ISTANBUL TECHNICAL UNIVERSITY * INSTITUTE OF SCIENCE AND TECHNOLOGY

DECISION MAKING FOR MULTI-PURPOSE TALL BUILDING PROJECT IN URBAN CENTERS

M.S. THESIS

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S U M M A R Y

The purpose of this thesis is to analyze systematic decision making in architecture and to propose improvements for the preperation of tall building projects in urban centers.

In the first part of this thesis systematic decision making and its importance is discussed. Decision making is considered as a stage of problem solving in every field and its necessity especially for tall building projects is explained.

In the second part analysis of decision making is discussed in the following sections.

. Components of decision making
. Dynamics of decision making
. Decision analysis procedure

Decision making for tall buildings is discussed in the third part. Components of decision as taken :

. Subjects of decision
. Objectives
. Factors are explained and listed.

In the fourth part a proposal matrix brings together the components that listed in the previous part.

Decision characteristics for tall buildings and as a result their effects on the matrix are explained in the fifth part.

This study intends to combine the approach of systematic architectural design developed in the Faculty of Archi - tecture, Istanbul Technical University, with the results of studies, researches and experiences of other countries and especially of the U.S.A. where tall building complexes are dominant elements of urban centers.

C O N T E N T S

ŞEHİR MERKEZLERİNDE YÜKSEK YAPI PROJELERİ İÇİN KARAR VERME

Ö Z E T

Karar verme insanlık tarihi kadar eskidir. Tarih boyunca basit günlük ihtiyaçların karşılanması, savaşların kazanılması, üretkenliğin arttırılması ..vb. nedenlerle "karar verme" önemli bir faaliyet haline gelmiş ve zamanla bu alanda özelleşmiş kişiler ve sınıflar dahi ortaya çıkmıştır.

Özellikle sanayi devrimi ile, karar verme tekniklerinin geliştirilmesi gereği anlaşılmıştır.

Kararların etkinliğinin arttırılması için her bilimsel faaliyet alanında olduğu gibi karar vermenin de sistemleştirilmesi gereği doğmuştur.

Sistemleştirme, bilinçli olarak belli bir metodu takib etmektedir.

Metod yaklaşımında ise, bilimsel problemin aşamalara bölünerek ele alınması önerilir.

Bu anlayış doğrultusunda "karar verme", problem çözme eyleminin bir alt aşaması olarak ele alınabilir. Bu şekilde karar verme süreci daha kolay anlaşılır ve uygulanabilir hale gelir.

Problem çözme eyleminin adımları aşağıdaki gibi ele alınmaktadır :

. Problemin formüle edilmesi,

. Problemin açıklanması,

. Çözüme ulaşmak için hareket şeklinin belirlenmesi,

. Karar verme,

. Uygulama,

. Sonuçların Kontrolu (ve geri besleme).

Mimarlıkta olduğu gibi sanat ve bilimin bir arada ele alındığı bir alanda özellikle sosyal, psikolojik ve estetik özellikleri değerlendirmek zordur. Bu nedenle sistematik karar verme teknikleri mimarlıkta diğer bilimlere göre daha yavaş gelişmektedir.

Buna rağmen çağdaş mimarlıkta özellikle, şehir merkezlerindeki yüksek bina kompleksleri gibi karmaşık yapılaşmalar için kararlar alırken, sistematik yaklaşım, para, zaman, işgücü kaybı ve sosyal, psikolojik tatminsizlik, rahatsızlıklar gibi sonuçların önlenmesini sağlayabilir.

Her çeşit yapı bir karar verme eyleminin sonucu biçimlenir ancak yüksek binaların karar verme sürecine katılan değişkenler nitelik ve nicelik bakımından karar vermenin sistemleştirilmesini zorunlu kılar.

Günümüz insanının iş yapma biçimi, değişen beklentiler ve standartlar özellikle yüksek yapılarda kendini açıkça gösterebilmektedir.

Karmaşık fiziksel ve sosyal yapılarıyla yüksek binalar için alınacak kararlara çeşitli alanlardan girdiler vardır.

Başta daha küçük araziye daha çok yapılaşma anlayışıyla ekonomik nedenlerden, bu yoğunluğun neden olduğu psikolojik sorunlara kadar uzanan bir çeşitlilik sözkonusudur.

Yüksek yapılarla ilgili karar sürecine girmeden önce bu çalışmada, genel olarak karar vermenin analizinde bileşenler üç grupta ele alınmıştır :

a. Karar konuları,

b. Amaçlar,

c. Etkenler

Karar vermenin dinamiği ise ;

a. Problem çözmenin diğer adımlarıyla ilişkiler,

b. Alternatifler,

c. Modeller olarak ele alınmış ve karar analizi prosedürü adıyla karar süreci açıklanmaya çalışılmıştır.

Karar analizi prosedürü, karar bileşenlerinden hareketle şu aşamalarda ele alınmıştır :

. Karar konuları ve etkenlerin belirlenmesi,

. Amaçların, beklentilerin belirlenmesi,

. Karar probleminin kurulması ve analizi,

. Olasılıkların tahmini,

. Çözüme ulaşmak için hareket şeklinin belirlenmesi,

. Hareket şeklinin optimizasyonu ve çözüme uygunluğu açısından hassasiyetinin analizi.

Bu genel karar analizinden sonra, yüksek binalarla ilgili kararlarda gözönünde tutulması gereken özellikler tartışılmıştır.

Yüksek binaların ortaya çıkışı ve günümüze kadar yapımlarını gerekli kılan faktörler, sembolizm, korunma,teknoloji, ekonomi ve çeşitlenen faaliyet alanları olarak ortaya konmuştur. Sonuç olarak ortaya çıkan çok amaçlı kullanım, karma geliştiştirme projeleri ve megastrüktürler ele alınmıştır. Bu tür yapılaşmaların şehir merkezlerinde sıkça görüldüğü A.B.D. ve özellikle ele alınan Chicago şehrinden örnekler getirilmiş, gelecekte bu anlamda yapılaşmaların özelliklerini yansıtan düşüncelere yer verilmiştir.

1976 yılında A.B.D.'de Moser tarafından geliştirilmiş karar matrisi özellikle yüksek binalar için hazırlanmış ve Yüksek Yapılar Konseyi yayınlarından Monografta 1981 yılında yayınlanmıştır. Bu çalışmada yüksek yapılarla ilgili kararları etkileyen faktörler ayrıntılı şekilde listelenmiştir. Aynı yayında matrisin ileride geliştirilmesinin gereğine de değinilmektedir.

Bu yayından kısa zaman evvel, 1979 yılında Istanbul Teknik Üniversitesi, Mimarlık Fakültesi'nde ortaya konan "Amaçlar Sistemi" geliştirilerek, bu çalışmada

Moser'in hazırladığı listeye benzer bir sembolik matriste birleştirilmiştir.

Ayrıca yine Istanbul Teknik Üniversitesi, Mimarlık Fakültesi'nde Prof.Dr.Altan Öke tarafından ortaya konan karar konuları matrisin diğer bir bileşeni olarak ele alınmıştır.

Böylece üç bileşenden oluşan matris, bu çalışmada ele alınan ve karar vermenin bileşenler adı verilen karar konuları, amaçlar ve etkenler takımının işleyişini örneklemektedir.

Yüksek yapılar için hazırlanan karar matrisinde önceden amaçlar sistemi bulanmadığı için İstanbul Teknik Üniversitesi'nde geliştirilen çalışma ve bu tezle ilave edilen değişiklikler ve gerekçeleri ayrıntılı biçimde ele alınmıştır.

Örneğin yüksek yapılarla ilgili amaçların ortaya konması sırasında şehir ölçeğinde kararların önemi arttığından özellikle ilave edilen bu maddelerin açıklanmasına ağırlık verilmiştir.

Amaçlar sistemi üç grup amacı bir araya getirecek şekilde olaşturulmuştur :

1. Faaliyetlerle ilgili amaçlar,
2. Çevre ile ilgili amaçlar,
3. Yapım ve süreklilik ile ilgili amaçlar.

Karar konuları başlıca dört grupta toplanmıştır.

1. Arazi kullanımı ve ulaşım,
2. Yapı elemanları ve sistemleri,
3. Biçim ve karakter,
4. Yapım sistemi.

Faktörler ise yüksek binaların ölçüsü, gerektirdikleri teknoloji, standartlar ve karmaşıklıkları nedeniyle büyük çeşitlilik göstermektedir. Yüksek binalarla ilgili faktörler bu çalışmada aşağıdaki gruplarda ele alınmıştır.

- Fiziksel çevre faktörleri,
- Yapının yeri,
- Arazi kullanımı gereklilikleri,
- Yoğunluk,
- Mali kaynaklar,
- Yapı ekonomisi gereklilikleri,
- Malzemenin sağlanabilirliği,
- Ekipman,
- Yapım sistemi gereklilikleri,
- Ulaşım,
- Şehrin gelişim gereklilikleri,
- Şehrin görsel formu ve estetiği,
- Kullanım değişikliği gereklilikleri,
- Emniyet gereklilikleri,
- Fizyolojik gereklilikler,
- Psikolojik faktörler,
- Sosyal faktörler

Bu açılımları esas olarak alan matriste karar bileşenlerinin aralarındaki ilişkiler ele alınmıştır.

Yüksek yapılar için karar vermeyi sistemleştirmek için kurulan matristen çıkan sonuç farklı ülke, grup ve kişilerin değerlendirmelerine göre farklı sonuçlar verebilir. Bu çalışmada özellikle ülkeler ölçeğinde karar karakteristikleri incelenmiştir. Birinci grupta Amerika Birleşik devletleri, ikinci grupta Avrupa ülkeleri ve üçüncü grupta gelişmekte olan ülkelerle, Türkiye'deki gelişmeler ele alınmıştır.

Bu ülkelerde karar karakteristiklerinin devletin katılımı, toplumun duyarlılık konuları ve eğilimleri, politik ve sosyo-ekonomik faaliyetlerden etkilendiği gözlenmektedir.

Bu etkenlere paralel olarak ihtiyaçların farklılığı, eğitimsel ve kültürel farklılıklar ve yaklaşım farklılıkları matriste işaretlenen ilişkilerin farklı yorumlanması sonucunu yaratabilir. Fakat uluslararası literatür taraması ve farklı ülkelerde geliştirilen görüşlerin senteziyle hazırlanam matrisin genel formu ve düşünce sistemi, konuyla ilgili karar problemlerinin çözümünde kullanışlı bir araç olma özelliği taşımaktadır.

I. INTRODUCTION : SYSTEMATIC DECISION MAKING IN ARCHITECTURE

Decisions have been a part of humanity and most of the human activities are based on a process of decision making.

Decision making is a developed stage of intelligence depending on use of logic and, it is as old as humanity itself.

For a biological mechanism activities of survival are based on passive life mechanisms, hereditary actions, and simple or complex reflexes, etc.

The human animal evolved itself out of a biological mechanism and substituted a cultural mechanism. This cultural process was so successful that human civilizations developed, but these civilizations led to decision problems which were too complex for the cultural mechanism. The civilizations therefore produced classes of specialists for that purpose (Bross, 1966). Decision makers therefore, had important places in societies and they had great responsibilities for the future of civilizations.

Throughout the history, human beings used different methods to solve daily problems, to win battles, to increase production or to solve problems of different kinds. They searched for more effective and practical methods to reach the best solutions and to provide better conditions as an individual, as a community, as a nation or even as a group of nations.

Increasing demands and expectations of users have generated new ideas. To improve the quality of work, to increase the efficiency of actions ; to reduce the risk of errors, and to avoid waste of time and effort, problem solving approaches have been systematized.

One of the major human needs, providing shelters to live in, stretches back to the people who used caves, trees, then to the people who set up the first tents and piled stone upon stone. Even, at that time, in providing any natural shelter or artificial structure for permanent or temporary residence (Caxton, 1969), decisions about protection or about some other limited basic needs had to be taken.

Protection from enemies, animals and from extreme climatic conditions were "factors". To minimize or to control those effects were "objectives", and location, structure or materials to chose were "subjects of decision". Especially after the use of "word" and "speech" as tools of communication those variables were first used unconsciously then consciously. Those can be called components of decision making and the relations between them proved to be an approach to the decision process in time.

It is also possible to observe a similar kind of logic in the successful samples of architecture in history like the Babylonian buildings in Mesopotamia. As a factor, Babylonians did not have stone or timber but the area was rich in clay, river water, and sunshine, so, to reach their objective, sun dried brick was invaded and developed as the principal building material. They used the material they had available in an efficient way.

Egyptians, the people of the Nile valley, used the available material in their area, delicate sand-stone, in quantity to reach their objective of constructing buildings of great mass and height and of durable form lasting for centuries against the time factor.

Today the complex structure of metropolitan cities socio-political and economical factors became more dominant to natural environmental factors. However this indicates not only an increase of the complexity of the decision making process but also requires research for changing traditional approaches. At this point a systematic decision making in architecture enables one to solve the complex problems letting the input of current investigations without missing salient points.

Being systematic is described as "consciously following a definite method". A method is a selected group of activities created to solve the problem and methodical approach divides the work into stages. So, it is possible to divide the work of "problem solving" into stages.

The number of stages is not a matter of great importance. Many scientists and philosophers suggested different techniques with slight differences in meaning and emphasis. What really matter here is that decision maker should have thorough understanding of the major sequence of operations to use them efficiently.

Stages of problem solving :

. Problem formulation
. Interpreting the problem
. Construction courses of action
. Decision making
. Implementation (Jackson, 1977)
. Testing results (and feed-back)

Taking decisions in an environment of uncertainity and risk has always been difficult and statistics may also involve into the process.

Statistical information is entered to the "constructing courses of action" stage. Statistical decision is an intellectual mechanism based on the scientific method (Bross, 1977) and this require a systematic set of steps as listed above to reach to the best available solution.

Scientific research, which is the search for new know - ledge, may appeal to people who are individualists and their methods vary from one person to another. A policy followed by one scientist may not be suitable for another, and different methods are required in different branches of science. However, there are some basic principles and techniques that are commonly used in most types of in- vestigations (Beveridge, 1968). The basis of science are accumulation and classification, therefore commonalty and generality. There are several studies about decision making in architecture made by individuals or institutions. Based on international literature search, this study in- tended to apply that knowledge systematically to the "De- cision making" approach, developed at Istanbul Technical University, Faculty of Architecture and intended to reach to a general matrix.

Here, in this study, systematic "decision making" in arc- hitecture is discussed focusing on the multi-purpose tall building projects in urban centers and the results are presented on a symbolic relations matrix.

Decision making in building design, as in many fields of design and planning, is concerned with narrowing the field of search, in the universe of possible solutions (Moore, 1968).

Usually in real life, as in the field of architecture problems do not have only one possible solution. To reach "the most suitable solution", it is necessary to choose the best between different courses of actions leading to different solutions and this is the main purpose of the decision making stage.

Evaluating the proposed courses of action according to the relevant criteria is very important, because of the reason described above in architectural problem solving. This includes evaluating the complex relations between subjects of decision, objectives, factors, and developing of alternatives, formation of models of a building or related systems and collecting, generating ideas.

. Importance and Necessity of Systematic Decision Making

Parallel to the change of human activities, demands and expectations have changed. Problem solving and decision making processes have been developed and systemized especially after the industrial revolution. In this way increasing the productivity of capital, time, manpower and energy became possible while increasing intensiveness and creativity.

To reach a final judgement, opinion or conclusion under present circumstances in our complex societies, it is necessary to act systematically to increase the efficiency of our actions by preventing delay, avoiding waste of effort.

Otherwise, mistakes in decisions cost much today in terms of money and time. Reducing risk of making inefficient decisions can be prevented by working systematically. This kind of approach also involves considering "what is next to do?" so, knowing the order of actions makes decision making process more logical, more clear for decision maker and decreases the possibility of careless work.

Systematization of decision making helps to improve the efficiency of the decisions by making it easier to evaluate the effects of the action. Discussing "effects", prevents careless work errors. Careless decisions without a systematic approach usually leads the direction of the study to actions which do not serve as a useful objectives or which leave the most important issues out of account. A systematic decision making may prevent following errors:

. Taking the easy but inefficient way out
. Uncritical pursuit of the obvious
. Pursuit of private or irrelevant objectives
. Irresponsible indulgence of whims and fancies
. Copying other peoples decisions
. Impulsive reactions to events
. Prejudice
. Ignorance of better methods
. Inattention to earlier stages of problem solving (Jackson, 1977).
. Time schedule errors.

Systematic problem solving starts from the definition of the problem, making every tool ready before decision making. As mentioned before it is processed in stages. Here, the importance of stage or step-by-step procedure lies in it's ability to force decision maker to conceptualize and structure the problem in a logical way. This systematic route is the most efficient and safest way because systematic problem solving will not let decision maker pass through the decision making stage until finding at least one course of action for satisfactorily solving the problem.

In case of having more than one courses of action decision maker just need to choose a preferable one. Determining systematically the best available strategy, to fulfill some stated preference criterion, can be regarded as a backbone of taking decisions in an environment of risk and uncertainty. In this way problems will become more easier to solve, using the selected suitable strategy. Because of its advantages systematic decision making become a major approach of problem solving in every field like in the field of architecture.

. Decision Making and Contemporary Architecture

The art and science of designing buildings (Piper, 1985) is an ancient profession and has a great influence on our lives. It is significant to appreciate that a sense of quality should permeate the work of an architect, as their responsibilities to an individual and to the society is very important in many ways.

Creating the human environment have usually been one of the major activities of civilizations parallel to the other physical and social activities. The problems,needs and demands of yesterday had changed today. To provide social and physical activities, today's man-made environment should gather complex futures.

In contemporary architecture, analyzing those problems and consciously processing decision making steps accepted as a major necessity. Today, it is possible to apply the recent developments in the problem solving studies to contemporary architecture. This requires a systematic study of society, technology, economics, urban infrastructure etc. Like those complex information to get and evaluate, contemporary architecture has much to do before just "building" anything.

Since 1950's techniques developed in other fields have been applied to architectural design. Horst Rittel, Bruce Archer, Christopher Jones, Thomas Markus, Gregory Broadbent are among the writers who studied the act of designing from different points of view (Öke, 1984).

There are several approaches to decision making today,but as a general procedure of decisions in architecture, the architect must decide on the criterion for identifying the preferred course of action like collecting ideas, generating ideas or setting up a model. Then it's neces - sary to decide on a procedure to evaluate available courses of action and evaluate each of them according to the procedure, in other words a strategy have to be accepted. After identifying this, architect resolves to carry out the chosen course of action.

To systemize decision process, it is possible to classify variables in three groups and those are called "components" of decision in this study.

Components "factors" effecting the building or it's environment; architect's or society's "objectives" and "subjects of decisions" must be clearly defined and listed before going into the design process. Then it will be much more easier to set up the useful models" and to develope alternatives.

Objectives may vary to a large scale or even may reach to extreme architectural understandings but the success of the building depends on its satisfaction of the objectives of any kind.

To reach those objectives, systematic approach makes decision making in architecture more explicit with its definite and logical procedure. The variety of major prin - ciples are available which may be applied to any archi - tectural situation when a decision is required. However, in a field like architecture where art and science meets, it's hard to reach solutions with only countable variables as uncountable ones still needs a given value to evaluate. Because of this reason studies and applications of decision making in architecture is slower than most the other science branches.

In contemporary architecture, there is a strong need for a systematic approach even its difficulties in applica - tion, because unsuccessfully made decisions cause large scale of problems. Mistakes and unefficient decisions about physical environmental subjects usually cause loose of money, time, and manpower while social and psychological ones cause dissatisfaction and uneasiness which are very complicated problems to analyze and solve.

. Decision Making and Tall Buildings

The field of architecture is the science and technology underlying the creation of the built environment and an art whose quality affects the lives of huge number of people. High rise structures especially has greater in- fluence on the urban life in many ways.

Every kind of building in any scale needs "decision making" before involving into implementation.

Design is a set of decisions and especially for tall bu- ildings the number of decisions are increased according to the increasing number of components. There is also a quite increase of complexity according to the number of factors effecting, the variety of objectives and subjects of decision.

In spite of expressive symbolic meaning of multistory bu- ildings their principle importance lies in the economic and civic fields. In the world of modern industrial society they represent an indispensable means of concentration of useful area for various purposes connected with the stay and activity of many people-that is their real mission (Syrovy, 1973). Because of this reason components of de- cision related with tall buildings became more complex also involving in social studies.

"High densities" does not mean "tall buildings" directly. When making decisions for high density settlements, it is important to investigate both the alternative for low - rise developments and for tall buildings. In the second case, it is obvious that there will be a slight increase of the complexity and variety of factors effecting tall buildings. Those factors can be divided into groups and will be discussed in the following chapters.

Current pattern of business activities, the availability of land, and economics of urban systems or infrastructure usually causes an urge to built up. Providing more built space on less total land and overcoming the threat of urban sprawl, tall buildings are the major part of much of the urban centers today. In spite of their complex decision making process, tall buildings in many cases may become more suitable solutions when compared with low rise buildings.

Photo 1, Chicago loop,1990
Photo by Murat Mayor

Depending on complicated characteristics of this building type, decisions on tall buildings need consideration of additional variables with wider contents, some of them in city scale. Here, in this study we will try to clarify those and try to form a systematic decision making matrix especially for multi-purpose tall building projects in urban centers.

2. ANALYSES OF DECISION MAKING IN ARCHITECTURE

Parallel to the increasing need in every field, systematic decision making became a subject of scientific studies including architecture, and in scientific approach "analysis" has a great importance.

The division or separation of decision into the parts that compose it; the breakdown of a design, building or communication into its constituent elements or components such that the relative sets of produced ideas are made clear and the relations between the ideas expressed are made explicit (Rauh, Wright, 1975).

Analyses like that are usually intended to clarify the meaning of the design, building or communication and indicate how it is organized, also showing the way in which it manages to convey its effects as well as the basis and arrangements.

In this study decision analysis includes the following parts :

- Components of decision
- Dynamics of decision
- Procedure of decision analysis

However this differs from the analysis in architectural design. Because of that, before discussing decision analysis, architectural analysis will be reviewed in a similar classification for purpose of comparison.

Analysis in Architecture is listing of all design requirements and the reduction of these to a complete set of logically related performance specifications (Jones, 1963).

It is possible to review this kind of analysis in three parts :

a) Analysis of components ; is identification of the elements included in a design, building or communication For example, the ability to distinguish the elements of a tall building curtain wall, from the elements of the steel structural system.

b) Analysis of relations ; is described as the interactions and connections between elements and parts of a design, building or communication like the skill in comprehending the interrelationship among the various architectural sub-systems and elements of a building.

c) Analysis of organizational principles ; is the organization, systematic arrangement, and structure which hold the design, building, or communication together, including explicit as well as implicit structure such as the mechanism that makes design, building or communication a unit. The ability to infer architect's purpose, intellectual perspective, or design philosophy as shown in examples of his work.

2.1. Components of Decision Making

The nature of an object or process is determined by the nature of its components (Alexander, 1963). Some components of decision making will be discussed here in three groups:

. Subjects of decision
. Objectives
. Factors

A decision making approach according to this classification have been used in some architectural design studios at Istanbul Technical University, Faculty of Architecture.

2.1.1. Subjects of Decision

Subject of decision is described as the theme of final judgement or opinion for any variable which can have alternative situations or characteristics. In architecture, this term includes major decision areas such as "land use and transportation" or "building elements and systems".

To reach to a solution for a certain objective, decision maker should define some subjects of decision to study. In the same way, there may be a complex interaction between factors and subjects of decision. Decision maker should check all the factors related to the subjects to reach an effective solution which will work in the real life.

In architectural problems, subjects can usually be related to more than one factors. At this point architect should evaluate and give values to those relations to compare the importance and to reach a final decision. This can prove to be a problem for tall buildings because both the number of subjects and factors will be increased to great amounts and relations between them will be more complex to evaluate.

2.1.2. Objectives

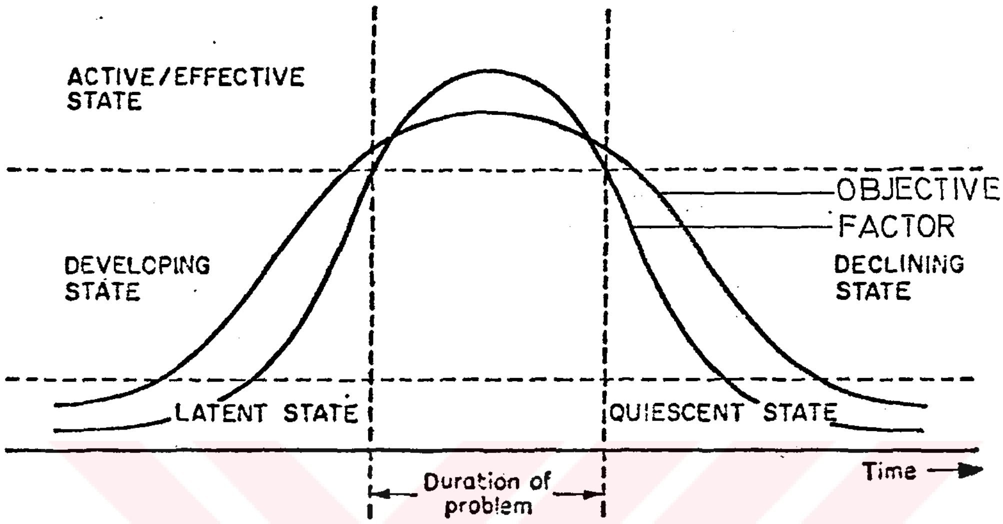
Objectives have to be apparent to start to make decisions. This may include the objectives related to the product or to the society itself.

All problems are existed to be solved but in terms of urgency, it's possible to classify them in groups to evaluate them more efficiently (Jackson, 1977).

. Latent
. Developing
. Active

. Declining
. Quiescent

Figure 1 ,Duration of problem



As seen in the graphic during the "duration of problem" period, factors related with objectives become more active than any other time. This indicates the importance of relations between objectives and factors in decision making process.

During the life-cycle of the problem, active objectives usually coincide with effective factors. When the objective is in either developing or declining state, best thing to do is starting to the decision making process if it looks fairly easy, but otherwise for complex decisions, it may be better not to do anything rather than making an attempt that should fail. Latent or quiescent objectives usually do not cause problems on a great scale.

As there are five stages, those form a set of twenty-five possible combinations.

Figure 2, Suggestions for combinations of Factors and Objectives (Jackson,1977)

FACTOR	OBJECTIVE: Latent	Developing	Active	Declining	Quiescent
Latent					
Developing			ACT QUICKLY!		
Effective		Is it necessary ?	Big problem !	Why bother ?	
Declining			WAIT A BIT!		
Quiescent					

Objectives of any kind effects subjects of decision. Decision.maker should decide on certain subjects to reach to the already defined objectives. While doing that decision maker have to consider factors.

Objectives and factors may have different kinds of relations and this may occur between different groups such as "contrasting relations". Factors may help or limit the objectives. For example contrasting relations may either be between different groups like user, owner, supporter or may appear within the same group (İnceoğlu, 1984).

While defining objectives, persons or groups related to the design or building has great importance. Input from participating roles will certainly effect the success of the product. Roles related with a building (as a product) can be classified as :

. Building users
. Client
. Designers
. Builders
. Manufacturer (Bayazıt, 1982)

In architectural design, according to a study which was made in I.T.U.(Ayıran, Umur, 1979), it's possible to classify objectives according to their subjects.

a) Objectives related to activities
b) Objectives related to environment
c) Objectives related to construction and endurance

2.1.3. Factors

Factors are variables which have effect on realization of objectives.

Any contributing cause effecting decisions should be carefully identified and listed before involving into making decisions.

First presentation of factor analysis was by Spearman in 1904, assuming that a correlation between any two items implies three things. First is two factors which are specific to each item, and a third factor that is common to both of them. Such as if we take tall building esthetics and urban form as two items, those are both effected alone and together in many cases by different factors.

Decision making without considering a complete set of factors for each subject and for the related group of subjects may cause serious inefficiencies in any kind of problem solving.

Factors can be listed in two major groups. There are variables effecting objectives which can be controllable or uncontrollable.

Physical environmental factors are considered to be "uncontrollable" and effects of those to the performance of individuals are considered "controllable" (İnceoğlu,1984).

Factors have strong influence on subjects of decision.

Especially in a field like architecture, feasibility, in other words possibility of realization of objectives while factors define the general conditions, has a great importance. In some cases factors may also make it easier or impossible to reach to objectives.

A set of factors for tall buildings had already been listed by Moser in 1976 especially for tall buildings. However as declared by Council on Tall Buildings and Urban Habitat ; "By systematically investigating the effects of different combinations of variables on all factors (and through computerization can this be done comprehensively), ever more accurate and objective determinations can be made".

As the purpose of this study a set of factors similar to Moser's will be combined with the systems of objectives and subjects.

In future, relations shown by this symbolic matrix can be evaluated as formulas or sub-programs of a very complex program. This will certainly provide much quicker results from the matrix and will help to bring it into use.

2.2. Dynamics of Decision Making

Principles of interaction among components in decision making will be discussed in this part. This subject includes relations,alternatives, and models.

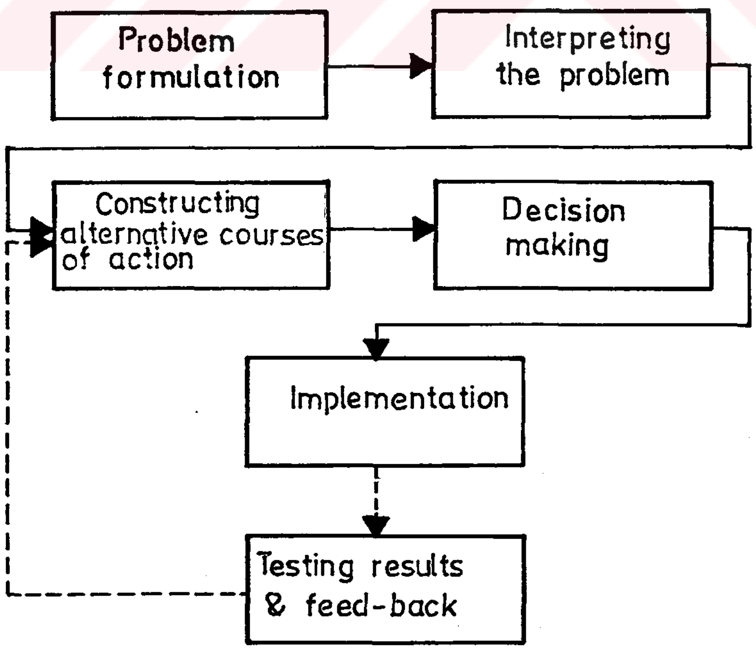
2.2.1. Relations

.Relations with other stages of problem solving.

Architectural design can be described as a decision problem.

As mentioned before, decision making is one of the stages of problem solving and problem solving can be broken down into five stages. Those courses are tied to each other with strong relations.

Figure 3, Stages of problem solving



Most important stage of decision making can be accepted as constructing alternative courses of action. As seen in the diagram above, it begins where the stage of "interpreting the problem" ends, at a point where an appreciable understanding of the problem situation has been attained. Collecting and gathering ideas, forming up models of the situation in a visual or manipulable form, take place in this stage for developing alternatives or more effective courses of actions.

In decision making stage, those proposed courses have to be evaluated according to the relevant criteria. Relying upon the ability to make sound judgement of the relative merits of the various possible outcomes, the stage of decision making is completed after the best course of action has been determined and after a firm commitment has been made to carry it out.

Results of the previous stage are evaluated and selected in this stage, so powerful relations between two stages make it very important to act sensitively in each stage.

In the same way the "implementation" stage is the realization of the chosen course of action. All of the studies may be wasted unless it is carried out properly. Various kinds of plans and controls are needed to ensure that, what was decided is actually done. If decisions are not applied as implementation they do not have any value for problem solving.

2.2.2. Alternatives

Alternatives are a set of mutually exclusive choices or possibilities and should be carefully elected in the decision making process.

Alternatives which were systematically developed in the "constructing courses of action" stage allows decision maker to consider a wide range of choices, also decreasing the possibility of mental resistance to new ideas. The most difficult mental act is to re-arrange a familiar bundle of data, looking at it differently, escape from the prevailing doctrine and search for alternatives.

. An overview of techniques to develop alternatives

Until today, a variety of alternative developing techniques had been created and some of them found their way as applications in the real life.

a. Morphological charts

Morphological charts; used to expand the areas in which the solution will be searched for a design problem (Jones,1970). Usually it starts with the definition of the functions that a design product should provide. Than a set of alternatives have to be created enabling those functions. Those are recorded in cards. The suitable group of solutions are chosen from the solution group of each function.

b. Analysis of interconnected decision areas

Analysis of interconnected decision areas; is a technic to identify and evaluate all of the compatible groups of sub-solutions (Jones,1970). Suitable options in decision areas are identified and incomplete options are elected. Compatible groups of options are listed together and when there is a quantifiable criterion of choice, compatible group of them is found according to the best criterion.

c. Synectics

Synectics can be described as the theory of operations that turns unrelated individuals into a problem definer-solver group (Beyazıt,1978). Synectics is developed to direct instinctive mental acts and nervous system towards exploration and transformation of design problems (Jones, 1970).

Forming a group of selected people related to the subject to operate as an independent development department is needed in this technic. Lots of practice in the use of analogies are given first, and complex problems are submitted to the group. Than groups output is submitted to the present organization for evaluation and implementation.

d. Biological analogy

Biological analogy ; can be successfully used as resemblance, comparison or similarity to the nature.

It can be applied to both social and technical problems (Tapan,1984). In architecture, especially technology of buildings depends a great deal on design by analogy (Broadbent,1970).

e. Brain storming

Brain storming : as a technic of developing alternatives, produces sudden aberrations or inspirations, stimulating the group of people to develop many ideas in a limited time (Jones,1970). Selected group of people for brain storming are not criticized and also their wild solutions accepted. Combining and improving other peoples ideas is possible leading to the higher quality of ideas. The quantity of ideas are important and each is recorded for a later evaluation.

f. Check lists

Check lists ; enables designers to use knowledge of requirements which have been found to be relevant in similar situations (Jones,1970), also allowing designer to detect the missing parts of the solution. List of questions found in similar situations is prepared to ask someone which is related with the design to be evaluated.

g. Removing mental blocks

Not being a major technic of alternative developing, removing mental blocks is found to be helpful to determine new directions of search when the apparent search has resulted with an unsatisfactory solution.

It's especially useful to review of unsatisfactory results or relationships and allows re-evaluation of the design situation (Beyazıt,1978).

. Evaluating Alternatives

In any kind of alternative evaluation, judgments about the value of the subject and methods for given purposes are important in terms of their effects on solution. Quantitative and qualitative judgement about the extent to which designs and methods satisfy criteria, or using a standard of appraisal can be a definition for "evaluation of alternatives" in architectural decisions. The criteria may be determined by decision maker or may be directly given to.

2.2.3. Models

Representation of a system by another system (Öke,1983) has a great importance in decision making. While studying models, decision maker tries to reach to the decisions for applications in the real world.

Selected course of action by using a symbolic mechanism leads to the implementation in the real world, so the chosen solution of decision making is translated into sensory world.

Especially in a field like architecture which has direct influence on the lives of individuals and societies, economic, social psychologic decisions should be taken carefully. It is usually less complicated and cheeper, for this scale, to use models instead of applications and feed back in the real world.

Models also provide a frame of reference for consideration of the problem. This is still an advantage even if the preliminary model fails in prediction (Bross,1986).

There are several explanation of models according to physical structure. Churchman, Ackoff and Arnoff in "Introduction to Operational Research" (1957) classify models in three types :

. Iconic models ; scaling down or for special purposes scaling up the actual physical dimensions (Can not share all of the original's properties).

. Analogue models ; representing the various properties of the original by properties of different kinds.

. Symbolic models ; being a basis of computing, thay consist of equations, sets of equations or only express relationships.

Irwin D.J. Bross in Design for Decision (1966) identify four types of model :

Physical models ; is referred to the Iconic models of the first classification, Abstract models ; as Analogue models ; Symbolic models as described under the same name and additionally Mathematical models ; as Bross discuss them as a different type from symbolic models.

The decision making matrix of this study represents relations between components of decision and formed as a symbolic model.

Models can also be classified in five groups according to character of representation (Öke,1983).

a. Purpose (Decision, explanation, control, communication)
b. Physical structure (Iconic, analogue, symbolic)
c. Dimension (Scaling up and down, prototypes)
d. Time (Real, extended, shortened)
e. Change of structure (Static, dynamic)

2.3. Decision Analysis Procedure

Decision analysis is an approach forcing decision maker to carry out a complete and logical evaluation of alternative strategies. Main purpose to do that, is systematically determining the best available strategy against some stated preference criteria.

This can be considered as the basic way of taking decisions in an environment of uncertainly and risk which is usually processed in different stages. Stages of decision analysis is not needed to be rigidly applied for each case. For example, an architect usually does not need to draw decision trees to take decisions for a modest vacation house, but when it comes to decisions for a tall building complex, this kind of a procedure forces the architect conceptualize and structure the problem logically also making him to decide systematically.

A similar set of five stages had been developed by Gordon M.Kaufman and Howard Thomas in 1977 but the process of decision analysis will be discussed giving more value to the components of decision in this study. Here, decision tree is thought to be a usefull tool for architectural applications in which alternative directions can be seen and evaluated easyly.

. Decision analysis procedure

1. Defining Subjects of Decision and Factors

Before drawing a decision tree, subjects of decision related to the proplem and factors effecting those subjects have to be identified. Also the relations between them must be clarified. This stage indicates the first control over the problem.

2. Defining the objectives and assessing pay-off values for the outcomes

At this stage objectives have to be cleared, the total pay-offs for end-positions have to be evaluated which will be placed into the decision tree (This may also be the first stage according to the nature of the problem). Those are usually transformed into utility values particularly when the outcomes in the problem can not satisfactorily be described in terms of money, such as creating the suitable tall building environment for the psychological health of an individual.

3. Structuring and analysis of the decision problem

Decision maker starts to draw a decision tree, while doing that, this stage enables to breakdown complex decision problems into sets of more amanageable decision problems. The advantage to do that, no matter how simple or complex the problem may be, decision maker can define the problem in a detailed way, consider all feasible alternatives and clarify the nature of the uncertainties and risks.

4. Assessing probabilities

Assessing probabilities for the uncertain events in decision tree is important as decision maker often faces risks in his work.

Certain degrees of knowledge can be designated to use in decision making process, not only the certain ones.

Knowledge can be classified in four groups in terms of certainty :

a. Non-structured uncertainty : The states of the system are unknown at any time,

b. Structured uncertainty : The states of the system are known, but we do not know what will be the state of the system at any time,

c. Chance : The states of the system are known, as well as the laws of probability at any time. If the law do not vary, the chance is called "stationary" ; in the opposite case it is "non stationary".

d. Certainty : The states are known and it is possible to describe the state in which the system will be at any time (Kaufmann, 1968).

In some cases, most of the knowledge can be based on probabilistic events and those must be evaluated more carefully according to deterministic knowledge.

5. Choosing the course of action

After defining possible courses of action, decision maker chooses the alternative with the maximum expected utility.

By using the process of repeated application of the expected utility, principle results in the eventual elimination of all alternatives except the best feasible strategy.

Based on Bellman's principle of optimality in dynamic programming , this is commonly used procedure despite the use of a simulation in some complex problems.

6. Sensitivity analysis

The optimality of the selected "course of action" largely depends on the quality of the judgement or probability and utility which went into the analysis. Decision maker can judge the sensitivity of the selected strategy to variations in the inputs effecting final judgements. For example, decisions of a tall building project may or may not include esthetic values in spite of utilities interms of money. If there are no regulations or public pressure about esthetic values, decision maker is responsible for the sensitivity of decisions.

3. DECISIONS FOR TALL BUILDINGS

In this chapter components of decision especially related with tall building projects will be discussed.

Subjects of decision and objectives are studied by decision maker for a better understanding of the situation and for making the process more clear. Most of the factors are already existed in any case and in duration of problem, they may gain more importance as mentioned before.

Decision maker usually have to accept them and must work within the limits of factors when an effective control over them is not available. When taking decisions for tall buildings those relations become more complex because of increasing environmental facts, size, and technology required.

Photo 2, Chicago & Sears Tower, 1990
Photo by Murat Mayor

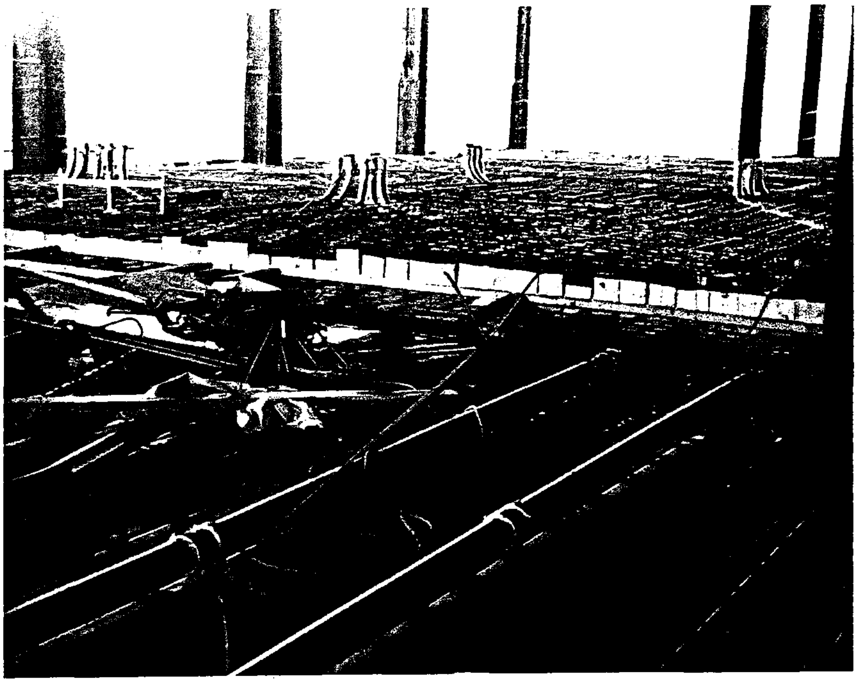


Photo 3 & 4,

Steel floor combined with complex service facilities,
Des Moines Principle Tower, Iowa, 1990
Photo by Murat Mayor

For example, world's tallest building, Sears Tower is a 110-story office building. 76.000 tons of steel was used for the structural system. The building has more than 16.000 bronze-tinted windows. Its 16 double decker elevators divides the Tower into three separate zones. Six automatic window-washing machines clean the building exterior eight times a year (Sears Tower, 1990). Like this extreme example, tall buildings usually show those kind of complexities.

3.1. Factors Causing Tall Buildings

For a better understanding of the development of tall buildings, it is necessary to discuss the factors causing development of tall buildings until present day. (In addition to the factors of tall building decisions).

. Factors causing tall buildings :

1. Symbolism

One of the strongest factors to built tall appeared as religious symbolism such as the purpose of building tumuluses and pyramids.

Additionally, constructing the biggest, the most visible, and in other words, the tallest structure in the settlement became the indication of social status and a way to express power. Elevation equalled to power and status for almost every society.

In the beginning usually tall structures were only symbolic and those were not used for sheltering. Shelters were usually serving as combined living and working places and mostly were limited in height because of the materials and building methods.

Religious symbolism also play an important role today. For example the symbolic element of the mosque is the minaret. It endeavors to soar towards the sky and towards God. Builders raised minarets to make people hear the caller and they designed minarets of such a height so as to approach God's clemency and pity (Nafe,1990).

After 19th.century, tall buildings housing huge number of people for different purposes arose from the need for an impressive demostration of economic power; architecture played a subordinate part (Aregger and Glaus,1975).

2. Protection

Being a general factor for all building types, tall structures seemed to be safer for same kinds of dangers like climatic conditions and animals. What is more, parallel to the developing of society men felt the need for protection also from other men and need for privacy which caused of developing first walled homes than walled cities which indicates first tall constructions appearing as defensive look out towers.

3. Technology

However, tall edifices of those days could not be considered prototypes for the high rise buildings of today. The modern skyscraper was a completely new invention with almost no antecedents prior to the middle of the 19th.century (Blake,1974). With it's structural, environmental and supporting systems today's skyscrapers formed and equipped with products of high technology.

For example The John Hancock Center reaches skyward 344 meters above the ground. Towering television antennas accentuate the height of this Chicago landmark. Up to

2.000 men worked in construction, which required 5 million man-hours to complete. The building contains 1.250 miles of wiring and 11.459 panes of glass. The world's fastest elevators carry passengers non-stop from ground level to observatory in 39 seconds (Coldwell,Souvenirs,1990).

4. Economy

Modern skyscraper originated in Chicago, a city which was economically dominant over its hinterland area, and the first skyscraper was designed to house the commercial office of an insurance company (William Jenney's Home and Life Insurance Company Building, 1885).

Today, especially in urban centers land prices are extremely high and this is the main cause of economic factors generating tall buildings in metropolitan areas.

5. Activities

Increase in volume and type of activities that must be housed and served by current types of buildings became a kind of factor today. Usually zoning regulations determine disposition of activities. However "megastructures" are exception to this generalization.

Functional categories of buildings can be classified as;

- Government : Administrative buildings,court of low, etc..
- Institutional : Libraries, hospitals, schools, museums.
- Commercial : Shops, stores, offices, banks and other public utilities.
- Residential : Apartments, hotels, dormitories
- İndustrial : Manufacturing, warehousing, material processing buildings.

- Public assembly : Restaurants, theaters, auditoriums.
- Special purposes: Observatories
- Transportation and Communication : Transportation interfaces, garages.
- Multi purpose buildings and megastructures : Various kinds of activities.

In contrast to the zoning approach and to the laws separating major activities of living and working, multi-use buildings received attention in last decades. However, this concept is rather new for most of the countries in application and will be discussed with some examples.

Marina City (1959) in Chicago, 300 North State Street, designed by Bertrand Goldberg, is considered to be the first tall building to break the zoning ordinances by a special permit. Two tower complexes includes marina, shops, restaurants, parking, offices and 450 apartments in each tower.

Goldberg wished to build mixed-use skyscrapers of 72 stories tall, linked by sky-bridges, and containing everything from housing (446 units) to schools and retail shopping centers. However, 1985 dated project did not go ahead (Chicago, Museum of Science and Industry,1989).

John Hancock Center (1969) in Chicago, 875 North Michigan Avenue, designed to combine multiple uses in one tall structural system of hundred stories. Designed by Skidmore Owings and Merril (Bruce Graham, design partner and Fazlur Rahman Kahn, senior project engineer) the complex contains commercial spaces on floors 1-5, parking for 1200 cars on floors 6-12, offices between floors 13-41 and apartments from floors 44-93. An observatory, restaurants and bar occupy floors 94-96.

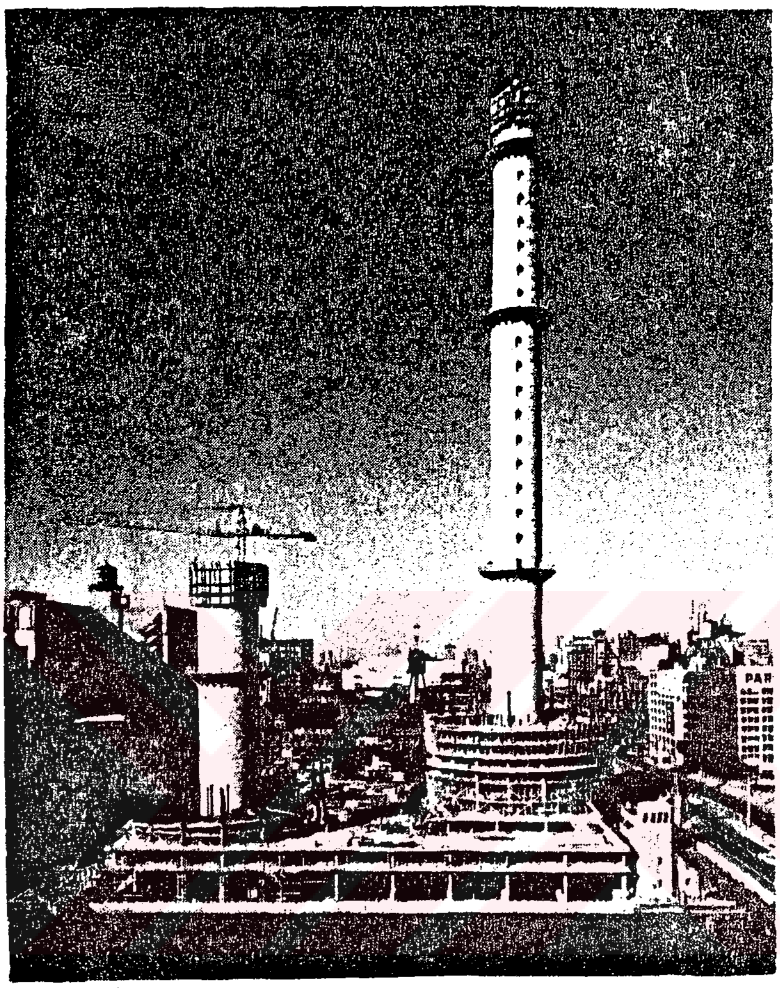


Photo 5, The round utility cores,
Marina City under construction,1959
Photo by Portland Cement

Photo 6,Marina City with its surroundings,1990
Photo by Murat Mayor

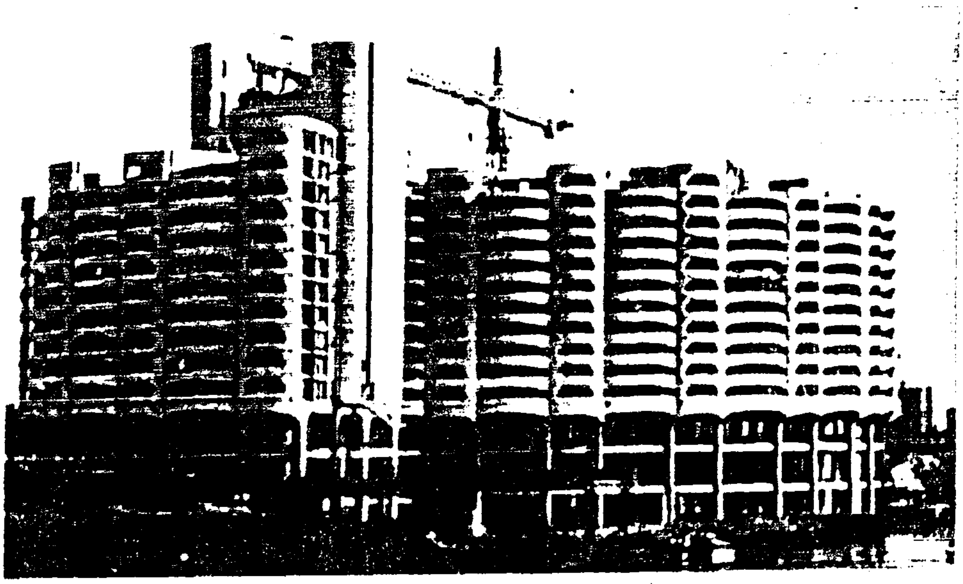
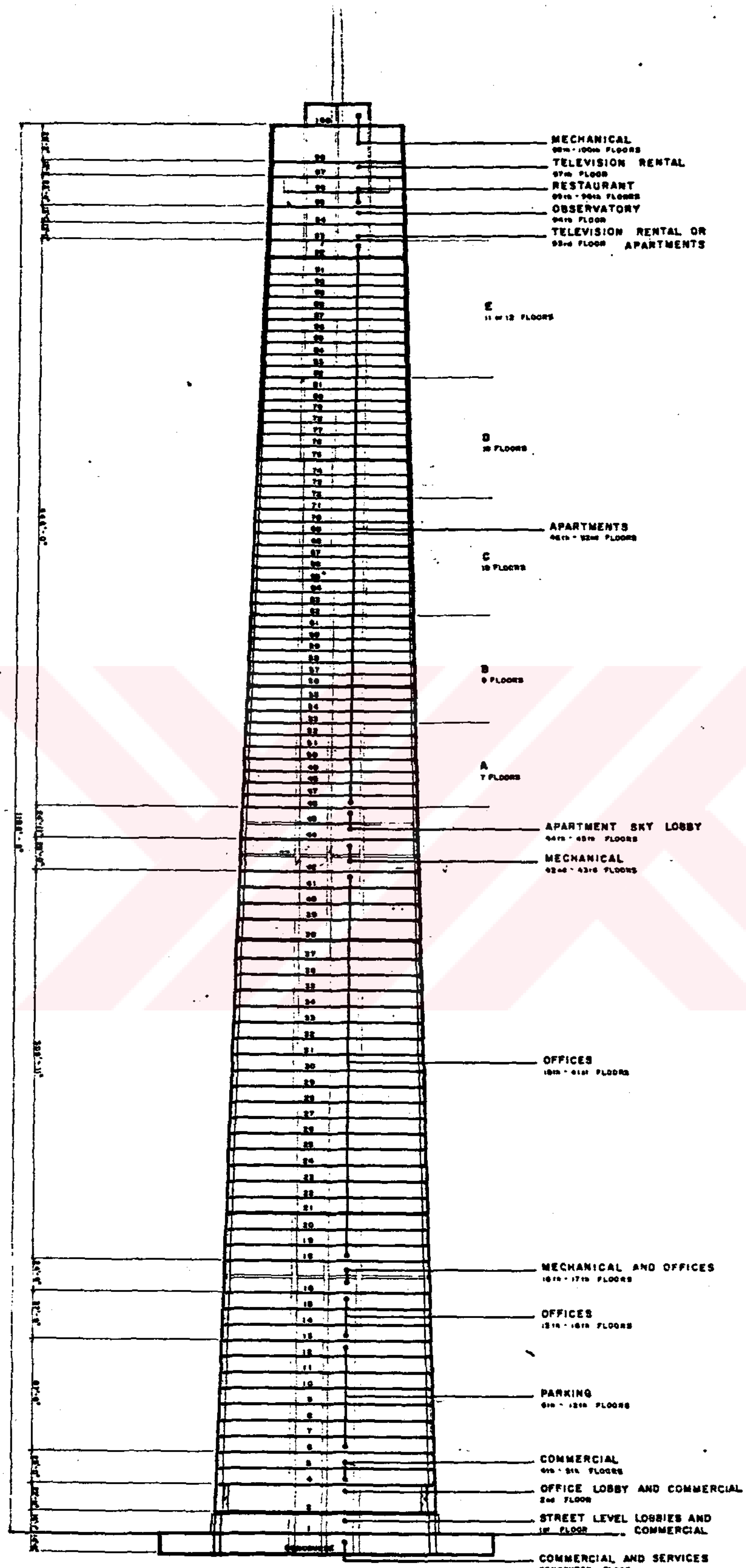
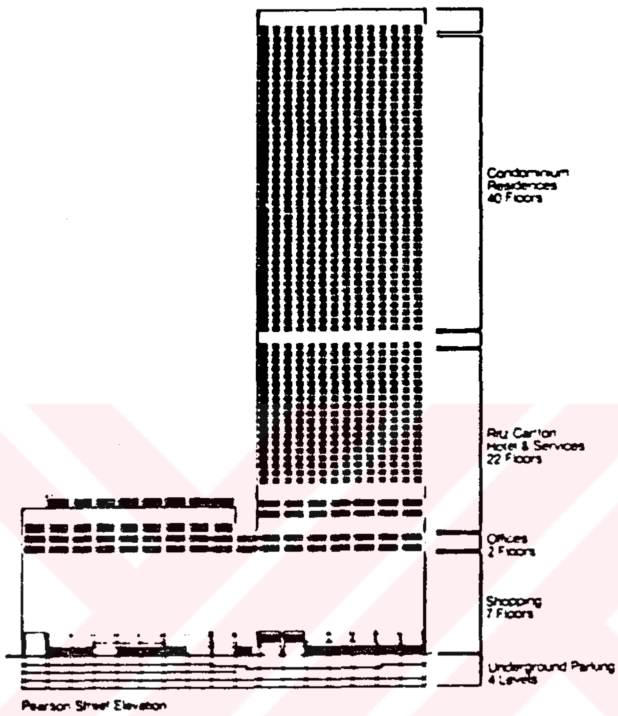


Photo 7 & 8, River City under construction,1985
Photo by Orlando R. Cabanban



Drawing,
The John Hancock Building
(Section)

Water Tower Place (1976) in Chicago's Michigan Avenue represents a new generation of urban mixed use speces consisting of a 12 story shopping center, theatre, office flats, luxury hotel and condominiums.



Drawing,
Elevation along Pearson Street

Within in the foreseeable future we may expect to see residential and commercial, as well as business nuclea can be located in self-maintaining megastructures, vertical or horizontal.

Salinas and Talavera in 1988 (I.F.H.P. World Congress) revealed their opinions about the future settlements. According to those opinions; historical structures will be located in park-like areas and will function as

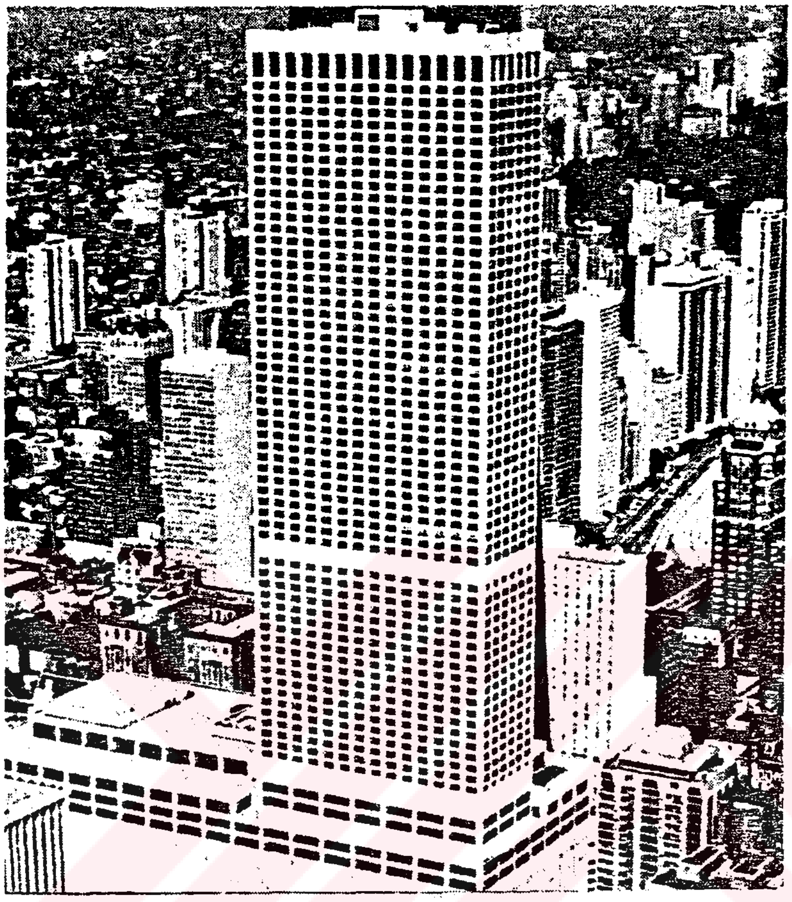


Photo 9, Water Tower Place
Photo by Loebl Schlossman Hackl

administrative centers. All of the megastructures will be furnished with complete utility systems and connected to the whole area by fast transportation of which they will be nodal stations and separated from each other by forested leisure parks (Salinas,1988) .And buildings will be equipped for the requirements of Telematic (Home interactive and intelligent systems, Intelligent buildings and tele-activities such as tele-shopping, work, education) revolution (Talavera, 1988).

This changing human activities will probably cause horizontal megastructures where land is limited and land prices are extremely high.

3.2. Analysis of Decisions for Tall Buildings

Components of decision will be discussed leading to the decision making matrix and points specific do tall buildings will be explained.

3.2.1. Objectives related to tall buildings

Decision making model of Moser, 1976, does not include the input of objectives to the schematic matrix(*) which is prepared especially for tall buildings, however, "System of objectives" is considered one of a component of decision making which is necessary to consider in decision making process.

In architectural design there is an already defined classification of objectives called as "System as Objectives". Three years after Moser's model, this lists is prepared at Istanbul Technical University, Faculty of Architecture (Ayıran,Umur,1979) It has been used for years

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(*) Published in Monograph,1981, Tall buildings planning and environmental criteria, Council on Tall Buildings and Urban Habitat.

as a part of the educational approach. In this study it is used with some additions and expansions for a better consideration of tall building decisions. According to this classification the major groups in architectural design are listed under three headings.

a) Objectives related to the activities,
b) Objectives related to the environment,
c) Objectives related to construction and endurance.

For multi purpose tall buildings in urban centers, also the same type of objectives system is acceptable, however some objectives gain more importance like the expected image in the skyline of the city. So, those specialized objectives for tall buildings will be discussed in this part.

While taking decisions to built tall or directly for tall buildings ojbectives can be equalled to the positive qualities of high rise developments.

Tall buildings may provide some qualifications that others can not and usually those become the reason to built tall. Because of this reason it is very important to mention this specified objectives related to tall buildings which may be existed for other types of projects but not in this combination and value.

System of Objectives

1. Objectives related to the activities :

1.1. Providing the required conditions for enabling activities

In every kind of building type no matter it is high rise or low rise there are already agreed minimum standards for diffirens types of human activities.

1.1.1. Providing the required dimensions for activities

1.1.1.1. Providing required physical dimensions for activities and equipment.

1.1.1.2. Providing phsycologically required dimensions

1.1.2. Providing required relations between activities.

1.1.2.1. Providing the suitability of major activity groups and locations of activities.

1.1.2.2. Providing required relations and required conditions for those.

1.1.2.3. Providing required comminication facilities.

1.1.3. Providing the required physical environmental conditions

1.1.3.1. Providing bioclimatic confort

1.1.3.2. Providing eye confort

1.1.3.3. Voice confort.

1.2. Providing the required conditions for continuity of activities.

1.2.1. Providing required social and pshcological con - ditions

Different cultural attitudes about privacy, space and density, the family and the individual indicate that there may be many "human natures" and these can be differ from one society to other and by the time.

In general , tall buildings seem to be appropriate, especially as living spaces, for individuals affluent enough to leave at will, independent enough to seek friends among strangers and autonomus enough to find pleasure and satisfying recreation in public places. But tall buildings seen to be in appropriate for people whose economic circumstances afford them little opportunity to get out of the house, who depend largely on the extended family or on the neighbourhood as an extension of family for their friendships and social contacts, and whose living patterns revolve around the security of family-oriented private spaces (Monograph, 1981). As an objective tall buildings may provide some possitive qualities according to those income, social and psychology related factors. On the other hand in societies with large number of urban poor, not adopted to the urban life in the sky, building tall buildings for commercial purposes and for more luxury apartments may yield free urban ground for building lowrise, low cost housing units.

1.2.1.1. Providing the required conditions about color form,texture and smell.

1.2.1.2. Providing the suitable visual relations with other environment.

1.2.1.3. Providing privacy.

1.2.1.4. Providing suitability with social structure.

1.2.2. Providing suitable security conditions

For all building types "safety" has importance. There are already defined safety regulations for most of the building types. For buildings over certain limits in terms of height there are special requirements about safety.

For example a tall building may be less vulnerable to natural forces like earthquake, or to extreme loads of inhabitants than low-rise buildings which might not be required to follow such determined design criteria.

High-rise buildings can also en courage the achivement of higher construction and building standards giving more importance to quality in uniform construction detailing, services and engineering.

1.2.2.1. Providing security of performing activities.

1.2.2.2. Prevention of life incase of danger.

. Fire
. Earthquake
. Accidents
. Others

1.2.2.3. Protection from unexpected effect of outer environment

. Crime and Vandalism
. Harming plants and animals
. Others

1.2.3. Flexibility (Added in 1990)

For tall buildings especially internal flexibility may provide future changes in use. Enabling multi use facilities for tall buildings may also be provided by mega - structures.

1.2.3.1. Internal Flexibility

1.2.3.2. External Flexibility

2. Objectives related to the environment

2.1. Objectives related to the nature of physical environment and environmental systems

2.1.1. Providing suitable relations with the built environment.

2.1.1.1.Development control objectives (Added in 1990)

Tall buildings can become elements for incremental growth of an urban center if effectively coordinated with comprehensive master plan of the city. In this way it is also possible to provide more amenities that should be impractical for small concentrations of people.

Tall buildings can make a strong impact on the growth and development of the urban centers and the entire city. Their interaction with the man-made and natural environments have to be sensitively considered in planning and design stages to get good results. In 1975, conference of The Council on Tall Buildings and Urban Habitat in Romania, concluded that tall buildings should not be adopted as a solution for an entire city, but as a solution for a part of the city; that this type of buildings should be most reasonable as a rule only in crowded area of big cities, but they should be in consistence with the general requirements of urban environment.

As an objective, tall buildings can either lead or follow the development or redevelopment pattern of an urban center which means that they can be used to develop "nodes" of incremental, decentralization, they can generate the recentralization of developing cores or can spring up in response the economic demands of urban growth (Gan, 1974).

2.1.1.2. Land use objectives (Added in 1990)

Land use objectives may become important for tall building when considerations are taken on city scale.

In urban centers, where horizontal development is possible but not desirable and when precious surrounding agricultural area limits the expansion or when it is necessary to avoid urban sprawl, high densities may be achieved with tall buildings.

If the objective is providing more total usable space on less total land, then tall buildings can be suitable and also overcoming the threat of urban sprawl, they provide higher densities.

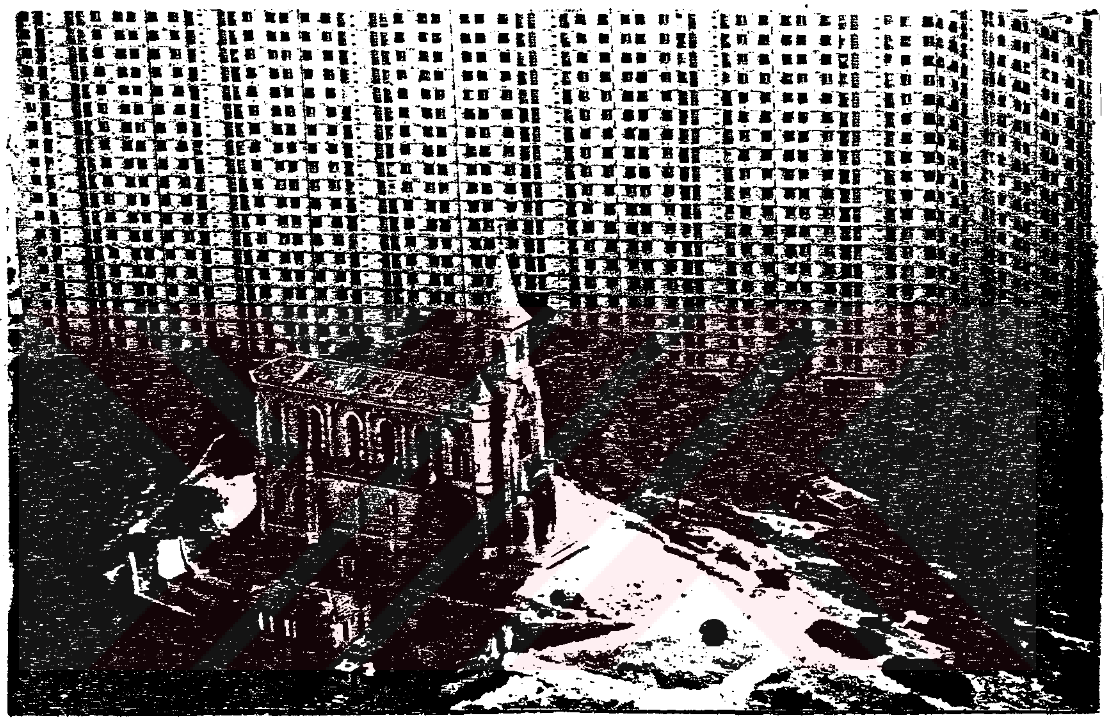


Photo 10, Marseille, France, 1987
Photo by Ministere des Affaires, France

Usually the demand for space is equalled to the term of "density". If decision maker accepts the premise that taller buildings need more open, public space around them to offset the loss of private outdoor space, then high buildings and high density will not necessarily be synonyms, (Contini and Lamela, 1973) and decision maker should keep this in mind while defining objectives.

So, the objective may still be creating public and green area in urban centers. This addition of public areas and green space is often considered one of the advantages of the higher density of tall buildings over low rise constructions (Martin,1972,Marh and Trace,1968).

While selecting objectives related to the land use decision maker should be careful about the goal of saving urban land. For example ;

Considering that in most major urban centers about 15 % of the area is devoted to residential buildings (London County Council, 1961) and if this land is developed as six or more storied buildings, still there might not be a great savings in total urban land over an average three story housing given equivalent standards of open space as observed by Correa in 1975. Because compared to housing sector single story industry warehousing, transportation, etc. take up 35 % to 50 % of the urban centers.

So, in every urban center, increased commercial densities alone as high rise buildings can not tend to yield major savings in urban land except the extreme examples of unusually large urban centers like Chicago and New York City.

Objectives related to land use can be directed in two ways to increase the efficiency. Council on Tall Buildings and Urban Habitat suggests to consider those two areas carefully considering the important difference between the sectors.

1) The optimum land use efficiency resulting from the use of high rise residential and high rise commercial buildings of varying heights and in combination.

2) The percentage of urban land saved by the use of multilevel industry, warehousing, and transportation

2.1.1.3. Cousing danger for environment

Tall buildings may couse danger for environment in case of failure like all other building types but usually because of the height and the heavy mass of the building those damages may be greater. However because of the used technology and continues maintanance chances of failure is lower than low-rise structures.

- Earthquake
- Wind
- Fire
- Rain and Snow
- Accidents
- Other

2.1.1.4. Providing suitable relations about smoke, smell, vibration.

As tall buildings are usually built in C.B.D's because of high rate of transportation of any kind minimizing unwanted effects gain more importance.

2.1.2. Providing suitability to the transportation systems.

As an objective much more than providing suitability tall buildings make possible a concentration of urban services including transportation systems with consequent reduc - tions in cost and energy. Sophisticated urban network for the building may be beneficial for entire urban area.

As an objective if planned to generate more effective public transportation, tall buildings may be used as tools to alleviate the problems of urban automobile traffic as well (Monagraph, 1981).

2.1.2.1. Providing appropriateness between different types of transportation systems.

2.1.2.2. Providing suitability of padestarian transpor - taion :

- Easy transportation
- Safety
- Not preventing other systems

2.1.2.3. Providing suitability to the vehicle transpor- taion :

- Easy transportation
- Safety
- Not preventing other systems

2.1.3. Providing suitability to the urban services.

As explained in 2.1.2. tall buildings may also be used as instruments for concentration and for making more efficient of urban cervices.

2.1.3.1. Providing suitability to the energy systems and distribution

- Electricity
- Gas
- Others

2.1.3.2. Providing suitability to the communication systems

- Telephone
- TV.
- Radio
- Data network
- Others

2.1.3.3. Providing suitability to woter distribution and collection systems.

- Drinking woter
- Using woter
- Collecting rain woter
- Collecting used and dirty woter

2.1.3.4. Providing suitability with other systems.

2.2. Objectives related to the social cultural and esthatic values of the society.

Tall buildings like other buildings may provide suitability to the physical environment but as a visual objectives contrast may also considered as an approach.

2.2.1. Providing suitability to the naturel environment.

2.2.1.1. Providing suitability to the natural topography

2.2.1.2. Providing suitability to the natural plants

2.2.1.3. Providing suitability to the other natural environmental elements (Rocks, rivers, lakes, etc.)

2.2.2. Providing suitability to the man made environment

2.2.2.1. Providing suitability to the already existed physical environment or to the environment which is planned to be created.

2.2.2.2. Providing suitability to the cultural values

2.2.2.3. Symbolism and prestige (Added in 1990).

as compared with the percentage saved by high-rise housing or commercial buildings (or both), or in combination with them.

2.1.1.3. Providing suitable relations about the effects of sun

Tall buildings should be carefully designed to provide suitable sunning conditions for inhabitants of the building itself and for the neighbouring buildings and the streets. There are certain regulations of some cities about the subject.

2.1.1.4. Providing suitable relations of view

Tall buildings usually can provide better views for inhabitants of themselves but a careful consideration should be made also for neighbouring buildings and generally for the city in which tall buildings are located.

2.1.1.3. Proving suitable relations about air movements and climate.

Tall buildings when acted in combination with surrounding low-rise and high-rise structures, they may turn innocent breezes into unwanted and dangerous street winds. Because of thet reason especially for tall buildings wind tunnel studies may become neceessary in most cases. Otherwise some unexpected results may accure.

For example like experienced in Durban, South Africa, previously established uniform height restrictions created an almost wall like tall buildings along the coastline. Now,those buildings effectively shutts off cooling and dehumidifying sea breezes from the center of the city.

Providing a sense of social power, prestige and creating in the eyes of most citizens the corporate image of economic power and the government image of national power may be considered as objectives in some cases.

Fulfilling the desire to built upward, objectives of symbolism and prestige can be discussed in national and individual levels. And this may become a subject of social studies.

At national level, representing national technological progress and economic power, tall buildings traditionally considered as a sign of power and prestige.

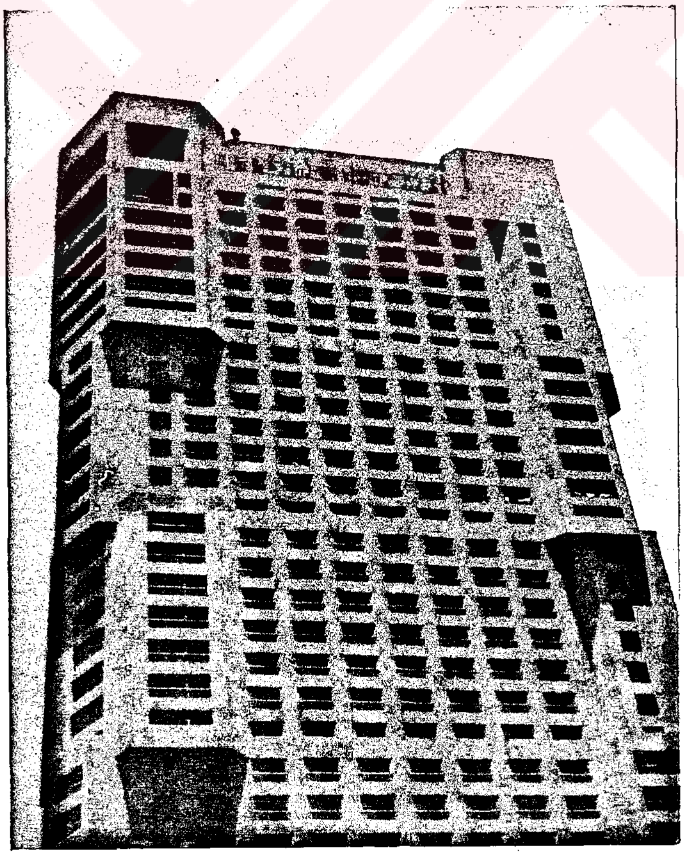


Photo 11, Cairo Ramesses Hotel,Egypt,1987
Photo by Murat Mayor

Today high rise buildings "provide the image of progress, affluence, sophistication and modernization. This is particularly the case in the minds of urban elite, be they politicians, bureaucrats or businessmen. Newspapers and magazines have also contributed and strengthened this image. It has been taken for granted that tall buildings are necessary and relevant (Lim, 1974).

Photo 12, The John Hancock Building and The Woter Tower,1990
Photo by Murat Mayor

For example in U.S. edition of Newsweek, Nov. 1989, selling of Rockefeller main tower to a Japanese company, considered of loosing the national prestige. Selling the buildings of other companies never made a deep effect in the eyes of citizens like this.

Sometimes contrast to the natural demand and economic conditions some countries try to give a different image. "Those, projecting the image of a rapidly industrializing, progressive nation, adopt tall buildings as a symbol of growth and modernity, to be seen as such by both their own citizens and the outside world" (Khalili,1974) and this may be considered a kind of objective.

Symbolism in private level, carries importance for organizations and individuals. Especially for companies involving in large scale business, tallness itself is a matter of prestige and indication of their stable business. For example Canadian banks give great importance to the presence of a tall building carrying their name. Banks are competing with each other to built the tallest. "In Toronto, three banks have built successive buildings, each marginally higher than the previous one, each striving for more prestige and therefore greater drawing power of clientele" (Barnard,1976). Their objectives to built the tallest depends on this purpose.

In the level of housing, tallness alone as a matter of prestige and objectives about a better view show interesting relations.

Often, as well where the view may be no better and no more or less permanently open at top than at middle floors, and where the elevator ride is surely longer, the top floors still command higher rents (Contini,1973).

3. Objectives related with construction and endurance

One of the most important subjects about objectives related with construction and endurance is "economics".

In general, the main reasons to built tall depends on economic purposes. In every kind of projects there are certain profits expected which are usually existed in terms of money for tall building projects.

Especially a tall building belonging to private sector should pay well to become feasible to built. Feasibility studies and economic analysis gain considerable importance for tall buildings to reach economic purposes.

It is relatively easy to make calculations by using building construction cost estimators. However, economic objectives include not only the construction period but the whole life time of the building (ISU,1990). Because of that reason, detailed calculations and sensitive future forecasts should be made in order to define logical and reasonable objectives.

For example Chicago's second largest building, the headquarters of Amoco Oil Co., on East Randolph Drive near the lake shore has a problem with it's marble exterior. The cost of refurnishing the 80 story building is expected to be about $ 1 Million a floor. The project should be completed by 1992 (Thompson,1990), and this will also effect the performance of the business during the replacing period.

Another example is Citicorp tower in New York City. The shed roof created to contain solar collectors to save money but they were non economic in use and scrapped by the budget wielders, leaving a form without a purpose and creating an ice slide in winter, which on occasion has caused the street below to be blocked off to protect passers-by (Bassler,1989). This is also an unsuccessful example of the economic objectives.

As seen in the examples the sensitive balance between investment and profit as an objective have to be cleared much before the design stage.

Photo 13,

Amoco Standard Oil Building
Chicago,1990
Photo by Murat Mayor

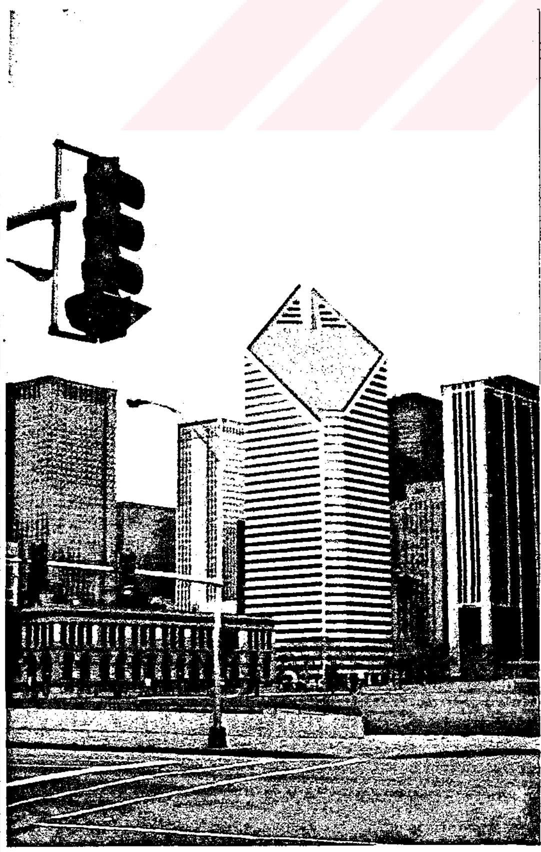


Photo 14,

Associates Center with its sun collectors,Chicago,1990
Photo by Murat Mayor

For tall buildings all other subjects related with construction and endurance gain their importance because of the size and requirements of tall building projects.

3.1. Enabling physical existence

If taken as objectives tall buildings may utilize alreadly existed recources in contries where the construction industry is geared to large volume production. Where sufficient recources and materials are available, large tall building projects can be agents in possitively developing them. If the required skills are available, they can also provide jobs in significant number to possitively affect the local lobor force (Monograph,1981).

3.1.1. Providing feasibility with available economic and technical conditions

3.1.1.1. Providing economic feasibility of the building

3.1.1.2. Providing technical feasibility of the building

3.1.2. Providing suitability of construction system

3.1.2.1. Providing suitability between construction systems, and building elements, building systems.

3.1.2.2. Providing suitability of construction system to the physical environment.

3.2. Providing endurance

Tall buildings usually planned to stand for long times and they still have to provide the specifications that they had during the first couple of years. However maintenance and repair works need more care and more money when compared to low rise constructions. Because of that objectives should be carefully identified during the decision making stage.

3.2.1. Providing endurance against time

3.2.1.1. Providing endurance against tearing off

. Because of use
. Because of environmental factors

3.2.1.2. Providing endurance against atmospheric effects

. Rain
. Snow
. Air pollution
. Sun
. Accidents
. Other

3.2.2. Subjects of Decisions

In decision making, to reach to already defined objectives, decision maker should define subjects of decision.

Subjects of decision should be listed so that, operations with them have to enable decision maker or architect to reach his objectives while checking related factors at the same time. This means, combination of selected variations of subjects of decision can provide the solution.

Starting from 1962, systematization of design process had been accepted and checklists, including problem and objectives sets applied in education at Istanbul Technical University, Faculty of Architecture (Öke,1974). The following list of subjects of decision is a part of this approach, and is also used for the decision matrix of this study.

1. Land-use and Transportation

- Building density
  - . Lot Coverage Ratio (L.C.R.)
  - . Floor Area Ratio (F.A.R.)
- Disposition of activities
- Arrangement of building masses
- Arranging open spaces
- Specifications of spaces
- Vertical and horizontal organization

2. Building elements and systems

- Separator or combining elements
- Finishes and decorations
- Environmental systems and related equipments
- Transportation and communication systems
- Security systems

3. Form and Character

- Geometrical forms of masses
- Form and texture of surfaces

4. Construction Systems

- Equipment
- Work order

3.2.3. Factors

As described before, "factors" has great importance for the entire decision making process. While selecting and operating with subjects of decision to reach objectives, factors should be considered.

Factors may help or limit the objectives or even some - times make the objectives impossible to reach.

Physical factors are usually accepted universally to varying degrees but there are still a kind of subjectivity about social and psychological factors. Different countries, different cultures, and different agencies or individuals will inevitably give different weight to many of the factors. That is why final judgement can still remain subjective. As The Council on Tall Buildings and Urban Habitat (Monograph,1981) concludes in a parallel way, there are also two advantages of this which may develop the matrix in future ;

a) As the matrix is developed, by allowing numerical weights to be individually selected for the factors. any country or region can use the matrix to evaluate their own tall building proposals, one against the other. It is only necessary that all of the proposals to be evaluated in one package employ the same numerical weights.

b) Allowing feedback, the matrix can "learn" where and in what circumstances the greatest or least variation in the numerical weight given to specific factors occurs. This is supposed to lead to a gradual decrease in subjective weighting and an increase in the matrix's over-all objectivity.

Moser's model (1976) includes a well prepared list of thirteen major factors. Partly based on this list of seventeen factors, factors listed in this classification will be included in the matrix.

Factors :

- Physical Environmental factors
- Location
- Land-use requirements
- Density
- Financial resources
- Economics
- Availability of materials
- Equipment
- Construction systems
- Transportation
- Urban development requirements
- Urban esthetics
- Adaptability needs
- Safety requirements
- Physiological requirements
- Physchological factors
- Social factors.

3.5. Need for a Decision Making Matrix for Tall Buildings

Tall buildings and their environment are very complex in nature. Especially when it comes to multi-purpose tall building complexes, relations between internal activi - ties cause additional complexity to the decision making.

As discussed previously a large number of information about those exists however they should be utilized effectively for developing a guide of over-all considerations for high-rise projects in a systematic approach.

Without missing any point, decision maker need to consider all subjects of decision giving different values, lead - ing to reach his goal.

To do that a systematic decision making matrix can be useful dealing simultaneously with the multitude of factors from structural to physiological.

A manageable model of decision making which may also be used for evaluation, will certainly save time in future cases and can be developed as it is applied to the real world.

4. THE MATRIX

. Type of presentation

To explain the relation between the components in a systematic way, relation matrix is one of the most suitable presentation form when decision maker needs to consider such complex problems like ones related to the tall buildings and their psychical,"social environment".

An array of elements in rows and columns, treated as a unit using special laws in facilitating the study of relations between elements is a useful technic to represent complex relations of decision elements.

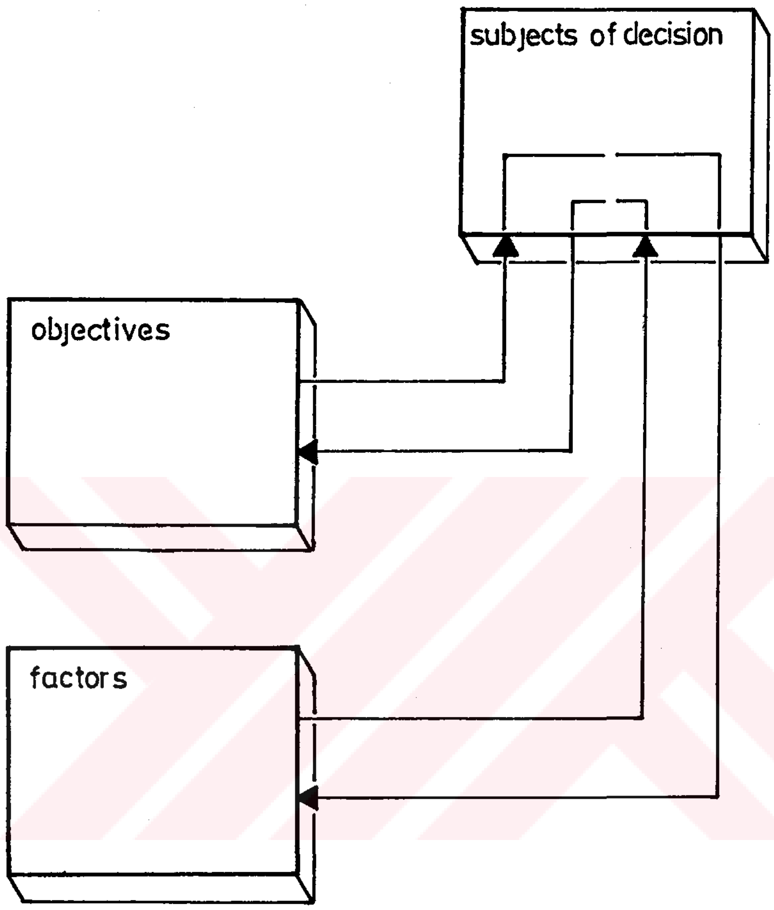
In this technic the elements, here, "components of decision", in which logical relations are searched, have to be listed carefully.

After deciding the way of presenting relations such as marks indicating the existence of relations or mathematical equations and formulas, each relation is studied between two or more elements.

The three major elements of the matrix is formed for especially tall building related decisions in this study. Relations between a) Subjects of decisions, b) Objec - tives, c) Factors are shown in the following diagram indicating the order of the matrix.

Considering future needs for additions and changes, the matrix will not be strictly determinative. In case of existence any recent progress in the field, new input

Figure 5, Relations of components of the matrix



to the matrix will be possible by allowing future data entrance.

Every relation marked in the following matrix may not be suitable for every individual, group, or country (*) however, the order of the components and the type of the symbolic matrix they form is a useful decision tool.

(*) More information will be given in the next chapter.

.The Matrix

SUBJECTS OF DECISION: Land use & Transportation (1–7); Building elements & systems (8–13); Form & Character (14–15); Construction systems (16–17)

Objectives	1 .Building density L.C.R.	2 " F.A.R.	3 .Disposition of activities	4 .Arrangement of building masses	5 .Arranging open spaces	6 .Specifications of the spaces	7 .Vertical and horizontal organization	8 .Seperator or combinig elements	9 .Finishes & decorations	10 .Environmental systems & related equipments	11 .Equipments supporting activites	12 .Transportation & Communication Systems	13 .Security Systems	14 .Geometrical forms of masses	15 .Form & texture of surfaces	16 .Equipment	17 .Work order
1.Objectives related to activities																	
1.1.Providing the required conditions for enabling activities																	
.Providing suitable dimensions for activities			●			●	●	●									
.Providing suitable relations between activities			●	●	●	●	●	●				●					
.Providing suitable physical environmental conditions						●		●		●	●		●				
1.2.Providing required conditions for continuity of activities																	
.Providing suitable social and pyschological conditions	●	●	●	●	●	●	●		●					●	●		
.Providing suitable security conditions							●		●	●	●	●	●			●	
.Providing flexibility			●			●	●		●	●	●					●	
2.Objectives related to the environment																	
2.1.Objectives related to physical environment and environmental systems																	
.Providing suitable relations with the built environment	●	●		●	●		●	●	●					●	●		
.Providing suitability to the transportation systems	●						●					●					
.Providing suitability to other urban services	●	●										●					
2.2.Objectives related to social,cultural and esthetic values																	
.Providing suitability to natural environment	●	●		●	●									●	●		
.Providing suitability to man made environment	●	●		●	●			●	●			●		●	●		
3.Objectives related with construction and endurance																	
3.1.Enabling physical realization																	
.Providing feasibility with available economical and technical conditions	●	●	●			●	●	●	●	●	●	●	●			●	●
.Providing suitability of construction system .								●								●	
3.2.Providing endurance																	
.Providing endurance against time						●		●	●	●	●	●	●				

FACTORS				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Physical	Climate	Air Temperature					●	●	●		●		●	●						●
		Humidity							●		●		●	●						
		Air movements (Wind)		●	●		●	●	●		●	●								
		Sun radiation					●	●	●	●	●		●	●						
		Rain & snow					●	●			●		●	●						
		Lightning					●	●								●				
	Earthquake			●	●	●	●				●					●				
	Fire					●	●		●	●	●			●		●				
	Air pollution							●	●			●	●	●						
Location	Urban centers			●	●		●	●							●		●	●	●	●
	Development areas			●	●		●	●							●		●	●	●	●
	Rural areas			●	●		●	●							●		●	●	●	●
Land-use requirements	Industrial			●	●	●	●									●				
	Commercial			●	●	●	●	●												
	Residencial			●	●		●													
	Warehousing			●	●	●	●													
	Agriculture			●	●		●													
	Parking			●	●	●	●	●												
	Cultural,recreational					●	●													
	Underground use					●		●												
	Open space			●			●	●												
Density	Area per unit (residential)				●	●	●	●			●									
	Area per person(commercial)			●	●	●	●	●			●									
	Units per land area			●	●	●	●	●												
Financial Recources	Initial investment						●	●	●		●	●	●	●	●	●	●	●	●	●
	Local financing						●	●	●		●	●	●	●	●	●	●	●	●	●
	Bank credits						●	●	●		●	●	●	●	●	●	●	●	●	●
	Borrowing by bonds						●	●	●		●	●	●	●	●	●	●	●	●	●
	Partnerships and incorperation						●	●	●		●	●	●	●	●	●	●	●	●	●
	Government aid			●	●		●	●	●		●	●	●	●	●	●	●	●	●	●
	Allocation from public funds						●	●	●		●	●	●	●	●	●	●	●	●	●
Economics	Cost	Land	Site	●	●	●	●	●	●	●										
			Surroundings	●	●			●	●	●										
		Building	Materials						●		●	●	●	●	●	●	●	●		
			Equipment																●	●
			Labor																●	●

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Income		Market conditions	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Sale/Rental income potential of the unit		●	●	●		●	●	●	●	●	●	●	●	●	●		
		Management income		●	●	●		●	●	●	●	●	●	●	●	●	●		
Availability of materials		Local materials								●	●	●	●	●	●		●		
		Materials of other reagons								●	●	●	●	●	●		●		●
		Imported materials								●	●	●	●	●	●		●		●
Equipment	Construction	Movers/graders																●	
		Cranes				●			●	●								●	
		Framework							●	●								●	
		Other																●	
	Building	Elevators			●	●			●				●	●	●				
		Illumination			●		●	●	●	●	●	●	●		●				
		Airconditioning			●	●	●	●	●	●	●	●	●		●				
		Plumbing			●	●		●	●	●	●	●	●						
		Communication			●			●	●	●				●	●				
		Security							●	●	●	●	●	●	●				
Construction		Structural	●	●					●	●								●	●
		Exterior				●				●	●				●				
		Interior			●				●	●	●	●			●				
		Building systems							●	●	●	●	●						
Transportation	Public	Pedesterian roads				●	●		●	●				●	●				
		System	●	●		●	●	●	●	●				●	●				
	Private vehicles				●	●	●	●	●	●				●	●				
Urban Development requirements		Political requirements and limitations	●	●	●	●	●	●											
		Urban sprawl	●	●	●											●	●		
		Redevolepment of the urban core	●	●	●	●	●	●											
		Urban infra-stucture	●	●	●	●	●	●				●	●	●					
		Visual form of the city				●										●	●		
		Preservation of natural elements	●				●												
Urban Esthetics		Historic buildings / areas	●	●	●	●	●				●					●	●		
		Character of the city	●	●		●	●			●	●					●	●		
		Skyline	●	●		●	●		●	●	●					●	●		
		Street views	●	●	●	●	●		●	●	●			●		●	●		
		Shaping spaces	●	●		●	●		●	●	●			●		●	●		
		Focal points	●	●	●	●	●	●	●	●	●			●		●	●		
		Natural forms	●	●		●	●			●	●					●	●		

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Adaptability needs	Multiuse capabilities			●			●	●	●	●	●	●	●	●	●	●		
	Internal flexibility			●		●	●	●	●	●	●	●	●	●	●	●	●	
	Buildings life time		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Safety requirements	Earthquake		●		●			●	●	●				●				
	Wind		●		●	●			●	●				●			●	
	Fire			●	●		●	●	●	●				●				
	Accidents				●				●	●	●	●	●	●	●	●	●	●
	Power failure						●	●			●	●	●	●			●	●
	Crime & vandalism		●	●	●				●	●	●	●	●	●				
Phsyological Requirements	Physical health					●	●	●	●		●	●		●				
	Illumination	●	●	●	●	●	●	●	●	●	●	●						
	Air conditioning			●	●	●	●	●	●	●	●	●						
	Voice control			●	●	●	●	●	●	●								
	Hygenic conditions						●		●	●	●	●	●					
Psychological	Humane proportions	●	●		●	●		●	●	●					●	●		
	Loneliness/social contact	●	●	●	●	●		●	●				●					
	Contact with nature	●			●	●			●	●								
Social	Crowding	●	●	●	●	●		●	●				●					
	Family stability			●			●	●										
	Anonymity			●				●	●				●	●				
	Public order													●				
	Mental health	●	●						●						●	●		

5. DECISIONS FOR TALL BUILDINGS

Decision making matrix is intended to generalize the decision process, however, it is difficult to discuss a strictly defined decision making process for tall buildings. Usually, different physical and socio-economic environments define high rise development needs for each country.

Because of that reason, prime characteristics of tall building decisions are reviewed, based on the studies of The Council on Tall Buildings and Urban Habitat (Monograph, 1981) and comparison with the situation in Turkey is made in this section.

, Building skyscrapers in the modern world began in the United States towards the end of the 19 th century. American cities and urban centers were first to experi - ment this phenomen.

Especially Chicago loop, lower and middle Manhattan in New York City reached to extreme growths when compared to the other cities of the world. Instead of advantages those developments bring problems for those cities as well, such as ;

Physical environmental problems :

. Uncomfortable winds
. Shading problems
. Air pollution

Social and psychological problems :

- Social polarization
- Inactive periods

Photo 15, Surroundings of the central business district
of Chicago,1990
Photo by Murat Mayor

Photo 16,

Apartments near to John Hancock Building,1990
Photo by Murat Mayor

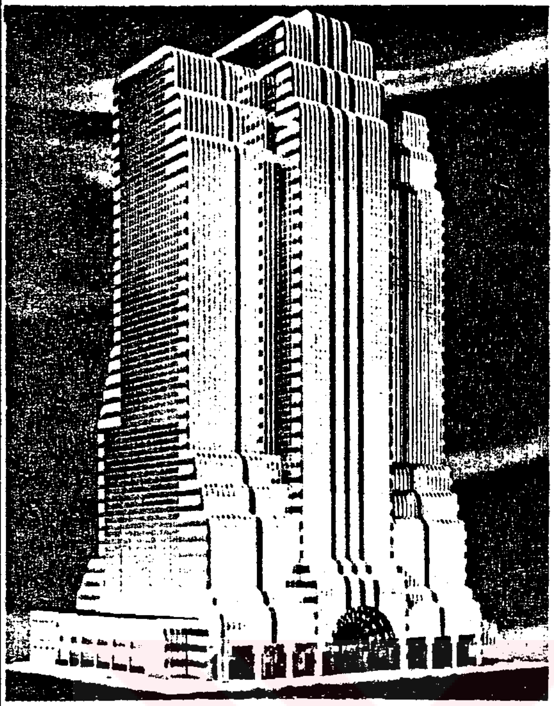


Photo 17,
North Western Terminal Project
A combined commuter terminal
and office complex,Chicago
Photo by Steinkamp / Palmer

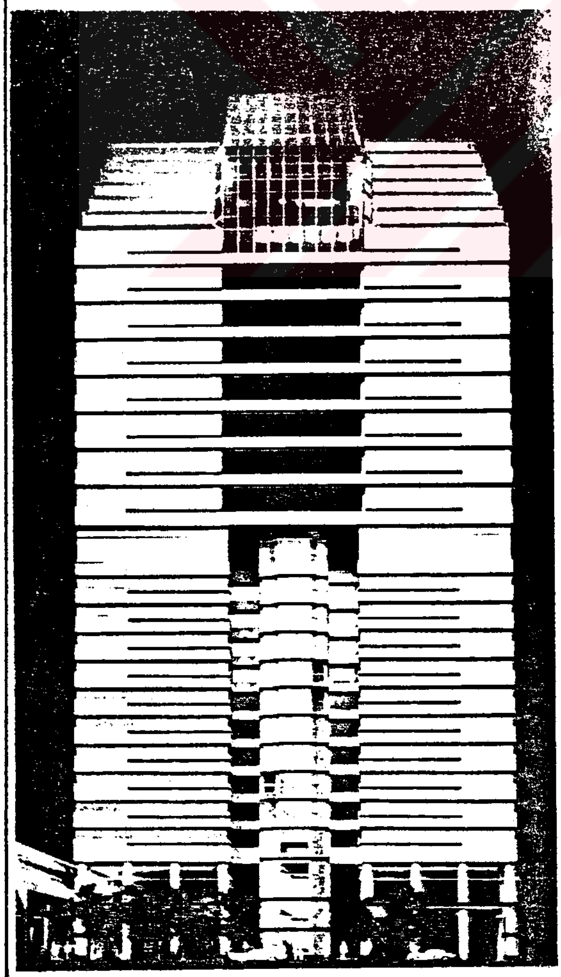


Photo 18,
Loop Transportation Center
Multi-use structure,Chicago
Photo by Orlando Cabanban

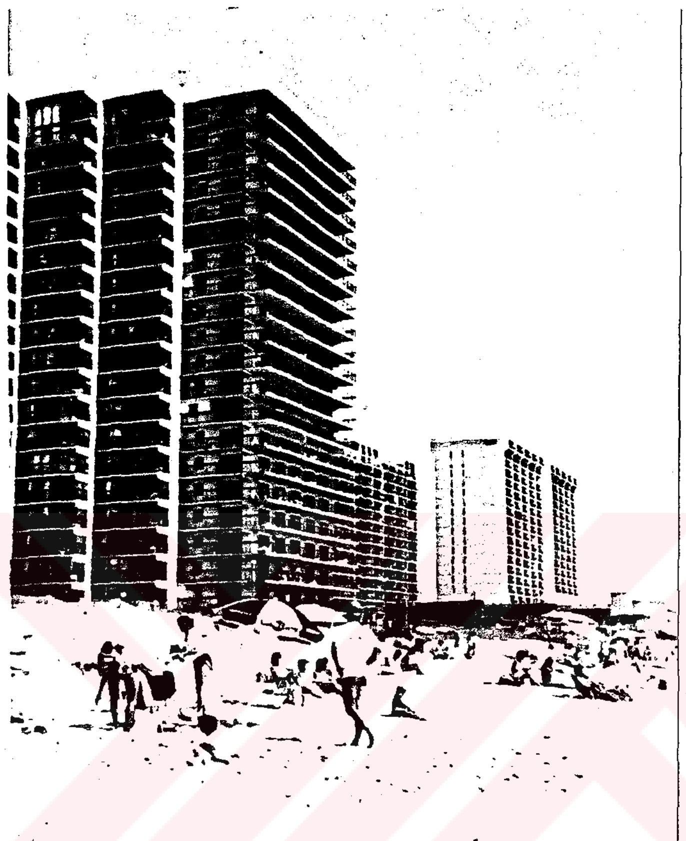


Photo 19, Apartments along the coast line ,today it is
not allowded to built tall in that area.
A suburb of Washington D.C.,Ocean City,1982
Photo by Murat Mayor

Tall building environment with it's positive and negative aspects depends on some prime characteristics of tall building decision making.

In the U.S.A., growth of private enterprises and profits within the "privatism" approach is one of the major characteristics. Decisions of "where and how to built tall buildings" are taken by private sector.

Public decisions about tall buildings can be described as a kind of reaction to already made decisions of private sector, usually forming a supportive effect to private interests.

Responsibilities of policy making are belong to semi - independent groups, both in the public and private sectors. Those policy alternatives about the external effects of tall buildings are tended to be excluded by tall building decision making. Responsibilities about externalities are relegated mostly to the public sector and policy response is characterized by substantial time lags.

. European experience for tall buildings differ from the American experience to the extent that the public sector had played much greater role in planning and decision making. European cities also differ from each other about tall building decision making process. For example, cities in socialist societies have engaged in more extensive forms of government planning or physical development than cities in non-socialist societies.

As another difference from metropolitan cities in U.S.A., in most of the European cities such as Rome, Prague, Brussels and Amsterdam tall buildings have not permitted within historical cores.

Photo 20, Paris,1985
Photo by Murat Mayor

High-rise housing in Europe has been receiving a good deal of attention over the last several years. On the one hand, this is due to the magnitude of the problems associated with high-rise complexes and the spectacular solutions sometimes proposed to resolve them (Groetelaers, 1984; Prak and Priemus, 1985).

On the other hand, it reflects the renewed debate on the relative merits of this form of housing (Bergh and Rutten, 1985). Currently existing high-rise complexes

Photo 21, Out of the historical core,
Office building,Rome,1986
Photo by Murat Mayor

Photo 22 ,Housing in Monaco,1985
Photo by Murat Mayor

have some problems as listed below ;

. Absolute and relative obselence
. High mobility rates
. High vacancy rates
. Rent arrears
. Crime and vandalism
. Maintenance problems
. Ethnic segregation
. Concentration of house-holds

As an additional problem after 1992 even within the European single market "migration" may cause serious problems (Spiegel, 1988). Decision making commitees are also working on this subject for the planning the future of European Community (Moleenar, 1990).

As a sample of European experience, in Netherlands, high rise housing is found mostly in post-war residential areas. There are substantial differences among these areas (Van Eijkeren, 1979); some show concentrations of problems, others function quite well (Neth.J.Housing and Environmental Res., 1987).

Photo 23, High-rise housing from the sixties,not a very popular type of housing for families with young children. Netherlands,1987, Photo by Delft University

Some characteristics of tall building decision making in European cities can be classified in two major groups.

Public sector applies different forms of planning control over tall buildings depending on the prevailing political system.

Public and private sector have a great sensitivity about externalities of tall buildings especially about the topographical, esthetic, and historical values. Historical values significantly limit tall buildings in most of the European urban centers.

- As the third group, in developing nations, high rise buildings are spreading at an increasing rate in especially south east Asia in the last decade parallel to the increasing population.

In developing nations the phenomenal growth of urban center population is explained in part with demographic factors for example the changes in birth rate and the migration from rural to urban areas.

This become the most important reason in many developing countries to built tall.

An overview of situation in developing countries and developments in Turkey.

a. Migration

Migration to the large cities and to other European countries is being experienced in large scale in Turkey.

As a strong factor television and other kinds of public communication network have important role but studies indicates that rural population's movement toward the urban centers appears to be coursed by the weakness of the rural economic base than by the lure of city attractiveness.

Inside the city, the consequences of urban population growth are congestion, overcrowding, and a general deterioration of the urban physical environment. So, high urban densities, squatter settlements, traffic problems and pollution are becoming more prominent like the recent situation in Istanbul. Additionally noise of activities of crowded population reaching over acceptable comfort limits disturbs people physiologically and psychologically (Future of Istanbul, 1990).

As an other problem of migration, requirements of living in high density settlements and in high-rise settlements causes a serious social problem of changing life-styles.

b. Un-planned developments

In general, high densities exist in an unplanned environment where most other structures are either one, two or three stories around the high rise structures.

Tall building developments has not kept pace with the needs of housing and commerce generated by rapid urbanization and rising land values. In Turkey, with today's knowledge, forming high densities with tall buildings can provide advantages over high densities of low-rise buildings (Öke, 1989).

As one of the advantages of tall buildings, they can provide more green area when compared to the same density areas with low-rise buildings. However, those gained areas are hardly ever appreciated (Mayor, 1988).

Attention needs to be focused on cities themselves and the vital role that green tracts play in preserving urban environment (Sugiyama, 1989).

c. Rapid changes

Rapidly growing population and changing economic activities are generating substantial demand for new tall structures like new high rise housing projects and touristic purposed buildings mostly located in west and south coasts of Turkey, including Turkey's tallest building in Mersin. However, some developments does not based in concentration of activities but existed because of desire for prestige and architects whims (Göçer, 1969).

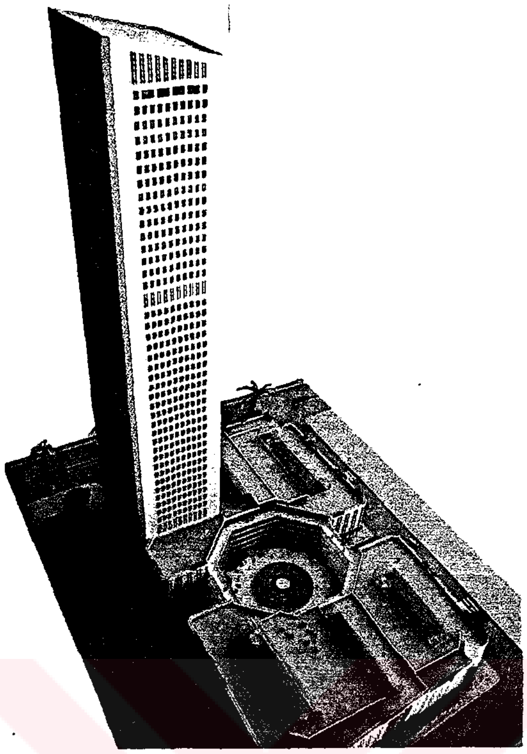


Photo 24, Model of Mersin Metropol Building
Mersin ,Turkey

Because of rapid changes usually disordered nature of urban planning and inadequate supporting services are significant constraints on high rise construction.

d. Land speculation

Land speculation is found to be particularly attractive because it involves no risk, the commodity in question, land, rarely depreciates in value and the capital gains on its transfer are enormous in many cities of Turkey.

d. Heavier responsibility of public sector

When compared to the private sector, heavier responsibility is given to the public sector for the area of urban development and especially for large scale housing projects. Because private sector generally lacks both the

Photo 25, Mersin Metropol under construction,
Reflecting a considerable contrast
with its surroundings as a result
of rapid changes in the area.
Photo by Ustay

resources and the necessary incentives to play a serious role in high rise developments when compared to European and American cities.

f. Unefficient coordination between plans

An an other problem "the lack of coordination between economic and physical planning" can be discussed. A survey of United Nations shows that land planning is being carried out in virtual isolation from national economic development planning in most of the developing countries. The consequences of this sectorial approach are ;

- The location and spatial dimensions of the economic plans or programs are not being taken into consideration.

- National plans do not, usually speaking, provide any guidance on urbanization and urban development policies.

- Little or no provision is made for urban development programs. Generally, regional or urban plans are not implemented because the national plans did not provide any financial outlay for the objectives.

According to different characteristics of various countries, some relations on the decision matrix may gain more importance while others loose their value or does not need consideration. Therefore, relations marked on the decision matrix can be evaluated by different countries, different regions, and even by different groups and individuals. But the order of components and the logic of the matrix forms a capable model to face any decision problem related with architectural design. Enabling designer to systematize the decision process, this model can be used universally.

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CURRICULUM VITAE

Born in Istanbul in 1967, M.Murat MAYOR, Architect, com - pleted his secondary education at Şişli Terakki Lisesi (Highest rank).

He graduated from the Faculty of Architecture, Istanbul Technical University (Highest rank) in 1988 and has been awarded with Ord.Prof.Emin ONAT Dr.Ing.E.h. prize each year during his undergraduate study. He also received "Yapı Endüstri Merkezi" award in 1988 and Cemil Başo Award in 1989, for being the most successful student of the de- partment of Architecture.

He completed his graduate courses and researches at the Istanbul Technical University and Iowa State University.

Followings are his professional memberships ;

- I.F.H.P., International Federation For Housing and Planning, The Hague Netherlands,
- Council on Tall Buildings and Urban Habitat, Pennsylvania, U.S.A. "Social Effects of the Environment" commitee member.
- A.I.A., American Institute of Architects, Washington D.C., Student membership.