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SER INVOLVEMENT IN BUILDING
DESIGN — A STATE-OF-THE-ART
REVIEW

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ABSTRACT

This paper reports results of a systematic literature review on the definitions and levels of user involvement in the design process. Although many studies have highlighted the importance of user involvement for the quality of both process and final product, the term still lacks a clear definition and different models describe diverse involvement levels, which are detrimental to the advancement of knowledge in the area. The present study focused on the mapping of definitions of user involvement and comparisons of the different proposals of involvement levels for outlining a clear definition of the term, based on the levels of involvement, and contributing to the consolidation of the theory of user involvement in the field of architectural design. Moreover, this research assists architects to find the most appropriate level of user involvement for the design they are developing, improving the practice of involving users in the design process.

KEYWORDS

User Involvement. Participatory Design. Co-design. Design Process. Building.



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ENVOLVIMENTO DE USUÁRIOS EM PROJETO DE EDIFÍCIOS – REVISÃO DO ESTADO DA ARTE

RESUMO

Este artigo reporta os resultados de uma revisão sistemática de literatura sobre as definições e níveis de envolvimento de usuários no processo de projeto. Embora muitos estudos tenham ressaltado a importância do envolvimento de usuários para a qualidade tanto do processo quanto do produto final, o termo ainda não possui uma definição clara, e diferentes modelos descrevem diversos níveis de envolvimento, o que dificulta a consolidação do conhecimento nesta área. O presente estudo foca o mapeamento das definições de envolvimento de usuários e comparações das diferentes propostas de níveis de envolvimento, para delinear uma definição clara do termo, baseada nos níveis de envolvimento, e contribuir para a consolidação da teoria de envolvimento do usuário na área de projeto de arquitetura. Além disto, a presente pesquisa auxilia arquitetos a encontrar o nível de envolvimento de usuário mais apropriado ao projeto que desenvolvem, contribuindo para a melhoria desta prática.

PALAVRAS-CHAVE

Envolvimento de usuários. Projeto participativo. Codesign. Processo de Projeto. Edifícios.

I. INTRODUCTION

User involvement approaches have been described as essential in aligning users' needs and preferences, as 'experts on their own experiences' (SLEESWIJK VISSER et al., 2005), to building design, thus ensuring value generation and high-quality building performance (STERN et al., 2003; STEEN, KUIJT-EVERS, KLOK, 2007; SFANDYARIFARD, TZORTZOPOULOS, 2011; ANDRADE et al., 2012).

A proper understanding of the meaning of value to users supports the achievement of clients' satisfaction and prevents design changes, frustration to designers and additional costs related to the design process (THYSSEN et al, 2010). Moreover, user involvement contributes towards justifying and legitimising design decisions, so that disagreements on the design outcome can be avoided (N. O. E. OLSSON, BLAKSTAD, HANSEN, 2010).

Clement and Van den Besselaar (1993) emphasise the right of users to "have a direct influence on matters that concern them in their work", and that includes the built environment. Although several studies have explored user involvement in areas, such as public policies (ARNSTEIN, 1969; CHOQUILL, 1996; BRODY, GODSCHALK, BURBY, 2003; STANGEL, SZÓSTEK, 2015) and information technology (DAMODARAN, 1996; KUJALA, 2003; HESS et al, 2013; BARCELLINI, PROST, CERF, 2015; FRAUENBERGER et al, 2015), few of them have focused specifically on architecture and built environment. According to Malard et al (2002), the literature on the involvement of users in the architectural field usually addresses decision-making processes related to urban planning and management and lacks a conceptual clarity of user involvement in decisions on technical and design solutions, which implies differentiated insertions of users and architects and hampers the management of the participation process. A clear definition of the different levels of user involvement, suitable to the architectural field, can contribute to the dissemination of this practice among architects. Therefore, further research is necessary for the clarification of the concept and process of user involvement in the architectural design.

Although many texts have addressed user involvement over the past decades in different areas, the term still lacks a clear definition (KUJALA, 2003; MAGNUSSON, MATTHING, KRISTENSSON, 2003; FRAUENBERGER et al., 2015; LAM, DEARDEN, 2015). A consensus on theory or definition of participation is hardly found, and clarity is demanded to organize academic dialogues (CARPENTIER, 2016).

This study started with a literature review from 1969, seeking to understand the concept of user involvement and its related terms. As no consensus could be reached, a state-of-the-art review of mainstream papers published between 2012 and 2016 in scientific journals indexed in specific databases was conducted for verifying the existence of a consolidation of the concept in recent publications. The first goal of this study was to map the existing definitions of user involvement in the design process in general and then compare the different user involvement levels described in the literature, to contribute to the consolidation of these ideas in architectural design.

¹ “State of the Art through Systematic Review”, Software developed by LaPES, from Federal University of São Carlos. Available at http://lapes.dc.ufscar.br/tools/start_tool, access on Feb. 23, 2017.

Initially, this paper describes the research approach, in the section 2, showing the systematic literature review – SLR – stages and the protocol. Then, the paper synthesises the quantitative results of the SLR, in the section 3. The section 4 presents the qualitative results, describing several definitions and levels of user involvement propositions, found in the literature. This is followed by a discussion and a summarization of the findings, in the section 5, where a consolidation of the concept and levels of user involvement, suitable for architectural projects. Finally, the conclusions are presented in the section 6.

2. RESEARCH APPROACH

A broad literature review was conducted from the text of Arnstein (1969) – who proposed the first known model of users’ levels of involvement – up to current research, for mapping user involvement approaches, understanding the theme, its origins and evolution, and determining the main issues related to it.

The review showed that terms related to user involvement still lack a clear definition, once different authors have conveyed several meanings to terms like user involvement, participatory design and co-design. A systematic literature review – SLR – was conducted towards checking a consensus on the terms between 2012 and 2016, mapping research in this period and understanding the current state-of-the-art of effective user involvement in the design process. An SLR is a study method that assesses all available research relevant to a specific issue applying well-defined steps (NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL-NHMRC, 1999; ZAMBONI et al, 2010;), and aims at establishing a consistent survey of the state-of-the-art in relation to that issue, based on a careful planning and execution (KHAN et al, 2003; MUNZLINGER, SOARES, QUEIROZ, 2012). Our SLR investigated the way the concept of user involvement and its levels have been addressed in recent years and verified possible consolidations, avoiding bias in results.

StArt¹ software, a computational tool that supports SLR, was used, once the steps and activities of an SLR are numerous and repetitive (ZAMBONI et al, 2010). The three stages proposed by Munzlinger et al. (2012) were followed, due to their similarity to the stages proposed by the StArt tool:

- Stage 1: Definition of the ‘Study Protocol’ for the planning and formalization of the research;
- Stage 2: Research implementation, based on the Study Protocol;
- Stage 3: Summary of collected data.

At the Stage 1, the Study Protocol was defined. The objective and the main and secondary questions that would guide the SLR were determined with the support of the study protocol preparation form, provided by StArt.

- SLR goal: Search and review of scientific papers for a clear definition of user involvement in the design process and diverse definitions of levels of user involvement.
- SLR main question: What does user involvement mean in the design process?
- Secondary Question 1: What terms are commonly used to define user involvement?

- Secondary Question 2: What are the levels of user involvement in the design process and which of them are more suitable for the architectural design field?

According to the goal and questions, the criteria and entries for the search were determined (Table 1).

	Criteria	Entries
Keywords	Research goal, questions and main terms found in the first literature review.	'co-design'; 'participatory design'; 'user involvement'; 'levels of user involvement'; 'design process'.
Databases	Scope of search in journals relevant to the design	'Web of Science'; 'Scopus'; 'Science Direct'.
Language	languages included	Portuguese; English.
Research Method	Higher efficiency in search	Search through databases rather than manual search.
Period	5 years	2012 until 2016.
Research areas	Related to the design process.	Architecture (Social Sciences) built environment and Engineering.
Study Types	High-level studies published after a blind review from specialists.	Papers published in scientific journals.

Table 1. Criteria and entries for the SLR

At the Stage 2, the research was implemented, based on the Study Protocol. This stage was divided into three phases, namely Identification, Selection and Extraction. Each phase is described as follows.

Identification: According to the entries described in table 1, 262 articles were identified in the three selected databases and sent to the next phase, selection.

Selection: Duplicated papers - identified in more than one database - were excluded. The eligibility of the identified papers was determined after our reading of their abstracts, according to the criteria established in the protocol (Table 2).

(I) = inclusion	(E) = exclusion
(I) Definition of participation	(E) User involvement in health research and treatments
(I) Definition of user involvement	(E) Participatory action
(I) Definition of co-design	(E) Not focused on user involvement
(I) Levels of user involvement	(E) Not related to the design process
(I) Methods of user involvement/participation/co-design	(E) Network and Computer Architecture
(I) Theory of user involvement/participation/co-design	
(I) Case analysis	

Table 2. Paper Eligibility Criteria

Papers classified according to both exclusion and inclusion criteria were listed in the next stage and read in full for the verification of relevant data. 11 papers out of the 262 ones selected were duplicates, 205 were rejected and 46 were included for review.

Extraction: All papers selected in the selection phase were read in full and those that met the requirements established in the protocol were classified as 'accepted' and included for data summarization. Papers that only cited the central terms and that did not contain relevant information or data for the research were excluded. 37 articles were accepted and 9 were rejected.

At the Stage 3, the data were organized into quantitative and qualitative results. Quantitative results presented figures and tables of papers grouped by topics, year of publication, eligibility criteria and main journals, towards showing the focus of recent research in the area and providing its concentration and paucity, as well as the main journals discussing the theme and the field in which the theme has been most prominent. Qualitative results have complemented the literature review of co-design.

3. QUANTITATIVE RESULTS

The quantitative results classified the 37 extracted papers according to the criteria established in the protocol. Their overall organization was inspired in the SLR presented by Wang et al (2013).

3.1 Papers by year of publication

According to Figure 1, papers relevant to the area have been published over the past five years, with a higher incidence in 2015 and 2016.

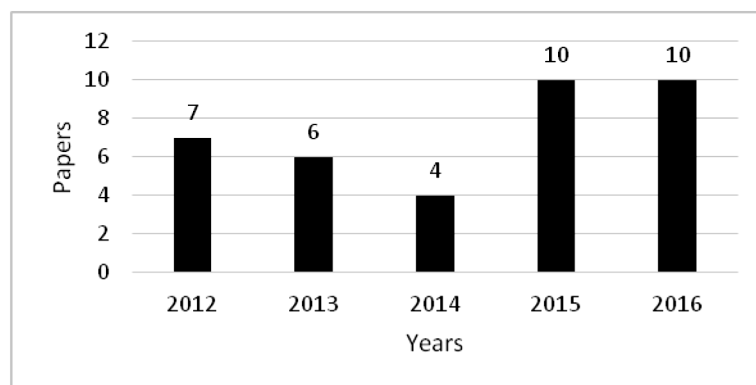


Figure 1. Number of extracted papers by publication year.

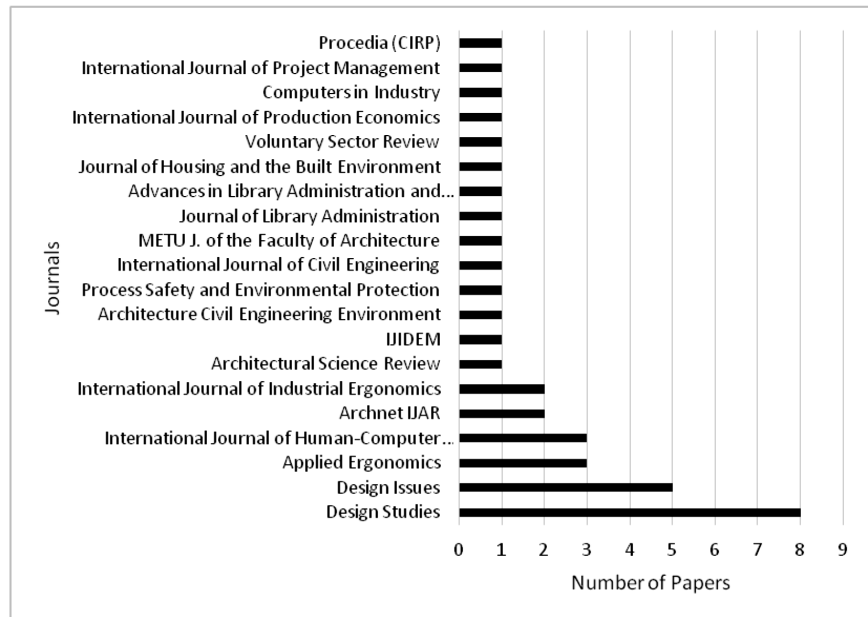


Figure 2. Number of extracted papers by journal.

3.2 Main journals for the theme

Among the journals indexed in the databases selected for the present SLR, the extracted papers are mainly from the Design Studies (21.62%), and the Design Issues (13.51%), as shown in Figure 2.

3.3 Papers by Eligibility Criteria

For each paper selected, eligibility criteria were indicated for inclusion or exclusion in SLR (Table 2). Most papers focused on theory, methods, and case analysis related to co-design, user involvement or participation (Fig. 3). Three papers defined user involvement, eleven defined co-design and seventeen defined participatory design.

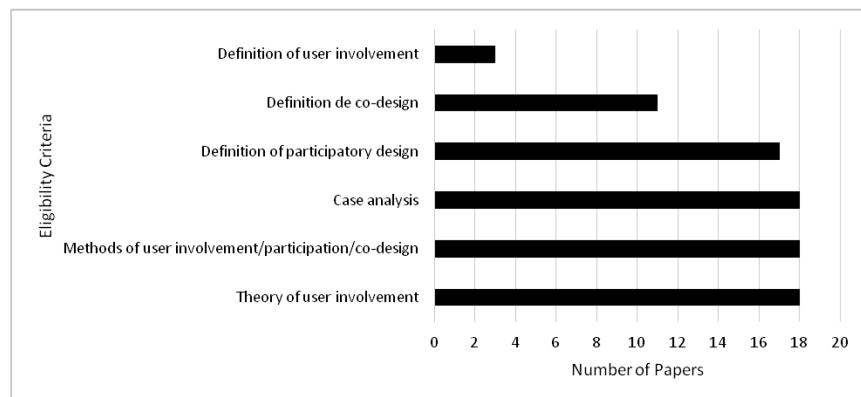


Figure 3. Number of extracted papers by eligibility criteria.

3.4 Paper Classification Topics

The first classification topic is the Research Area of the paper. Although the present research focuses on architectural design, papers from other areas that provided relevant data on user involvement suitable to be applied in the field were admitted. Figure 4 shows the total number of papers for each of the six identified areas, namely graphic design, service design, information technology, urban planning, product development and architectural design and Figure 5 illustrates the distribution of papers between 2012 and 2016, per area. The number of papers on user involvement in buildings and infrastructure designs considerably increased in 2016.

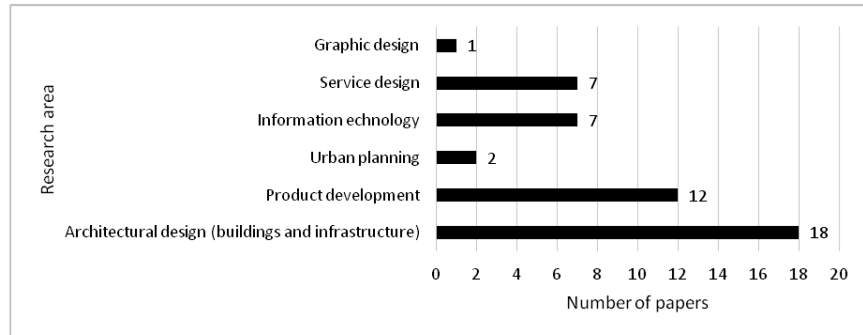


Figure 4. Topic 1: Number of papers by research area.

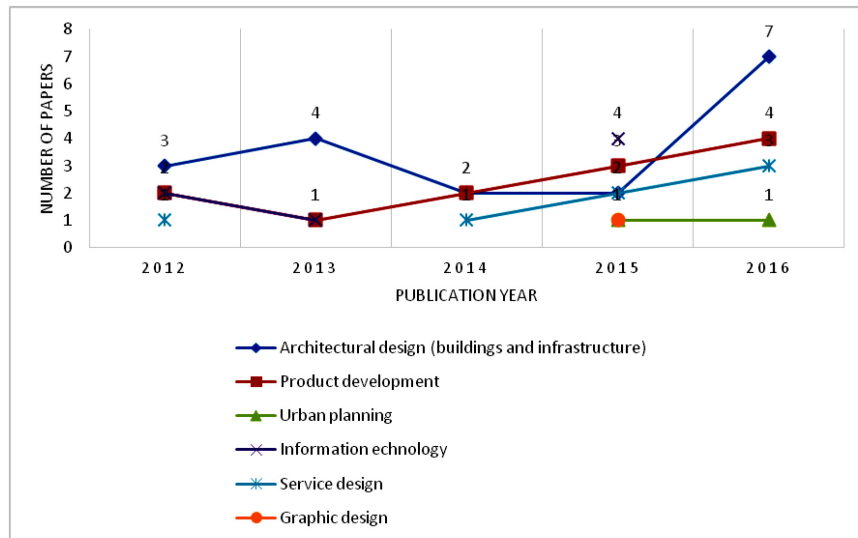
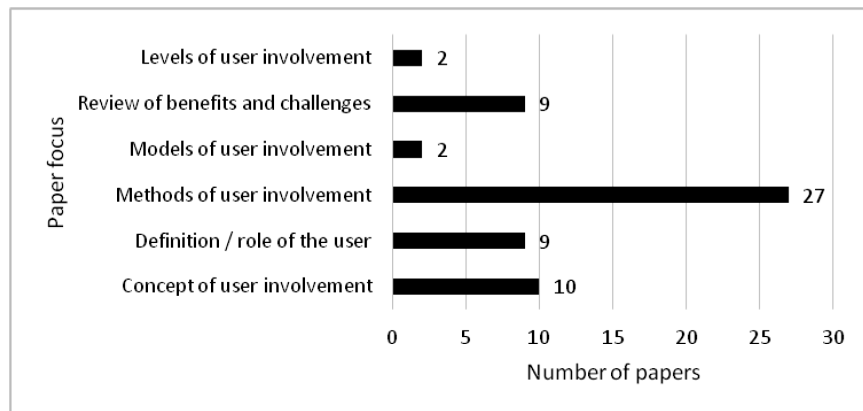


Figure 5. Topic 1: Number of papers by research area between 2012 and 2016.

The second topic refers to the paper focus. Figures 6 and 7 show the total number of papers for each focus and their distribution between 2012 and 2016, respectively. Most papers (72.97%) focused on the methods of user involvement, however, only two addressed the level of involvement and two described models of involvement. Publications on methods increased in 2015 and 2016.



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Figure 6. Topic 2: Number of papers by paper focus.

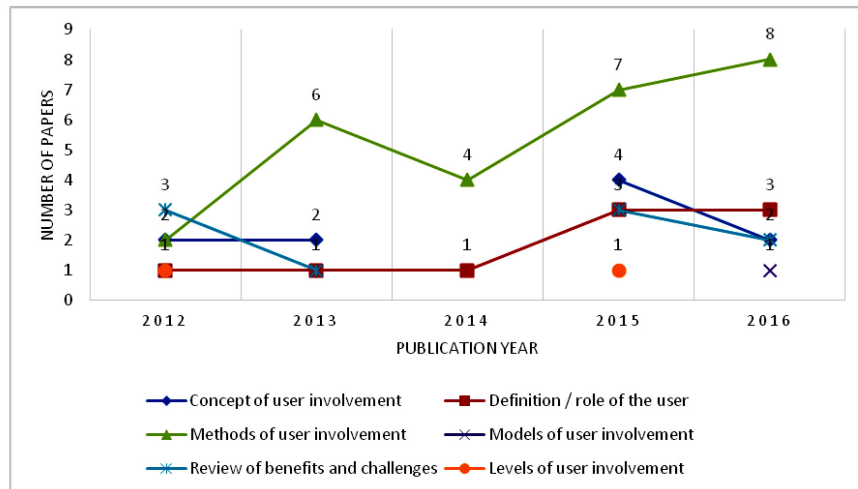


Figure 7. Topic 2: Number of papers by paper focus between 2012 and 2016.

The research methods used were analysed in the third topic. The methods identified were literature review, empirical study – which included case studies, interviews and focal groups – and artefact proposition (Fig. 8). According to the figure, the empirical study was the predominant method.

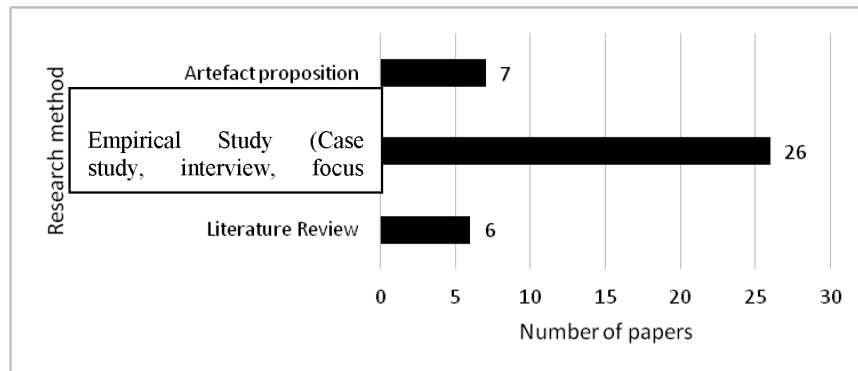


Figure 8. Topic 3: Number of papers by research method.

In the last topic, the terms identified for user involvement were co-design, participatory design, user involvement, user participation, customer engagement, customer involvement, and participative design. In some cases, more than one term was used in the same article. According to Figure 9, the most frequent term is Participatory Design, followed by Co-design and User Involvement. The other terms are punctual.

The SLR showed a diagnosis of research on user involvement between 2012 and 2016, describing the main journals for the theme – among the ones indexed in the selected databases – main contents, predominant research areas and methods,

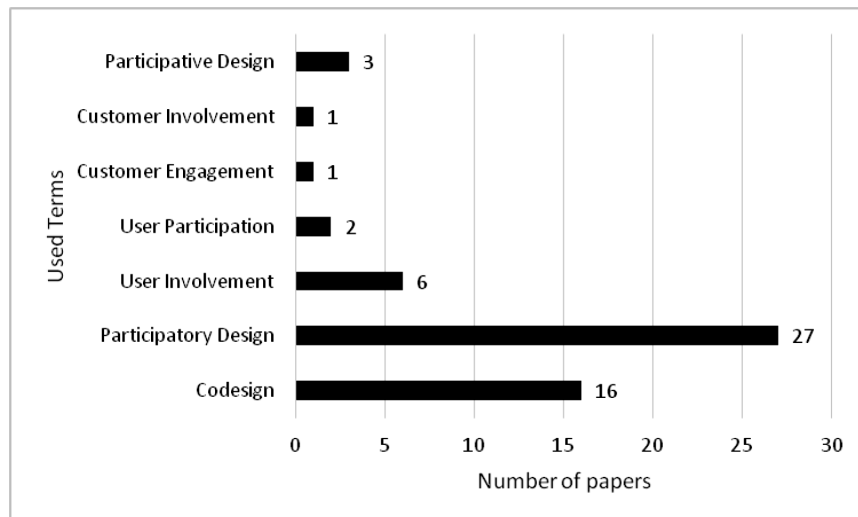


Figure 9. Topic4: Number of papers by used terms.

main terms, among other feature and the outcomes can guide future research on user involvement. However, a consensus on terms has not been reached, since authors continue using different terms in several meanings.

4. LITERATURE REVIEW AND QUALITATIVE RESULTS

As proposed by Kaulio (1998), the term ‘user involvement’ represents possible interactions between users and the design process. It is broad and refers to several levels, each one representing the relationship between users and service providers, with different levels of power (ARNSTEIN, 1969; KUJALA, 2003; BAGGOTT, 2005). According to Kirby et al (2003) and Sinclair (2004), participation is multidimensional and the level of user involvement is one of the key dimensions for its understanding. Different levels are now addressed, aiming at constructing a clear definition about user involvement in building design, which is fundamental for the programming of both design activities and process coordination.

4.1 Levels of user involvement

The level or degree of user involvement is related “to the range of influence that users or their representatives have over the final product” (BERGVALL-KAREBORN, STAHLBROST, 2008, p.105). The degree of user involvement must be determined for the clarification of many aspects of the involvement method, such as demand for direct involvement and decision-making mechanisms once they impact on the implementation of the design process (KIM, CHA, KIM, 2016).

In the field of public administration, Arnstein (1969) proposes a ladder with eight rungs “corresponding to the extent of citizens’ power in determining the end product”. Besides simplification, the ladder enables the understanding of the different levels of involvement. The author describes two heterogeneous groups involved, namely power holders and have-nots, grouping divergent views, subgroups with significant disruptions and competing interests. However, the have-nots often have a perception of power as a monolithic system, and those in power regard them as mass, not understanding their differences, which explains the simplified representation of the proposal (Table 3).

Table 3. Levels of user involvement according to the ‘Ladder of citizen participation’. Source: Adapted from Arnstein (1969).

	LADDER RUNGS	DESCRIPTION
CITIZEN POWER	Citizen Control	Level of control at which a program or institution can be self-governing.
	Delegated Power	Citizens make decisions on programs or plans.
	Partnership	Distribution of power between citizens and power holders through negotiation.
TOKENISM	Placation	The have-nots can have their say, but the final decision on the legitimacy and viability of opinion is still made by the power-holders.
	Consultation	To legitimize participation, it is important both to inform and request citizens' opinions, with the support of methods, to assure that opinions will be effectively considered.
	Informing	The have-nots are often informed on their rights, responsibilities and options in advanced stages of planning, if they cannot negotiate or feedback the system properly.
NON-PARTICIPATION	Therapy	The have-nots are subjected to group therapies by administrators, under the illusion of participation in planning.
	Manipulation	“Distortion of participation” by organizing people on advisory boards or committees to approve plans that they did not participate in, to legitimize the decisions of the power-holders.

Other ladder-based models have been found in the literature. Based on the levels of Arnstein's model, Wilcox (1994) makes an adaptation for independent community interests to five levels, rather than eight, namely Information, Consultation, Deciding Together, Acting Together and Supporting. According to the author, no level is better than the other, but each level can satisfy different interests at different times. Hart's model re-read the Arnstein ladder for including the participation of children (HART, 1992). Choguill (1996) presents an adaptation of the Arnstein's ladder to developing countries, with the same eight steps, but with changes in the terms, the author argues it is better suited to the context of those countries.

Such approaches were criticized. According to Tritter and McCallum (2006), Arnstein's 'ladder of participation' is outdated and considers only the power to make decisions to assess the level of participation and point that the goal of citizen involvement is this control. The authors cited the Wilcox's and Choguill's models as uncritical re-readings of Arnstein's. Therefore, the authors proposed a more comprehensive model, since they believe "user engagement and empowerment are complex phenomena through which individuals formulate meanings and actions that reflect their desired degree of participation in individual and societal decision-making processes". According to the authors, when no compatibility is reached between expectation and method, user involvement becomes more susceptible to failures. Different from Arnstein, who relies "on models of participation constrained by a specific conceptualisation of activism" (TRITTER; MCCALLUM, 2006, p. 157), they that conclude user involvement requires both participants and non-participants legitimize dynamic structures and processes. Finally, the simplified conceptualization of the protagonists, the failures to consider the process and the results, and the lack of methods and feedback systems in the Arnstein's model are also criticized.

Carpentier (2016, 76) also criticized ladder-based models, due to a series of problems, as:

Quite often, these models suggest the existence of easy cut-off points between dichotomised positions. Even when several steps are distinguished, these discrete models still suggest fairly crude categorisations (e.g. citizen power versus tokenism and non-participation) which do not always rest well with the complexities of participatory processes. Secondly, the multi-layeredness of participatory processes also makes them difficult to be captured by the ladder-based approaches.

The 'wheel of participation', a method proposed by Davidson (1998), is divided in four parts, namely 'information', 'consultation', 'participation' and 'empowerment', is more suitable for the promotion of an appropriate level of user involvement and helps the achievement of aims clearer than those of ladders, which suggest climbing to the top of the ladder is always the objective.

Concerning information technology projects, the following levels of user involvement have been found (DAMODARAN, 1996):

- Informative: level at which information is conveying to and/or received by users.

- Consultative: users are involved and comment on a set of facilities or a predefined service; and
- Participative: system-wide decisions are influenced by users.

An approach used in several areas, such as design (HO, LEE, 2012) and product development (KAULIO, 1998), presents the user involvement in three different levels, namely 'design for', 'design with' and 'design by'. However, despite the similar nomenclature, the authors' definitions are different for two levels, as shown in table 4.

	Kaulio (1998)	Ho and Lee (2012)
'Design for'	Users are passive and designers control the whole process (users only provide information)	
'Design with'	As in the 'design for', designers obtain information on users and users are consulted on proposed design solutions.	The design process is shared between designers and users, who actively participate as designers.
'Design by'	The design process is shared between designers and users, who actively participate as designers.	Users can become designers and collaborators, as designers empower them to control the process.

Table 4. Comparison between the proposals of levels of involvement of Kaulio (1998) and Ho and Lee (2012).

Bergvall-Kareborn and Stahlbrost (2008) described to approaches, quite similar to Kaulio's definition, one proposed by Mumford (1979) with three design types as consultative, representative and consensus, and other proposed by E. Olsson (2004), composed by three degrees of user involvement, namely users as subjects, users as informants and users as co-operation partners. Olsson's three degrees encompass several roles on a scale ranging from 'passive subjects to be observed' to 'active empowered partners'.

In the area of architectural design, Wulz (1986) represents the user involvement through two opposing poles that, although not commonly applied, illustrate the extremes of the architectural design process. On the one hand, decision making is performed exclusively by the architect, whereas the user decides with no intervention of the architect.

The stages of architects' or users' influence form a scale between the two poles, that is reciprocal, because "the decreasing influence of the architect is followed by an increase of the user's influence" (WULZ, 1986, p.155). Such stages represent the forms of participation (or levels of involvement, as used in this paper), that is, representation, questionnaire, regionalism, dialogue, alternative, co-decision and self-decision, described in the table 5 and figure 10.

LEVELS OF INVOLVEMENT	DESCRIPTION	APPLICATION EXAMPLE
Representation	The architect considers the user's needs and wishes. It is the most passive form of involvement.	Project with anonymous end user (planning of apartment houses and town planning).
Questionnaire	It presupposes statistically treated systematic studies on the users' characteristics and common requirements, to be structured and generalized.	Mass production of residential buildings (1930s), which reinforced the separation between client/user and between user/architect.
Regionalism	It focuses on the symbolic and architectural qualities of a specific area, combining representation and questionnaire.	---
Dialogue	Users provide information and can comment on initial design proposals. However, final decisions are made only by the architect.	---
Alternative	Users choose one among several alternatives within a fixed frame. The architect presents concrete solutions to be understandable by laymen.	---
Co-Decision	The users have balanced decision-making power are balanced with that of the architect. The users are involved since the beginning of the process.	---
Self-Decision	Users make decisions and the architect ensures the requirements of society are respected.	Forms of self-build and self-help.

Table 5. Levels of involvement. Source: Adapted from Wulz (1986).



Figure 10. Forms of user involvement in the design process. Source: Based on Wulz (1986).

The term 'participatory design' has also been used to address several activities that take place under differing circumstances (SINCLAIR, 2004). Some definitions seem very broad, as the one provided by Wulz (1986, p.153), who states that participation is a synonymous of user involvement and can be defined as "a general concept covering different forms of decision making by a number of involved parties". Some others are more detailed, e.g. the one of Granath, Lindahl and Rehal (1996, 1):

Participatory design refers to a design process where different stake-holders, in some way, are involved in the design process to improve either the design process itself or the outcome of the design process.

And the one of Wilcox (1994, 50):

A process during which individuals, groups and organizations are consulted about or have the opportunity to become actively involved in a project or program of activity.

Author(s)	Definition of Co-design	Definition of Participatory Design	Research Area
Manzini (2016)	A general design process, in which diverse stakeholders and disciplines interact.	The term was only cited, but not defined.	Architecture
Lam and Dearden (2015)	An umbrella term that describes the methods and discourses of user involvement in the design process.	It has multiple meanings and can be used to mask coercive power.	Service Design
Hasanin (2013)	Concerns the creativity of people not trained in design to work in the design process with designers. (Cites (Sanders, Stappers, 2008)	A dynamic process that involves students' awareness of the 'cultural project' and the user involvement at the early stages of the design process.	Architecture (involvement of students, not users)
Taffe (2015)	Specific instance of co-creation, with design process joining work of designers with non-designers.	Process that considers users partners.	Graphic Design
Hicks, McGovern, Prior and Smith (2015)	Collective creativity applied throughout the design process. (Citation of (Sanders and Stappers, 2008)	Gives greater influence on the user at the early stages of the design process.	Healthcare Facilities
Kim et al. (2016)	Co-design is a method and the level of effective user involvement.	The term was only cited, but not defined.	Architecture, Engineering and Construction
Barcellini et al. (2015)		Citation of (Robertson, Simonsen, 2012)	Information Technology
Stangel and Szósteck (2015)		Practice of involving non-designer users throughout the design process in various co-design activities.	Urban development
Robertson and Simonsen (2012)	<u>Activity</u> of 'co-designing' something.	A <u>Process</u> , not restricted to involvement. It comprehends "a diverse collection of principles and practices all aimed at directly involving people in the co-design of the technologies they use".	Service and Product Design
Frediani (2016)		Discusses several concepts of PD. The author argues it should no longer be seen as a tool that mediates conflicts and interests and focuses on the quality of the final product and democracy.	Urban development
Gerling et al. (2016)		Process of involving users in a design development.	Game Design
Bowen, Durrant, Nissen, Bowers and Wright (2016)	The term was only cited, but not defined.	The term was only cited, but not defined.	Academic-industry Collaborations
Kelly and Matthews (2014)			Product Development
Frauenberger et al. (2015)		PD was adapted and re-interpreted for diverse contexts, existing a wide spectrum of approaches on this theory today.	Information Technology

Table 6. Comparison of co-design and participatory design definitions presented by the studied authors.

Sanders and Stappers (2008) describe two levels of user involvement in the design process, namely user-centred design and co-design. In the user-centred design process, the researcher observes and interviews the user to broaden his knowledge of the user and informs the designers. The user is therefore considered a passive object of study. On the other hand, in co-design, users are considered partners and play an important role in knowledge development and in the generation of ideas.

According to Kleinsmann and Valkenburg (2008), the goal of co-design is the creation of a shared knowledge among the members of the multidisciplinary team, through the exploration of each one's knowledge, to develop a new product.

In service project context, the prefix 'co' of co-design indicates a broad collaboration in dialogues, involving both the users and internal teams of the organization, to discuss provided services and to seek improvements in products or services, in new or innovative ways (BATE, ROBERT, 2007; FORLIZZI, BATTARBEE, 2004). This collaboration does not imply users will become project experts; rather, they will be engaged in the discussion as users with experience in the services (BATE, ROBERT, 2007).

Concerning an effective user involvement in the design process, the SLR detected several papers in which 'co-design' or 'participatory design' describes it. No consensus on the use of terms was reached. The sixteen texts that used the term co-design are listed in the table 6, comparing the definitions presented, and the application area of the related research.

The history and definitions of the term 'participatory design' are based on theories formulated in Scandinavia and the promotion of democracy, according to several authors. It has undergone several changes and adaptations in different areas through the decades since its emergence. The term 'co-design' is more recent and focuses on the practice of 'designing together'. In many cases the definitions for both terms are overlapped.

5. DISCUSSION

An overview of user involvement since its origins in several areas has revealed the reasons for this practice are related to the promotion of democracy and quality of the final product.

The literature review reported here found several definitions for the expression 'user involvement' in the design process, in different areas, with no consensus. This confirms the lack of a clear definition, highlighted by Kujala (2003) and Magnusson et al. (2003).

The literature review indicated the level of involvement as one of the key dimensions for understanding the user involvement. However, the literature review showed several approaches of levels of user involvement, lacking a consensus as well, even in cases that used the same terms to describe the different degrees, as seen in Kaulio (1998) and in Ho and Lee (2012).

Several models of levels of user involvement were studied. Firstly, the article showed some models configured as 'participation ladder'. Although widely disseminated, these models have been criticized for, for example, only considering the power of decision-making as a level of participation; control of decisions as the only aim of participation (TRITTER, MCCALLUM, 2006), and having a limited utility, leading to the understanding that the higher rungs, which indicate more participation, are better than lower ones (DAVIDSON, 1998; LIGHTFOOT, SLOPER, 2001; SINCLAIR, 2004). According to Sfandyarifard (2013), these models fail to consider types of users, methods, and results, that are key factors in user involvement.

Subsequently, the paper presented other proposals to classify levels of user involvement, used in several areas, and finally specific definitions of the area of architecture and urbanism.

As highlighted by Wilcox (1994), there is no level of involvement that is better than the others. Nevertheless, the clear definition of these different levels is necessary to guide architects on what level is most appropriate for the design they are developing.

To compare the different approaches of levels of involvement studied, related to design process in different areas, the figure 11 summarizes those levels, according to each author, allowing a better visualization of them. First ladder-based approaches were not included, since they had been largely discussed in literature and are based more on the pursuit of citizen power than on the understanding of their requirements.

According to the figure 11, the level of user involvement increases from left to right, while the involvement of design professionals decreases. The table was

of users in the design process, as designers. In this research, the term adopted for this level is co-design, because it is more common in the literature and reflects the characteristics of this level of involvement better.

Finally, the levels placed after line '2' indicates minimal involvement of designers, and users control the design process. Designers may eventually participate as consultants.

Based on this analysis, this research has found three appropriate levels for building design process, considering that different stages, in the same design process, can apply different levels of user involvement, which may be chosen by the architect or the process coordinator according to design demands, user profile and building type. No level is better than the others, but each one can satisfy different needs in diverse contexts. Instead of proposing new terms, this study has focused on pre-existing research, trying to condense and organize existing terms for different levels in a simple way, suitable for building design context, to foster academic dialogue and the contribution among different research teams.

At the first level of involvement, users provide information about their requirements, needs and preferences and receive information on the design and process from the design team. The level is called 'Informative', based on Damodaran's proposition, well-accepted in academic research. Likewise, the second level is inspired in Damodaran's proposition 'Consultative', in which users can give their opinion on a set of predefined design options.

The third level is divided into two types, namely Participatory Design and Co-design. The division is based not only on the level of involvement itself, but also on the type of demanded participation. Both levels can be applied at the same level of involvement. Although there is no consensus, it is possible to propose different definitions regarding the focus of participation. While PD focuses on participatory decision making throughout the design process, co-design has a more operational character, through which design actions are shared between designers and users.

The term 'participation' or 'participatory design' is shown in the outcomes as it has been used with several meanings, a lot of them related with democracy. It refers mainly to a broad movement started in Scandinavia and does not clearly indicate, according to the results, the exact level of user involvement. Some authors consider PD and co-design as synonymous (STANGEL, SZÓSTEK, 2015), while others consider PD concerns to a more encompassing process (ROBERTSON, SIMONSEN, 2012; BARCELLINI et al., 2015; TAFFE, 2015).

This paper proposes that in PD the user knowledge and experience about the product or the service are transmitted to the designers in a continuous process of dialogue throughout the design development process.

On the other hand, co-design can be characterized as a joint design performance between users and designers in the design development. It is appropriate when users' experiences and knowledge are pertinent to the design action. Users participate on design operationally, either together, or with the help of designers. It is usually more appropriate in the early stages of the design, that is, in the programmatic, formal and functional issues definitions, present in the stages of briefing and concept design, up to the developed design. As the process progresses towards the technical design, the participation of users as co-designers

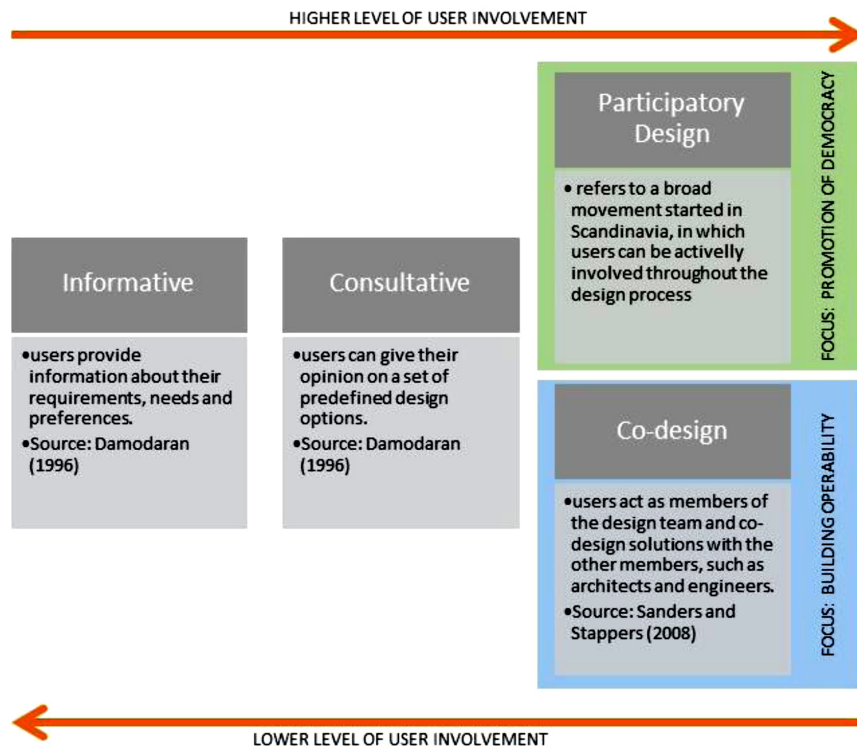


Figure 12. Levels of user involvement proposed for building design process.

becomes more difficult due to the limitations of knowledge and design experience.

Both strategies can be applied as a high level of user involvement in the design process and used separately or in a complementary way, according to the type of participation desired (Figure 12).

6. CONCLUSIONS

Involving user in the design process may properly align the building design and the needs and preferences of both current and potential users, enhancing the performance for the activities in the building. However, the literature lacks a clear definition of user involvement and the suitable levels of involvement in building design process. This paper has raised several approaches of user involvement in many areas, through systematic literature review, aiming at delineating a clear definition of the appropriate levels for this kind of design process, to help architects and design professionals choosing which level of involvement is more appropriate to each context, since there is no level better than the others, absolutely.

As a result, the research has compared the levels of user involvement that can be used in building design processes, in architecture, presenting their definitions, provided by several authors. Only the levels involving both users and designers were considered.

Finally, this paper contributes to the discussion about levels of involvement, by the comparison of several approaches found in literature. Future research may consider deepening the topic to address appropriate methods for each level of user involvement, considering the different stages of the design process.

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