learned. This causes project delays.

c- There is no effective reward for educational initiative. For example, the salary of an employee who received a doctorate degree may be increased by only three Egyptian pounds per month.*

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* This is equivalent to @ $2.5

d- Periodic bonuses are usually based on a flat rate. This serves as a disincentive for employees who work hard.

B - Profit Motives of Firm:

The firm's profit motivation leads it to behave in the following way:

1 - Overestimation of project costs to profit against unexpected inflation.

2 - Underestimation of both project development and implementation time-tables to present to the client the best case to implement his project.

3 - Setting priorities on projects in an environment of acute deficit of technical manpower leads to neglect and delay of projects of secondary importance.

4 - Being unconcerned with project alterations, due to changes in political leadership, as long as the firm receives fees for all revised work.

C - Administrative Deficiency:

Administrative deficiency contribute to project delay in the following way:

1 - Unmanageable standard operating procedures such as:

a- All employees, excluding the directors, when on an official assignment, must use public transportation and not a taxi unless specially approved. This leads to waste of time. The situation is further aggravated by the fact that the number of cars that any agency can own is limited to a certain number by official directions.

b- The rule that any official trip even if it is to be out of the city of Cairo, should start from the firm's building and not from the employee's home, is inefficient. Most employees avoid project trip assignments and instead insist on mailing notes concerning, for example, the data they need. This sometimes causes long delay in receiving information.

c- The request for a car for an official assignment must be approved by the department general director. If he is absent or sick, it might be a problem to get a car if the "Automobile Service Department" personnel insist on following the rules.

d- The Department of "Typist-pools" have the right to refuse typing any bills of quantities, of

construction materials used, prepared by any department unless it is reviewed and signed by the department general director. This is to avoid retyping the entire bills of quantities in case they require corrections (a situation that frequently occurs).

2 - Lack of a system that assures consensus on basic information about any project before starting its design process. (Example: the late discovery that the capacity of the city-sewerage net cannot accept the amount of sewerage disposed from the EIH building). A situation that caused a loop-back process in design and at the end caused the client to be hesitant about constructing the building after the consensus building activities were changed.

3 - The lack of an efficient tracking system in the firm, which should have complete data concerning project progress at any time.

4 - In case that bidding process allows awarding contracts to more than one contractor, project engineers had to define the details of the contractors' respective responsibilities, the end tasks to be carried out by each. This situation

causes time delay and sometimes technical errors and design errors.

5 - Lack of a system to coordinate the problems of overlapping between contractors (in case of awarding contracts to more than one). The need to intervene between the contractors causes delay.

6 - Project implementation phases are not adequately administered, or studied, to make sure that the components of the building completed first will be operable through its subsequent implementation phases. The uncertainty concerning the government commitment to the project completion on schedule encourages that to happen.

7 - The firm takes no action to assure the client's reimbursement to the contractor(s) for his/their monthly invoices on time.

D - Innovation Discouragement:

In a bureaucratic organization, people may shrink away from innovation. They feel comfortable with the traditional systems and avoid adopting new ones. This is to avoid being accused of any mistake or being asked questions about the new system they cannot answer. Bureaucrats seek promotion

and good periodic bonuses which are based on no mistakes. For example:

1 - The proposal to use solar heating for the EIH building was cancelled after long effort without considering the economic losses implied by the decision.

2 - The opposition from the Typing Pool and the Sanitary Works general director to adapting a new way of preparing the bills of quantities for typing is another example. It rejected a good saving in engineers' time while causing no additional effort for the typists.

E - The Deficit in the Professional Technical Manpower:

Professional manpower is declining gradually, with heavy impact on the activities of the firm. This is due to the higher wage opportunities in private firms and in the oil-rich Arab countries in general.

F - The Timing of Inputs from Parallel Activities:

The lack of coordination among the different agencies involved in the project development and implementation processes causes considerable project delay. Since each agency has its own concerns toward its project priorities,

the timing of their inputs differs considerably. This causes modifications to the project's design details and loop-backs which bring about delay.

G - The Tendency to Segregate Between the Technical and the Administrative Sectors:

There is lack of coordination between the working staff of both the technical and the administrative sectors which adversely affects the productivity of the firm.

Second: THE GOVERNMENT LEVEL:

There are a number of factors that are sources of project delay at the governmental level revealed by the case. They can be presented as follows:

1 - The absence of clear definition of policy goals with regard to the amount of resources available.
2 - The absence of an agreed methodological planning framework.
3 - The uncertainty concerning the availability of funds required.
4 - The inefficient strategy for funds allocation.
5 - The lack of adequate initial studies of projects.
6 - Political leadership changes.

7 - The shifting and overlapping roles of the different responsible organizations.

8 - Incapability to interpret national goals and policies.

9 - Importation rules and red tape problems.

I: The Uncertainty Concerning the Availability of Funds Required.

There are two major sources for funding any project which affect its development and implementation processes:

A - Foreign Financial Support;

B - Governmental Funds.

These two sources of funds are affected by several factors which can be presented as follows:

A - Foreign Financial Support:

Foreign financial support is affected by political factors which can be categorized as follows:

1 - Politics of the Middle East and international political relationships of the region.

2 - The availability of finance and aid.

3 - Aid linkage to specific projects.

4 - Timing of offering the aid.

5 - Dependence on economy of donor countries.

6 - The impact of currency changes.

B - Governmental funds:

The governmental funds are affected by several uncontrolable factors:

1 - The national political process.

2 - The availability of foreign loan funds.

3 - The national budget cycle.

4 - The overlapping of organizational concerns which cause competition among the different governmental sectors for scarce capital resources.

5 - The existing institutions and the outcome of its unresolved issues.

6 - Level of fund allocations which determine when and with what intensity a project is undertaken. That is the priority of a project to some extent governs the total budget allocated.

7 - The large changes in appropriation of funds from one year to another may exacerbate the insufficiency of budget.

9 - Changes in domestic economies: changes in price and demand.

II: The Inefficient Strategy for Funds Allocation:

The strategy for project funds allocation lacks defined rules and is generally affected by the following factors:

1 - The underestimation of project costs. This is done to encourage project approval. By the end, it may cause delay or cancellation.

2 - The underestimation of project's time-tables to encourage its approval.

3 - Affecting project priorities by personal interests of the actors representing different participating organizations.

III - Political Leadership Changes:

Changes in political leadership bring different ministers with different goals and opinions concerning projects annual allocation and priorities. The ministers are free to do that because neither are there any clear identified national goals, nor an agreed upon planning framework. These deficiencies encourage a new minister to behave as follows:

1 - He tends to have a new staff who may not have any idea about the projects in question.

2 - He tends to change the project design just to feel comfortable that he has given his opinion concerning the projects under his authority and to show that he has not ignored them. This situation may cause a loop-back process. It may also exacerbate project budget allocation.

IV: The Shifting and Overlapping Roles of the Different Organizations Involved:

The overlapping roles of different organizations are a usual phenomenon in Egypt. It causes project development and implementation processes to be delayed significantly. The owner of the project is usually known but who is responsible for doing it always remains undefined.

V: Inadequate Administrative System:

The administrative system which exists in Egypt is inadequate for implementation of policy decisions. The governing institutions bear a clear imprint of the colonial legacy: they are modelled after the British local authority system. The British local authority model poses particular problems about the division of authority and responsibility. So, public administration in Egypt faces a

whole range of institutional problems which plague bureaucracies almost evreywhere. For any purpose involving large-scale administration, modern states appear to have no option but to ultimately adopt some form of bureaucratic model for the institution concerned.

VI: Importation Rules:

Construction equipment importation is a real problem in Egypt. The red tape plays a very heavy role in causing time delays.

VII - Miscellaneous Factors:

There are some causes of project delay that can only be listed as miscellaneous factors:

1 - The market's inability to provide the required equipment and materials necessary for projects' construction.

2 - The government expropriation of privately-owned lands and dwellings (for projects for the public good) is very hard to schedule in the overall implementation process.

3 - The weak control by the government over settlers who squat on lands designated for governmental projects.

4 - Unexpected events like technological change and the interference of any unknown underground utilities (due to the incomplete existing maps of utilities).

VIII: Lack of Project feasibility Studies:

Lack of project feasibility studies causes a substantial economic loss especially with regard to the very limited national resources. For example, I know two cases of this kind in El-Dakahlia governorate in Egypt:

1 - The case of El-Dakahlia Milk Factory. The governor of El-Dakahlia thought of building a huge factory to produce all kinds of dairy products (cheese, yogurt, butter, skimmed milk, etc.). The factory cost some millions of dollars to construct. When the factory started to work every one was confronted with a real surprise. The governorate's milk supply was not enough to run the factory at full capacity. So, a lot of money was spent inadequately resulting in an enormous economic loss because of the lack of an adequate initial study.

2 - The case of "El-Mansoura Cultural House": This building was designed to constitute all the social activities in the city of El-Mansoura. The building appropriation was determined with a certain annual allocation. The final designs were prepared after a substantial time (due to a lot of political effects and personal interactions). However, when work on the foundations started a lot of technical problems occurred due to the nature of that site's soil. The soil was so weak that it required a lot of cement and rebars for the building foundations which took most of the money allocated for that building. This happened because the initial study of the nature of the soil was not adequately carried out. The result was that the construction process for that building has lasted for more than fifteen years. A fact that simply means a substantial economic loss.

THIRD: <u>THE IMPLEMENTOR LEVEL:</u>

There are a number of sources for project delay which contractors and implementors encounter:

1 - Problems in purchasing construction equipment. This is due to:

a- The shortage of foreign currency; and

b- Importation regulation problems.

2 - Implementors have no assurence regarding the availability of construction materials on time because of the market inability to provide sufficient quantities of construction elements.

3 - The delay in reimbursing the implementor for his monthly invoices on time.

4 - Shortage in the construction labor manpower; problems of poorly skilled laborers who cannot achieve a high-quality standard of work.

5 - Shortage in the technical manpower affects the implementor. For example, a site may not be supervised by a site engineer for a long time, due to lack of technical staff in the supervising firm. When an engineer finally comes to the site and finds the job was not done according to the specifications, he stops the job and orders it done again. This causes the implementor expense and delay.

VI - IMPLICATIONS FOR CHANGE

Sources of project delay were revealed by the cases and summarized in the last chapter. While in many cases the problems are typical everywhere, the particular form of them observed here, and the kinds of solutions that are possible, are particular to the condition of Egypt. In many ways an extraordinarily traditional and conservative country, even when compared with others in the developing world, these problems in Egypt are unique in many ways.

Moreover, the measures used to mitigate them have to be chosen in such a way that they are not resisted by the political leadership. Means of improvement must be tolerable to the traditional framework of prerogative and professionalism. We must, at the same time, face the fact that many of these issues identified are basically uncorrectable during the immediate future.

FIRST :Problems that can be corrected:

To present paths for change and correction, I will follow the same categories used to summarize the sources of project delay.

I- The Agency Level: Measures to counteract:

A- Features of Organizational Practice That Repress Initiative:

1- Employees should be secured against being unfairly punished. This can be achieved in the following way:

a-i-An employee should not be transferred to another department against his/her wishes unless a meeting with the chairman is held to discuss with the employee and his department's general director the reasons for that decision. Besides, the firm's "Public Relations" Department should issue a a monthly magazine in which the employee's case had to be presented. If the employee still feels unsatisfied, he/she should have the right to complain to the syndicate, which should investigate the merit of the case. Although syndicates in Egypt are weak, they might be called upon to inform action on issues of this kind.

ii-In a case where several bad secret annual reports are awarded, the firm should review these cases through a special committee to which an employee can complain.

iii-For the case of the bimonthly bonus, I propose that the amount of reward should be dependent on

factors that are to be calculated by the "Accounting Department".

b - It is very important to decentralize decisions by pushing them down to the levels where decision is best informed. Junior professionals and mid-career level employees should be given the opportunity to participate in decisions when their knowledge is important to those decisions.

c - To overcome the problem of deficit in the technical manpower, firms may allow their engineers to take on projects as free-lance work, based on the employees length of experience in the field and not his/her length of sevrice.

d - Allow the employees to discuss their complaints freely with superiors in order to seek resolution of problems. A typical complaint is when the coordinative functions of any employee's work with other agencies is suppressed by a manager in the interest of saving time.

2-a-Promotion should be encouraged on a competitive bases rather than on the basis of length of service. This can be achieved in the following way:

i-Linking income to personal productivity.

ii-Formation of a special group of the most efficient engineers who will receive high salaries (similar to those offered by private companies and maybe higher) to carry out the responsibility of setting projects' preliminary designs. This is an effort to deal with the very mixed quality of agency personnel, giving adequate opportunities to those who seek it.

iii-Encourage work with external consultants (despite their high fees). Give those who are willing to learn the chance to work with the consultants and encourage them even to compete with them. Then those who prove to be efficient should have the chance to join the special group and earn higher salaries. I believe that after some time the whole firm will consist of completely competitive special groups. This policy can be complementary to the fact that Egypt is hosting many high quality foreign professionals because of current aid policies.

IV-As I mentioned before, allow the engineers to take on additional projects on a free-lance basis for a reasonable fee that does not exceed a certain percentage of the employee's regular salary per

month. This tribute is only for hard-working employees whose names are written on a special list, call it, for instance: "Hard Working Employees List". This list has to be prepared by a group, say of five persons, in the administrative sector. Their focus will be the employee's productivity over the last six months. In other words, over three consecuetive bonus periods.

The list may be subjected to frequent changes, according to employees' performance which will be measured according to the relation between the cost of the building and its preparation expenses. This is another effort to give special opportunities to high quality professionals.

These suggestions will oblige the employees to understand the precious value of time and consequently will assure more work accomplishment. Moreover, these suggestions will provide employees with a secure status. Their performance will be the only judge for their income and position stability. Here, Seitz presented his "Innovation Model" which he described as follows:

"Innovative model is a person system characterized by emphasis on the individual's job performance, not the position occupied. In addition, advancement and retention are determind by relative job performance."[20]

b-Promotion should occur within the same specialized sector and not from one sector to another. This is to prevent assigning an employee to a position where he is unfamiliar with the nature of the work.

c-In case an employee gets a higher educational degree, such as a masters or a doctorate degree, his monthly salary should be raised to a level that reflects the degree he obtained. In other words, there has to be a reward for obtaining higher educational degrees.

d- The periodic bonuses should not be based on a flat rate. Instead, they should be based on performance. The formula could be based on a percentage of project profit shared by the work team in set portion depending on the kind and level of work of each member.

B - Profit Motives of Firm: Maximization:

In fact there is no specific way to oppose a firm's strategy to maximize its profit. But it is essential for the firm to amend its strategy as follows:

1 - The initial examination of both project costs and time-tables must occur early in the development and implementation processes in order to secure project legitimization and budget allocation, as suggested by professor Gakenheimer[21]. Since there are no uniform standards for this purpose, initial improvement can be made by adopting standards for casting and budgeting.

2 - It is appropriate to adjust the estimated time - tables to include reasonable delays produced by uncertainties.

3 - Concerning project alteration, I believe there is no way the firm can deal with this.

C - Administrative Deficiency:

Administration plays a very important role that affects all the activities within any firm. So, much attention has to be paid to correcting the administrative system of the firm to assure a high rate of work accomplishment.

In fact, bureaucratic organizations are seen as being adapted to problems of control rather than problems of change. This is an important point to note, especially in the case of countries, like Egypt, with a recent history of colonial domination and rules. The problem in Egypt is different and more severe than in many developing countries.

In matters of this kind, a scientific management method (such as PERT/CPM) would be helpful in making the project development process more robust, and making evident the loss of time and money consequent to interventions and management deficiencies. (See the appendix on PERT/CPM).

However, I believe that the following suggestions will be of help to any agency:

1 - Encourage rules to be flexible to facilitate work accomplishment rather than to hinder the firm's productivity. Decentralize part of the general

directors' responsibilities, which are better done by the departmental directors.*

2 - Establish a system for getting adequate initial information about the possibilities to execute certain sizes of buildings on certain locations to avoid future changes in the design details. Also, the firm should send one of its executive engineers to survey the site.

3 - Ask the client to surround the site with a fence and to assign a guard to protect it against the informal settlements. I mention this to avoid a case similar to the one of the "Services Collective Building" at El-Zawia El-Hamra neighborhood in Cairo. After the bidding process was over, when the contractor went to the site to start working, he was confronted with the existence of a three-story concrete skeleton on the site. What happened was that the informal sector realized that the government was planning to build a project on that site. So, very quickly they

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* For example: procedures for requesting cars for official assignments, archive drawings withdrawal procedures, bills of quantities approval for typing, etc. are not critical matters.

squatted on that site to oblige the government to pay them a lot of money as a reimbursement. Consequently, that situation delayed the execution of the project for an unknown time.

4 - The firm's executive engineers should be required to provide the data necessary for project sanitary works. They are more efficient at that than others.

5 - Coordination within the firm should be encouraged. This can be achieved as follows:

a- Encourage periodic meetings of members working on a project. This seems a very basic requirement, but is often not done in Egypt.

b- Establish a system of periodic follow-up through which each general director has to be committed to finish the work in a specific period (agreed upon with the senior and junior engineers). The chairperson of the follow-up meeting will be responsible for reprimanding any person, on any level, if a project under his/her responsibility is delayed without an acceptable reason.

6 - The "Follow-up Department" has to monitor projects all the time, not only at the time of offering the periodic bonuses. They have to submit monthly

reports about project status to the head of each sector so he can solve any problem on time. If this does not work in a satisfactory way, it might be supported by a "Management Aid System", to give feed-back information about what is going on.

7 - a- If a project consists of several components, it might be appropriate, from the very beginning, to calculate materials requirements separately. This will help avoid delay if the building is to be constructed by more than one contractor.

b- It might be appropriate to add a clause to the contract between the firm and the implementor stating that there might be some items to be added or deleted during building construction as long as both the design and the implementation phases can be overlapped.

8 - The land-use-overlapping problem can be alleviated if the project supervisor applies an appropriate network analysis study (PERT/CPM).

9 - Engineers should adequately study the phasing process to allow making the building usable throughout the implementation of its sequential phases. This may help the contractor to concentrate on all the project's phases regardless of the

uncertainty of the government committment to the project's completion.

10 - The client should be obliged to pay the implementor on time after completion of project components. This could be achieved through giving the right to the implementor to demand from the client a money penalty agreed upon in the contract, say per half month delay in reimbursement. It is one of the top reasons in Egypt for a project to be delayed because of the implementor cash flow problem.

D - Innovation Discouragement:

There must be a spirit of encouragement of the practice of new ideas in technology, management, etc. to improve the quality of the projects and to help improve productivity. The employees should have the chance to present their ideas to help achieve better quality work or to help improve the work process or staff relationships. The firm should reward innovative employees and describe their innovations in its monthly internal magazine.

E - The Deficit in Professional Technical Manpower:

The problem of the deficit in professional technical manpower, and its impact on the development and

implementation activities of the firm, can be dealt with as follows:

1 - Give the engineers the chance to carry out additional projects on a free-lance basis (similar to the way of dealing with external consultants).

2 - Encourage pursuing a system of "Accomplishment Meetings" that may be arranged by the "Public Relations" Department. These meetings are to be held under an approved request from any engineer who has finished a design he feels includes critical or new idea(s) that he wants to share with his colleagues. To encourage an engineer to do that, offer him a certain amount of money per hour of accomplishment meeting.

3 - Establish a system of periodic training programs within the firm to enhance the employees' skills. These training programs will help alleviate the existing deficit in the firm's professional staff.

4 - Firms should benefit from the training programs organized by the training staff of the "Ministry of Housing and Construction" in Cairo. These programs are organized to teach new ideas in technology, management, etc. They are prepared for

different levels of authorities and for various kinds of careers. These training programs help introduce new concepts in design, planning, etc. Some examples of these concepts are the site and service, industrialized buildings, work study, network analysis (PERT/CPM), etc.

F - The Timing Inputs from Parallel Activities:

Coordination among the different agencies involved in project development and implementation processes should be considered a fundamental issue. The external agencies, and subcontractors, should be obliged to submit their studies to the main design firm periodically. This can be achieved through the contracts by assigning a late weekly submission penalty. This will help assure having the subcontractors studies inputs on time.

G - The Tendency to Segregate the Technical and the Administrative Sectors:

Cooperation and good relations between the firm's technical and administrative sectors should be highly encouraged to assure more work accomplishment. This might be achieved through frequent trips or through special training meetings in which the employees may understand the

nature and the problems of work of the other sector.

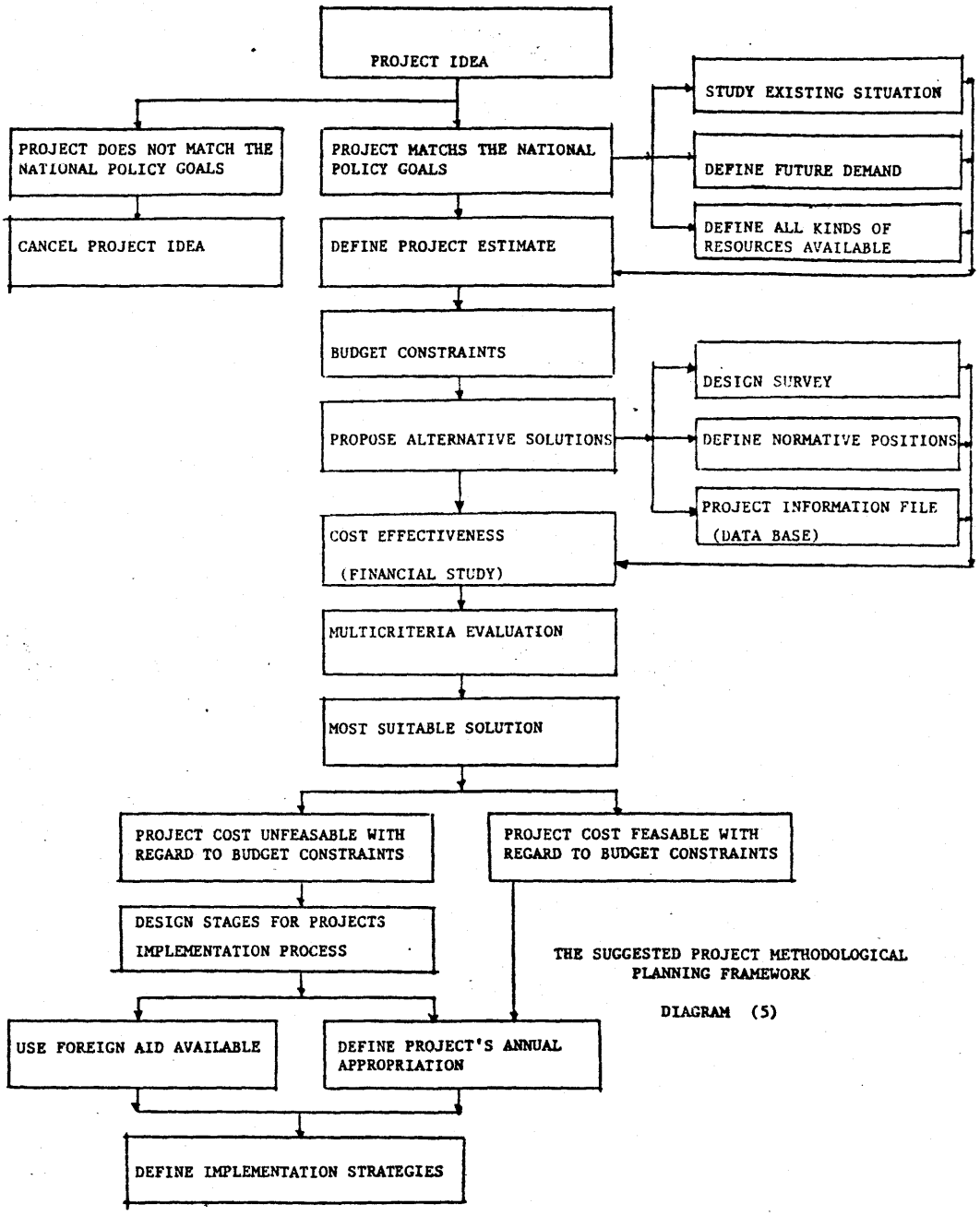
II: THE GOVERNMENT LEVEL:

At the government level, studies concerning how to formulate broad national goals, with regard to available resources, are required. The studies must be based on the following guidelines:

1 - There has to be an efficient strategy for funds allocation. This strategy has to be linked to the broad national goals. This is further explained in diagram 5.

2 - Projects have to be throughly studied, initially, to assure their legitimization and annual allocations. Besides, this will help avoid the large investment.

3 - In the case of the change in the political leadership and the consequent staff changes, it is appropriate that the design firm prepare a summary of the project and submit it to the new minister. This will help him to be familiar with the project and its process and may reduce the amount of changes in the design details and character.



THE SUGGESTED PROJECT METHODOLOGICAL PLANNING FRAMEWORK

DIAGRAM (5)

4 - The government has to clearly identify the roles of the different agencies and organizations involved in any project's development and implementation processes to avoid shifting and overlapping roles. In Egypt there is a tendency for such roles to evolve and shift over time. For given projects these roles should be stable.

5 - The government should facilitate the process of import of materials and equipment necessary for construction, to avoid delay because of current regulations.

6 - The government should pursue a policy that limits both professional and labor emigration. This can be achieved through creating incentives for staying in Egypt.

7 - The government has to encourage the factories that produce construction materials to improve their productivity. The government may also construct new factories, to eventually replace foreign aid support.

8 - The government has to encourage technical education to produce skilled technicians.

Until now, I have been refering to the problems that can be rectified at both the government and the agency levels. As for the implementors' problems, if the above mentioned suggestions are implemented, his/her problems will be minimized.

SECOND: PROBLEMS THAT CANNOT BE CORRECTED:

These problems are not correctable in Egypt for the forseeable future:

1 - The bureaucratic system cannot be completely changed. Yet, it might be possible to deal with its negative effects and features partially.

2 - The uncertainty issue is uncorrectable, but tends to be mitigated by the actions mentioned above. It includes the following items:

a- The availability of foreign loan funds;

b- The national budget cycle;

c- Budget allocation among the competing different governmental sectors with their overlapping concerns;

d- The low appropriation of funds for individual projects;

e- The time of expropriation of privately-owned lands and dwellings' problems;

f- The government's weak control over the informal sector; and

g- The interference of unanticipated time delay factors, such as interfering underground utilities or otherwise.

However, the uncertainty can be dealt with by a change which ought to be monotonic, continuous, positive, gradual, and have a constant context.

CONCLUSION

I hope that this covers all the possible factors that affect project development and implementation processes (including those that can be controlled and corrected and those that cannot). I also hope that the lessons learned and policies suggested will be considered by the authorities in my very dear country, EGYPT.

VII - Appendix (1)

PROJECT MANAGEMENT

A NETWORK MODEL

PERT/CPM

Projects that are undertaken and completed many times over are those that best lend themselves to tight control. The time, personnel, and other resources needed for completion are fairly well understood from past experience. Projects that are one-time-only undertakings are more difficult to plan and control. Many activities in the public sector are of this variety. The **overall project** may be a first, but the **components or tasks** of the project have been done many times before in similar projects. Some examples are: construction of a highway or a hospital, development and implementation of management system, conducting a major research effort, etc.

The **PERT** model (performance evaluation review technique or program evaluation review technique) and the **CPM** (critical path method) are two network models that are developed concurrently for the planning and control of projects. Each model has one main ingredient that is absent in the other. The PERT system originally permitted three different time estimates for each individual task, while

CPM permitted only a single time estimate. On the other hand, CPM identified time-cost trade-off point, whereas PERT did not. During the years since their origin the two methods have essentially been merged, with the current product incorporating the advantages of each model as well as many later developments. In the following discussion there will be no distinction between PERT and CPM (we actually use the termenology of PERT and the network analysis of the CPM).

Content of PERT/CPM:

To plan and to control a project require two peices of basic information about each task:

1 - The length of time to complete each task.

2 - The tasks that must be completed before another task can begin.

Project Network:

In using the network diagram to illustrate the project, activities are represented by circles and sequencing is represented by arrows. Once the network is complete, the estimated time of each activity can be inserted in the circle representing that activity. The activities represented by the "start" circle and "finish" circle are

not real activities but merely signify the beginning and end of the project. The estimated time for each activity can be used to estimate the time for the whole project; in particular the time estimates will lead to the **critical path** for the project (refer to **figure 1**).

The Critical Path:

A series of connected activities is called a **path.** The length of time associated with the path is the sum of the time estimates associated with each of the activities on the path. The path with the greatest time estimate is called the **"critical path".** The time required to complete the critical path is the shortest amount of time in which the entire project can be completed. Delays allong the critical path result in a delay of the project; if the project is to be completed in less than the time estimate of the critical path, then one or more activities on the critical path must be hurried or **"crashed"** so that their combined completion time becomes less than the original estimate. On the other hand, crashing an activity not on the critical path will provide no benefit. A delay in a noncritical activity will have no effect on the project finish time. For a more complex projects a more formal method of determining the critical path is needed.

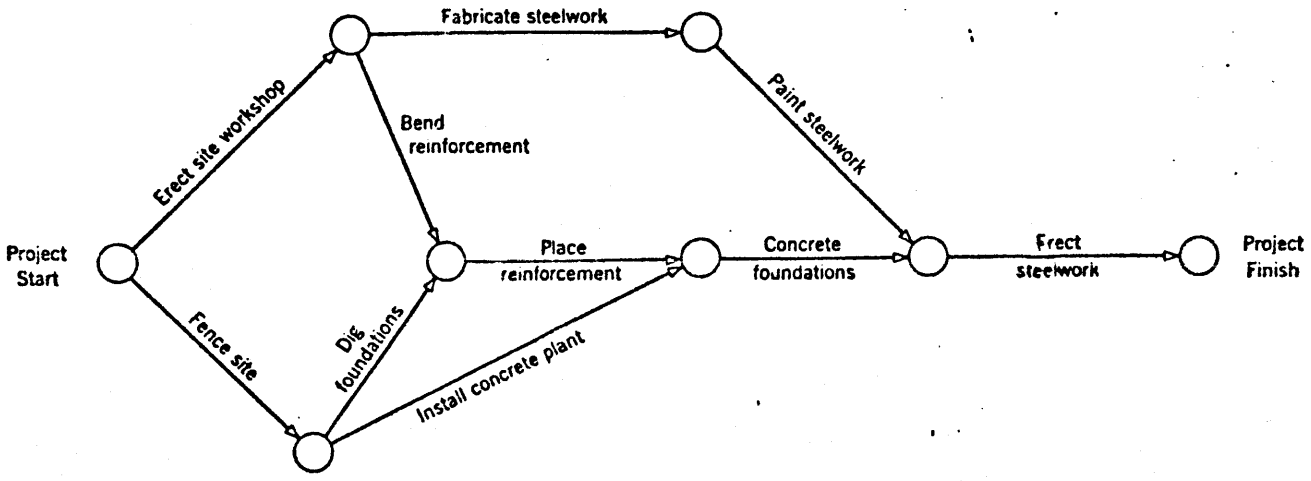


Figure 1. Network diagram for a simple project, showing component operations.

Early Time, Late Time, and Slack:

In order to find the critical path of a network, we first determin the **"early start time"** (ES) and the **"late start time"** (LS) for each activity. ES is the earliest that an activity can start after all preceeding tasks are completed. LS is the latest that an activity can start without delaying the entire project. The difference LS-ES is called **"slack"**; it represents the amount by which an activity can be delayed without delaying the project. An activity that has no slack is called a critical activity; the path of critical activities is the critical path.

So, passing through the network from start to finish we find the following:

1 - The early start time of an activity with no predecssors is zero.

2 - The early finish time (EF) of each activity is the sum of its early start time plus the time required to complete it.

3 - The early start time (ES) of any other activity is the latest of its immediate predecessors' early finish time. ES of any other activity is equale to the largest of the EF of all of its immediate predecessors.

The next step to find the critical path is to determin the late start (LS) and the late finish (LF) for each activity. The late start time for any activity is the latest that that activity can commence without delaying the whole project. The late finish time of any activity is the latest that that activity can finish without delaying the whole project. In order to determin LS and LF of each activity, pass through the network backwards, from finish to start as follows:

1 - The late finish time of an activity with no successors equals project's finish time.

2 - The late start time of any activity is its late finish time minus the time to complete it.

3 - The late finish time of any other activity is the smallest of its successor's late start times (refer to figure 2).

The "slack" is the amount of time an activity can be delayed without delaying the entire project. The slack for an activity is found by getting the difference between its LS and its ES. (equivalently, this is also the difference between its LF and EF). **Shared slack** is shared with the other activities in sequence with it. **"Free slack"** is the amount of time an activity can be delayed without delaying

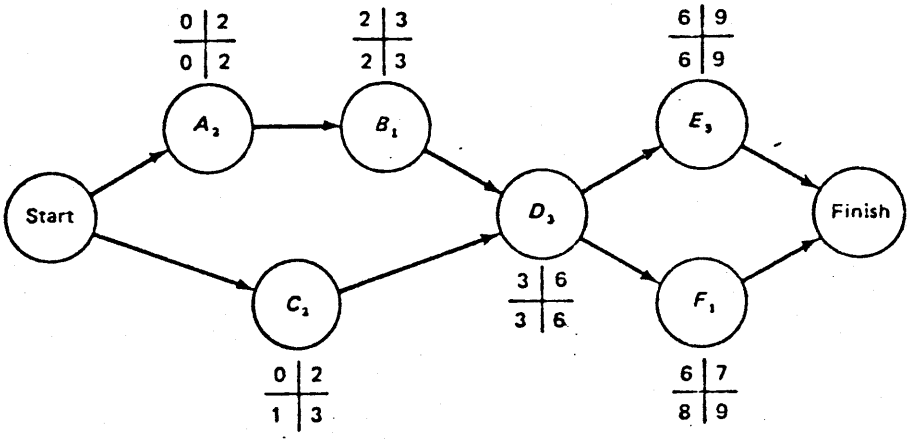


Figure 2 PERT diagram with $\frac{ES|EF}{LS|LF}$

or reducing the slack of any other activity.

Activities with zero slack are termed **"critical activities"**. A delay in any critical activity will delay the entire project. A sequence of critical activities forms a critical path. It may happen that there is more than one critical path.

As one can imagin, complex projects generate rather complex networks. There are many computer programs available for computing the slack and finding the critical path, provided one knows the sequence and estimated times of activities. Having found the project completion time, one can then determin when the project must start in order for it to be completed on time.

Crashing Activity Times:

The costs of project are of three basic kinds:

1 - Direct costs of activities.

2 - Indirect costs of supervision, administration, and so forth.

3 - Opportunity costs including late penalties and forfeited early bonuses.

Generally, as the overall length of a project

increases, the direct costs decreases, but the indirect and opportunity costs increase. Consequently, crashing activities may decrease total project costs while increasing direct costs. Costs here include monetary outlays and nonmonetary effects. Estimated activity times are ordinarily based on normal working conditions. The length of times required to complete an activity can sometimes be shortened, at a price. In some instances that price may be a dollar cost; for instance, additional personnel may have to be hired temporarily or regular personnel may be asked to work overtime. In other instances crashing the activity may lessen the quality of the activities; for instance, the surface of the highway may not be quite smooth if the smoothing operation has been rushed, or an agency report may be less informative if charts have to be omitted in the rush, or the proper equipment may not be available if the sites have to be hurriedly selected.

If it is necessary to speed up the project, then it is worthwhile determining (1) which activities are worth crashing and (2) which of those activities can be crashed at least cost, either monetary or otherwise. When the crash time of the critical path is less than the regular time of

a noncritical path, then noncritical activities may also have to be crashed.

Variable Activity Times:

The time required by most activities, especially those depending on human performance, is rarely a constant. Rather than make a single estimate of the activity time, three estimates are made. The three different estimates and their symbols are:

a **The optimistic time.** This is the shortest amount of time the activity would need under the most favorable circumestances short of a miracle. The probability is very small that the activity aould actually be completed in this amount of time.

m **The most likely time.** This is the amount of time that the activity is most likely to require.

b **The pessimistic time.** This is the amount of time the activity needs under the most unfavorable circumestances short of an act of God or some man-made catastrophe. The probability is small that this amount of time would actually be needed by the activity.

From these three estimates of activity time the mean, or expected activity time, is found by getting a weighted average of the three estimates. Intuitively it seems

reasonable that the most likely time "m" should be given a greater weight than either the optimistic time "a" or the pessimistic time "b". the equation for the expected activity time supports this notion; it is:

$$t = \frac{a + 4m + b}{6}$$

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