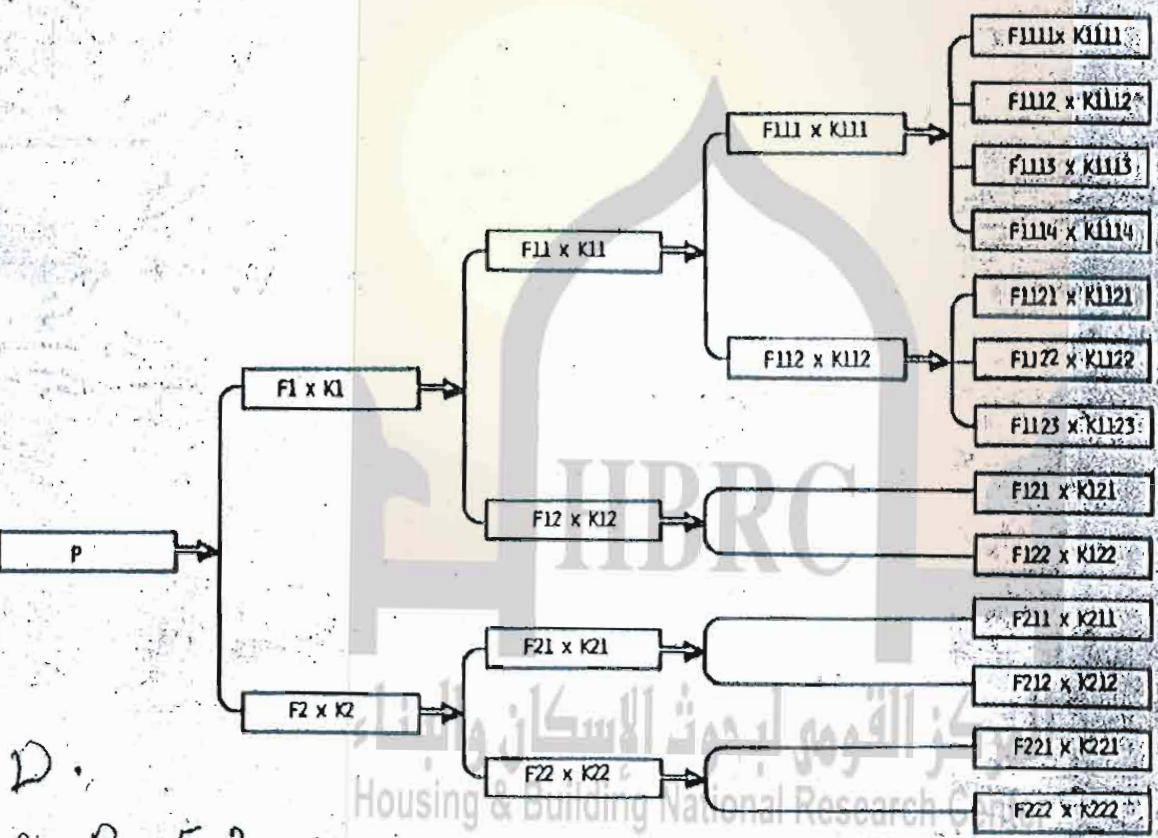# GENERAL ORGANIZATION FOR HOUSING BUILDING AND PLANNING RESEARCH
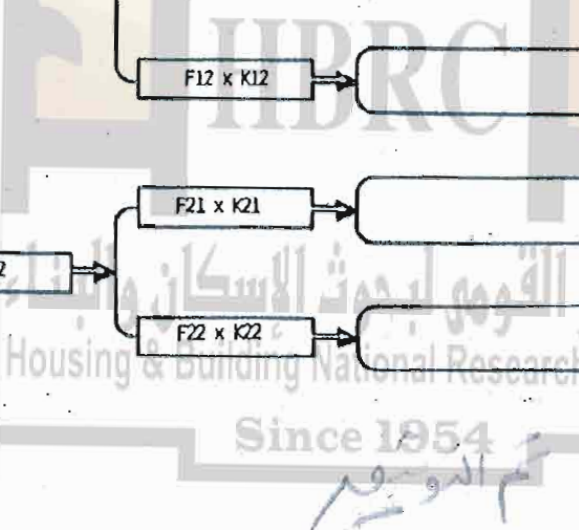
Department OF Housing And Urban Planning
Dr. Magda Metwally

SYSTEMATIC APPROACH TO
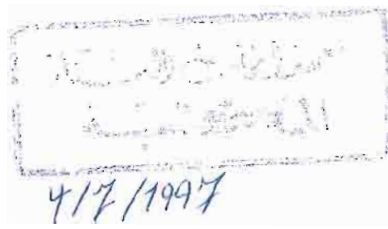
HOUSING DESIGN EVALUATION

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2. THE PERFORMANCE OF HOUSING UNIT DESIGN

Problem Definition , Model Formultion , Formulation of Objective Functions

GENERAL ORGANIZATION FOR HOUSING BUILDING AND PLANNING RESEARCH

Department OF Housing And Urban Planning   **1985 –**

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SYSTEMATIC APPROACH TO

HOUSING DESIGN EVALUATION

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ASSISTED BY :

ENG.   HOSSAM ELDIN IBRAHIM

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CONTENTS

1. PROBLEM DEFINITION

The design problem can be solved in a variety of ways. It is rare for one alternative to be an exact substitute for another, each solution tends to provide different benefits and to have a different cost. A design is judged not only by its appearance, by the way it functions or by its cost, but by all three, that is by the value it provides for the money spent. Value is difficult to assess, the relevant factors are numerous and complex.

The determination of the most efficient design cannot be an exact science. Some uncertainty is inevitable because judgements about a design can only be made against a background of an uncertain future. Nevertheless, in the field of building, as elsewhere, many numerical techniques are available which can be used to reduce the uncertainty inevitable in most judgements and which can lead to an increase in the probability that the design will produce good value for money.

The major problem arising when using numerical techniques for the design evaluation is the difficulty of applying the evaluative techniques to architectural problems. The performance concept allow us to reformulate our knowledge of the resources from which the building is assembled and relate it to the value system of the building's user. It is a procedure used to describe desired attributes of a system in order to fulfill the user's requirements. In other words, it is a measure of physical attributes of buildings.

1.

In the building, all the elements are dependent on each other,
and a building is the result of an interaction of all its parts.
The performance required of particular elements of a building depends
on the function of the spaces they contain, and the elements position
in relation to these spaces and to other elements.

The performance concept consists of a set of elements sequen-
tially developed and begins with the performance requirements.
Performance criteria are those characteristics used to assess the
degree of fulfillment of the requirements. Once criteria are iden-
tified, there is a need to develop a method of evaluating solutions
prescribed to satisfy the requirements against such criteria. The
most evaluative techniques are based on physical tests. But some
criteria do not lend them.selves to numerical evaluation, so that
simulation techniques will have to be utilized to determine if the
solution is satisfactory. In other cases the judgment of experts
may be the only evaluation possible.

For establishing the performance of the design solution, there
is three basic steps in appraisal:
a) Representation: The solution is modelled in any suitable way. The
    model might be verbal, mathematical, visual or even "full-scale"
    (ex. a building-in-use).

b) Measurement: This is a neutral activity in which the performance
    of the model is obtained on as wide a variety of counts as nece-
    ssary. Cost, environmental conditions, flexibility, space
    utilisation, are amongst those that suggest themselves easily.

c) <u>Evaluation</u> : The measured results are now evaluated: cost-benefit analysis; aesthetic and value judgment; comparison with ideal, average or standards; conformity to constraints recorded in the analysis-all these and other techniques are appropriate.