Re-Architecture: Reality or Utopia?

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ABSTRACT
RE-ARCHITECTURE: lifespan rehabilitation of built heritage (2004-2007) is a doctoral research funded by the Foundation for Science and Technology, Portugal; and hosted by the Unit Architectural Design and Engineering, Eindhoven University of Technology, The Netherlands. This doctoral research is now reaching its final stage.

RE-ARCHITECTURE is a design process support system created to effectively assist architects and architecture students, when developing or simulating rehabilitation interventions in built heritage. It provides to its users a work environment with methodological guidelines, technical knowledge and functional tools.

We believe that RE-ARCHITECTURE will contribute, directly, to the quality of rehabilitation designs, and indirectly, to the preservation of both natural and built heritage. Nevertheless, to verify if such belief is in fact, reality or utopia, we must test it and wait for the results. Meantime, this paper shall focus on the explanation of its most relevant utilities.

Keywords: Re-architecture, Design Process, Lifespan, Rehabilitation, Built Heritage

Contribution:
The contribution to the CIB 2007 congress ‘Construction for development’ is to sustain the importance of lifespan consciousness in rehabilitation design developments. RE-ARCHITECTURE is a design process support system that aims to support the designer reaching this ambition.
1. INTRODUCTION

The research method of this doctoral research followed a first phase of design theory, exploring the problem field and taxonomy. Then, a second phase of design production, developing, producing, and testing both theory and prototype – RE-ARCHITECTURE. Finally, a third phase of design result, validating theory and production, as well as, establishing assumptions and recommendations for further research (Pereira Roders, 2006).

At the present stage, the researcher has finished the production and is testing RE-ARCHITECTURE, further illustrated in this paper. Two countries were chosen to represent Northern and Southern Europe countries. The Netherlands and Portugal, where RE-ARCHITECTURE is being tested from February until June.

Hence, Portuguese and Dutch architects were invited to use RE-ARCHITECTURE. Simultaneously, two groups of architecture students are being monitored during the development of a rehabilitation design.

Eindhoven University of Technology (TU/e) and Instituto Superior Manuel Teixeira Gomes (ISMAT) have signed a Protocol / Erasmus Agreement especially to cooperate for the purpose of this research; promoting the exchange of knowledge and experience among students, tutors and researchers.

The following chapters of this paper present the most relevant utilities of RE-ARCHITECTURE that both architects and architecture students are having access to and that might profit from, whenever supported by RE-ARCHITECTURE during their design processes and respective developments.

2. RE-ARCHITECTURE

RE-ARCHITECTURE is a design process support system (DPSS) that intends to effectively support architects and architecture students, when developing or simulating rehabilitation interventions in built heritage.

It sustains the importance of lifespan consciousness – regarding the building’s past, present and future – in rehabilitation design developments, through a theory-based approach introduced in the design process and the respective design developments.

Reachable through a website, RE-ARCHITECTURE provides to each designer a personal access to the work environment (Figure 2.1) where technical knowledge, methodological guidelines, tools, etc. are available to support his/her design processes.

The designer can either follow the entire design process attentively, or simply consult the inherent knowledge of particular sub-stages, and use the available tools, parallel to his/her own design processes, whenever necessary.
New User / New Design

As first action, designers should register themselves as new users and fill in the required personal information. At this stage, they should agree, among other clauses, with the fact that their access to RE-ARCHITECTURE shall be conceded for a temporary period of four months and that this doctoral research is authorized to use their personal information for characterizing the sample of users, as well as their work material to monitor their use of the developed prototype.

Plus, they should also fill in the Pre- and Post-Survey; which will allow the researcher to control their initial level of lifespan consciousness (Pre-Survey) and respective progress, after three months of use (Post-Survey). Their work flow will also be objectively monitored, making use of process mining techniques (Alves de Medeiros, 2006).

During the trial period, the designer is able to create individual design processes for each rehabilitation design. Only he/she will be involved with its progression and will have access to it. Consequently, he/she will be able to register, with safety, the results of each sub-stage followed, from the theorized design process.

The work environment

The work environment of RE-ARCHITECTURE is subdivided in two universes (Figure 2.2): the technical knowledge and the tools that support specific sub-stages of the theorised design process (e.g. analysis, simulation, evaluation, etc).
The universe of the technical knowledge is fundamental for designers, mainly in their initial period as users of RE-ARCHITECTURE. The designer can consult the guidelines and get acquainted with the respective fundamental parameters, depending on the stage where he is currently in the rehabilitation design.

There are four different types of tools that support specific substages of the theorized design process.

![Figure 2.2 RE-ARCHITECTURE: The work environment](image)

![Figure 2.3 RE-ARCHITECTURE: The Documentary Inventory tool (3DI)](image)
The first type of tool is a “log-book” (Figure 2.3) that supports the designer registering chronologically the inventories and surveys developed regarding the building target of rehabilitation; as well as, its duration, sources of information, related parameters, information and/or knowledge, usefulness level, etc.

The designer can make use of it, in the analysis and synthesis sub-stages of both pre-design and design stages. These tools can become very useful, not only to organize all current design documentation; but also to preview future designs, making possible to estimate with precision and objectivity the necessary time and the best sources of information, for similar inventories and surveys.

The second type of tool is the “evaluation system” (Figure 2.4), that gives the designer the possibility to evaluate the building target of rehabilitation (pre-design stage) and its respective design proposal (design stage); taking as fundamental parameters, the ones he has previously surveyed during the previous sub-stages.

The third type of tool is a “database of building elements” (Figure 2.5) available in the sub-stage of simulation (design stage). This database summarises the technical knowledge of seven international references in the theme of sustainability and durability; and supplies technical knowledge e.g. life, maintenance and replacement cycle values, ecological ratings, advantages and disadvantages, observations, etc.

With this tool the designer is able to identify and structure the new existence of the building by subtractions, remainings and additions, as well as, compare the technical characteristics of similar constructive elements, before choosing one specific building element as addition.
The fourth and last type of tool is the “report” (Figure 2.6) to support the decision sub-stages (pre-design and design stages). This tool allows the designer to create several reports, dependent on the stage where he is currently working and on the type of results he is willing to present.

Only the results that the designer has registered, with the previously described tools, shall be available at the list of results. From the list of available results, the designer only needs to choose, the ones that he is willing to add to his report. Promptly the tool produces a report that the designer can print or save as PDF document.
3. OBJECTIVE

Both universe of technical knowledge and universe of tools, available in RE-ARCHITECTURE, aim to support the designer theoretically. Consequently, the designer could, not only improve his design proposals, more lifespan conscious and sustained; but also, his method to present periodically and scientifically, to the other actors involved, the results of his design process.

With RE-ARCHITECTURE, the designer will feel much more confident and will justify his design decisions based on objective and factual arguments, result of a profound and methodological pre-design work.

Accusations such as superficiality and subjectivity, normally attributed to designers, have no longer base of sustenance, as all proposals developed during the design stage (new existence) will clearly reflect the degree of consciousness facing the reality of the building (pre-existence), profoundly surveyed and assessed in the pre-design stage.

In this way, all designers who also believe in the potentiality of a design process that combines technical knowledge / theory with the technical reality / practice, can make use of the methodological guidelines, technical knowledge and available tools, to complement and/or sustain their own design processes.

4. CONCLUSION

Even if well intentioned and theoretically sustained, not always the prototypes developed to support designers in their design processes are well received and automatically implemented. Some end up disused, perceived by its users as too complex, time-consuming, ineffective, etc.

It is fundamental for this doctoral research to objectively verify, if in fact, RE-ARCHITECTURE supports its users and their design developments. From the theorised design process till its implementation process and construction of the prototype, faults and virtues shall be respectively identified.

Therefore, based on the results of the test period it will be possible to verify if such theoretical-practical design process, sustained by ecological idealisms; really contributes to the quality of rehabilitation designs; as well as, to the raise of lifespan consciousness of the designer. Or if instead, it is still a theoretical utopia that needs further revisions to finally be able to surpass the theoretical border.

5. REFERENCES