

Designing from context: Foundations and Applications of the ViP approach

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Abstract

In this paper it is argued that the design of a context should be the start of all design projects. Context is hereby defined as a set of factors selected and combined by the designer. These factors can be states, developments, trends, or principles. Based on his position taken, either explicitly or implicitly, towards this context, the designer can define a set of parameters for the user-product relationship or the product itself. Such a context-driven view on designing has led to the Vision in Product design (ViP) approach and is illustrated by two example projects.

On August 13, Dutch television showed a documentary in which a young Dutch film maker, Maarten van Soest, visited Robert Opron, the French automotive designer of a.o. the Citroen GS, CX, SM, and the Renault 5 and Renault Alpine. Together with Opron, he wanted to design the ideal car. They started by drawing up a list of parameters the car should satisfy. These parameters are desired qualitative characteristics of the new car or of the interaction with the car. They for instance decided that the ideal car should be playful and obedient, that it would make physical demands on the driver and be moody like an actress, and that you can attach yourself to it like you are attached to your loved one. It is not hard to see that these parameters would lead to the design of a car that is completely different from what we are used to. It is however harder to see where these parameters come from. In other words, why did Opron and Maarten choose these parameters as characteristics of the ideal car?

In this paper we will try to show how the foundations for parameter setting are laid down in the context. The notion of a context that will be defended here is a broad one. In our view, a context comprises all aspects or factors a designer [1], implicitly or explicitly, considers for his design. It will be argued that a designer should be aware of this context in order to couch context factors into positions, opinions, or views and subsequently set the parameters for the product (or the interaction with the product). This view will be illustrated with two design projects in which the Vision in Product design (ViP) approach (Gijsbers 1995, Hekkert 1997, Hekkert and Van Dijk, 2000) was applied. The ViP approach is a context- and interaction-driven design method that is based on the theoretical view outlined in this paper.

1. Levels of description

In trying to understand products and why they are what they are, it is helpful to discern three levels of description (see Figure 1). At the most basic level we can describe a 'product as it is', a material shape with components, colour, form, and other quantifiable characteristics. As such, "it would be no more than a 'piece of junk lying around'" (Verbeek and Kockelkoren 1998, p. 36). It is only in relation to people that any product and in fact any 'being' in the world, such as artefacts, animals, plants and people, is what it is (Heidegger, 1997). Thus, a 'product' only becomes a functional and meaningful product when it is seen, used, interpreted, or possessed by people. This relatedness to people (or users) is the second level of description. At this level, we can describe a product in terms of what it affords us, what it means to us, how we see, feel, or experience it, how it is used, talked about, and thought off, by us.

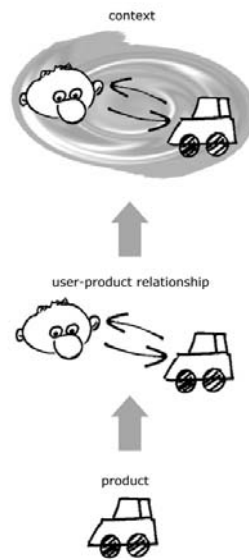


Figure 1: Levels of description

The user-product relationship is not something that takes place in isolation, but is part of a larger context. This context consists of all kinds of factors, e.g. social patterns, technological possibilities, and cultural expressions, that affect the way people perceive, use, experience, respond and relate to products, i.e. the nature of the human-product interaction (Hekkert 1997). These effects on the interaction are mediated by the concerns of the user. When factors change (see next section), our concerns could be modified or changed as well. For example, when social networks become more global, we can have a need for new means of communication; when new types of music appear on the market, it may change our musical taste; when technology allows for genetic modification of plants, our concern for health might be affected. Our concerns, in terms of goals ('what we want'), standards ('how we believe things ought to be'), or taste ('what we like'), determine how we appraise or evaluate products when seen or used (Ortony, Clore and Collins 1988). Such evaluations further determine our affective or emotional response to products and (thus) our product choice (Desmet and Hekkert 2001).

Given the relationship and dependencies between products, users and context, the identification and/or selection of relevant context factors should be the start of all design projects and is the prime responsibility of the designer.

2. Context factors

When you look at all the factors surrounding and possibly affecting a user-product relationship, most of them will today be approximately similar to how they were yesterday (the last couple of years) and will probably not be very different tomorrow (the next couple of years). Think for example of our infrastructure, the means of transport available to move from a to b, the number of children born each year, or the laws and regulations we have to obey. Such factors, that are (or look) relatively stable at the moment of observation, we call states. States thus refer to

conditions in the world around us that do not seem to change in the near future, but, by their nature, do not have to be fixed. In a couple of years we can have a new means of transport or a law may have been removed or modified.

A factor can, however, also be in a state of change at the moment of observation. When a factor concerns a phenomenon that is currently changing, it is called a development. A development can, for example, be in the field of technology (e.g., the arrival of Blue Tooth), society (e.g. the number of double-income families increases), economy (e.g., rising interest), or concern a shift in the composition of the population (e.g., increase of the ageing population). In these examples a few fields, i.e. technology, demographics, in which developments can be classified are indicated. Other fields from which developments could be extracted are ecology, culture, politics, or society. These developments are the kind of factors that are often taken into account for scenario building (Schwartz 1991, Van der Heijden 1996). For a set point in time in the future, one tries to predict into what kind of context such a set of factors will lead.

A special class of developments is constituted by factors concerning tendencies in the behaviour, values, or preferences of (groups of) people. Such developments are often specified as trends. Among teenagers, it is currently a trend to send hundreds of sms-messages each week. In many households it is 'trendy' to not cook at all or to prepare an immense five-course dinner.

Finally, there are also factors that are, by their unvarying nature, constant over time. These factors we call principles and refer to immutable laws or general patterns that can be found in human beings or nature. For example, our capacity to process information seems to be limited to approximately seven chunks (Miller 1956), we generally prefer colours in the order blue, green or red, and yellow (McManus, Jones and Cottrell 1981), and 'memes' can, by analogy with genes, be conceived of as the units of information transmission in the field of cultural evolution (Dawkins 1989). The latter principle recently played an important role in the context of a student project, leading to the design of a mobile communication concept for Sony Ericsson (Lim 2001; Figure 2).

Whether a development, trend, or principle, factors can differ to the degree that they are 'objectively' measurable or quantifiable. Some factors could be based on solid numbers (e.g., the number of single households is increasing by 2% each year), other factors draw more on personal interpretations of events by the person describing the context (e.g., there is a general movement to start refusing to lead a hurried life). Also principles, although assumed to be universally valid, can be based on assumptions, such as the meme-concept, or personal beliefs (e.g. after our death we will reincarnate). This distinction about the validity of context factors is of importance when one tries to describe the current or future context of a user-product relationship. In the next section we will deal with the decisions a designer will face when he takes up this task.



Figure 2: Concept of a mobile communication device (design Sonny Lim). The device allows the user to store and share pieces of digital information (memes).

3. Designing a context

3.1 Selection of factors

A huge number of factors of all types could, in principle, determine the nature of a user-product relationship. These factors are also interrelated which makes the context a complex web of interdependent factors. Ideally, a designer would like to map all possible factors and their interrelations. Since this is an impossible task, a context, as a starting point for a design process, is always a creation of a designer. For this, the designer has to take a number of decisions.

First, a designer has to assess what factors are relevant for the product that is going to be designed. This decision or task depends to a large extent on the definition or framing of the design problem (Schön 1983). Gielen, Hekkert, and Van Ooy (1998), for instance, showed that a restructuring of the traditional way problems are formulated in the design of toys for disabled children, forced the designer to consider types of information, i.e. context factors, that were not considered before. The way a design problem is framed or structured determines the domain on which the factors could or should have an impact. A domain contains the minimum set of requirements applicable to the final product and/or user. What is minimally required could be determined by the client, tradition, or the designer himself. The problem domain that is related to the assignment 'design a waking device' differs considerably from the one based on 'design an emotionally intelligent alarm clock for 2003'.

When the domain is set, the designer can restrict himself to a surveyable selection of factors that he considers relevant to that domain. In the case of the domain in the previous example, a designer could for example select developments in the field of affective computing and trends related to sleeping. However, a designer could also select factors that, at first sight, may not seem to be relevant to the domain. He may do so simply because he regards a certain principle as interesting in itself or because he would like a particular trend to have an effect on his design. The designer of the alarm clock could for instance incorporate a principle about the function of dreams or consider the trend that people less and less often eat at regular hours. It has been demonstrated that such a 'strategy', i.e. the selection of context factors that are not obviously related the problem domain,

contributes to the originality of the solution to a design task (Snoek and Hekkert 1999, Snoek, Christiaans and Hekkert 1999).

Related to relevancy is the issue of validity as discussed in the previous section. Some factors are generally agreed upon or based on indisputable facts, others can be much more idiosyncratic or speculative. Whether the context is build up by expected and valid factors or by less founded, but desirable factors is to be decided by the designer. Choosing for obvious and safe factors has the advantage of coming up with a context containing likely and defensible elements; selecting less obvious and more personal factors increases the likelihood of coming up with a fresh and new perspective. In our view, the important thing is that the designer is conscious of where he positions himself on this 'certainty' dimension.

Next to a selection of factors, a designer further shapes the context by assessing a hierarchy among the factors. That is, a designer can indicate that he expects or wants some factors to have a big impact on the domain, whereas he regards other factors as less important. Both the selection and valuing of factors has big implications for the final design and it is to the designers' responsibility to make these choices. On the basis of the selected factors, their importance, and their interrelations, the designer must build a complete and coherent as possible picture of the context of the user-product relationship that he is going to design.

3.2 Defining one's position

Although the selection and ranking of context factors is already a personal enterprise, it does not yet tell how the designer believes, expects or wants to respond to them. A designer could regard a certain trend, such as the increasing amount of time spent surfing on the internet, interesting or relevant for his design of a television set. Only by selecting the factor, the designer does not indicate what he thinks of such a trend and how he thinks it should be interpreted. In order to let the context eventually influence the design, a designer must determine one's position: he must define in what way he wants to react to the context (factors). This is a value judgment or a personal view, even if the designer just goes along with certain developments or trends. After all, a designer could also wish to counter a particular development. Further, it is not always enough for a designer to approve or disapprove, but he could also indicate in what way he interprets certain factors or interrelations and how he wants to deal with them. The designer of the television who is not happy with the above internet-trend could for example simply state that people should not surf so much, but he could also react to this trend with the opinion that we should have more physical exercise.

You can also define a position without it being explicitly based on a context factor. Such a position could be a personal interest, belief, or wish you want to apply and you do not have to know what it is based on. Maarten, the filmmaker, for instance argued that he "loves the physical" and therefore he proposed that the ideal car should make physical demands on the driver. Of course, as Maarten acknowledged, the fact that most modern cars do hardly make such demands reinforced this love [2]. Expanding the factor-based context with such ideals, wishes, or dreams will make the context much more personal and has a big impact on the design process and the final design.

Seen in this way, a design ideology is a particular fixed position, a standard on what is good for the world, what products ought to be, or what users should be provided. In the head of many environmentally conscious designers, sustainability is such a fixed position, as is ease of use in the head of ergonomically oriented ones. In their criticism of digital products, Hummels and Overbeeke (2000) argue that a

designer should (always) respect 'the user as a whole' and a product should be a 'context for experience'. As sympathetic as all these positions may sound, adhering to any view in advance implies that a designer is not free to create his own context and take his own position.

4. Parameter setting and the ViP approach

On the basis of his positions and opinions that are founded in the context, the designer can set the parameters for his design. Such parameters or qualitative characteristics can concern the product itself or the way we interact with or are related to the product. Examples of both types have been described in the introduction with respect to the ideal car. At the end of that same documentary, Opron also adopts a context-based approach to defining parameters for the ideal car. Overlooking the sea near his cottage at the coast, he sighed that cities like Paris, Amsterdam, and New York are incredibly chaotic. Therefore, we should design a simple car, a pure car (like this landscape), an object that does not kill people, a car in which we feel fine. Implicitly, Opron makes a number of statements about people in a chaotic world and what their concerns are. As simple as it may sound, Opron's flow of thoughts is very much in line with the theoretical framework outlined in this paper. It is this same framework that we have used to develop a design approach that must support a designer to find the set of parameters for his product design.

This approach is called Vision in Product design (ViP) and has been described elsewhere (Hekkert 1997, Hekkert and Van Dijk 2000). Next to the theoretical framework about context factors and how they affect a user-product relationship, the ViP approach does contain some standards that reflect our opinion about value and quality in product design. The most influential standard of our design position is the importance we attach to authenticity and originality. It implies that we think a designer should strive for maximum freedom and should be driven as little as possible by competitors or product-related needs of supposed users. Whether he is creating a new context or sets the parameters for his product, the designer should try to avoid obviousness and worn paths. Again, this is not a necessary consequence of the theoretical framework, but part of our design opinion that has coloured the ViP approach. It is our belief that this standard can make the design process more inspiring for the designer and the result more interesting for everyone.

Furthermore, within the ViP approach, the theoretical framework is translated into a six-stage method a designer could use as a guideline. After a first stage in which the designer deliberately tries to get rid of his preconceptions, the second stage is devoted to the design of a context for his design. For this, the designer collects the relevant and interesting factors, combines them, and determines his position. For the setting of parameters, we have developed two intermediate stages: the interaction and product vision stage. Instead of first deriving user concerns from the context factors or translate the stated opinions directly into product characteristics, we regard it as much more elegant and effective (see Boselie and Leeuwenberg 1985) to define the interaction between the user and product. Such a qualitative notion of the way a product is used and experienced by the user, i.e. the vision of interaction, describes the user concerns and the product features, which address this concern, at the same time. It is the type of parameter that concerns the user-product relationship. On the basis of this vision of interaction, the designer is required to define the product parameters, i.e. the qualitative characteristics the product has to embody. The last two stages of the ViP method are concerned with conceptualisation and materialisation and will not be discussed here.

5. Example projects

In the last section of this paper we will describe two projects in which the ViP approach was applied. In the description of these projects we focus on the most important context factors selected, how the designer wanted to deal with these factors, and how this position is eventually reflected in the final design.

5.1 *Link*

The Belgium company Durllet develops luxury, leather sitting furniture for more expensive market segments. In 1999, they approached the Dutch design agency KVD to design a concept seating element for 2005. The agency emphasized two context factors. With respect to the status that so often surrounds the high-quality products of Durllet, KVD selected the development that status more and more results from the relationship with products. Instead of it being an intrinsic property, the meaning of status emanates from a personal and convincing interaction. Next, they highlighted the trend that people start to recognise the importance of emotions in human behaviour and thinking. Therefore, KVD wanted to seduce people and let them feel the space to show their emotions. From the status factor, they derived that status can be obtained when you involve other people in your interaction with products.

These two positions resulted in the design of Link (Figure 3), a sitting element constructed of three interconnected hassocks that invite to be used in many different ways. You can either expose yourself completely by facing the centre, or hide your vulnerability by turning your back to the other two bulges. The quality of the fabrics, patterns, and stitches, the monolithic and organic shape, and the fact that Link can be used by more people at the same time, ensure that users cannot avoid interacting with the product. The naturalness of their interaction will eventually determine the amount of status Link can provide.

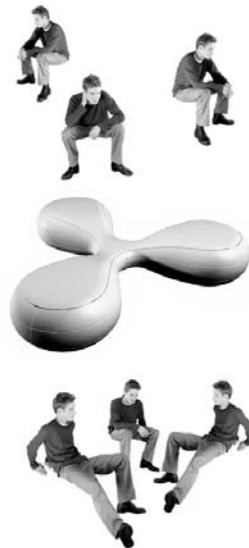


Figure 3: Link, a sitting element for 2005 (designed by KVD)

5.2 DutchEVO

At Delft University of Technology the research program 'Smart Product Systems' aims to carry out research on efficient and durable products and systems. As part of this program, they are developing a lightweight, sustainable concept car for urban areas, the DutchEVO. The context for this car contains a large number of factors of which three stem out (Knoppert and Porcelijn 1999). First, they stressed the principle that the perception of the driver narrows down with increasing speed. Secondly, it was argued that the development of increasing globalisation – in culture, economics, religion, etc. – has enhanced our expressive repertoire and resulted in the desire to express ourselves in various ways. Finally, because our interaction with our surroundings and other people is more and more mediated by technology, we are starting to hide behind it in order to avoid confrontations.

These three factors were brought down to one general position. As a reaction to these factors, it was decided that we need space and freedom to experience our surroundings fully and express ourselves in an unforced manner. This statement was translated into a 'low threshold' concept car with a number of distinctive features (Figure 4). The car only minimally protects you from outside conditions, like wind, temperature, and noise, by using very thin and light materials. The car has a Catamaran-like structure that makes the floor situated at the top level of the tires. This affords a natural, step height way of entering the vehicle and the performance on side impact is impressive, i.e. the car has an outstanding passive safety. Both to compensate for the large frontal plane that would result from the relatively high floor level and to make the car as aerodynamic as possible, the car is fitted with a Venturi, allowing the wind to flow under the car without turbulences. The interior of the car is reduced to its bare essentials, thereby avoiding users to process information that is irrelevant or disturbing and allowing them to express themselves freely.



Figure 4: DutchEVO, a sustainable concept car for urban areas (design Rick Porcelijn)

6. Concluding remarks

In the introduction we posed the question where Opron and Maarten found the parameters for their user-car relationship and the car itself. Given that we have argued that parameters are based on a context, either implicitly or explicitly, we will conclude this paper with a speculation on the context of Maarten and Opron's ideal car.

We see three developments at the origin of their context. First, artefacts are becoming increasingly explicit and leave less room for personal interpretation. Next, society is becoming more and more cultivated; everything is done to make our lives as convenient as possible. Finally, the traditional dominant position of men in social life is gradually disappearing. Because of these developments, men cannot behave anymore as they would like to – for example as a seducer - and try to compensate this by aggressively rejecting authority and being understanding when it comes to childlike or playful behaviour. This pattern made Opron and Maarten see products, i.e. cars, as a means to revitalize masculinity. Therefore, they want their ideal car to be playful and obedient, to be physically demanding and moody like an actress. They even want us to be attached to it like we are attached to our loved one.

Notes

1 Whenever in this paper we speak of 'a designer' this could of course refer to a man or a woman, and also to a design team or a company.

2. Maarten's position was probably based on dissatisfaction with current products and not on a possible new context. Without exploring this issue any further at this point, we would like to stress that such an unease with the status quo could lead to fixation effects and limits the solution space of the designer (see e.g. Snoek, Christiaans and Hekkert 1999), and is thus not in line with the view defended in this paper.

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