

DEFINITION OF A NEW DESIGN PROCESS FOR THE REUSE OF MONUMENTAL BUILDINGS¹

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Summary

Conservation is taking the necessary precautions for buildings or city elements with historic or artistic value to continue their lives. Conservation action can be defined as “keeping alive” including yesterday, today, and tomorrow. The reuse of cultural heritage as an element of the conservation phenomenon is quite important for maintaining the sustainability of human made sources. The new function given to the monumental building is the most important element in the sustainability of the building.

In reuse studies with a sustainability scope, new function defines a new building. Giving a new function to a building means to put the building into a natural design process. Therefore, refunctioning includes the concepts of “reprogramming and redesign” together. The reprogramming process includes the evaluation of the spatial capacity of the building for the new function requirements and the process of revision of the requirements according to the existing situation. The process of reuse works opposite to architectural planning. The areas for the various human activities in the adaptation to the new function are limited with the spatial formation, structure of the building and conservation measures. While the new function is defined within the specific limitations and potentials of the building, it is necessary to preserve the cultural identity. In this study, the design process, including the aim, user requirements, restoration principles, environmental adaptation, spatial organization, and architectural character will be determined.

Keywords: Adaptive Reuse, Design Process, Sustainability

1 Introduction

Sustainability is defined as the development that satisfies the needs of the present, without compromising the ability of future generations to meet their own needs [1]. Sustainability in architecture, on the other hand, is the system examining the relations between people and economic use of resources, reuse activities, built environment.

Basic strategies of sustainable resource use are *reduction*, *reuse* and *recycling*. In this connection, reuse of monumental buildings as building stock, is an issue that must be dealt

¹ This study has been conducted on supervision of Prof. Dr. N.Gül ASATEKİN and prepared as part of the on-going thesis study of Esra Yaldız, PhD student in Selcuk University, Institute of Physical Sciences, Department of Architecture,

as a sustainable resource use. At the heart, sustainability understanding can be said to have an aim to pursue a balance between conservation and economic growth. To obtain this balance, objective is the to protect and develop monuments against damage and annihilation [2]. Usability and sustainability of monumental buildings that were built in order to address people's needs in the period become possible with using them via functions, which are in accordance with the period's characteristic. If this condition is satisfied, then the formation of sustainable environment will be provided. The best way to protect monumental buildings, which lost their functionalities or cannot fulfil the requirements of their functions on the ground of changing cultural, physical and social conditions, is to present them to people's use. The aim in this, however, is to protect whereas means is to be reuse. This use, on the other side, must be definitely within a respectful purpose for historical identity of buildings. The new function must not be an aim for the building itself but must be a means for sustainability of building's cultural property.

In the studies carried out for monumental buildings, which are qualified as parts of our cultural heritage, each of new projected function specifies a new building. Herewith, generating a planning process depending on function, aim and environment in limitations of conservation criteria for monumental buildings is required. To be able to make the correct decisions on new functions in generated planning process accrues with a correct setting of design process.

2 Architectural Design Process

Planning in architecture is the systematic collection and evaluation of architectural data [3]. Planning stages (Fig.1) that generate architectural planning processes are programming, designing, implementation and usage stages. Mutual relation and interaction between these stages are quite significant.

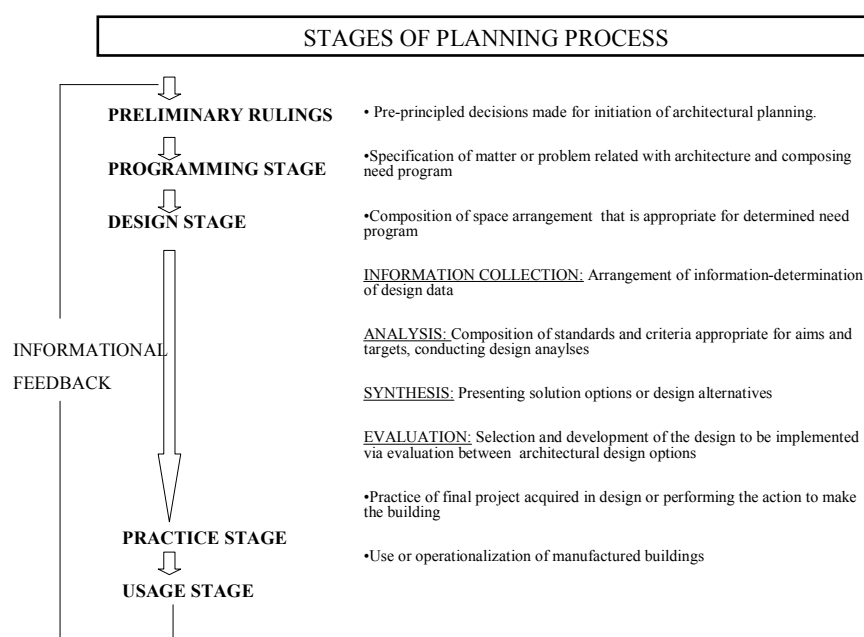


Fig. 1 Adaptation in Planning Process Stages [3]

Design is one of the steps in planning process. Architectural design is identified as the process that proceeds with mostly trial-and-error method through complex relations and immediate inspirations [3]. Design process is the action scheme, established with technics and tools used during the design action, and develops with stages. Architectural design process, in general terms, consists of information collection, analysis, synthesis and evaluation (Fig.2) stages [4, 5, 6].

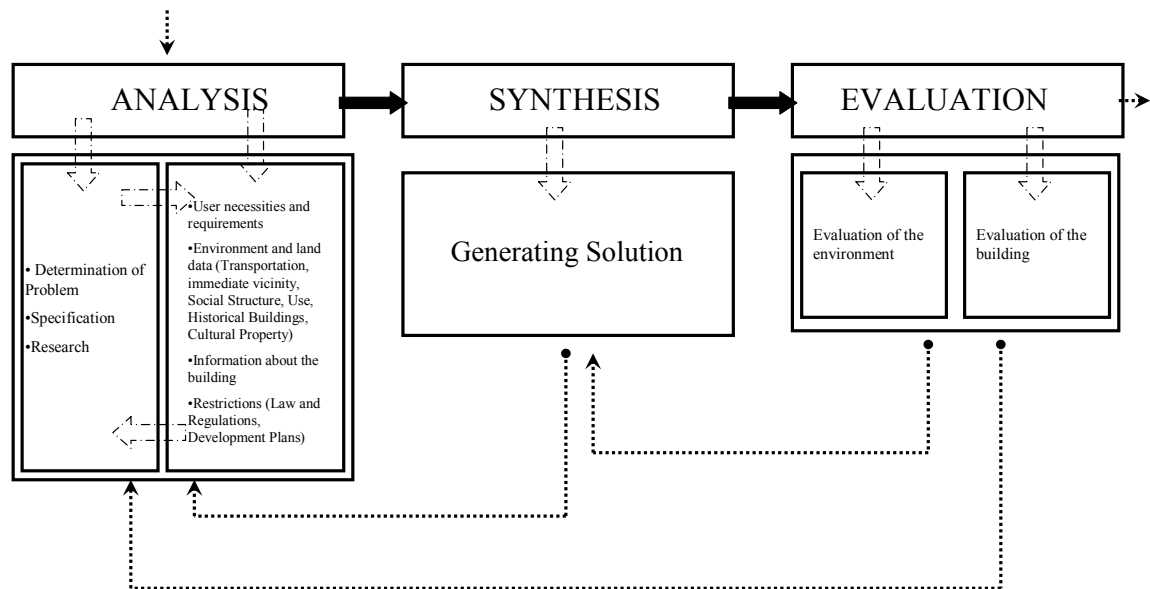


Fig. 2 Classic Design Process is a classic model charted in 1960s as an analysis-synthesis-evaluation model.

Design process is infinite and there is no such thing as flawless design process. The process requires problem solution as well as finding the problem; design process is composition of spaces in order to fulfil the needs [5]. Design process can be identified as a set of transaction chain, from the first point in which the problem occurs to the last step in which the solution is propounded. It is possible to approach architectural design process as consisting of different points of view and different steps [7]. In the preliminary studies in which design process was studied, the process was defined to have two stages [8]. The first stage is research and discovery and the second is synthesis and discipline. The final design is the result of these two. Herbert [9] identified architectural design process as a problem-identification and problem solving procedure. Accordingly the process have been separated various stages as problem, comprehension and hypothesis, verification and design. Archer [10] suggested a different model improving on the analysis-synthesis-evaluation model. Programming was defined as the analytic stage of analysis design and information collection. This stage includes observation and measurement as well. Synthesis and development are classified as the creative stage. Archer [11], in the study, suggested a circular structure between data collection, analysis, synthesis and developing processes. The processes presented were handled in three main stages as 'analytic', 'creative' and 'realization' according to their operating characteristics they include. Later, however, the idea that design process can be specified with different forms as both horizontal and vertical came into the forefront [6].

In later studies, a continuous loop, which repeats the design process, was mentioned and classified as identification and decision, characterization and examination, research

and growth, classification and analysis, realization, use after-completion and evaluation [12] (**Fig. 3**).

In 1987, Aksoy labelled architectural design process as a transparent (glass) box, as problem-identification, information collection, analysis, goal setting, evaluation, developing and final product (Fig. 4).

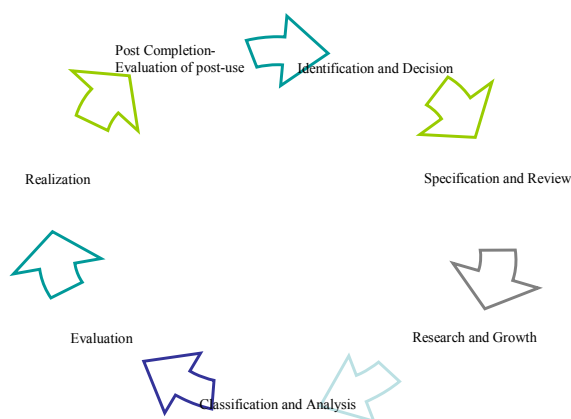


Fig. 3 Sanoff 1977 Design Process Loop

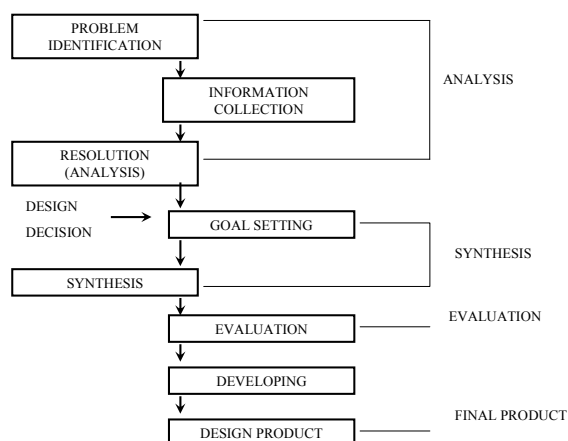


Fig. 4 Transparent (Glass) Box Process [13, 14]

3 Reuse of Monumental Buildings

Change is identified as the transition from the past environment and buildings to another one in time, and appears in monumental buildings as functional and physical differentiation. While physical differentiation that occurs in buildings can be overcome with repair and service, necessity for spatial changes in available buildings with the aim of smoothing away the functional differences that occur in time comes forward. Conservation issue includes continuity in building along with the agenda of adaptation to reuse. As a part of our cultural heritage, when monumental buildings are dealt with, it is seen that these buildings can be assessed in different ways.

- Not using buildings with the idea that they no longer provide social benefits,
- Using them with their original functions,
- Using them with a new function as different from the original one [15].

Assessments of these buildings with the aim of modern use is a substantial approach in terms of making a cultural tie between the past and the future via keeping alive the cultural heritage, historical, cultural and aesthetic values. In this context, reuse of a monumental building includes the action of inserting the building into present living environment. This is the most difficult way to evaluate cultural heritage.

The only way for monumental buildings to be used at present and live in the future is using them by giving new functions squaring with the characteristics of the period in which they were built. If this situation is maintained the formation of the sustainable environment happens to be supported [16].

3.1 Specification of a New Design Process for the Reuse of Monumental Buildings

Giving a new function to a building means to put it in a natural architectural design process. Reuse in monumental buildings is a decision-making action for the future of this building. This decision-making period operates in contrast to the architectural planning process. In adaptation to reuse, areas that are required for people’s activities are limited with the spatial and structure that building holds [17]. Namely, there are certain limits and potentials of the available building. While identifying the new function, particularly protection of cultural identity [18] is required according to these limits and potentials (**Tab 1**).

Tab. 1 Transformations in the Building as required by the Performance Changes in the New Use [19]

Transformations in the Building as required by the Performance Changes in the New Use		
Stages	Performance requirements	Alterations
<ul style="list-style-type: none"> ▪ Programming 	<ul style="list-style-type: none"> ▪ Performance requirements defined at the beginning (flexible) 	<ul style="list-style-type: none"> ▪ Change of architectural program only
<ul style="list-style-type: none"> ▪ Design 	<ul style="list-style-type: none"> ▪ Changes in the architectural characteristics, their effects on the building performance 	<ul style="list-style-type: none"> ▪ Change of architectural program only
<ul style="list-style-type: none"> ▪ Implementation 	<ul style="list-style-type: none"> ▪ Design data during implementation 	<ul style="list-style-type: none"> ▪ Design changes
<ul style="list-style-type: none"> ▪ Original function 	<ul style="list-style-type: none"> ▪ Performance of the original function 	<ul style="list-style-type: none"> ▪ Limited changes in use, radical changes of function, changes in design or architectural program
<ul style="list-style-type: none"> ▪ New function 	<ul style="list-style-type: none"> ▪ Evaluation of the performance of the new function using Post Occupancy Evaluation method. 	<ul style="list-style-type: none"> ▪ Repairs for the new function may cause destruction of the characteristic features

A new function specifies a new building. For that very reason, re-functioning includes “re-programming and re-architecture” concepts together with itself. Based on performance concept for the evolutionary planning understanding, which consists of planning, design, practice, implementation and evaluation, and adding the stage “adaptation/recycling for reuse”, continuity of this loop can be enabled [20, 21]. Building has to ensure certain requirements of the new function. Re-programming period involves evaluation of spatial capacities that the building presents, together with the new function’s requirements and then review process of the requirements (**Fig. 5**). The building that is re-used in this process is both conserved and experience alterations, different from its original function[19].

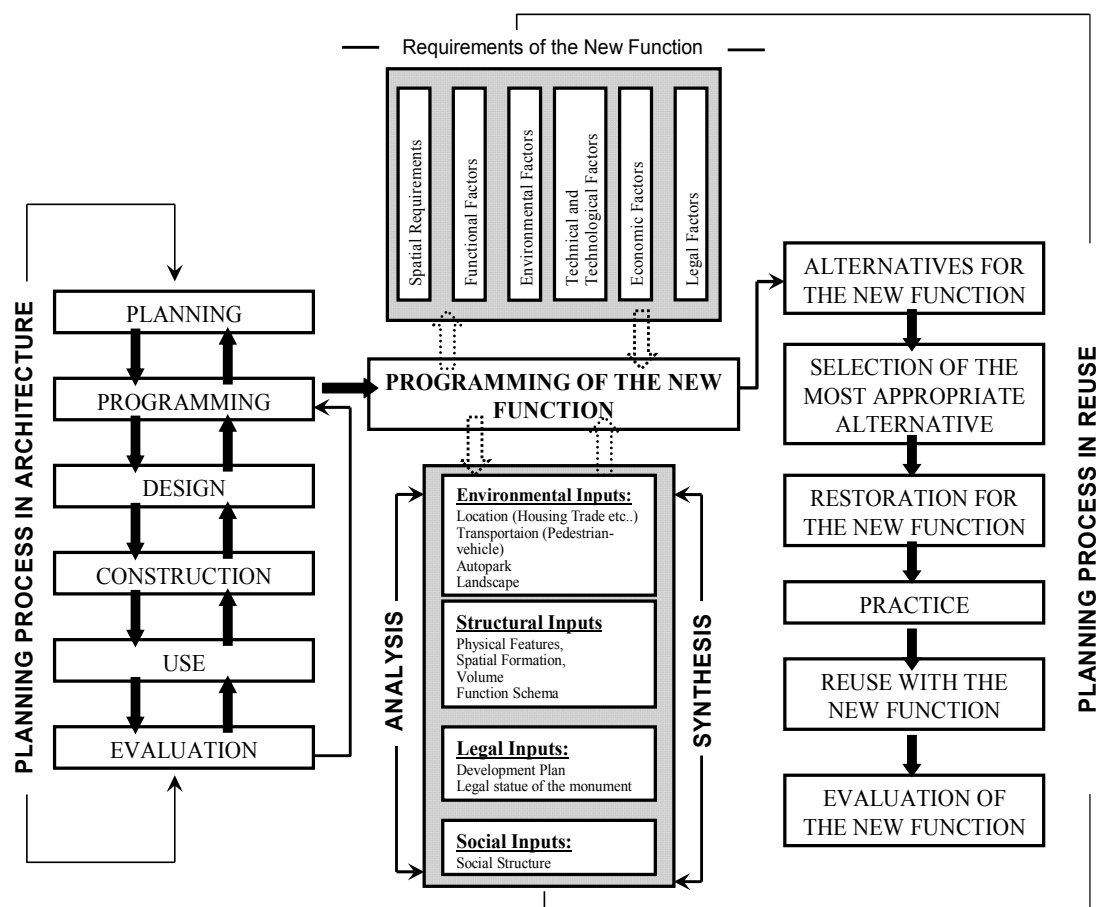


Fig. 5 Planning Process identified for reuse

Process of adaptation to reuse occurs in a different way from declared architectural planning process. In order to meet the desires and requirements of those who use the building; an identification of environmental qualifications, in which actions and behaviours would take place, is performed and the relations that are wanted or available and capacities generate the main data group. Design process that appears in planning processes of specified monumental buildings [13] may be entitled as identification of problem, analysis, synthesis, decision and final product for restoration (Fig.6).

Stages of design process for reuse:

- **Problem Identification:** is assigning function to the monumental buildings/structures.
- **Analysis:** Analysis stage for monumental buildings is done on two levels as information collection and goal setting.
 - **Information Collection:** It is done for the environment and the building. Environmental research includes analyses of the issues such as social structure, immediate vicinity, transportation, location, auto park, zoning plan in scale of vicinity and region, legal statue of the monument. Building research, on the other hand, involve gathering information about and analyses of documentation, examination, legal statue of building, document researches, physical researches, characterization of changes from the past to present, determination of values that building has, spatial formation of monumental building, capacities of spaces that building contain within itself, volumetric size, functional setting of building.

- **Goal setting and Targets:** This stage approaches the issues about monumental building not to lose the values with the new function; choosing the appropriate function as environmental, spatial, technical and social factors for the monumental building, potential of the intervention for removal when required, ensuring the continuity of the new function without harming the originality of building.

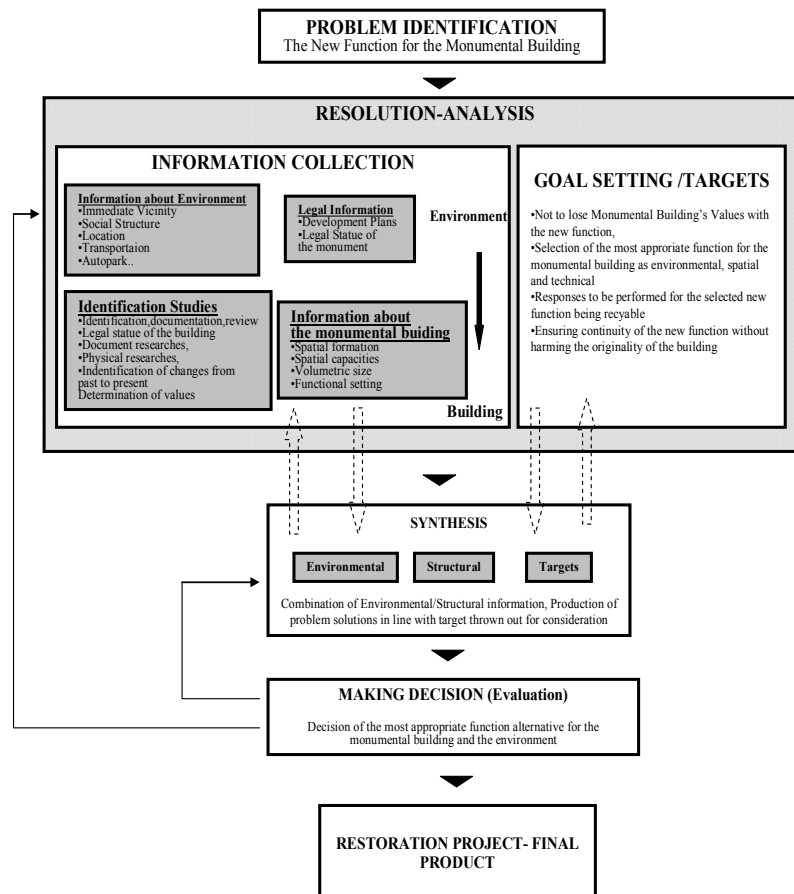


Fig. 6 Design Process Model Built for Reuse of Monumental buildings

- **Synthesis:** This is the stage in which a synthesis of information, which is gained via constructional and environmental researches, is made in line with the targets specified for consideration; and a composition of options of appropriate functions for monumental building is carried out.
- **Decision (Evaluation):** In this stage, there is a decision making process for most appropriate function alternative ensuring sustainability of monumental building with its environment without harming originality and that requires the least response to it. Positive and negative aspects must be assessed well here. The idea that new function is not an aim but means to ensure the sustainability of building must be in the foreground. This stage can make feedbacks to the synthesis and analysis.
- **Restoration Project – Final Product:** This is the final stage, in which the restoration projects are prepared, using the most appropriate function alternative for monumental building and environment as the basic reference.

4 Evaluation-Conclusion

With the main idea that each function must identify a new building within architectural discipline, “re-planning”, “re-programming” and “re-design” are the concepts that come forward. The aim in declared architectural process is to compose spaces in which human actions, based on utilization purpose, can be performed. The aim in design process in re-use of monumental buildings is, on the other hand, the identification of the most appropriate function for the available space of the monumental building, with conservation criteria, environmental, spatial, constructional and social inputs. Determinants of planning and design process in monumental buildings aim to make building liveable in line with conservation criteria.

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