

A Conceptual Client-Designer Framework: Inspiring the Development of Inclusive Design Interactive Techniques

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Abstract. The adoption of inclusive design approach into design practice is compatible to the needs of an ageing society. However, tools and methods that promote inclusivity during new product development are scarcely used in industry. This paper is part of a research project that investigates ways to accommodate inclusive design into the design process in industrial context.

The present paper is based on the finds from the observations and interviews with industrial designers and interviews with stakeholders. The outcomes from the study supported a better understanding of the client-designer dynamic as well as the stages in the design process where information related to inclusive design could be introduced. The findings were essential to inspire the development of an inclusive design interactive technique to be used by clients and designers.

Keywords: universal design, design for all, new product development, industry, designer.

1 Introduction

Developed countries have faced the challenges of ageing populations. If on the one hand the fact that people are living longer means that the society has improved living standards, on the other hand, it means that the society has new challenges to cope with. The loss of physical, sensorial and cognitive capabilities is a typical problem that naturally results from the ageing process. In this case, the best practice in new product development would be to consider a wide range of user capabilities to promote independent living among the elderly population. This is the design principle advocated by inclusive design theory and methods. Hence, the adoption of inclusive design seems to be appropriate in such scenario.

Differently of what could be expected in an ageing society, inclusive design approach has not been widely used in industry [1-3]. Actually, the currently available tools and methods created along the last years to evaluate accessibility of new design concepts have been scarcely used. This may be a result of incompatibility issues of the available techniques with the design practice [4]; or the lack of incentive to companies to adopt inclusive design [5]; or both.

This paper is based on an ongoing research project that has investigated the design practice in order to propose tools and techniques that work tandem to the design process in industrial contexts. An exploratory study was conducted with designers and stakeholders to understand the reasons of non-adoption of inclusive design and how inclusivity could be accommodated into the design process. The study was carried out within six different companies to understand the design practice and contextualise the client-designer dynamic when defining user requirements.

The next session briefly describe the methods used and then, the following session presents the findings from the interviews with industrial designers and stakeholders. The outcomes supported a better understanding of the client-designer dynamic as well as the stages in the design process where information related to inclusive design could be introduced. The findings were essential to develop the conceptual client-designer framework presented on session 4, which inspired the development of an inclusive design interactive technique to be used by clients and designers.

2 The Study with Industrial Designers and Stakeholders

A total of 18 industrial designers and 6 project stakeholders participated in the study. The designers were from six design agencies and internal designers of one large multinational company. The stakeholders were from two large multinational companies.

2.1 Data Collection

Data was collected through unstructured interviews, an acknowledged method to conduct exploratory studies in qualitative research [6]. The method supported in-depth investigation of the design activity through opinions, knowledge, behaviour and experience of the participants [7]. The participants were encouraged to talk about their background and experience in the field, as well as to give a broad picture of their role in the consultancy or in the company. The interviews were audio recorded and transcribed afterwards.

Towards the end of the interviews with designers, they were presented with a tool built in Google SketchUp. The tool was in the very early stages of development, but attended the intention of exemplifying an interactive way to supply designers with information about inclusivity. The tool elicited reflections and further description about the way user requirements are dealt in the process and how designers currently evaluate accessibility and usability in their work routine [8]. In fact, the most valuable comments related to inclusive design came to light after presenting the tool.

Two examples were presented to the designers: For some of them a 3D modeling simulation of a remote control, and; for others a 3D modeling simulation of a simple medicine's pack, both inside Google SketchUp. The last steps of the simulation exemplified how the designers could check the legibility of the letters in the remote control or in the pack. The simulation followed the sequence below, the step 3 run the visibility test to check the legibility and the step 4 presented the result of the evaluation:

1. designing the box (with color and material) and adding the text (with font size, style and color);
2. setting the ambient light and setting the reading distance;
3. selecting visibility test in the inclusive design tool in the tools window;
4. receiving some advice from a window that pops up on the screen, which describes the range of population excluded from reading the text in the pack and some advices regarding font size, style and background/foreground color contrast.

The idea of the last screen was to understand whether the information about inclusivity would be useful. The information was given through the percentile of the UK adult population excluded from using the product due visibility issues. Additionally, in the same window, the percentile is followed by a recommendation that guides the designer towards creating more legible features. In this case it was “you could change the font type, font size or the background-foreground color to change the exclusion”.

2.2 Data Analysis

The interviews’ transcripts were coded and categorised using Atlas.ti software. The categorisation was based on patterns of text – utterances – that were related to the same idea. They were analysed following the principle proposed in grounded theory [9]. Every time a relevant fact was recognised in a transcript, old transcripts were re-analysed to find out the views of past participants related to that aspect. For example, as the research evolved, the role that clients play in the design process had to be clarified, as a result of which other questions were raised and past transcripts were re-analysed.

Care was taken to ensure that the same code was not duplicated for a single participant under the same interview topic. This procedure prevented the reoccurrence of codes only based on single views. Codes and categories were mapped according to the importance given to the concept (reoccurrence) and its connection to other sub-categories (co-occurrence). The maps of categories and codes were interpreted and represented in a framework format. The framework was presented to the designers and the stakeholders in what is called here as ‘feedback sessions’. These sessions were important stages to correct misunderstandings and to confirm some of the results from the interviews. Although few participants were not available to meet the researcher once again, most of them took part in the sessions.

3 The Design Process through the Eyes of Designers and Clients

The exploratory study described here started observing and interviewing designers as it initially intended to understand how designers create, evaluate and present their ideas. The intention was also to recognize the differences among design domains and the hindrances to inclusive design adoption [10],[8]. The study however, indicated the

need to understand the influence of another actor responsible for feeding the process with user requirements – here called the client. All the interviewers from different companies (design agencies) indicated the influence of the client as the fundamental one to establish a user-centred design process. The consistency among the interviews adjusted the research to also consider the client (project stakeholders that commission the project to designers) as part of the study.

The designers also expressed their opinions regarding an ideal inclusive design interactive tool.

3.1 An Inclusive Design Tool According to the Industrial Designers

The responses of the designers highlighted two main aspects related to the tool built into Google SketchUp: the interactive interface and; the information provided.

Inclusive Interactive Interfaces

The idea of developing an inclusive design interactive tool was well accepted. However, there was a controversy regarding the software interface used by designers. Product designers tend to use 3D modeling tools, such as CAD software, whereas in other design domains designers do not use 3D modeling, normally all the graphic design is done in 2D graphic software. Consequently, it is necessary to consider the variations across different design domains before proposing interactive tools incorporated into computer graphic systems.

Information about Inclusivity

Regarding as the information provided through the interface – the percentile of the population excluded from using the new concept – the designers were unsure about its value. They explained that generally they reason that the new design is targeted at a portion of the population. The target market is defined by or with the client. In their practice, the designers consider that a reasonable amount of people from the entire population are always excluded if they are not part of the target market. The following comments highlight the views of some of the designers related to target market:

“Most products are focusing on certain bits of that population [] you try to cover as larger market as possible, but it is very difficult to cover the whole market, and still have a credible product. Often products are developed to focus on those groups. There are telephones available which are made to be used by the elderly. They often haven’t been immersed with the technologies we have in our lives. So, there might be a bit of technophobia, they might not want the complexity of Facebook; they might want the ability to phone people. So, there are mobile phones out there which are focused on that group, which take all those things into consideration.” (39:05 – D3)

“I do not know if we have done anything for the extreme range of people. We’ve done products for specific sectors. We’ve done a couple of bariatric products for very heavy people, and I’ve done a couple of things specific for older users. I cannot think about a product that includes a very broad spectrum.” (12:25 – D4)

According to the designers' comments, unless clients request the design to include a wide range of people as end-users, the objective of providing information about inclusion will not succeed. Information about inclusivity therefore is not only a matter for designers, but also clients. As already mentioned by Gill [12] Small to Medium-sized design consultancies tend to face the pressure of costs and tight deadlines from the client, which constrain the designer's decisions.

Among all the interviewees the role of the client was always outlined as the main supplier of information of potential consumers and their needs. Moreover, if the client does not act as an information supplier, the designers would consider the type of research, and the amount of time the research would consume, based on the project resources defined with the client. The results indicate the importance of the client in the design process. Clients therefore were interviewed and the outcomes are highlighted in the next session.

3.2 Aspects Considered by Clients According to the Stakeholders' Interviews

The stakeholders highlighted the aspects they have to consider while planning a new project and before commissioning the project to designers. In this study the stakeholders are the people who represent the interests of the company that owns the final product. They often play the role of clients when commissioning the project to the designers.

Target Market, Market Share, Market Response

According to the stakeholders, the users' specifications are based on demographic data related to the target market and some other user requirements, which is result from market research. However, market research is generally conducted to understand the market needs, expectations and market share, not accessibility and usability issues. The tendency is to divide the market into groups of consumers and then to target at those specific markets. The comments from the stakeholders transcribed below highlight how the product is planned:

"We do try and target different groups. I mean we do look at, 'Right we know this segment exists, we know that segment exists' and what we try and do is tailor products around them. [] We're very focused on making sure that it does what it needs to for the people we're targeting the product at but it's not so extreme." (S3)

"Good designs always take into account people's needs anyway. There will always be extremes of users that you might decide that you can't afford, because it would make the product too expensive to deal with. [] So, you might decide that it makes more sense to design products in a first place, to meet the mass market." (02:09 – S1)

Difference on Sales, Competitors and Final Price

According to the responses, changes on design features, including changes towards improving accessibility or usability would happen if they make a difference on sales or brings advantages over competitors, which would increase the market share. Moreover, the expected cost-benefit of the changes to the consumers is also considered before investing in the product.

“It's a very competitive market in the UK and people's perception of what they are willing to spend and what they end up spending is actually quite different and I mentioned in Germany and in France people spend a lot more on these products so we are driven by cost to a large extent, unfortunately... because it's difficult to put prices up without people switching to competitors or not buying the products at all which I think would be a disaster. So that's probably the biggest challenge we face.” (S5).

Clients seem to deal with a number of factors related to the impact of design changes on market, competitors, final price, the brand and others. They mentioned that *“there is a kind of trade off”* within the company's requirements before they make decisions. According to the participants, the way the clients deal with the requirements is based on the resources (basically time and budget) allocated to the project, the company's prioritization and in some cases legal obligations.

3.3 The Influence of the Client in the Design Process

The influence that clients exert in the design activity is indeed a fact that has to be considered before proposing improvements to the practice. From the very beginning, when the brief is delivered to designers, until the end of the conceptual phase, when an idea is selected, clients influence every stage. In fact, the brief, the research and the evaluations carried out by the designers seem to be sturdily dependent on clients' views, procedures and funding for the project.

The quote below demonstrates the power that the client exerts in the process. The comment illustrates what was replicated among the interviews with designers and stakeholders.

“I have control over the brief for the products, I have control over the design, I have control over the cost, the specifications, but I also have control over the marketing messaging that we speak to consumers.” (S5)

It is therefore part of the designer's job to attend the client's interests. In cases where clients awareness of their market includes the understanding of end-users needs related to accessibility and usability, they could drive new ideas towards more user-centred design. According to the interviews, if the client is aware of critical parts of the project, they will then request, while briefing the designer, to conduct research, test or evaluation to ensure that there will not be any problem in the final product.

3.4 The Design Decisions Made by Client and Designers

The designers described the design process as a trade off activity that has to consider many aspects of the design, such as functionality, aesthetics, manufacturing process, materials, components, usability, disposal and others. According to the designers, the reasoning behind the requirements' prioritization is mainly the key requirements established on the brief; but also the research, tests and evaluations carried out by them, and; the knowledge and experience of the designer.

It seems to us that both, clients and designers, make decisions related to the design. This may happen while clients are defining the project, even before delivering the brief to designers; or when designers are creating new concepts. However, there are important stages along the design process that clients and designers make decisions together. These stages are the design meetings.

The client-designer meetings represent stages where design decisions happen. The meetings are used to specify the project, to discuss the project and to present and discuss the ideas. Therefore, to support the development of more inclusive designs, one way is to inform both - designers and clients - about inclusivity while design decisions are made. Therefore, design meetings were identified as the strategic phases to inform about inclusive design.

4 A Conceptual Client-Designer Framework

A conceptual framework was developed based on the findings outlined in the previous session.

The framework focuses on the very early stages of the design process, which is described by other authors as the planning phase and the concept development [13-14]. During these initial phases the client defines the brief; the client commissions the project to designers; the brief evolves within the client and the designer decisions, generating the design specifications; the designer carries out research, generate ideas, test them and present the ideas to the client; the client gives a feedback after reasoning on the companies requirements and the priorities for that project; the designers will work in the proposals and present them back to the client. The process of 'presenting and getting feedback' may happen once or several times, until the new design concept is selected for further development.

The framework is presented on figure 1, highlighting the designer and the client inputs alongside the process. The numbers shown refer to the phases when client-designer meetings are held:

1. Meetings to Specify or Discuss the Project:

The meeting(s) used to deliver the design brief and develop the design specification. These meetings are important stage(s) to introduce information about accessibility and inclusion if that has not been considered until that moment.

1. Meetings to Present and Discuss Ideas:

Initial ideas are embodied into presentations and delivered to clients in their meetings. Clients give feedback and directions according to their priorities, but clients also rely on designers' interpretations of better solution. Interventions that inform about the accessibility and inclusivity of the proposals being presented in such meetings could direct the project towards more inclusive products.

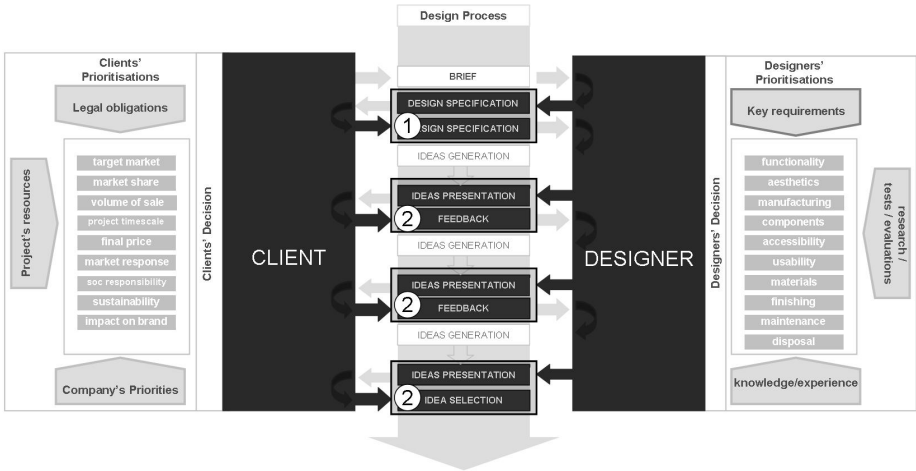


Fig. 1. A conceptual client-designer framework: defining stages to inform about inclusivity

5 Inclusive Design Interactive Techniques

Based on the outcomes described in the previous sessions inclusive interactive interfaces have been idealized. Figure 2 presents an example of an inclusive design advisor to be used in client-designer meetings, where the design concept under development is presented to the client. In this example, the interface has been

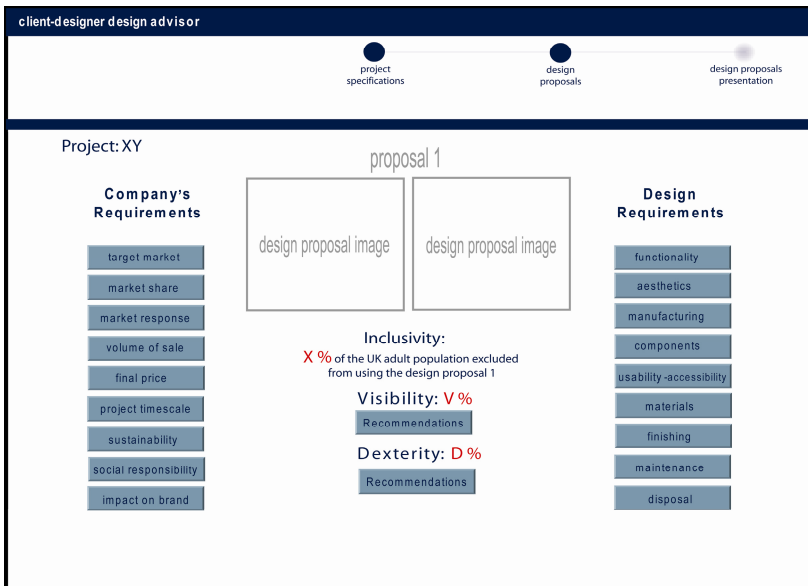


Fig. 2. Inclusive design advisor to be used by clients and designers in design meetings

developed to present both (client and designers) with information about inclusivity. The interface is supplied with buttons that links to information about inclusive design and its relationship with company's requirements as well as design requirements.

This inclusive design advisor has been developed to be tested with live projects. This would bring essential knowledge to the inclusive design research field, clarifying whether client and designers would consider the exclusion results related to the design proposals; change the design, and; to what extent inclusive design is part of the trade-off during design decisions.

6 Conclusion

The study presented in this paper was conducted to understand the design practice in industrial contexts in order to propose inclusive design interventions cognizant of it. The interviews supported the development of a framework that contextualizes the client-designer involvement with the design process. The framework emphasizes the influences that both – client and designer – exert during the initial phases of the process. Additionally, it highlights the stages – design meetings – where design decisions are made by clients and designers together and thus, information about inclusion might be beneficial to the project if supplied at this stage. The conceptual framework has inspired the development of an inclusive design advisor to be used by clients and designers, with information relevant to both in order to encourage inclusive design uptake in industry.

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