# User requirements in the design of European affordable housing

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## Abstract

The paper highlights how the knowledge of users is complex and still defective in the area of European affordable housing. Although demand is far more changeable than supply, more market research has been carried out on existing housing stock than on behavioral/cultural models. Furthermore, there is a lack of design research capable of generating innovative design inputs.

The significance of this article lies in proposing a systematization of the detection of user requirements. In the field of affordable housing, there is still a widespread traditional top-down approach which assigns designers with an external intuitive analysis of user requirements. This paper suggests that the European local systems should equip themselves firstly with housing market research concentrated on behavioral/cultural models and secondly with design research conducted by research-oriented professionals.

The paper focuses on some research methods which could be used by design researchers during their inquiry into user requirements. The results of such research would be the starting points for individual design practices which would be based upon solider and more detailed research foundations.

KEYWORDS: affordable housing, built environment, design research, interior design, research method, user requirement

## Introduction

The area of research into housing in design culture has always been subjected to the inertia of tradition and has not been the subject of experimental processes as much as other themes.

Nevertheless, it seems that the switch from industrial to postindustrial age has marked a turning point and housing has gained more of a central role within new critical theory.

As Franco La Cecla (2000) suggests, it seems that society requires a preindustrial condition: if the industrial age has turned the domestic space from "situation for living" into a "device" devoted to fixing behaviors, the liquidity of contemporary living (see Bauman, 2000) requires us to give up the modernist spaces and reinterpret the domestic spaces of the preindustrial age (La Cecla, 2000) which appeared to have a flexible nature.

After all, it is clear that existing real estate is increasingly inadequate, in qualitative terms, to meet housing demand (Tosi, 2004). The former, mainly inherited from the modern age, is showing growing signs of obsolescence in view of a dynamic society undergoing major demographic and cultural transformations: the average age is rising; immigration is expanding; there is an ever stronger sense of individualization; the range of family units is increasing, and now encompasses various structures, resources and reference models.

Design culture is grappling with new issues and some of them are widely recognized: designers' unease about segments of "new users" (for instance, elderly people, one-parent families, young couples); the general weakness of alternative approaches (such as the participatory design of the Seventies and Eighties) which have produced unimpressive results in mass housing (Amendola, 2009); an opinion that the switch from industrial to postindustrial age will transform domestic spaces into the most important centers of human life (Junestrand, 2004); innovative technologies and new related activities, which will cause substantial transformations in the domestic space (Allameh, Heidari Jozam, de Vries, Timmermans, & Beetz, 2010); the loss of credibility of the traditional top-down sequence of "needs analysis / planning decision" (see Tosi, 2004), which allows an oversimplification of reality that is unsuitable for a more and more complex society.

While every project is always a complex issue, since it includes people in its equation (Frascara, 2002), a research on housing is even more complex since it tackles less verifiable elements in larger numbers. (Bourne, 1981). All of this is occurring in an increasingly multiform society where opposite cultural settings seem to coexist: while social individualization is on the rise (Beck & Beck-Gernsheim, 2002), situations of temporary cohabitation are becoming more common as a consequence of family reunification or economic, logistic or cultural circumstances (Boeri, 2011, p. 122).

Therefore, in order to discover the deepest desires of housing consumers, the research world has to examine unclear heterogeneous social and cultural structures.


## Design research and housing

The area of housing is a common theme of research in the field of architecture. It mainly analyzes "the experiential aspects of architecture following the phenomenological tradition, or look at more technical issues" (Heikkinen, Jacobson, & Pirinen, 2008). More and more research

groups are working in the scope of the Smart Home with the target of integrating technology into domestic environments, but most of them disregard the application of technology to lifestyles in the real world (Allameh et al., 2010). The most important topic should be how the future home will be concretely able to provide spaces in line with not only (changeable) technologies but also with complex lifestyles.

The new issues in design culture, as described above, concern not only the form and the configuration of artifacts but also designers' way of thinking and knowledge and the processes activated in the development of a project. According to this perspective, the research typically carried out in the architecture field, which is mainly phenomenological and addresses the study of the form and the configuration of artifacts, tends to be rather incomplete; this is in stark contrast with design research, which is not only phenomenological but also epistemological and praxiological (Nigel Cross, 2007, p. 48), and aimed at the study of designerly ways of knowing and at the study of the practices and processes of design.

Furthermore, the phenomena of the individualization of living preferences and of the aestheticization of housing consumption lead us to consider the housing space as increasingly similar to a consumer product (Heikkinen et al., 2008) and to imagine consequently the usefulness of an approach related to the design research typically applied to products.

We know that, although housing space and consumer products are increasingly similar, they do not overlap completely, since housing has very important connections with its location and with social, cultural and economic fabric.

This reflection has the goal of assessing how design research typically applied to products could be effective in the field of affordable housing, especially in researching user requirements.

## Mass-housing and knowledge of users

John Broome (2005) sees mass-housing as being incompatible with participatory architecture, which allows a knowledge of dwellers. Consequently, for Broome, mass-housing is inevitably at odds with a sustainable housing process.

The author of this article senses that once again, there is a divergence between design research and traditional architecture, with a different reading of the concept of participation. In particular, the architecture field seems to consider participation as being exclusively geared towards the object, directed at the design and the construction of the real artifact; whereas design research has adopted a more recent idea of participation focused on the design process, directed at identifying users' latent wishes and at conceiving an experience. In the latter case, while the final phase of design may be inspired by the results of the participatory phase, it can be put in charge of the designer (ultimately responsible for the final product), and the people involved in the participatory phase are not necessarily the actual (or only) users of the designed product.

Therefore, while it is true that mass-housing is incompatible with the traditional participatory architecture referred to by Broome, we cannot consider that form of participation as the only form with the potential to offer an understanding of users. On the contrary, for mass-housing we can posit other forms of knowledge of users offered by the wide landscape of design research and applicable to the design development process.

As far as research methods for human-centered design are concerned, Hanington (2003) classifies them into three groups: traditional, adapted and innovative methods.

This nomenclature, combined with Sanders' (2002) observations on the different ways of accessing experience, reveals a quite clear distinction between the methods available: traditional methods, mainly corresponding to those used in market research, are focused on what people *say*; adapted methods, borrowed from the human sciences and based on observational research, concentrate on what people *do* and use; innovative methods are focused on what people *make*, when they create using the tools available and express their thoughts, feelings and dreams.

The process of detecting user requirements in contemporary affordable housing must combine several research methods (see Donn & Petrick, 2003, p. 70).

In accordance with Heikkinen, Jacobson and Pirinen (2008), we suggest that methods allowing residents to examine their own lives without the disturbance caused by researchers or designers are valuable. Indeed, emotional aspects, which it is important to make use of, consist of "intimate issues particularly in the case of home, which is often considered a highly private place" (Ibid.).

Below, we will review the research methods which could be used in the affordable housing sector. We imagine that a study conducted using these research methods would form, at the level of local housing system, background knowledge from which each individual design-led project would benefit.

## Contribution of housing market research

Traditional methods are useful in the explorative phase of research even if, as Hanington writes (2003, p. 13), ), they "are open to criticism, particularly for their reliance on what people say to be true, often subject to the influence of self-report bias or the natural tendency to make oneself appear 'good'".

Donn and Petrick (2003, p. 73) recognize two reasons for reviewing the available market research at the beginning of the process: the research becomes more focused and gains credibility for having considered the work that has already been done.

In this paper we want to focus on two contributions which we can expect from housing market research: the segmentation of inhabitants and the examination of stated preferences.

*Housing market research and segmentation*

The general task of housing market research is to describe the market in question and provide a preliminary segmentation in order to organize and hierarchize the users of the local housing system. For each segment of users, the market research should give indications on demographic and technographic features, on the most widespread behavior patterns, on the most profound needs and on supply in relation to those needs.

If the role of market research is to develop an initial 'filtering model' for the local housing system, based on the assumption that housing submarkets exist, an agreed definition of 'housing submarket' remains the thorniest question (Islam & Asami, 2010). In any case, the evaluation of alternative definitions of submarkets depends on the purpose for which the submarkets are constructed (Bourassa, Hoesli, & Peng, 2003).

The models of segmentation often refer to existing housing stock. Some models follow topographic criteria and outline spatial agglomerations; some are similar to the quality-based models of the traditional market segmentation: the dwellings are clustered in submarkets on the basis of their common qualities, in terms of both their structure and the services provided by the surrounding environment (Islam & Asami, 2010); other researchers (Tu, 1997; Goodman & Thibodeau, 2007) make topographic and qualitative segmentation models converge, in order to take into account both sides.

Kauko, Hooimeijer and Hakfoort (cited in Islam & Asami, 2010) classified three different theoretical approaches of housing market segmentation: neo-classical economic models, localized disequilibrium models and behavioral/cultural models.

The behavioral/cultural models, which take segmentation as a result of socio-cultural choices by consumers, are the most interesting models from the point of view of design research. Nevertheless, their popularity is very low and, so far, most research has dealt with existing housing stock, totally overlooking consumers' needs (Islam & Asami, 2010).

One of the most relevant issues is the availability of housing market research. Indeed, the value of housing market research is circumscribed to a local area and cannot be extended to a large territory.

In Europe, the different housing policies in force in the various countries mean that a sole segmentation in the field of the affordable housing is unlikely. On the one hand there are countries with a universalistic approach whereby affordable housing is directed towards the whole population; on the other, there are countries with a targeted approach limiting affordable housing to underprivileged families only. In the latter, the segmentation of users is more limited, concerning only medium-low income brackets. This fact is important since conventional classification of family units is based on family structure, ethnic origin and income (Bourne, 1981), and since income is a decisive parameter in shaping taste (Bourdieu, 1979). We deduce that in countries with a targeted approach there is not only a bigger risk of social segregation but also a larger standardization of preferences and lifestyles.

If, on the one hand, housing market research is delimited to a local area, on the other hand a segmentation of users is not available in each local housing system

*Housing market research and stated housing preferences*

Many methods are used to understand stated housing preferences. Jansen, Coolen and Goetgeluk (2011) have published an important overview of this topic.

Almost all methods mentioned here are based on a kind of socio-demographical segmentation; only the Lifestyle Method (Jansen, 2011, pp. 177-202), which has the goal of building/restructuring/distributing dwellings according to lifestyle group preferences, relies on a lifestyle segmentation instead.

Jansen (2011, p. 178) argues that "socio-demographic and lifestyle variables may be related in different ways to housing preferences".

> *Socio-demographic variables may determine what is attainable and what is needed and lifestyle variables (e.g., values or emotions) may determine taste. The type of housing - ground-plan, size, and cost - may be linked more to socio-demographic variables (income, age, size of household) whereas the appearance of the house may be particularly lifestyle-dependent (status, architecture, view, safety). (Ibid.)*

The author of this article believes that structural features (size and organization of space) and lifestyle features are not two drastically separated dimensions and that they both contribute, with fuzzy borders, to the construction of that housing experience which the designer's work concerns. According to this view, it is possible to plan an integration between the Lifestyle method and other methods according to a traditional socio-demographical segmentation.

Among the latter methods introduced by Jansen, Coolen and Goetgeluk (2011), the Decision Plan Nets Method seems especially appropriate for the field of affordable housing.

Although the affordable housing sector has different traits in the various European countries, it is equally sensitive to socio-economic aspects, and design actions must find a balance between achieving social objectives and saving resources.

Therefore, if the general goal is the well-being of users, it is necessary to identify which aspects are structural components of that well-being and which, on the contrary, are surplus elements. An explorative inquiry should be able to note not only users' preferences but also their level of rigidity, that is if preferences are more vital (rigid) or more simply generated by attractive (flexible) elements.

From this perspective the Decision Plan Nets Method seems effective, since its aim is to reveal, through people's choice process based on individual mixes of dwelling (environment), characteristics that are deemed essential, those that can be compensated for and those that are deemed irrelevant. The DPN is based on a structured (computerized) interview that shows people's choice processes and it reveals a set of imaginary houses that the housing consumer would consider acceptable (Goetgeluk, 2011, p. 59).

In the field of affordable housing, where designers have often to prioritize, it can be useful to have information on the priority that users assign to their desires.

## Unobtrusive ethnography methods

Among the methods borrowed from ethnography, we find two interesting research methods allowing observation without the disturbance to home life caused by researchers.

The first method is the observation and interpretation of environmental traces, especially those alterations indicating a redesign of the space by users, who gain possession of a place and try to adapt it to their own needs (see Zeisel, 1984; see also Chiesi, 2009). This type of observation has the quality of indirectly revealing certain behaviors and unsatisfied needs of users.

In the book *Low cost design* (2010), Daniele Pario Perra produces a broad review of objects and actions reinvented by anonymous authors. Some of these function as telltale signs comparable to those provided by generative tools. "We can recognize the reinvented object or the innovative action on the territory as projections of the status of their inventors, of their culture and to some degree their evaluation of the surrounding context" (Pario Perra, 2010, p. 19).

> *Rescued from the skills of professionals, design can become the history of humanity. We can read every object as the crystallization of complex social relationships. It is as if the DNA of spontaneous creativity resided in its capacity to epitomize a profound, ancestral necessity in a simple and at times immediate gesture, but one never really satisfied. (Gandolfi, 2010, p. 19)*

Emiliano Gandolfi defines this area of anonymous but brilliant contributions as the scope of a "parallel creativity", a collection of gestures "capable of meeting needs that do not find an immediate response in terms of suitable products or political responses" (Ibid., p. 20).

This kind of observation does not involve the most intimate issues of daily life; it can, however, capture emotional qualities in an indirect way.

The second method is photo ethnography. The researcher gives a camera (still or video) to a dweller who is asked to capture images of his or her life and describe them with accompanying notes. Then the researcher reviews the images and the related notes and learns from them. "This approach is highly useful when the presence of an ethnographer would drastically alter people's behavior [...], or when it's not appropriate or cost-effective for others to be present" (Ireland, 2003, p. 27).

Ferro Trabalzi (2010) highlights that rethinking the design of public housing based on the everyday practices of its residents is a proactive way of bringing a new sense of reality back to the profession.

# Creative methods in affordable housing

> *Innovative methods typically are identified by their participatory nature, creative engagement and outcome, and their relatively specific application to design research. Examples include design workshops and other creative sessions in which participants (users) are invited to engage in the generation or manipulation of visual artifacts to communicate their thoughts or ideas. (Hanington, 2003, p. 15)*

Innovative methods, specific to design research, can be seen to be at variance with market research (see Donn & Petrick, 2003). Market research and design research do not center on the same issues: the former focuses attention on general trends and the latter on the needs and the wishes of specific users; the former mainly responds to the needs of marketing, while the second provides useful inputs to designers, who are able to make a more natural transition to design decisions from the visual information provided. Innovative participatory methods are empirical but also imaginative: they help users understand their deepest wishes, getting over their limitations in structuring their own needs.

> *Creative methods are particularly appropriate during generative research, often referred to as projective because of their success in uncovering needs and desires that may be unknown even to the user, and that are difficult to articulate when probed for using traditional methods. (Hanington, 2003, p. 15)*

Traditional methods "tend to be better at confirming known entities, yet are less critical in determining as-yet undiscovered information" (Ibid., p. 13). Market research carries out an explorative phase only; on the one hand, it selects special features which are accepted as being conventional but, on the other hand, it does not guarantee the detection of changeable behaviors of the population.

As already mentioned, traditional methods act on the basis of known entities found in existing housing models. Known entities are not consequences of individual needs and wishes but are the causal parameters on which new projects impose further individual behaviors. Consequently, an inquiry using market research only is unlikely to be able to innovate housing models on the basis of new, changed needs.

To better express the issue, we can seek a parallel in the book *You Are Not a Gadget: A Manifesto* (2010) by Jaron Lenier, who observes in computer science the evolutionary imbalance between the hardware world and that of software: on the one hand the development of computer hardware has been astonishing, while on the other the progress of software tools and web surfing has been relatively limited, trapped by infinite lock-ins which have held it back.

Similarly, we could consider people's behaviors as software and social and cultural structures as hardware. While social and cultural structures change freely and quickly, housing styles (part of behaviors) get trapped in the inertia of those existing dwellings which are their only explicit form. Family structure (the hardware) changes but people's housing styles (the software) do not change as quickly. In other words, the behaviors, activities and housing styles of users do not seem to have the chance to evolve and adequately respond to those needs which arise in parallel to the transformation of society and their structures.

For the reasons we have seen, affordable housing has a pressing need for tools able to fill the fuzzy front end with the genuine dreams and intuitions of people.

There is no formula for completing a list of definitively valid participatory creative methods. "The whole purpose of innovative methods is to allow for creativity in designing methods appropriate to the situation" (Hanington, 2003, p. 16).

In each local housing system, there should be researchers capable of coordinating heuristic inquiries based on generative tools with people from all stakeholder groups within the system. The work of these professionals takes shape as highly research-based, founded "on a solid understanding of the context of use that has been ethnographically informed" (Sanders, 2006; see also Ireland, 2003, p. 28).

## Conclusions

Although we perceive an uninterrupted growth of complexity and dynamism of users' needs and we sense the need for more accurate analysis tools in designer's hands, in the field of affordable housing there is still a widespread traditional top-down approach which assigns designers with an external intuitive analysis of user requirements. In cases where traditional participatory architecture is not practicable, it is opportune to take an increasingly systematic approach in the study of local user requirements.

European local systems should equip themselves firstly with localized housing market research and secondly with design research entrusted to specific research-oriented professionals. Such professionals will have a broad skills base, and be capable of managing market research studies, grasping institutions' goals, conducting interviews, empathizing with very different users and activating inputs to mediate between individual needs and the general interest. The answers produced by researchers would have the goal of producing a cognitive background which every designer involved in the local context should proceed from. They would be the starting points for individual design-led projects, which would change from their front end and be based on solider and more detailed research foundations.

However, there is an issue which appears still not to have been addressed in sufficient depth by the theoretical debate.

Today we can observe many good practices which are attentive to users' individual needs, and just as many which stimulate civic life; but there are no shared theoretical structures suggesting how much weight to give to every variable, which is the right borderline between individual interest and common good, and how the role of researcher/designer can be political (if it is).

On the contemporary scene, which is taking shape as highly user-oriented, researchers and designers find themselves having to make arbitrary choices between the satisfaction of individual needs and the progress of civic life; a study on their critical role is to be hoped for.

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