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FROM ACCESSIBILITY TO EXPERIENCE: OPPORTUNITIES FOR INCLUSIVE DESIGN IN ARCHITECTURAL PRACTICE

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Abstract

This paper presents an explorative study on the relation between architectural practice and inclusive design. It is hypothesised that the limited adoption of inclusive design in architectural practice may relate to a particular mind-set and/or a lack of information formats that are compatible with (architectural) design practice. The first part of this paper reviews literature from various design disciplines on potential factors that influence the adoption of inclusive design. Influences are sought in the direction of the international context of inclusive design, the limitations of current information formats, and the specific context of architectural practice. The second part of this paper reports empirical research results from 20 interviews with different stakeholders in architectural practice in Flanders, Belgium. The aim of these interviews was to investigate current perceptions, sources and tools, as well as perceived barriers and motivations for inclusive design. Combining these findings with those from other design disciplines reveals opportunities for a closer relation between architectural practice and inclusive design. It was found that a focus on accessibility legislation – both in terms of content and format – inhibits a potential broader understanding of user experience, which could correspond more to architects' way of working.

Introduction

Today's ageing and diverse society challenges designers to leave the image of the average user behind and design products, services and environments that take into account the largest range of users possible. This requires considering the needs of others, which can substantially differ from designers' due to differences in age, gender, ability, ethnicity, profession, situation, etc. (Imrie, 2003).

Successful examples of inclusive design offer added value to multiple users by considering a wider spectrum of needs in the design process. Think of lever tap handles, walk-in showers or low-floor buses and trains. Despite these demonstrations of its potential strengths, inclusive design has not (yet) become a standard design practice. Particularly in architecture, inclusive design has not (yet) come to the foreground (Heylighen, 2014; Wauters, Vermeersch and Heylighen, 2014).

The reasons for inclusive design's limited adoption in architectural practice are unclear. Therefore, this paper presents an explorative study on the relation between inclusive design and architectural practice. It is hypothesised that inclusive design's limited adoption may relate to a particular mind-set and/or a lack of information formats that are compatible with (architectural) design practice.

The background section briefly introduces how inclusive design is understood and how understandings have shifted. It is presumed that the framework of and critiques on inclusive design hold hints about the factors influencing its adoption in design practice.

The review section reveals different barriers and drivers for inclusive design, based on literature from various design disciplines. First, the international context presents different policy as well as market related forces that push or pull practice towards inclusive design. Besides the (negative) perceptions of inclusive design, also the (poor) ways in which user information features in design practice may help explain its limited uptake. Therefore, the second subsection reviews literature on how currently available user information and tools to generate it are experienced by designers, and points out their limitations for the (inclusive) design process. The first two subsections treat the different design disciplines together. Yet, the design process in architecture may differ at certain points. Therefore, the third subsection focuses on the specific context of architectural practice, which inclusive design practice should comply with.

We explore the relation between architectural practice and inclusive design in more detail through a qualitative empirical study. After discussing the research set-up, we report the results from 20 interviews with different stakeholders in architectural practice in Flanders, a region

in Belgium. These interviews seek to investigate current perceptions, sources and tools, as well as perceived barriers and motivations for inclusive design.

Finally, the discussion combines the results from the empirical study with the literature review, which allows identifying opportunities to improve the relation between architectural practice and inclusive design.

Background:
Understandings of inclusive design

The objective of taking into account the largest range of users possible when designing is established by design approaches like universal design (Mace, 1985; Preiser and Ostroff, 2001; Steinfeld and Maisel, 2012), inclusive design (Coleman, 1994; Imrie and Hall, 2001; Coleman, et al., 2003) and design for all (EIDD Design for All Europe, 2004). Despite some semantic distinctions and different geographic origins, they share a similar purpose. In this paper, these approaches will be considered interchangeably and henceforth referred to as inclusive design.

An early definition characterises inclusive design as "the design of products and environments to be usable to the greatest extent possible by people of all ages and abilities" (Connell, et al., 1997). This ambition aims to differentiate inclusive design from design for special needs, which is tailored to a specific target group through adaptations or assistive technology. Coleman et al. (2003) describe this distinction as a move "from margins to mainstream". The needs of a diverse range of users are no longer addressed by specialised products but incorporated in mainstream products, assumed to benefit all, as illustrated by the above-mentioned examples. These examples show features like "equitable use", "flexibility in use", "simple and intuitive use", "perceptible information", "tolerance for error", "low physical effort" and "size and space for approach and use", which are known as the Principles of Universal Design (Connell, et al., 1997).

Inclusive design has often been criticised for pursuing an unrealistic goal, as a design solution perfect for all would be impossible (Steinfeld and Maisel, 2012; Heylighen, 2014). In reaction, contemporary understandings of inclusive design do not refer to a definite "best" solution, but present inclusive design as a process of continuous quality improvement. Yet, also inclusive design as an approach to design has been criticised for being too weak (Heylighen, 2014) and lacking a theoretical background (D'Souza, 2004; Imrie, 2012).

Heylighen (2014, p.1362) contests this, stating that:

(...) the importance of an attitude or approach to design should not be underestimated. Because the description of a design problem does not contain sufficient information to resolve it, the attitude in which it is approached strongly determines how the problem is understood and thus how it will be resolved.

This understanding highlights that inclusive products, environments and services can be created by integrating attention for users into designers' creative ways of working, rather than imposing a new design method.

An approach is more flexible than, e.g., a set of standards or rules, as it provides a perspective or normative angle rather than prescribed solutions (Kirkeby, 2015). Moreover, it is dynamic, as it enables a response to changing societal issues. Whereas the early focus of inclusive design was on solutions improving usability for older and disabled people, over the years it has evolved parallel with societal issues. Inclusive design's focus has widened to a broader understanding of diversity and is now associated with sustainability, business potentials, innovation and Corporate Social Responsibility (Bendixen and Benktzon, 2015). Steinfeld (2013, p.56) suggests redefining inclusive design as "a process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation".

Putting forward the notion of diversity, Winance (2014, p.1341) argues that inclusive design should aim at "a plural environment endowed with varied resources and characteristics that respond to and encourage the diversity of ways of taking action that people put in place". This requires insights into the particular instead of the average. As such, a focus on providing multiple opportunities for people's different ways of using space counters the abovementioned critique that inclusive design unrealistically aspires a singular, one-size-fits-all solution.

These shifts in understanding provide new arguments for the adoption of inclusive design in design practice. Yet, the question is to what extent this (evolved) thinking has penetrated design practice.

Review: Influences on the adoption of inclusive design

International context of inclusive design

When reviewing the past 15 years' literature on the adoption of inclusive design in different design disciplines (e.g., product, service, interaction, architectural design), two main sets of drivers become apparent: (a)

inclusive design policy, most often expressed through a legislative framework, and (b) the business case of inclusive design. Whereas the first pushes design practice, the latter exerts a pull towards inclusive design.

The policy-related drivers can be traced back to inclusive design's roots in the civil/equal rights movements. Their efforts resulted in milestones like the 1990 US Americans with Disabilities Act and the 1995 UK Disabilities Discrimination Act. More recently, the 2006 UN Convention on the Rights of Persons with Disabilities forced governments worldwide to develop initiatives in favour of inclusive design. Given the international legislative framework, it is not surprising that surveys on practitioners' perceptions of inclusive design identify legislation and regulations as one of the main drivers (Vanderheiden and Tobias, 2000; Coventry and Jacobs, 2005; Macdonald, 2006). Yet, a UK study (Dong, et al., 2004) shows that legislation is a less dominant driver in Europe than in the US and Asia, probably because of different cultural frameworks. Whereas the US minority model focusses on individual rights like access, the European social equality model focusses on the right to participate in society.

Besides the legislative push, a second set of drivers relate to the consumer market (e.g., Kohlbacher and Herstatt, 2011). Research in the early 2000s identified market drivers such as demographics, consumer demand, potential differentiation and/or innovation, and an increasing market share through addressing those currently excluded and/or serving new indirect markets (Vanderheiden and Tobias, 2000; Dong, et al., 2004; Coventry and Jacobs, 2005). More recent research also includes social responsibility and brand enhancement and emphasises inclusive design as an innovation tool (Goodman, et al., 2006; Macdonald, 2006).

Apart from perceived drivers, also perceived barriers have been the subject of surveys among designers, manufacturers and retailers. Inclusive design's uptake seems to be hampered by perceptions that it has no business case, sacrifices aesthetics, increases costs, is a more complex design process, is not an end user need, is design for disabled people and slows down time to market (Vanderheiden and Tobias, 2000; Dong, et al., 2004; Goodman, et al., 2006). Furthermore, more practical barriers are identified, such as a lack of time and budget, a lack of skills or tools to practice it, a lack of knowledge to assess accessibility, competing requirements and the influence of the client or the company's culture (Coventry and Jacobs, 2005; Goodman, et al., 2006; Goodman-Deane, Langdon and Clarkson, 2010).

We thus notice that scholars' shifts in understanding inclusive design (see Background) are slowly penetrating design practice. This is reflected to a large extent in practitioners' perceived drivers but not (yet) in their perceived barriers to the adoption of inclusive design. This suggests that

there are still many challenges to address, which seem to relate to prac-
titioners' perceptions and the practical applicability of inclusive design.

Limitations of current information formats

Information about users enters the design process in various forms, de-
pending on the discipline or sector. Often it is produced by professionals
other than designers, in the form of, e.g., market research data, human
factors, ergonomics or usability data. Various studies found that design-
ers perceive this kind of data negatively (Melican, 2004; Goodman, Lang-
don and Clarkson, 2007; McGinley and Dong, 2011; Nickpour and Dong,
2011), mostly because of the information's poor applicability in the de-
sign process.

Criticisms concern the information's accessibility, form as well as con-
tent. Designers have low awareness where to look for information and
find it hard to assess its usefulness (Restrepo and Christiaans, 2004). When
the information is presented in an abstract form, it appears complicated
and unfamiliar to designers, making it difficult to interpret and translate
into design concepts (Feeney and Bobjer, 2000). Typically, information is
text-based, and all too often presented in detailed, long-winded docu-
ments, which are not designer-friendly (Bruseberg and McDonagh-Philp,
2002). Goodman, Langdon and Clarkson (2007, p.122) summarise that, in
order to be designer-friendly, information "should be quick and easy to
find and use, visual and stimulating, flexible and open ended, and relate
clearly and concretely to design issues". In terms of content, information
is found to be too academic. Designers mistrust too much analysis or
interpretation (Restrepo, 2004). Often information is too authoritarian
(Goodman, Langdon and Clarkson, 2007), or too narrowly focused with-
out allowing further exploration (McGinley and Dong, 2011). Also the lack
of inspirational value makes currently available information little com-
patible with design practice (Cassim, 2005; Sleeswijk Visser, 2009).

A study among product designers identified the client's design brief
as an important resource of user information (Goodman, Langdon and
Clarkson, 2006). Often designers back up this information by referring
to their own experience (Cuff, 1989; Imrie, 2003) and imagining them-
selves in the user's role (Hasdoğan, 1996). This often leads to unfounded
assumptions (Cooper, 2004). Also colleagues and experts are an impor-
tant information source. What makes them particularly convenient is
their immediate accessibility and ability to translate knowledge to fit
designers' specific requirements (Restrepo and Christiaans, 2004; Kirke-
by, 2015).

Besides processed information, user involvement techniques and simu-
lation tools have been developed for designers to generate user informa-
tion themselves. In practice, however, they are not widely used (Zitkus,
Langdon and Clarkson, 2012). Although designers are not enthusiastic

about the tools and information provided, they do experience a need for information about users, which leads them to apply methods in an informal, intuitive way. These methods can be, e.g., focus group interviews (Bruseberg and McDonagh-Philp, 2002), prototypes tests (Sims, 2003), informal feedback from family and friends, or a few days of observation on location (Sleeswijk Visser, 2009). The methods are used in an opportunistic fashion, to explore a certain problem or aspect ad hoc.

These observations suggest that designers are not per se averse to taking into account user needs, but that the available resources do not suit their creative process (Bruseberg and McDonagh-Philp, 2002; Mival, 2004; Choi, et al., 2006; Sleeswijk Visser, 2009). A misfit seems to exist between the (inclusive) design process and the information formats currently available (Lofthouse, 2006).

There might be opportunities for information formats that tie in with designers' ways of working. An important need of designers identified by various researchers is that for in-depth information, which provides insights into people's actual interactions, experiences and values (Boess and de Jong, 2007; Sleeswijk Visser, 2009). A study that explored new ways to introduce experiential user data to architects found that they are looking for the stories underlying people's experience. The diverse formats presented to architects in the study (e.g., engaging with people, reading stories or watching videos) were experienced as "ideal to increase sensitivity without standardising or steering too much" (Annemans, et al., 2014, p.1633).

Sleeswijk Visser (2009, p.29) states that "rich experience information contains intangible aspects, such as feelings, aspirations, motivations, which can be best understood by experiencing them subjectively." Immersing designers in people's daily life is important to increase their information uptake, as it makes it more vivid and engaging (Fulton Suri, 2000; Porter, et al., 2005). This can counter designers' tendency to refer to their own viewpoint (Cuff, 1989; Choi, et al., 2006), and broaden their empathic horizon (McDonagh, Thomas and Strickfaden, 2011). Fulton Suri (2000, p.795) illustrates how information about a real person encourages empathy as follows:

> It is hard for a designer, without personal experience of what it's like to use a wheelchair, to feel more than a reluctant obligation to follow regulations that apply. In contrast, a personal meeting with Richard or viewing a video documentary about him making a train journey in his wheelchair will introduce the designer to a real person with whom he can empathize … Not only will a designer be more receptive to recommendations that will make Richard's interactions more rewarding, it will most likely be an experience that stimulates new design ideas and that creates understanding that will transfer to other projects too.

Rich experiential user information allows depth of discovery, "giving scope for the design audience to complete the interpretations, allowing a level of co-ownership" (McGinley and Dong, 2011, p.193). Giving designers the opportunity to identify design-relevant themes in data from real-life studies, allows them to frame these in their own way. This data structuring is a critical component of the design process (Melican, 2004). Moreover, visual and/or tangible information stimulates a design response (Fulton Suri, 2000). These findings are worth considering in the light of improving inclusive design's uptake in design practice.

Specific context of architectural design

Different design disciplines (e.g., product, service, interaction, architectural design) have been recognised to be both significantly similar, and characterised by specific differences (Visser, 2009). Architectural practice lacks some aspects that are crucial to other disciplines. For example, in terms of information resources, market research is rare in architectural practice. Also an in-house design research department is exceptional, because of the small scale of most architecture firms. In terms of design methods, architects rarely make full-size prototypes, because of the large scale of their projects. These factors may explain why architects are less familiar with user involvement than, e.g., product designers (Sanders, 2009).

Characteristic to architectural design are the many building codes and regulations, guaranteeing that minimum standards are met. The requirements architects need to take into account are diverse, including, e.g., sustainability, accessibility and heritage value. Imrie and Street (2011, p.101) found that "architects and other professionals have ambivalent attitudes towards the regulation of the design and development process and, for many, it is seen as a potential source of intrusion into, and diminution of, the integrity of their expertise and knowledge".

The regulations most relevant for inclusive design – those of accessibility legislation – have a negative connotation for architects, who complain that they "restrict their creativity and 'take away the challenges of the designer to come up with intelligent solutions'" (Gray, Gould and Bickenbach, 2003, p.35). Architects are found to be sceptical about standardizations and ask for more open guidelines (Kirkeby, 2015).

Taking a closer look at the specifics of the Belgian situation, which constitutes the background of our empirical research, we see that the scope of accessibility legislation is limited: it only concerns physical difficulties (e.g., wheelchair accessibility), without addressing other aspects of diversity; it reduces accessibility to measurable facts (e.g., door widths, heights of thresholds), which are checked on floor plans by civil servants who approve the building permit (Schijlen, et al., 2015); and it only concerns public buildings.

In a survey among Flemish architects, accessibility legislation ended up in the top 10 of the most irritating aspects of the profession (NAV, 2012). As a result, it is most often implemented only after major design decisions have been taken (Wauters, Vermeersch and Heylighen, 2014), while a better understanding of diversity is important from the conceptual design stage on (Donahue and Gheerawo, 2009). In line with the previous subsection, we suggest that inclusive design's uptake might be hampered because the legislation's format hardly offers insights into users' situations.

Although not welcomed enthusiastically, regulations have become part of the design process, and architects have developed strategies to deal with their increasing gamut. An important transformations in architectural practice, due to regulations, is the arrival of new professional actors: consultants who are specialised in requirements architects need to take into account (Cuff, 1992; Imrie and Street, 2011). The fact that architects increasingly (need to) work with other professionals may explain why they think regulations are threatening their position as experts.

In Flanders, consultancy concerning accessibility is provided by accessibility offices, originally non-profit organisations that operated on a provincial level, which are now being integrated into the regional government. Note that Belgium has a tradition of institutionalised consultancy. A different situation exists in the Netherlands, for example, where more commercial consultants (e.g., accessibility consultants and environmental psychologists) offer services with regard to the legal requirements concerning accessibility (Schijlen, et al., 2015). A study on the collaboration between Flemish architects and accessibility officers found that officers were contacted by architects for "checking legislation, offering best practice examples, or describing actions in situations of use" (Wauters, Vermeersch and Heylighen, 2014, p.1489). Although a major motivation for collaborating was architects' hope to take a short-cut for legal procedures, the study also identified the wish to broaden attention to people's diversity and the potential for more integrated advice.

Empirical research set-up

Whereas the previous part of the paper reviewed literature from various design disciplines on potential factors that influence inclusive design's adoption in practice, the following part explores the relation between architectural practice and inclusive design in more detail through an empirical study in architectural practice in Flanders.

Research context

In-depth interviews were conducted as part of a research project entitled "Rent-a-Spatialist", which aimed to explore the potential of disability experience as consultancy in architectural design practice (Schijlen, et

al., 2015). The project starts from the idea of disabled people as "user/experts", i.e., people who have "developed natural experience in dealing with the challenges of our built environment" (Ostroff, 1997). Besides attitudes towards a potential consulting service, also more general issues concerning architectural practice's relation to inclusive design were investigated. The latter will be discussed below.

Participants

Whereas many studies on inclusive design's uptake in practice are based on the perspective of designers only, sometimes combined with that of, e.g., manufacturers (in product design), this study broadened the scope of participants in order to account for the complex reality of architectural practice (Cuff, 1992). The study's participants include stakeholders from different segments of the building sector in Flanders. They were selected for their ability to give an insider's overview of the relation between inclusive design and the segment(s) they operate in. An overview of the participants and their corresponding segments of expertise can be found in table 1.

A first group of participants represents architecture firms. Ten firms participated, ranging in size from a few collaborators to nearly 100. Larger firms are multi-disciplinary, e.g., because they have an in-house engineering department. All-round architecture firms as well as firms working in specialist segments (e.g., care) were selected. In most cases, one of the firm's partners was interviewed. In two firms, we conducted the interview with two respondents.

A second group consists of clients or client associations, both from private and public organisations. Recruiting clients was harder than recruiting architecture firms. We obtained for example a low response from commercial property developers. One housing developer explained his refusing to participate as follows: "I believe that this matter rather belongs to architects, designers. In my opinion this is not really material for developers".

A third group are people working for governmental agencies involved in promoting or facilitating inclusive design, mostly advocates of inclusive design. Participants work in agencies at one of the four governmental levels, ranging from local government (a municipality) over provincial and regional (Flanders) to federal government (the Belgian state). We also interviewed an accessibility officer from one of the accessibility offices (see above).

Table 1
Participants

Architecture firms				
	Company size		Discipline	Segment of expertise
A1	small	(<10 employees)	architecture	housing; public buildings; …
A2	small		architecture	schools; housing
A3	medium	(10-40 employees)	architecture	housing; public buildings; …
A4	medium		architecture	housing; public buildings; …
A5	medium		urbanism	public space
A6	large	(40-70 employees)	architecture	care
A7	large		architecture	offices; housing; … (all-round)
A8	extra large	(>70 employees)	architecture & engineering	station areas
A9	extra large		architecture & engineering	care; housing; … (all-round)
A10	extra large		architecture & engineering	care; industry; … (all-round)
Client bodies/associations				
	Organisation		Department	Segment of expertise
C1	city real estate & development agency		project management	housing; public space; culture; …
C2	hospital		spatial programming	care
C3	association of cities & municipalities		environment	public space; …
C4	local hotel & catering association		board	hotel & catering industry
C5	public transport service		stations' accessibility	station area
Governmental agencies				
	Governmental level		Department	Segment of expertise
G1	local government (municipality)		diversity	housing; public space; culture; …
G2	provincial government		culture	culture
G3	regional government		tourism	hotel & catering industry; culture
G4	federal government		science policy	culture
G5	non-profit organisation that is being integrated into regional government		accessibility consultancy	all-round

Methods

Participants were invited by e-mail, sometimes with additional phone calls, for a face-to-face interview. Before the interview started, they were informed about the study's goal and approved by means of a written informed consent form. In total, 20 in-depth interviews were conducted by the first author (in some cases accompanied by a colleague) in the first quarter of 2014. The interviews were semi-structured, in the sense that an interview guide was used to cover certain topics but the order of the questions was adapted to the course of the interview, allowing participants to express their priorities. On average the interviews took 68 minutes. All interviews were tape-recorded and summarised. Relevant quotes were transcribed and translated from Dutch to English by the

authors. The overall study's methodology underwent ethical review. The methodology and intermediate results were also discussed with an external steering committee (Schijlen, et al., 2015).

Questions that steered the analysis of the interviews include: what are practitioners' perceptions of inclusive design? Which sources and tools do they currently apply? What are their perceived barriers and motivations for practising inclusive design?

Results:
Perspectives from architectural practice in Belgium

Perceptions

Amongst most participants, a **target group thinking** could be observed. When discussing inclusive design, they focused mainly on disabled people. The projects they associated with inclusive design were projects with a clear care element. Inclusive design was associated with segments like care tourism (e.g., a hotel offering care services), specialised education (e.g., a school for autistic children) and adapted living (e.g., a house for a family with a mobility impaired child). Participants considered an inclusive design approach less relevant for other projects within these segments, which were labelled "normal". This suggests that most participants' understanding of inclusive design is limited. Yet, it had already improved over the years: a municipality's equal opportunities officer stated that, e.g., managers' fear that an accessible bar would turn into a "ghetto" for disabled people was gradually disappearing.

The most dominant understanding of inclusive design was that of accessibility, presumably due to the legislative framework. More specifically, accessibility was often perceived as most important in public buildings. These buildings have a wide audience possibly including disabled persons, participants argued, which justifies or assures the added value of an inclusive design approach. On the other hand, few participants considered private buildings with a wide audience, like office buildings. This distinction can be presumably traced back to the legislative framework as well. Inclusive design seems to be associated in the first place with projects which involve authorities demanding accessibility. Only a few examples of business cases in the private sector were mentioned (e.g., senior/life proof living). Moreover, as mentioned, we did not manage to interview project developers of such projects.

In a few segments, however, we noticed an inclusive philosophy. This was the case for care, culture and public space. The former could relate to the fact that care organisations offer services to people who need care or are in a vulnerable situation, and are by consequence concerned

with their wellbeing. In the culture segment, it could relate to the aim to offer an experience of culture and heritage for all (e.g., museums). Someone from the federal science policy department explained:

> *We all work with the philosophy . . . 'our heritage is there for everyone'. Now, let those 'everyone' then come into contact with your heritage and your activities as much as possible. And whether [these initiatives] are the ateliers that museums create for people with a mental impairment, or people with a social impairment, or for people with a psychological problem, or . . . the Alzheimer's ateliers . . . these are all things that are actually going on in the world of museums. And that's a fantastic cheque made out to the future. (G4)*

In public space this could relate to considering the mobility of the widest range of people with attention for vulnerable people (e.g., pedestrians, cyclists, children, older people) instead of specific target groups. An urban designer explained a certain design aspect in one of their projects as follows:

> *It's not designed like 'this is for older people' and 'this is for youngsters', it's just taking care of everyone. But it does offer guidance for people with poor vision, and it is accessible for those who are in a wheelchair, and you can park your bike in it, and you can sit on it. (A5)*

The approach to users in these segments is more integral than a focus on disability, as is the case in most other segments. Yet, participants rarely labelled their approach as inclusive design.

Sources and tools

The current user information sources architects mentioned include: their own experience, the client, standards and regulations, accessibility offices, interest groups, informal research methods and research-based information.

Architects referred to their own experience in designing similar projects. Also studying similar projects designed by other firms added to their architectural understanding. In most firms, this knowledge remains tacit. Only in the bigger architecture firms, knowledge becomes explicit in topical meetings, and through post occupancy evaluations to obtain user feedback on design concepts.

The first external resource architects turn to tends to be the client. Clients are particularly appreciated for their knowledge about the everyday life of the target group, which can be unknown to architects. Some clients are actively working on information, for example through working groups or by gathering feedback or concerns from users themselves. The downside for architects is that the requirements are often commu-

nicated through extensive reports. Clients can have a major influence on the design process. For example, the city real estate & development agency that participated in the study drew up a checklist with accessibility issues that was used when making project briefs and handed over to external architects. As such, clients' priorities can direct the focus of a design.

Participants frequently mentioned standards and regulations, often in relation to accessibility, and often with a negative connotation. Criticisms include that they often are contradictory, too strict, lack the reasoning behind a certain prescription, are difficult to integrate (because they concern a single aspect of the built environment), and are unable to record architectural qualities. Many architects dislike proposed standard solutions, and prefer to figure out solutions themselves. Moreover, some participants raised the concern that regulations can inhibit innovation, because they discourage architects to deviate from regulations, which would include the risk to miss out on subsidies.

Due to the institutionalised character of the Belgian situation, we mentioned, there are no commercial accessibility consultants, but so-called accessibility offices. Many governmental incentives exist to collaborate with these offices, such as the requirement to obtain their advice if one wants to qualify for subsidies. As a result, many participants felt obliged to consult the accessibility officers and experienced it as a "millstone" or something that "needs to be done" in favour of the building permit. This may explain why consultation was often postponed to late in the process and limited to checking building standards, as participants described. At this point, architects stated to be reluctant to make changes, certainly when these increase costs or compromise esthetical qualities. Although some architects were happy to be able to contact a specialist for specific questions, others thought the officers were too "fundamentalist".

Sometimes consultancy in the design process is also provided by non-professionals, such as interest groups. Some interest groups defend the rights of a specific group of disabled people. For example, participants mentioned an organisation of vision impaired people, which offered free screenings of, e.g., a hospital and a railway station. Other interest groups are sounding-boards set up to involve local residents in public projects, which may include advocates of users with different needs. Yet other groups operate within local authorities, such as an advisory committee on accessibility, providing advice on the design of public buildings and spaces in which the local government is involved. Yet, the situation can vary considerably in different municipalities. Whereas some have even appointed a central accessibility official, others lack an integrated policy, which undermines the potential successes of a structural collaboration between different departments.

In the segments with a broader understanding of inclusive design the situation is different from that in other segments. Architects working on care projects, for example, did not rely on accessibility legislation. They argued that the starting point of promoting independence does not always apply (e.g., in care homes, handrails are even contested to increase instead of prevent falling). Actually, architects designing care buildings set the bar much higher than accessibility legislation, aiming to dig deeper to understand user needs. In these situations, designers conduct informal research themselves to gain insights into user needs. This can include visiting the existing facility with the client, (undercover) observations (e.g., in an institution for juvenile delinquents), and individual or focus groups interviews with users (e.g., staff and residents of a residential care facility). Although participants do not frame these informal research methods within inclusive design, they serve a similar aim. One of the participants explained the information need as follows:

> I think that for us it's especially important to understand the question very well . . . And I think that you must reflect on other target groups, that also there it's mainly a matter of "what's actually the question behind what's being said?" . . . The underlying motivation is much more important to us, because we can work with it, and then we can seek solutions for it, which someone else doesn't think about. Well, that should be our added value, I think. (A9)

As a last source, some participants also mentioned research-based information. This was mainly found in professional journals, or obtained through seminars. Participants affiliated with a university, e.g., architects who also tutor student design studios, referred to master theses as a source. Participants from the care sector mentioned academic literature. The main reason to look for literature was an ad-hoc need for information about a certain target group. The added value of research-based information is that it can create a certain "frame" for the design, to which architects can link their concepts.

Barriers

An important barrier to practitioners' adoption of inclusive design are the difficulties with information sources and tools, as mentioned in the criticisms in the previous subsection.

Besides these practical issues, many perceived barriers relate to a poor understanding of inclusive design. For example, because many participants associated inclusive design with target groups, they perceived it as an expensive adaptation, which benefits only certain users. Because these users might change over time, they doubted whether the investment is worthwhile. In our study, financial aspects were associated with barriers rather than incentives for inclusive design.

Many participants mentioned unawareness as the key barrier to adopting an inclusive design approach. This likely results from not being involved with people who have different needs. One of the designers stated that attention should be drawn over and over again to certain user groups, whom all too easy tend to be forgotten:

> If [the accessibility official of city X] joins the meeting and puts figures on the table, then everyone, I think, is struck with consternation: 'ooh, is it actually so many people that have difficulties to see, and to walk'. And then I always think 'maybe we have forgotten about them just a little too much for a second'. . . . It's good that [people like the accessibility official] join in now and then to point our attention to a group of people who use public space differently. It's not something we're dealing with on a daily basis. We see it all, we can read it, we can hear it, we can feel it. (A5)

Indeed, several participants mentioned the need for sensitisation. A municipality's equal opportunities officer recalled that a meeting with a disabled person is often an eye-opener. Before, many architects "have the wheelchair in mind, the object", but through personal confrontation "these technical matters get a face, get a human dimension" (G1). Also other participants mentioned that personal interactions are tangible and motivating.

Even when participants were aware of the added value of an inclusive design approach, they experienced difficulties in convincing other stakeholders to opt for a specific design direction or solution. Both architects and clients experienced difficulties in discussing with people with a different mind-set or priorities, as experiential aspects and architectural qualities are difficult to quantify or even to put in words.

Motivations
The client's (positive or negative) stance towards inclusive design can be decisive. Especially in segments with a poor understanding of inclusive design, attention to users' diverse needs is often initiated by a question from the client. An architect testified:

> For instance, the town hall of [Town Y] . . . there also the question of the client was specifically to make the building not . . . just generally accessible . . . So it also started from that question, and thus the result of the design was also more apparent. . . . So not only making it literally accessible, but also . . . making it legible. (A3)

When the client does not perceive inclusive design as necessary, however, this often suffices for some architects to not pay attention to user diversity. Other architects, often those having affinity with inclusive design because of personal experience, see it as their task to "guide" their

(inexperienced) client. They will try to convince him/her, but as mentioned earlier this is not always easy.

As even participants in segments attentive to user diversity did not frame their approach as inclusive design, literal motivations were scarce. Yet, this subsection draws attention to some current needs expressed by participants, which in our opinion relate to inclusive design and may be motivations for adopting it. Interestingly, these needs were uttered in all segments, regardless of their degree of attention to users' diverse needs. Many architects mentioned that they lacked insights into how others experience space. This was especially true in the initial phase of the design process and/or when the project involved a certain target group. In terms of target groups, architects were particularly fascinated by the spatial experience of autistic people or mentally impaired people, whose world of experience was currently experienced as inaccessible for outsiders like architects. This suggests a need to "enrich" understandings of disability experience, and go beyond wheelchair accessibility.

Architects expressed the need for more explicit knowledge about users' diverse experiences, not only to convince stakeholders by putting facts on the table, as mentioned, it was also considered crucial input to the design process. It could help architects to understand the relative importance of different requirements and to assess the impact of potential design decisions and alternatives.

Ideally, architects would prefer a person to address these questions to. Several of them expressed a need for dialogue in design. In addition to clear requirements and their background in the initial phase of the design process, architects would like to be able to discuss their assumptions and test particular aspects of their design later on in the process. For example, checking in a mock-up whether there is enough space for circulation with a real person in a wheelchair appears more appealing than checking whether the plan complies with accessibility standards. Moreover, it allows discussing experiential aspects that relate to the architectural qualities architects aspire.

When the interviewer introduced the notion of a user/expert (see earlier) towards the end of the interview, this generated many positive reactions. A user/expert has the potential to address both the experiential information and consultation needs of architects that we identified in this section. An architect concluded:

It can surely be an added value. Because, then you get input from a totally different perspective. For otherwise you get a perspective always from an architect, an engineer, a technical viewpoint, or whatever, colour specialist or whatever – as such all fine, but indeed, the final end-user who has to lie in that bed, or wheelchair, or whatever, how s/he experiences that space, [that kind of input] is good. (A10)

Discussion: Identifying opportunities

The legislative framework

Findings from the literature review as well as our empirical study suggest that practitioners' perceptions of inclusive design are dominated by the legislative accessibility framework. Due to its omnipresence, many practitioners associate inclusive design exclusively with compliance with accessibility standards. Practitioners do not associate inclusive design with their own focus on architectural qualities, and their related attempts to anticipate users' experience. In this regard, the relation between architectural practice and inclusive design seems one of living apart together, as their common grounds are not recognised. The fact that architects work with multisensory qualities but do not perceive this as inclusive design was also found by Ryhl (2014, p.433), who states: "the legislative interpretation of [inclusive design] takes precedence over the architectural interpretation and . . . is perceived as limiting to [architects'] creativity and the quality of their work".

We found that, unlike their aim to set contemporary standards, regulations can also discourage innovation. Therefore, a shift is needed from attention for minimum standards to supporting practice in front of laws and regulations (Haugeto, 2013). This potential role of policy deserves further exploration, as our findings already show examples of how policy can have positive effects too. The legislative framework can for example facilitate relations such as collaboration with a local government's advisory board on accessibility. When propagating a strong vision, these (governmental) advocates can infect architects with enthusiasm and challenge them to come up with creative solutions. To change practitioners' perceptions, inclusive design thus needs to be framed differently.

The creative potential of design(ers)

We would like to come back to Heylighen's (2014) statement on the crucial role of the attitude or approach to designing (see Background). Also Restrepo and Christiaans (2004) argue:

Choices made by the designers depend on their understandings of the problem and its context, on their ability to structure that problem and that context and consequently, their success in obtaining proper information about the problem and the context . . . Problem structuring is a process of drawing upon knowledge and (external) information to give structure to the design space.

Findings from the literature review and our empirical study suggest that practitioners are looking for in-depth information about users' experience and that adequate information formats are currently lacking. There is an enormous opportunity for inclusive design in tuning its information formats to architects' ways of working. Providing architects with accessible and design-oriented information formats allows them to structure, interpret and translate the data from user studies to architectural qualities themselves (cf. Restrepo and Christiaans, 2004). This way, the creative potential of designers is maximised. Moreover, it brings architects back in control and re-values their status as experts, which is now invaded because of regulations side-lining them on topics like accessibility (Imrie and Street, 2011).

New formats to inform architects

In this respect, we need to recognise that informing architects can be more than providing them with static, textual information, which proved unsuccessful according to the findings from the literature review and our empirical study. An important strategy to increase inclusive design's uptake in practice is finding adequate ways of representing data about real users to designers (Clarkson and Coleman, 2015). Potential formats include direct engagement with user/experts in the design process (Schijlen, et al., 2015; Vermeersch & Heylighen, 2015), or indirectly communicating user needs through formats that allow more insight, such as mini-documentaries, or personas and use scenarios constructed with real-life data (e.g., quotes) derived from user studies (Dong, et al., 2015).

We suggest future research to study more in depth how user experience is currently addressed in architectural design practice. Studying architects' ways of working is expected to allow identification of requirements for new, tailored information formats. Also studying information formats that are successfully adopted in other disciplines might offer insights into qualities transferrable to architectural design practice. Combining these with the requirements peculiar to architectural practice, is expected to nourish the development of adequate information formats to inform architects about users' experiences.

Conclusions

This paper concludes that a focus on accessibility legislation – both in terms of content and format – inhibits a potential broader understanding of user experience, which could correspond more to architects' way of working. Although many practitioners have a poor understanding of inclusive design, we also identified a common interest in the spatial experiences of diverse users.

Potential exists to shift practitioners' mind-set and perception of inclusive design from accessibility towards – their already present focus on – people's spatial experiences. Inclusive design does not have to equal restrictions on the design process or a reduction of design solutions, but can also mean an enrichment inspired by diverse people's spatial experiences. When the creative potential of design(ers) is fully exploited, this can result in a plural environment (Winance, 2014), offering diverse spatial qualities and use opportunities.

Currently, diverse users' perspectives remain largely inaccessible to designers. Making these available would provide them with the motivation and information required to design inclusive environments. Therefore, design-oriented formats are needed that provide insights into users' needs. A study of the requirements and the development of such formats is a subject for further research.

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