Co-design in architectural practice: Impact of client involvement during self-construction experiences

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Abstract. This paper investigates how self-construction processes, considered as the utmost form of clients' involvement in the realm of building a family house, impact clients' and architects' interactions. The study of four cases (two involving "traditional" processes, two involving "self-built" processes) and the drawing of Experience Maps for each of them nurture reflections about satisfaction assessment, perceived quality and clients' integration to the architectural design process (potentially including co-design attitudes).

Keywords: Self-construction design process; co-creation; satisfaction assessment; architectural design

1 Clients and Architects Interactions in Architectural Design

It is widely accepted that designers and users are inextricably related in regard of both the design process and output. Designers have major impacts on the quality of the built environment, i.e. on the quality of life of many people. Designed artifacts, on the other hand, are meaningless unless endorsed by end-users (in power of taking ownership or rejecting them)[1]. These end-users are nowadays recognized as "owning the factual problem" [2] i.e. being experts of their own personal behaviors, experiences and issues. Research moreover points out that end-users are no longer willing to undergo the design process simply as external observers [3]: better informed, they expect to have their say all along the decision-making process, considering themselves as "part of the team" [4].

Acknowledging this evolution, disciplines such as product, service or software design progressively shifted from "usability" to "user-centered approaches" and eventually to "users-driven innovation" [5], while resources for participation such as "participatory design" or "co-creativity" and "co-design" also emerged, either in an institutionalized [6] or horizontal way [7]. In the field of architectural design, though, research shows that most architects rarely go beyond early conversational interactions to reach out to users' needs and expectations. Clients/architects' relationships have been investigated for decades [8; 9], and the analysis of their interactions offers provoking results: communication gaps largely subsist [4; 10; 11], limiting users' input to

functional and structural recommendations, with very rare attempts to integrate users into the design process.

It's a fact that architectural design processes entail numerous intricate, co-dependent constraints that might explain why architects are so reluctant to involve end-users as soon as preliminary design phases. But so is the case for closely related disciplines, such as product design or urban planning, where participation has yet been implemented (with various degrees of success) for several decades. This reluctance to involve users into the architectural process might therefore rather originate from some disciplinary tendency to consider architects as sole Masters of the design process, in control of prioritizing constraints in their own way. As discussed by Cole-Colander, architects indeed tend to focus on concepts, on powerful ideas that their achievements will convey; they try to persuade their clients to invest in a sustainable way of living, or in innovative building techniques and materials; they pursue recognition of their peers;... End-users, on the other hand, and even more specifically clients/future owners and occupants of the architectural artifact, are generally more attentive to other, complementary practical criteria such as cost, duration of the building process, return on investment, added value or future consumptions [12]. Expectations and definition of priorities, roles and missions therefore seem to quite drastically differ between architects and their clients. It is yet of crucial importance to re-align these perceptions, as the quality (of a service or a product) is defined as the intersection between the service/product provided and the initial expectations of the person served. Thus, if the provided service/product is below initial expectations, it is considered of poor quality; if the service/product meets the expectations, it is considered of acceptable quality; if it exceeds these expectations, it is considered of excellent quality [13].

Quality and satisfaction assessment in both the architectural field and construction industry have been the subject of research, but rather conducted in an attempt to develop processes such as "total quality management" and tools to manage customers' service expectations, post-process and post-occupancy assessments of such quality and satisfaction [13-17]. Those tools limit users' input to brief and design evaluation, neglecting the fact that their requirements constantly evolve through time, i.e. neglecting satisfaction towards the process and how it unfolds [18]. Satisfaction levels, as a consequence, remain under increased scrutiny and point towards delays, cost overruns and poor quality of products and services [19]. Since the 1960's government and industry reports have consistently warned about these low levels of users satisfaction, specifically within the architectural profession [1].

In this paper, we argue that architectural processes could benefit from the users' willingness for involvement and situated creativity. In order to do so, users should be considered as resources for the process, supportive of the architects who still have to deal with down-to-earth constraints (norms and regulations, timing, budget, …) and processes' uncertainties. When correctly facilitated, any level of co-design (even basic) might support this interaction, enabling clients to engage [20], learn and apprehend design values [1], and even reach problem and solution co-evolution [2]. On that basis, this research investigates how self-construction processes, where future occupants are largely involved all along the design process, impact end-users' and archi-

tects' interactions, satisfaction and assessment of the perceived quality (mainly in regard of the shared design experience).

2 Methodology

To answer this question, four case studies were chosen – two "traditional" design processes and two self-construction cases – all of these cases concerning new buildings (full-scale family houses or additions to existing buildings). We focused on such reduced-scale projects for two reasons: first because they constitute the larger part of the design activity of most Belgian architects [21], and therefore are representative of their daily realities, and second because clients, in the process of designing their own future dwelling, generally demonstrate more attachment and willingness to take part to the whole architectural experience. Additionally, according to Siva and London [1], the reduced scale does not diminish the relative complexity of the project in regard of the architect's involvement, in regard of stakeholders' respective definition of roles nor the multiplicity of constraints each has to adapt to. Cases were moreover chosen because they all still belonged to the early phases of the design process, understood here as the time interval between the first desire to build a new home, and the very first steps of the construction process.

Eleven in-depth interviews were conducted with the main stakeholders involved in those four cases, namely clients, architects and one carpenter with a recurrent expertise as "self-construction counselor" (two cases, one "traditional" and one "self-built", called on the same architect). Several themes were chosen to structure these semi-directive interviews: general presentation of the project (and its initial brief); criteria for architect's selection (or, when addressing to the architects: reasons why they agreed to accept the clients, their projects); questions about the perceived roles, missions and respective responsibilities of both clients and architects (as well as other trades, when necessary); description of the experience, the relationship and how it evolved/maintained through time; definition and description of the perceived "quality" all along the architectural processes.

Additionally, we took part to two work meetings (one concerning a "traditional" process, one concerning a "self-built" one) during which we conducted "fly on the wall" observations. This observation technique, after a short adaptation time, enables the observer to stay away from the stakeholders' activity and to interfere as little as possible with the ongoing exchanges and situations. If unnoticed enough, the researcher might this way observe the users, the contents and the contexts of a collaborative session in almost ecological conditions [22].

The contents of the in-depth interviews and fly-on-the-wall observations informed the drawing of Experience Maps for each case, illustrating evolution of actors' experiences and (dis)satisfaction levels with time. These Maps are built on basis of Adler's famous five-steps development model [23]:

- The **honeymoon step** refers to initial excitement and optimism, the individual feeling euphoric in regard of the new experience;

- During the **disintegration step**, or "culture shock", the individual goes through a period of confusion and disorientation, the differences (with the expected experience) becoming increasingly noticeable and cultural distinctions creating tensions and frustrations;
- The **reintegration step** is characterized by a strong rejection of the new culture; it demonstrates how the individual grows awareness for what really causes negative feelings and how he/she builds a basis for new cognitive experiences;
- The **autonomy step** is the moment when the individual feels comfortable with his/her status of both "insider-outsider" in two different cultures. This stage is characterized by more personal flexibility and by the development of "appropriate coping skills";
- In the fifth and last **independence step**, the individual is able to accept and draw benefits from cultural differences and similarities. As Adler underlines, "*he or she is capable of experiential learning that is holistically incorporated into identity, while at the same time capable of again having preconceptions, assumptions, values and attitudes challenged*" (p.18).

The first, fourth and fifth stages are considered as "positive experiences", while the second and the third (disintegration and reintegration) are rather considered as "negative experiences" in this paper. The Experience Maps are designed to only document the most significant moments, as defined by the subjects themselves: they therefore have no ambition to illustrate the complete design flow. Although they do not aim for exhaustiveness, we argue that these Maps constitute an effective way to visually question how traditional vs. self-built processes may impact clients' overall experience and satisfaction in regard of early architectural design phases.

3 Results

3.1 Case #1, Traditional Process – "Perseverance in the Face of Disillusionments"

The case, the building of a family house, gathers a couple of clients (referred here as A & B, to respect anonymity) and the architect A, with 30 years of experience. The client B involved herself a lot in the design of her house, providing the architect with very precise requirements in regard of architectural desires, functional needs and spaces' articulations. The client A, on the other hand, got rather involved in the technical follow-up of the building site. The construction follows a "traditional" process, involving several, independent trades. The clients will themselves only be in charge of a few late finishing work.

Following in-depth interviews conducted with each stakeholder separately, we draw an Experience Map divided in 7 main phases, in accordance with the descriptions provided by each subject (Figure 1). The first phase only involves the client B, who started to write down her ideas for her "future, ideal house" a decade ago: "*I*

observed everything, I collected a lot of inspiration material and images from other projects, in magazines, during my travels" (Client B, translated from French by the authors). The client, thus, demonstrates a high level of involvement (even prior to any concrete design project) and progressively builds her expectations. After 5 years as married couple, the clients A & B decide to buy a piece of land and to build a house. The client B recalls she felt some apprehension in sharing her vision of her "ideal house" to her husband: "*I have a strong character, and I don't dare imagine what would have happened if my husband had refused my ideas*" (client B). Client A, on the other hand, at that time had no particular requirements and therefore really easily accepted client B's suggestions.

The third phase corresponds to the search of an architect. Self-built process as well as turnkey solutions are rapidly dismissed: the first one necessitates time and skills the clients claim they don't possess; while the second one offers too limited architectural potentialities, according to the clients, to adequately meet their expectations. Both clients dreaded the search for an architect, especially client B who had at that time a strong opinion about architects in general: "*I had the image of an architect seen as someone cold, and uncommunicative*" (client B).

To the fourth phase corresponds the first acknowledged "negative experience" for both clients. The architect A has been chosen through word of mouth, and the very first meeting (on the building site) goes really well, as client B underlines: "*I was happily surprised to observe that the architect was looking for dialogue, instead of imposing his ideas*" (client B). The architect A is indeed very keen to listen to his clients' desires, but yet has to warn them that the single-story house they always dreamt of will not be technically possible, given the strong declivity of the land they just bought. This is experienced as a real shock for both clients, who imagined that somehow the land could be leveled to deal with this aspect. The client B, in particular, expresses difficulty in recovering from such a bad new, as she projected herself already a lot in her "perfect, future home". From the architect' point of view, it was no real surprise to deal with such disillusion and frustration; he'd rather work with clients that have a precise idea of their needs, even though it means help them face some discouragements from time to time.

The fifth phase constitutes an additional shock, as the architect presents an adapted project, well fitted to the clients' desires and to the land's slope, but way out of budget considering what the clients had in mind. The architect remains confident, as he's used to this kind of situations; he knows it will take time to work hand-in-hand with the clients to find compromises that will help decrease the total cost. During phase 6, the clients go back to a few turnkey contractors to evaluate how much a simpler project would cost. They rapidly realize that given the slope of their land, not even turnkey solutions will help drastically reduce the total cost. The architect A, meanwhile, remains optimistic and keeps submitting new ideas and solutions to the clients. Both of them will eventually admit that working with architect A remains the best solution if they want to build their "dream house". The end of the preliminary design phases does not generate any more disappointments according to the stakeholders, as clients and architect cooperate to find concrete solutions to adjust the project to the limited budget, and vice-versa. The construction experience is thus positively experienced by

the two clients, who define it as "*laborious and energy-consuming*", but also instructive and exciting. The architect recalls a positive, demanding but exciting experience, given his interesting and courageous clients.

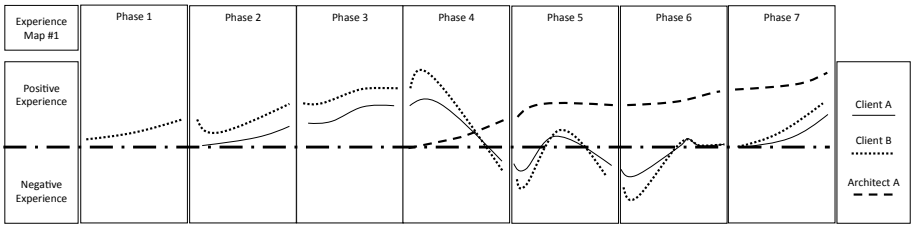

Fig. 1. Experience Map #1, traditional case.

3.2 Case #2, From Self-Built to Traditional Process – "About Keeping Control, even during Resignation"

The second case involves the same architect (A) and one main client (C). The latter wished to double the surface area of his town house by self-building an extension. He decides to call on an architect but only to make sure that his project is in line with some urban regulations. From his point of view, and at the beginning of the project, he felt perfectly capable of dealing with such a construction project all by himself. At the beginning (phase 1, Figure 2), the client is therefore quite euphoric and positive about his own capabilities to conduct the project successfully. The second phase marks a first disillusionment, as architect A underlines that the envisioned project actually infringes several urban regulations and that it won't be permitted to built it as such. The client C then admits the importance to call on the expertise of an architect, and asks architect A to re-draw a new design proposal for his extension: "*he opened my eyes on so many things in such a few time… it would have saved me a lot of time and effort if I had called on him at the very beginning*" (Client C). The architect, during the third phase, suggests three different design drafts to the client, who consider all of them "*completely off the mark*", but still interesting because they "*raise questions I never asked myself before*". The refusal of all three designs constitutes a disappointment for the architect, even though he realizes that the effort made at least had the added value to open up new perspectives. To the fourth phase corresponds the submission of a fourth sketch, this time considered as adequate by the client. Both stakeholders declare being enthusiastic at the end of this phase.

While waiting for estimates from several sub-contractors, client C decides to undertake some preparatory work (such as, for instance, delimitating the layout of the premises). This work consumes way more time than he had expected: "*I didn't realize it would take me a whole week-end to delineate the land… I have the necessary equipment, though, but learning how to use it correctly is another story*" (client C). Following this realization, the client discusses his project with several sub-contractors and eventually admits that he won't be able to conduct a self-built construction site as

initially expected: "*although my project is simple, the construction techniques are complicated. It's a full time job, that's all*" (client C). Phase 6 is a real disillusion phase, but qualified by the client himself as a "*positive, instructive experience*" as he remains in complete control of each decision and resignation, even this setback to a more traditional construction process. Architect A, meanwhile, describes the experience as globally positive as his 30 years experience made him accustomed to these kinds of uncertainties and hesitations.

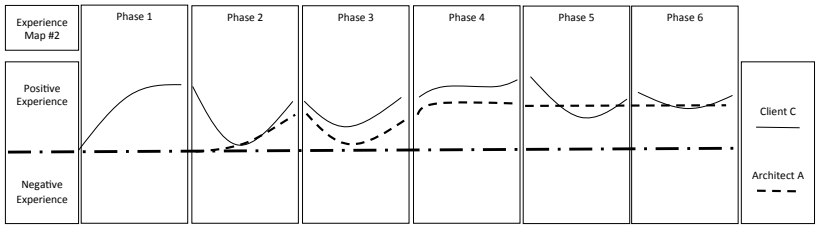

Fig. 2. Experience Map #2, from a "self-built" to a "traditional case".

3.3 Case #3, Self-Built Process – "About Letting Things Go, and Dealing with Communication Gaps"

The third case is about the extension of a four-façade existing house, built on a sloping ground. The client (D) has made the decision to self-construct in order to control the costs, but also because he says he's "someone manual" who likes making things by himself in order to control the overall quality: "*when I do something myself, contrary to sub-contractors, I take the time to do it well"* (client D). He wants the extension to be modest, not some "*ostentatious project*" that would denature the perception of the surroundings. This simplicity will not be to the liking of the architect (B), who comments: "*it's a functional, unoriginal project that answers the needs of the client, nothing less, nothing more*" (architect B). At the beginning of the project (phase 1, Figure 3), the client is reluctant to choose an architect; he says he never got good feedbacks about clients-architects relationships in general, and he dreads to enter in a potentially conflicting relation with someone he knows. He therefore selects architects he absolutely does not know; another selection criterion is that the architects have to agree with a self-built process involving timber structure. It's client's D partner who will at first meet the chosen architect (B; 20 years experience); she explains being very attracted to the "*modern-looking realizations*" that the architect presents on his website. The architect, after this first encounter, meets with the clients several times (phase 2), but admits "*having a hard time deciphering the clients' wishes; after two meetings, I still had no clear understanding of their program*" (architect B). He still decides to submit a first sketch, essentially to foster a more constructive dialogue in that regard. The client D considers this first sketch as unsatisfactory: "*he* [the architect] *didn't respect any of our wishes; the project was too modern with no specific opening towards the interesting view*" (client D). From the architect's point of view, the goal of this first design proposal was to "generate some debate". He adds having

some difficulties in reconciling both clients' points of view: "*several times I had the feeling to act as marriage counselor*". Although this first submission is considered as disappointing by all main stakeholders (see phase 3), they decide to pursue their collaboration and to keep discussing other design drafts. According to the architect B, "*they* [the clients] *kept sending me my prints back with written comments and corrections that weren't at the right scale, as well as out-of-scale free-hand sketches that expressed furniture's arrangements simply impossible to implement*" (architect B). The client D, on the other hand, didn't understand why the architect kept "*showing us modified plans including several errors we had already pointed out*" (client D). Those multiple attempts to adapt the project constitute consecutive shocks for the stakeholders that express "exhaustion" in regard of a "negative experience".

They eventually reach an agreement, and require a building permit for the selected project. The subsequent exchanges with the urban department cause additional shocks for client D (phase 5): the architect B is required to adapt several aspects of the project, modifications that very badly experienced by the client. Additionally, client D complains about several mistakes that subsist through the file. For instance: " *all along the report, he* [the architect] *stipulates I only have two kids and that the project only contains three bedrooms. But that is completely incorrect, I have three kids, each one with their own bedroom !"* (client D). These mistakes and communication gaps exacerbate the negative feelings. Meanwhile, the client D decides to invite an external counselor, expert in self-construction, in order to prepare for the construction site and to receive some technical advices. The counselor, after looking through the project, reassures the client D: the timber structure is absolutely not a problem, nor will be the self-built process. This encounter helps client D gaining back some optimism: "*since we got the building permit, I started to prepare for the construction and I'm quite excited to start*" (client D).

Phase 6, eventually, relates to the very first work meeting gathering all stakeholders (client D, counselor and architect B). From the client's point of view, the counselor provides professional advice and "*produces, in a single meeting, as much work as I had expected from the architect in several months*" (client D). The architect B, on the other hand, remains divided: "*he* [the client] *made every choice I wouldn't have done. Perhaps I should have refused this client after the very first encounter*" (architect B). At the end of this meeting, the counselor remains optimistic, but also a little anxious in view of the difficult relation between the client and the architect.

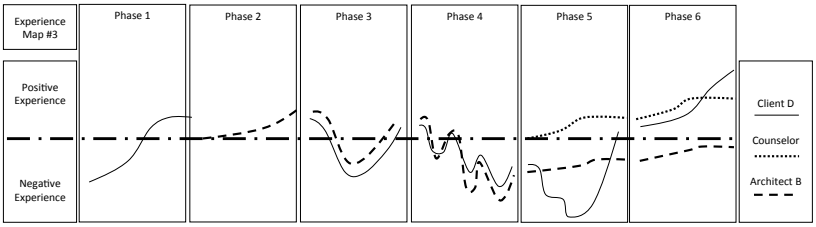

Fig. 3. Experience Map #3, self-built case.

3.4 Case #4, Self-Built Process – "About Shared Involvement and Co-Design"

The project is about extending an existing family house in order to build to client E, a professional caterer, an up-to-standards culinary shop. The architect C, 24 years experience, works with many clients interested in self-construction and finds the collaboration always fruitful: in his opinion, self-construction is like a "*rite of passage during which I like to see my customers transform and gain some experience*" (architect C). The client E, as independent caterer, argues having "some sympathy and compassion" for the job done by an architect, whose difficulties are quite similar to hers in her own words: "*services performed in tight budgets and whose clients will never be completely satisfied*" (client E). Client F (client E spouse) also gets involved in the project and holds a certain technical background in metal construction, acquired thanks to former activity in the industry.

The clients had not envisioned self-construction at first. But given their very tight budget and their willingness to build an "eco-friendly" extension, the self-built process suggested by the selected architect eventually convinced them. Client F quickly suggests integrating his expertise in metal construction to the project. Architect C is enthusiastic: "*it is very nice to meet clients with specific skills, that give us a place to pull ideas from*" (architect C). Client E, as for her, remains much more neutral and quiet: only the functionality of the final project really matters (phase 2).

Phase 3 relates the process of obtaining the permit. Although the urban department underlines the quality of the project (thanks to its apparent metallic structure, among other features), it requires the building to be slightly repositioned on the sloping ground. Both the architect and the client E have difficulties dealing with this demand, which, according to them, calls into question several qualities of the project. Client E remains again rather impassive, hoping that this difficulty won't slow down the process.

After obtaining the permit, and waiting for the construction to begin, client F starts studying the building plans with great attention. He detects some errors and incoherencies, and experiences them as a shock (phase 4): "*it would be better to avoid this kind of inaccuracy with auto-builders. Self construction itself is already pretty scary !"* (client F). The architect apologetically recognizes the errors, explains that several collaborators have reviewed the project (including interns) and that it is sometimes difficult to control a perfect transmission of information inside an architectural office.

Phase 5 starts with a first work meeting (including the clients and the architect) on the building site. Both the clients are really receptive and qualify this first "initiation to self construction" as very instructive and positive. Client E starts to really believe in the project's potential and its outcome: *"at first, I didn't think he* [her husband] *would be able to build all this by himself. But after a few weeks, I realized he could !"* (client E). Phase 6, yet, generates some disappointment as the implementation of the metal frame on site proves to be more complicated than expected. In view of the total weight of this frame, it seems practically impossible to put it in place without the intervention of some equipped sub-contractor. Client F has difficulties facing this new and comments: "*at that time, I had the impression to suffer some architect's cosmetic caprice*" (client F). The client F therefore asks the architect to find a solution, in order

for him to be able to self-pose the metallic frame. Eventually, the frame will be divided in two sub-parts, which makes the manipulation hazardous but feasible. At that point of the construction process (phase 7), all stakeholders judge the experience as positive. The clients, even though they describe the self-construction process as being "exhausting", underline the excitement as well as the instructive aspect of it. As for the architect C, even though the project generated some problems of communication (in between his office and his clients), he insists on the pleasure he experienced in seeing his clients blossom and be proud of their achievement.

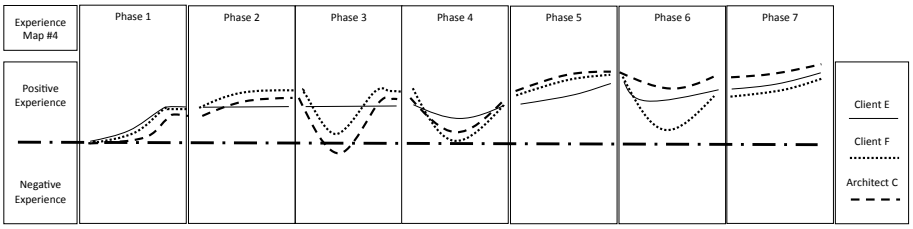

Fig. 4. Experience Map #4, self-built case.

4 Clients-Architects' Interactions in regard of Traditional vs. Self-Built Processes

The data collected through these four highly contextual cases have to be handled with care: future work will include a necessary step of Experience Maps' validation with the clients and architects themselves, and their limited representativeness should not lead to any kind of premature generalizations. We select here only some specific observations that might fuel some reflections about how traditional vs. self-built processes impact clients-architects' interactions during early architectural design phases.

From the first case, we recall that the perseverance of the clients and architect surpasses successive disappointments generated by a too large gap subsisting between early expectations and building realities, gap that generally causes disappointments in terms of perceived quality of a product or a service [13].

The second case, although not eventually conducted as a self-built process, is largely shaped by the strong character of a determined client who needs to keep control on every step of the process, including the resignation and decision to resort to a more traditional building process. This case demonstrates how crucial it is for an architect to remain focused, flexible and capable of adaptation when dealing with such uncertainty.

The third case illustrates the difficulty, for some architects, to "let things go". If the role of the client limits to "evaluating and detecting errors" from draft to draft, moments of interaction only resume in dealing with frustrations and tensions, whereas self-construction should instead generate constructive sharing of experiences/expertise. In this case, communication gaps largely subsist, and although the clients are eager to invest self-construction, they reveal unprepared to deal with the complexity of such a process. The integration of a "counselor", seen here as a new comple-

mentary expert, might help bridging this communication / preparation gap. Communicating regularly and explicitly also means enabling the clients to acquire enough knowledge (architectural "culture", awareness of projects' complexities, or even basic vocabulary) necessary to correctly express needs and requirements [1].

The fourth case, eventually, demonstrates how working hand in hand with informed clients (either because they hold some technical skills, or more simply hold some understanding of the architect's role and day-to-day difficulties) generates added value for the whole self-built process. Clients express satisfaction in view of an instructive process, as well as the architect who expresses satisfaction in view of generating what we would refer to as "architectural awareness". From this case we also recall that such clients-architects collaboration might generate creative insights and even, in some aspects, evolve through mutual learning and co-creative experiences typical of co-design processes.

Self-built processes, hypothesized in this paper as the utmost form of users' involvement, do not yet systematically translate into "positive" Experience Maps (i.e. experiences considered as fruitful and satisfying). Be they self-built or traditional, one should recall that architectural design and construction processes remain complex and ill-defined, full of uncertainties, incoherencies and unscheduled events expected to occur. After some "honeymoon phase", clients and architects will certainly experience some degree of "habitus shock", a concept we borrow from both Adler's five stage development model [23] and Bourdieu's sociological observations [in 24], and that explains why users experience disorientation, frustration and even stress as they face an unfamiliar (architectural) habitus. Self-built processes, we argue, might nevertheless ease the path towards Adler's autonomy step as the adjustment process necessary to deal with each of these shocks gets nurtured by a better understanding of the project's complexities and the realities of the world of construction.

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