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# A HUMAN-CENTRED STRATEGY EXPLICATING AND DESIGNING *HIDDEN PROGRAMS* IN ARCHITECTURAL DESIGN

RUTH STEVENS, ANN PETERMANS AND JAN VANRIE

## Abstract

In 1978, Silverstein and Jacobson articulated the "hidden program" as the socio-spatial backbone of an architectural design, an intriguing plea to incorporate users' psychological needs. Notwithstanding human-centred foci in design research, and recent professional attempts to anchor human-centred design in practice, it has not yet been formalised *what* psychological needs can be addressed nor *how* "hidden programs" come about. As the built environment today showcases interesting examples of "richer" programs, these programmatic gestures remain implicit, and they are therefore not systematically incorporated. This articles' aim is bifold, namely, to explicate these design efforts through a retrospective view of the design process via a specific novel human-centred lens focussing on psychological needs in architecture, and to interpret the findings into a strategy to design what we now label "enriched" programs.

Keywords:
architecture, programming, design process, human flourishing, design education

## 1. Introduction: State of the art of the program in architecture's recent design history

In trying to create a more "humane" architecture, the development of a "program" is key in architecture (Stevens et al., 2019a; 2019b). Strikingly, the development of such a program does not take the most prominent place in traditional architectural practice or research today; designing a program is still often sensed as inefficient (Hassanain & Juaim, 2013), and available programming guides or methodologies are regularly labelled as inadequate (Yu et al., 2005; Bogers et al., 2008; Hassanain & Juaim, 2013).

This has not always been the case, as in the 1970s the program was brought to attention in the work of architects such as Preiser (1978), Silverstein & Jacobson (1978) and Pena, Parshall & Kelly (1977), urging for a more humane approach in designing large-scale public buildings. In the 1970s, Silverstein & Jacobson (1978) criticized the lack of sufficient design time spent on the programming phase and coined the term "hidden program", meaning what we implicitly expect from a building, the shared understanding of a place, connected with how we intrinsically know to behave. For instance, we dress, order and behave differently in a fast-food bar than in a gourmet restaurant. Silverstein & Jacobson (1978) urged architects to depart from this *hidden program* in their architectural practice, believing it concerns an unrefined socio-physical form of the building, addressing certain needs people have. In their positioning paper, they use the example of a supermarket building, that "feels" intrinsically faulty. Instead, they depart from its hidden program, and redesign it to benefit shoppers by connecting buyers to growers (of food) and appealing to the buyers' understanding of where the food comes from. Looking at their suggestions from a humane point of view, it is clear that these authors are proponents of an experiential approach in architectural design and search for values people tend to seek in relation to the function of the building. Their approach has however not caught on in practice, and from the 1980s onwards, we seem to have lost this fragile connection due to Post Modernism and its focus on deconstructivist thinking in architecture (Cherry & Petronis, 2009, 2016).

In the first decades of the 21st century, the program in architecture theoretically reappeared to the foreground as a driver for more socially responsive architecture. In 1999, Hershberger stressed the potential of the architectural program to explore *values* of clients and of society, in a predesign phase (Hershberger, 1999). Values in that respect refer to philosophies, understandings and feelings regarding the raison d'être of the future building. These insights were operationalized by Barczik & Seger (2008) and Rietveld & Rietveld (2011) who amongst others furthered the strategy of designing "interventions with social relevance" to enrich architectural design. Koolhaas (Miljacki et al., 2006 argued that the program could circumvent the architect's passivity to enrol projects from their own initiative. The work of Aravena's Elemental Studio on incremental

housing (Elemental, 2020) is exemplary for Koolhaas' argument. These insights helped to develop inspirational, more humane architecture by a designer who aims to create something meaningful for (hu)mankind.

Thus, the program has evolved from a pre-design action (in the case of Silverstein & Jacobson (1978)), to being intertwined with the entire structure of design (Dinc, 2002). In other words, programming evolved from being a rather static event focused on capturing requirements into an iterative process incorporating social learning, as discussed by Dogan & Zimring (2002) and Zwemmer & Otter (2008). We see that the program is gaining foothold in practice, albeit not yet systematically and explicitly.

In 2018, in searching for ways to design a more humane architecture and integrate well-being, we introduced the novel human-centred design strategy of Design for Human Flourishing (DfHF) in architecture, in which program design ought to take centre stage (Stevens et al., 2019a; 2019b). In well-being literature, next to terms such as self-actualization (see Maslow, 1954) and thriving (Mäntysalo et al., 2019), the concept of human flourishing is perhaps the most ambitious interpretation of "well-being", meaning "a human process leading to self-actualization or becoming the 'best' person one can be, by fulfilling one's psychological needs[1] and applying and developing one's personal talents..." (Stevens, 2018; Stevens et al., 2019c), which is operationalized in architecture as follows: ... "by consciously and actively interacting with the designed environment that surrounds one" (Stevens, 2018; Stevens et al., 2019a; 2019b). The DfHF strategy distinguishes itself from other human-centred strategies through aiming for a long-lasting impact on the user, even when the users have left that particular environment, via the intangible characteristics of the environment, helping users to build inner strength and create meaning in their interaction with the environment (see Stevens et al., 2019b). Here we seem to encounter a revival of the initial "hidden program", as through our research, we have found that flourishing can be stimulated through architecture by environments that are loaded with a "rich" programmatic content. The theoretical trajectory of "Design for human flourishing" in Figure 1 provides designers with an insight into how these kinds of environments with enriched programs can be shaped (Stevens, 2018; Stevens et al., 2019b). Concretely, an understanding of a target group's psychological needs should be translated into meaningful activities that the to-be-designed environment should facilitate (see the left part of Figure 1). That gives further direction to the development of the physical, material reality of architectural elements (see the right part of Figure 1).

1 Psychological needs refer to needs that come from within, and appeal to the self-actualization of a human being (Ryan & Deci, 2001; Ryff & Singer, 2008; Desmet & Pohlmeyer, 2013). Psychological needs are "shared" needs within a target group, for instance, children feel the need to dare and challenge themselves, however the intensity levels up to which they feel and act upon it, can vary (Stevens, 2018).

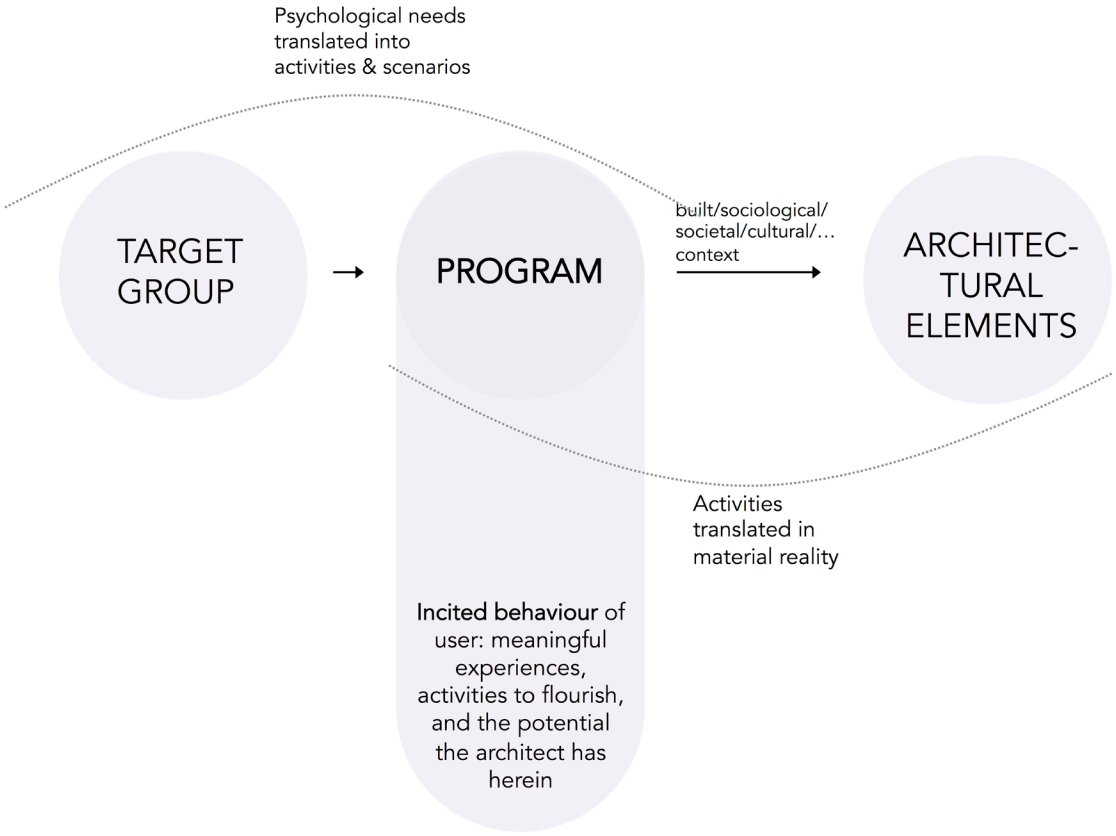



Figure 1
The DfHF theoretical trajectory: programming as a key design action

At that point, it became clearer what the program should consist of. However, exactly *how* it should come to life on the level of the architectural design process, was still unexploited territory. Therefore, in what follows, we elaborate on this in more detail, thereby answering the bi-fold aim of the article.

## 2. A programmatic problem statement & methodology

While diving into everyday architectural design practice through in-depth interviews with architects organised in 2018 (Stevens, 2018), we noticed a palpable twisted relation with the program-phase. Yes, interesting fragments of programs are found, however architects seem to be lost for words in *how* these came about.

These in-depth interviews with designers (see Stevens, 2018) learned that when asking them to cite the steps they encountered in their design processes, none of them explicitly mentioned "programming", notwithstanding they did seem to invest time and effort in handling user-related aspects. However, some mentioned a step they called "program of demand", handling the list of demands provided by the client, for example via a design brief. Several studies support the trend that designers nowadays have a too narrow understanding and restricted view on what a

program implies (Cherry, 1999; Robinson & Weeks, 1983; Stevens, 2018). Indeed, the design brief marks a start in an architect's design process, but instead of further developing such a document, it is often sensed as complete, or only limitedly refined by the designer (Yu et al., 2010), which endangers its accuracy. Studies that indicate gaps between user expectations and the degree to which a building meets these expectations (Hudson, 1999; Erdener, 2003; Bogers et al., 2008) learn that the design brief is not exemplary of user expectations, and therefore not representative for an architectural program. Moreover, it represents particular requirements to be attained; it does not provide answers (SDWC, 2004) or opportunities (Harputlugil et al., 2006).

After having performed these interviews (Stevens, 2018), we comprehended why architects do not *yet* feel equipped to formally design a program even though attention is rising, and actions are implicitly taken. Therefore, this articles' aim is to explicate efforts that are implicitly present, and structure these via the DfHF-framework, in a way that it is helpful for architects.

To do so, this article starts from dismantling the program into layers from a human-centred mindset, in line with Bernard Tschumi's advice "the first thing an architect needs to do is dismantle that program and redirect it" (Miljacki et al., 2006 p. 8). There we find an interesting starting point in searching for implicit design actions architects take today but fail to recognize and mention when sharing insights in their design process. To explicate these efforts, we set up a case comparative study with a qualitative approach, using in-depth interviews with architects and stakeholders to discuss the design process. During the interviews, documents of the design process were used as visual stimuli to help architects to self-reflect and to discuss the bits and pieces in their design processes, linked to flourishing.

The findings of the case comparative study are then structured in an explicit way that can be used to guide other architects in the early stages of their design process, help them to embrace programming matters and allow the program to claim more design attention during the early stages of design. This resulted in a four-phased process. We conclude the article by bringing this four-phased process into contact with the Design for Human Flourishing theory and discussing the value of our findings for theory, practice and education.

## 3. Dismantling the program into layers: finding *the flourishing layer*

In global terms, in architectural design, the program concerns reflections and decisions about the *functions* a building harbours (Cherry & Petronis, 2009; Hershberger, 1999; Pena et al., 1977; Duerk, 1993). We inter-

pret the program as a multi-layered construct that goes beyond simple *functions*, and with a human-centred mindset, we peel off layers based upon the programmatic content; that is, what it affords to its users, and the flow of information that needs to be integrated in the programming design process to obtain results. In that way, we can intercept what architects *do*, *do not do*, and *do not know they do* relating to the different aspects in the program, and develop strategies to insert in the process. The following four layers in a building program can be recognized: (1) a core theme, (2) a functional layer, (3) an experiential layer, and (4) a flourishing-layer.

**Table 1**
**Identified layers of an architectural program**

| PART OF PROGRAM | *Example movie theatre* | Implies | Facilitates | How does the designer know/receive this info? |
|---|---|---|---|---|
| CORE | *Movie rooms* | The building's main function | Its existence | Part of the repertoire, inherent knowledge |
| FUNCTIONAL | *Register, billboard, lavatories* | All that is necessary to have the building up and running | A more practical, functional visit | Communicated via the design brief & Familiarity due to expericene in designing that type |
| EXPERIENTIAL | *Snackbar, cafè, restaurant* | Stretching the main function, adding experiences to it | Savouring; a more pleasant and comfortable experience | Communicated partially via the design brief & Remembering proper visists there |
| FLOURISHING | *Film atribute museum, love chair* | Trigger fulfillment of spesific needs | A memorable visit, touching the heart | Not in the design brief & Mostly not explicitly designed... → *Designer needs to relive experiences there and understand how he/she felt and what made him/her feel that way.* = *understanding needs and linking these to spatial reality*<br><br>Designer must have good listening skills: read between the lines, interpret what is being said. |

To clarify Table 1, we use the example of a movie theatre. First and foremost, a movie theatre should harbour a relative number of film rooms where one can watch a movie being played, since playing movies is the main purpose of a movie theatre. This is the core program, or the building's main function, its *raison d'être*. This "core program" is usually part of the architectural repertoire of every architect.

Second, one would also expect a movie theatre to have a register to buy tickets and toilet facilities. Those accommodations make a movie theatre visit practical and functional. This so-called "functional layer" contains all the information necessary to have the building "up and

running". Information about the functional layer of the program is most often communicated to the architect via the design brief or the "program of demand" that a client presents at the start. These briefs often contain the basic and logical information. Some particularities specific to the type of building, such as the presence of different entrance and exit routes of the movie rooms in a way that people cannot sneak back in after their visit, are noted as well. Architects can also be familiar with this information through experience in this specific typology.

However, when going to the movies one probably also fancies the presence of a candy bar, a lounge area to wait comfortably until the movie room is ready for use, or the presence of a restaurant where one can anticipate on the movie with friends, or a café, where one can "cool off" and review the movie afterwards. These are activities of savouring (Hassenzahl et al., 2013). In other words, these architectural practices and accommodations make a movie theatre visit more comfortable and jollier. This is what we now call the "experiential layer". This kind of information can be partially communicated via the design brief but can be recalled by the architect when remembering his/her visits to a movie theatre, and what he/she *did* there.

Now what can make a movie theatre to be more flourishing? In what way can a movie theatre fulfil users' psychological needs? Maybe in supporting one to remember being taken to the movie theatre on a first date by their partner many years ago, in the hope of sharing a private romantic moment? Can some sort of designed physical intervention, for instance a love seat, trigger such a memory and help one to reminisce with one's partner? An architectural intervention to trigger flourishing can also be, for instance, about sharing knowledge, by means of a film attribute museum at the entrance, where one can brag to friends about knowledge of film attributes, or where one can expand knowledge about certain directors. Those are flourishing aspects, that feel like cherries on the cake to a movie theatre experience. These flourishing aspects are not communicated to the architect via a design brief, and they are most often not designed explicitly. They can only be designed by architects if they take the time to not simply run through their own movie theatre visits, but if they invest time in understanding how they felt during a movie theatre visit, and what made them feel that way. So they need insights and knowledge about users and their psychological needs at a particular time, and they need to link this to a spatial reality with a mindset on designing spaces in which a person can flourish.

Asking designers about the purpose of a movie theatre will generate many answers; it will hint at what layer their respective design practice typically manifests itself in in this respect, and the value a designer implicitly assigns to the different layers. To help designers create enriched programs, their focus must be on the flourishing layer. Thus, in order for

us to uncover implicit human-centred, flourishing gestures, we must direct our focus to question designers on how much they are personally aware of the flourishing layer, and how they use their gut-feeling and their own experiences through their design processes.

## 4. A first step to constructing an enriched program: – explicating implicit design efforts

Notwithstanding that programming seems to entail a non-explicit and structured part of the design process, hints of flourishing-related program particles are implicitly present in architectural practice, as evidenced by innovating architectural realisations, such as in care typologies. A Nordic example is Hjältarnas Hus (House of Heroes), a home for emotional care for child cancer patients (Hjältarnas Hus, 2018) in which the well-being of patients and their family is the main focus. To bring these ways of working to the surface, we must dive deeper into specific design processes of innovating cases and to learn from the built example (Daalhuizen et al., 2019) to explicate and tailor programming efforts regarding "enriched" programs.

### 4.1 Methodology

We have set up a case comparative research and selected five architectural care housing projects with an innovative program to investigate the research question "Via which implicit actions did rich programmatic fragments come about?". Cases were selected on two primary criteria: first, on innovations in the housing or care concept and second, on variation in typology (scale and size) of care housing[2]. We did not pose geographical restrictions in our search, as innovations are scarce. We are aware of the possible cultural dependency of certain innovations, this was researched and framed in the study of the cases as well. For each of the selected cases, in-depth interviews were conducted with the architect and/or with other designers/stakeholders who had a crucial role in the program-development of the concerned project (e.g., service designers, or the paying client), to zoom in on their design perspective and the process they went through in the design of the project. The in-depth interviews were semi-structured around questions that were drawn up around the first two components of the theoretical trajectory of DfHF, see Figure 1. In that way, the interview could provide nuanced insights into how the relevant designers' particular design process of the program occurred. During the interview, documents (sketches, plans, 3D images, notes, etc.) made during the design process were often shown by the architect and were used as a visual stimulus. Seven interviews took place at the interviewees' office, and two took place via digital communication ways, between July and October 2016. They each took in-between 120 and 180 minutes. In every interview, issues and aspects were profoundly discussed and unraveled[3]. Overall, a rigorous approach was applied complying with an explorative qualitative research method, and in

2 The typology of care housing was selected due to its societal relevance, the research interest from different (design) disciplines and the fact that DfHf is a target group dependent design strategy (Stevens, 2018). The selection criterium "innovations" can be illustrated by for instance a different take on the care concept, such as a demand-driven instead of a supply-driven care concept in the type of residential care centers. Another example of innovations is mixed populated sites, in which youngsters live together with older people and help to fulfill each other's needs. The second criterium of variation in the type points at the different types of elderly housing that are present: residential care, assisted living concepts, the small scale living concept, care houses nearby hospitals, etc.

3 The interviews were part of a case study research on programmatic gestures in the architectural design process, which can be read in detail in Stevens (2018).

that respect, it is not uncommon to report findings based on these types of input (e.g., see Lincoln & Guba, 1985).

Since the interviews were set up to gain insight and uncover implicit programming actions in the light of flourishing, the designers were first asked to capture the different steps in the design process on an A3 paper, to use as a guide during the questions and answers later on. All interviews were audio recorded, were transcribed verbatim and software was used to firstly link relevant fragments of the interview to the different steps that the designers had noted on the A3 paper. Secondly, software was used to filter, tag and label unique designed user experiences and "humane" design decisions, discussing in particular what the design should provide future users with. All these relevant fragments of text were coded to themes and keywords in order to place a true "humane" lens onto the concerned architectural design processes. Then, for each case, the architectural design processes were drawn out in consecutive steps, focusing on the "humane" design decisions by incorporating the different design actions and decisions architects had taken implicitly. Indeed, implicit actions that were taken intuitively by the designer, relying on gut-feeling, and that were not explicitly labelled as flourishing-related actions by the designer. We were able to explicate these using the lens of the DfHF theoretical trajectory (see Figure 1) and question our data regarding "what psychological need is addressed by what action?". Thereafter, the processes were compared across cases, and all coded fragments of the interview transcripts were cross-case-analysed to understand the particular design intentions, and to identify overlaps and differences. This rigorous approach led to saturation and "consensus" (see Lincoln & Guba, 1985) on a number of phases designers went through, and on a number of stages or specific places in the chronologic design process when they appeared to be taking implicit flourishing-related programmatic gestures. Finally, these phases and stages were accumulated using the DfHF theoretical trajectory. This resulted in a four-phased process as a way to design "enriched programs".

### 4.2 Interpretation of results: the four phases in creating rich programs

The four-phased process that resulted from the analysis of the in-depth interviews is presented in Figure 2 below. This four-phased process is the accumulation of different phases designers went through, and stages in which in their process they appeared to have designed implicit rich programmatic gestures in. Below, we will zoom in on each of these phases and explain what design actions are taken and what design techniques were applied in the respective phase.

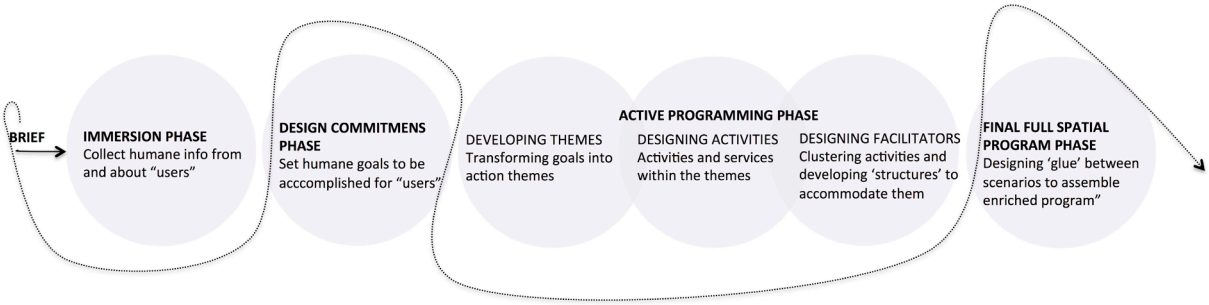



Figure 2
Explorative four-phased process to design "enriched programs"

A first phase we could notice is called "immersion" (Figure 2). This bundles designerly actions regarding collecting and filtering information about users and the design challenge. An empathic attitude and pinpointing psychological knowledge of the users, was found to be crucial by designers. Empathic attitudes have been the topic of a plethora of studies (e.g., Porter et al., 2005; Havik & Tielens, 2013; Cooper et al., 2014; Heylighen & Dong, 2019), in which empathy has mostly been addressed as a value that designers need to incorporate and adopt. However, the concept is also critically questioned regarding to what extent empathy can be useful and when it might evolve into tunnel vision or lead to emotions that one projects towards a particular target group (e.g., pity). In the interview data we noticed that designers attempted to process (e.g., via personas) and mould (e.g., via personification or narratives) the information to be useful in the subsequent design stages, and therefore critically discuss their own findings. Via their gut-feeling, designers used promising techniques (inserted in Figure 3, below), such as persona creation that stems from person-computer interaction (see Cooper, 2004), which portrays vivid users with their own characteristics, dynamics, worries and goals. We need to mention that architects usually are not trained in using this technique, which risks personas that turn out rather flat, instead of rounded in a way that they foster more interesting and diverse patterns of use in design practice.

A second phase that was noticeable is called the "design commitments phase" (see Figure 2). The cross-case analysis we performed demonstrated that at a point early on in the design process, after immersion, all designers tend to set themselves one or more design "commitments". These design "commitments" can be interpreted as "humane" end-goals for the user, values the design should comply with, that grew out of a "humane" interpretation of the results from the immersion phase. These can be formed when asking about positive route(s) a designer believes may fulfil certain psychological needs of the target group. In the light of the entire design process, these design commitments are a solid foundation for building an enriched program. It is a valuable task for architects to form commitments themselves, since we noticed it helped them in (i) developing a drive and motivation in the process, while also (ii) safeguarding a "humane" design attitude throughout the continuing

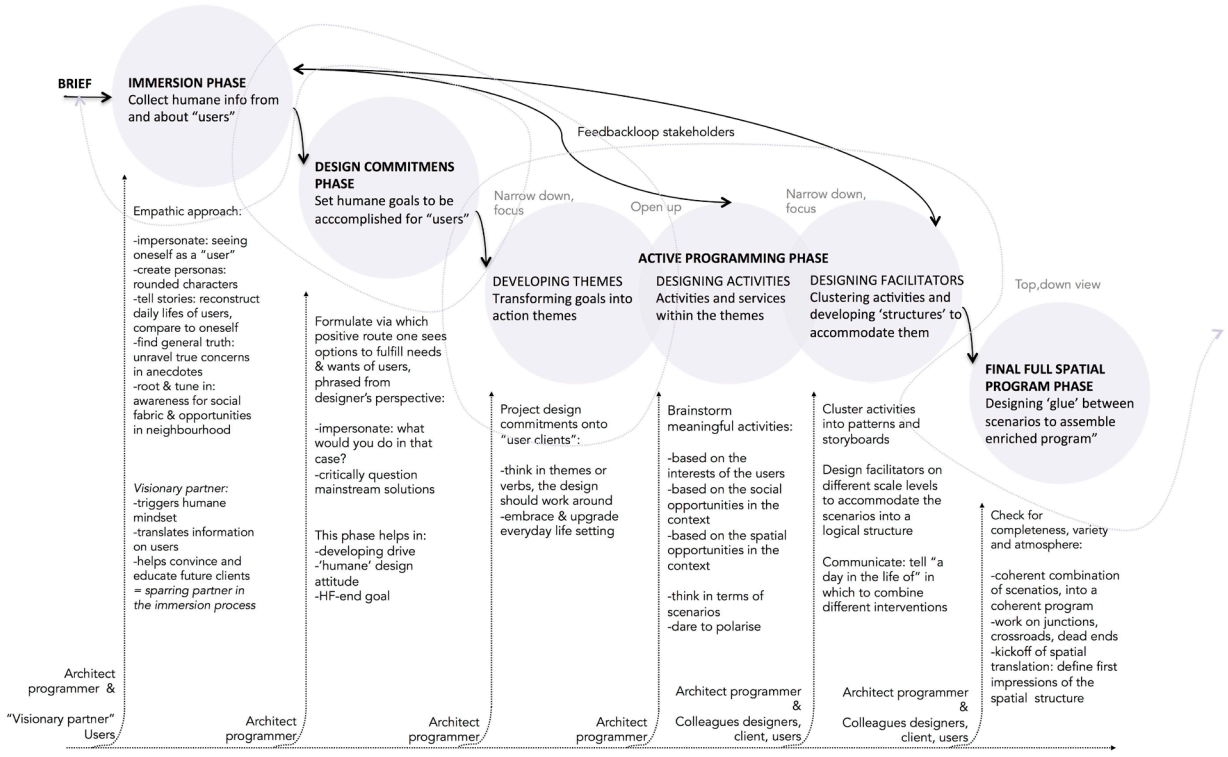
process, and (iii) envisaging the specific "humane" flourishing-end goal, further along the design process.

A third phase is the "active programming phase", in which *activities* take centre stage, and the basis of the enriched program is created. All designers who were interviewed at that point "filled in" their project with meaningful activities, action possibilities and primary ideas for spatial translations, as a refinement of the design commitments made earlier. The cross-case analysis of how the interviewees managed to do as such, led to identifying three sub-phases: (1) developing themes, (2) designing activities and (3) designing facilitators. The first sub-phase suggests to narrow down the commitments into themes and focus on taking a user-perspective regarding what the site should afford a user while incorporating their specific needs and wants. The second sub-phase requests the designer to open up, and to incorporate possible opportunities found in the social and spatial context and to widen the horizon by brainstorming with stakeholders. This is beneficial in creating a wide variety of suitable activities and action possibilities. Finally, in the third sub-phase, the designer is urged to narrow down again and to cluster meaningful activities and action possibilities into coherent scenarios and activity patterns, and to develop facilitators that allow the scenarios to take place in the future physical environment. This third sub-phase can be seen as a way to focus and prepare the designed results for a spatial translation. In that way, in bits and pieces, a richer program is pieced together.

Interviewees sought for activities in the everyday life sphere, instead of searching for grant gestures and to keep communication open between commissioners and stakeholders. In the development, designers often drew upon the act of storytelling, or provoking and developing narratives. The uses of stories, personas and scenarios are techniques originating in other design branches, such as a product design, and clearly have some potential to resonate with the field of architectural design (e.g., Emmons et al., 2016). It has been tested in an architectural design studio exercise (e.g., Stevens et al., 2016; Stevens, 2018), however, it should be explored more thoroughly to obviate pitfalls, such as to prevent the development of "flat characters" or "rosy stories" (Fulton Suri & Marsh, 2000).

The cross-case analysis revealed a valuable fourth and final phase, "final, full spatial translation" in which coherence was strived for in the program design, and a first step towards a spatial translation was made. For scenarios and facilitators to blend in together, we found that taking a birds-eye perspective and identifying spatial junctions present in the environment in which diverse activities and scenarios can co-exist, and mapping the potential user flows, had promising results.

As became clear in discussion of the four phases in detail, the interviews delivered a great deal of practical tips from architects and techniques stemming from their gut-feelings. These strategies and techniques were filtered throughout the interview, and afterwards linked to the respective phase corresponding to when a designer mentioned he applied this technique. In Figure 3 below, we inserted the strategies and techniques we retrieved from the interview data to the four consecutive phases, to provide a more all-encompassing view on the results of our study.




## 4.3 Illustration

To illustrate how Figure 3 can be operationalized in practice, in this section we explain how each phase in the design process of the Nordic case Hjältarnas Hus that was studied, is depicted. Quotes from the interviewees of the architectural design office (WA) and the project leader and employee of Hjältarnas Hus (CN) will be used for illustrative purposes.

Figure 3
Detailed four-phased process as a valuable way to design enriched programs

Figure 4
Architectural impression of Hjältarnas Hus in 3D render (copyright WA) and picture of the opening (copyright CN)

### *Immersion:*

Hjältarnas Hus is a cancer-relief and accommodative house for children who are treated for cancer, in the university hospital of Umea (northern Sweden), and their close family members. Within the design group of White Arkitekter, a member was specifically responsible for translating information from the target group of the building to the actual designers. Prior to designing, the design team (WA) and the commissioner (CN) contacted staff members from the childcare department of the university hospital in Umea, visited similar houses such as Ronald McDonald House, and got in touch with parents of children that were hospitalized, to collect impressions of the situation of parents with a severely ill child that is undergoing treatment. In that way, psychological data were collected, and designers could get a grip on the living habits and potential hazards that could be detected. Via giving children and their family members notebooks to fill in to "dream" about how the future building should look like and what it should accommodate, and via "play therapy"[4] sessions with children, the design team collected information on what future residents would need and appreciate in the surroundings. In that way, a very intense and diverse immersion process occurred for the design team and commissioner.

### *Design commitments:*

In the development of the Hjältarnas Hus, the major commitment was put forward to offer a "home" away from home to the families. It was driven by the fact that these families have in common that they often have to travel many times and for long periods throughout the vast, sparsely populated, northern region of Sweden for the treatment of their child(ren). Families often deviate to alternative accommodation (such as a hotel or motel) nearby the hospital to overcome long periods of treatment. However, hotels have strict mealtime and cleaning rhythms that might not concord with the parents' presence and absence, and motels are very impersonal. Thus, a more personal solution is desirable, embodied by the Hjältarnas Hus.

4 This was a "self-invented term" coined by the interviewed designer of the Hjältarnas Hus project referring to sessions with children in which they collected information on how they envisioned the house, and which they wished to see and experience there.

*(CN): Heroes House is a temporary home for families where someone suffered prolonged illness. When all else shakes and when you need to be together as a family. We are building a family house adapted to the children and the family.*

### *Active programming phase:*

#### (1) "Developing themes"

A first theme regarding the commitment "home away from home" that was projected onto the families was that they should be able to "live by their personal living habits". Concretely, the Hus should feel as if it were almost their own home, and its physical surroundings should offer an opportunity to concord with the perhaps twisted daily routines. Closely related to this is the theme of "finding each other": creating opportunities for parents to find relief and be able to collect strength, talk to others when they feel the need, and opportunities for children and their siblings to be amongst other children and play with them. The design group noticed that this theme implied a focus on the gradations within finding one another, and the different levels of intensity that are associated with that.

*(WA): We learned that it is important that the residents can choose between different grades of privacy and meeting people.*

#### (2) "Designing activities"

The design group envisioned activities in the realm of the daily living that resident families would like to undertake, in order to feel more "at home": "have a family dinner", "invite people over to have conversations with them", etc. Additionally, activities that the families would unwillingly undertake had to be explicated as well: "being able to cry", "retreat in one's cocoon", "have a private phone call", etc.

Within the theme "finding each other", low-level activities in the realm of the family were mentioned above, and were activities added that fostered contact between different resident families reciprocally: "being able to practice sports together", etc. Especially for the children, activities were developed to make the stay as comfortable, and creative and "fun" as possible, such as "play together: games, crafts, …", "read books and do homework together". The design group mentioned that conversations with similar houses learned that families often do not need an abundance of activities, as they already have a hard time handling the hospital situation and their ordinary daily living. Therefore, they aimed to offer *opportunities* for activities, and thereby *nudge* families to find their own need for certain activities they wish to undertake.

#### (3) "Designing facilitators"

Sensible to the different intensities that are inherent to certain activities, and handling the risk of one activity disturbing another, the design

group developed "gradations" in their design work in which to spatially organize activity ideas. For instance, when bringing people together through design, a family room seems an interesting place where people can meet. However, sharing a coffee and planning a group dinner with all residents, while another parent wishes to privately discuss specific private concerns over that coffee, renders conflict in the degrees of privacy and comfort all residents feel at that moment.

Regarding to the need for privacy versus meeting people, the "gradations" organization resulted in rooms in the Hus in which people can have private phone calls, rooms in which parents can drink coffee and talk to one other person in a rather private atmosphere, and places, such as a gym, where people can meet freely. In that way, different acts of private and more public social actions are organized and connected without risking conflict. In order to *nudge* parents and children to undertake self-care activities, the design team designed what we label "teasers" that would be placed in specific places. These teasers bridge the programmatic design of activities and the eventual architectural layout.

#### *Final spatial translation:*

For Hjältarnas Hus, "teasers" were inserted in the design to nudge certain behaviour. For instance, to encourage sport-related behaviour, a climbing wall was envisioned in a central area of the Hus, and art objects that invite residents to touch and play with, were placed in various spaces as well. These teasers hint at the many opportunities for activities the Hus offers to take one's mind off treatment. In that way, people are invited to think of other sport or art-related activities they would like to participate in, and the organization of the Hus then helps in making it possible, for instance, in organizing yoga sessions. Moreover, connections to local actors can be made as well.

## 5. Discussion

### 5.1 Value for theory, education and practice

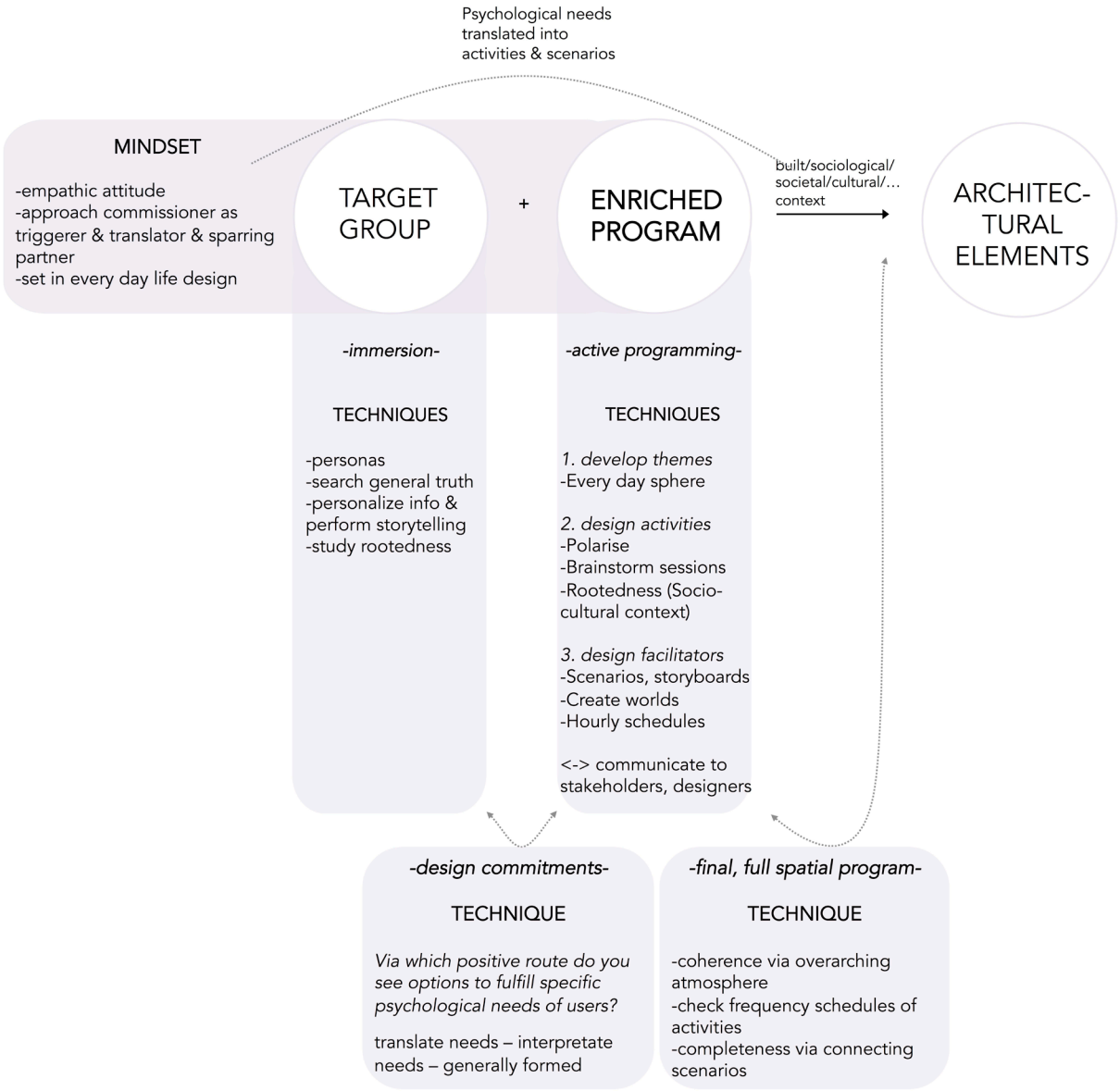
Now that we have shed light on how the bygone concept of "hidden program" can evolve into the contemporary "enriched program", via screening innovative design realizations through the theoretical lens of DfHF, we can critically review the results of our analyses and elaborate the value for theory, education and practice.

#### *Value for DfHF theory*

With regards to the theory of DfHF, we address the phased process with the DfHf theoretical trajectory (see Figure 1). Looking at the consecutive phases through the lens of HF, and structuring these via the theoretical trajectory, a more detailed way to handle the first two components, "target group" and "program", is now established, leading to more rich-

ness and more experiential depth in the program design. Some phases contain design actions that are directly linked to one component, such as "immersion", that is linked to "target group" and the threefold "active programming phase" that is linked to "program", while others bridge components, such as "design commitments", that bridges the components "target group" and "program", and "final, full spatial program", that bridges the design of the enriched program towards its spatial translation. The phases that form a bridge smoothen the process and prepare preliminary and intermediate design results for an upcoming next phase in the entire design process. Moreover, the techniques we have touched upon can further help architects to ask themselves the right questions at specific times in the design process when they aim to DfHF, in order to assist them in generating a design result that either provides insights or enriches the proposed program further.

Figure 5
Findings of the different phases and techniques in the light of the DfHF theoretical trajectory



Many more questions remain, as we noticed that next to a number of techniques that could be added to the trajectory, aspects regarding the mindset of the designer also surfaced (see left part of Figure 5). This raises the question of whether these soft skills are trained by architects.

We invite designers to further build insights into this matter.

Linking our findings back to the origins of the "hidden program" concept, this study has enlightened the depth of the architectural program, and its ability for users to attach meaning to it. In the 1970s, when the original concept by Silverstein and Jacobson was introduced, no theoretical underpinnings or overall strategies to link meaningfulness to architecture, nor how architecture is experienced by users, were available to anchor the concept.

Also, our study has further defined the "hidden program" from virtuous architecture (for instance, remember the supermarket design that educates users to the beneficial principles of growing food locally), to architecture for personal significance that can be generated for users. This is more in line with the current trend of architects today who attempt to work from a societal focus, such as Aravena, via Elemental (2020), and others. For attempts such as these of Aravena, our study can help to guide the architects to specific focus points in their architecture, in a way that they can truly put the finger on also the psychological and flourishing needs of the targeted audience.

### *Value for education*

As the program is undervalued in practice, understanding its complexity and its layers should be initiated in design education, in a way that students learn to develop a holistic image of the program, thereby circumventing tunnel vision later on in practice. Students tend to deliver designs that respond to certain contextual characteristics and/or to more functional considerations (Robinson & Weeks, 1983), which are only specific particles of the "program". It is crucial that students can render an all-encompassing image, on which future design strategies can be anchored. Therefore, we are strong advocators for integrating "program" as a topic in a course such as "Design Methodology", in which its theoretical foundations are framed, and design strategies are explained.

Again, the proposed four-phased process does not pretend to be a design method, but in order to further assist students in their practice, attractive formats to combine designerly information on human-centeredness in global and DfHF in particular need to be found. We have already experimented with a game format to tailor techniques for architectural practice and provide an easy-approachable tool (Stevens & Desmet, 2019). Moreover, it is a more "fun" and coherent approach, in a delineated situation. We intend to further explore this route in the nearby future.

### *Value for practice*

For architects in practice, it is believed the proposed phased process can help to enlighten the concept of "enriched program", and in exploring and conducting programming activities. Architects are now challenged to identify the participants in the process and actively engage and immerse in the needs and wants of users that need to be accommodated by a particular design. Moreover, architects are encouraged to integrate novel actions in their practice, such as formally setting design commitments, that function as a red thread throughout the process. The phased process incorporates a more detailed divergence-convergence movement (in the third phase), which is key in designing (see Sleeswijk Visser, 2013; Design Council, 2019). Each step in the phased process is seen in its proper context relative to the other steps, and the impact of changes on the entire process can be identified, clarifying its added value.

The interviews also revealed interesting techniques that architects adopted, such as personas, storytelling, etc. As stipulated before, a number of them have roots in different (design) disciplines, such as the art of movie making or product design. Others show kinship to techniques applied in other design disciplines; the use of scenarios is linked to the customer journey in retail design (see Petermans, 2012) or scenario use in human-computer interaction (Carroll, 2000). Vice versa, as researchers, we could notice promising techniques from different (design) disciplines that connect to the architects' way of working; for instance, techniques in comic book art and painting could assist us to take a first step in developing a visual communication tool (see Stevens & Desmet, 2019). More theoretical and designerly research should be put into these techniques to tailor them to architectural practice. All in all, our findings can have the potential to steer architects' practice towards more attention to the flourishing of users, especially in projects concerning more "vulnerable" users such as health care, care for older persons or school environments, if the critical reflections that are discussed in the next paragraph are addressed.

## 5.2 Critical reflections, limitations and further development

We have discussed the potential that the four-phased process can have with regards to the act of "programming", or, in other words, to design an enriched program. We thereby contributed to the theory and practice of human-centred design and built a bridge between both disciplines by formalizing design actions and making them available to architects in a structured and guided way. It is clear that a number of critical reflections can be made that need to be studied in more detail in future research.

Firstly, a methodological concern is how we can further assist architectural designers in adopting strategies from other branches, for example by using personas. Up to what level should architects take the lead in developing these, and up to what level can specialists (e.g., service

designers) bring expertise without the architect losing focus, as we have shown that it is of great significance that a designer runs through this process his/herself.

Secondly, if programming is to be intertwined with the entire design process, in what way can it become the decisive factor towards the final design result? How can it be transformed into the spatial reality? Koolhaas (Miljacki et al., 2006) noticed that in their practice, once the intricacies of the program are defined, it is transformed into configurations, in a way that it becomes the final architectural form. Searching for a suitable coded way to display programs and explore their spatial configuration is an interesting path for further research.

Thirdly, we can ask ourselves where and when a programming task ends? In-depth conversations with designers showed that they do feel responsible to ensure qualitative environments for activities to take place in. Moreover, when not occupied with programming extensively during the design phase and thinking out activities that fit the scene to mould the physical reality, no qualitative environment can result from the design efforts. Opposed to that, can an architect be held responsible to also engage and bring together various actors to exploit activities, or even to organize the activities once they are "installed" at the site? In other words, in what way can it be expected that an architect acts as a kind of site manager, or even event manager, when a design is in use?

Fourthly, architects today implicitly place effort in programming issues. The interviews brought to light that the involved designers are aware of the relevance of a sort of programming phase but acknowledge the fact that this "design time" is often hardly billable and often executed without additional fee (Juaim & Hassanain, 2011), pinpointing the financial flip side. Moreover, via interviewing designers, Hassanain & Juaim (2013) found that clients in architectural design processes often request a reduction in the time spent on identifying requirement and programming. Often, the budget is a primary condition described in the client's design brief (Hassanain & Juaim, 2013), and additional work might hamper to stay within budget. More research is necessary to optimize the efficiency of the design efforts regarding the enriched program. Currently, we have performed researched to develop a game-format in which the flourishing-techniques are combined (Stevens & Desmet, 2019). That way, an easy-accessible approach is presented for stakeholders to take part in and be confronted with the benefits of programming. Other advantages, such as a visual counterpart of the process, benefits communication regarding the design decision at the same time. As an architectural process is fragmented with different entities involved in every phase, a tailored communication approach is beneficial. We hypothesize that such a tailored format can help designers to adopt the HF-task as a sort of novel design language. Further research in this respect is necessary, but we hope that our approach is inspirational in that respect.

There are also a number of general limitations to this study:
A first limitation relates to the limited number of case studies that were analysed, and to the selection of the cases. Since a systematic attention to flourishing is relatively new and DfHF is not yet a widespread design approach in architectural practice, no "best practices" are well known relating to flourishing in architecture. The selection process was often guided by information retrieved from stakeholders of particular cases who referred to other interesting realizations of architectural firms. Also, one of the five researched cases has not been built yet due to political changes, which can be seen as a limitation, since one cannot be sure that the designed enriched program will effectively positively influence the flourishing of residents. Moreover, the debate on how to measure aspects as wellbeing and flourishing is still in its infancy (Petermans & Cain, 2019), and has not yet been applied in one of the selected cases.

Secondly, note that the results do not pretend to concern "fixed" design methods that can be used to design enriched programs; too few cases were studied to generalize. Moreover, generalizing design processes is a questionable goal in itself, since design processes are hardly linear nor rigidly structured in a similar way. This study should therefore be interpreted as an assembly of practical knowledge with regard to creating enriched programs and can be offered to architects to experiment with.

## 6. Conclusion

In the second part of the 20th century, a path was created to focus on more human-centred programs in architecture, however, it came to a standstill in Post-Modern times. Today, we can further this path with a novel interpretation: the recently developed "Design for Human Flourishing", to awaken the "hidden program" to which Silverstein & Jacobson already pointed in 1978. The DfHF theory helps to provide a nuanced understanding of how the concept of an architectural program is layered. After explicating the DfHF theory, a retrospect analysis of contemporary architectural design processes via a DfHF lens, helped to explicate via which steps designers can push through to the flourishing layer of the program and design relevant programmatic gestures for users. This resulted in a four-phased process that can be understood as *a* manner to practice DfHf and perform the act of *enriched* programming in architecture. This way, architects can be assisted in performing "programming" in their practice.

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