DESIGN

AND

DESIGN

DOGMAS

AN EXPLORATION AND THOUGHT EXPERIMENT

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Design and Design Dogmas

An Exploration and Thought Experiment

"We cannot see anything until we are possessed with the idea of it, take it into our heads, and then we can hardly see anything else"

Henry David Thoreau[1]

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[1]H.D. Thoreau (1849), *Civil Disobedience and Other Essays*

Summary

In the multi-interpreted concept of 'design', there exist ostensible 'rules-of-thumb', that guide present-day designers. Industrial designers have traditionally bridged the gap between industry and consumers, which is an interaction that dominates the world's economic, capitalist system. Since this system, on which our 'First World culture' is based, has severe consequences on the earth and its inhabitants, it is important to understand how these rules were shaped and how they influence designers. This essay is an attempt to understand the origin of these rules, and presents alternative ways of thinking. This is achieved by critically questioning 'design', according to the following structure: 'Why do we design?' (Part I), 'What is design?' (Part II), 'How do we design?' (Part III), 'How should we design?' (Part IV). Through these parts, socio-cultural, economic, technological and natural perspectives are interweaved.

Part I, 'Why do we design?', starts by addressing 'A Short History on Mass Design Culture and Production', which elaborates on the emergence of the 'designer for industry', who has its roots anchored in the 'Era of Modernity'. After the industrial revolution, people attempted to validate and create profit from invented production techniques, by selling the industry's products to the 'ordinary citizen'. The second subject, 'Industrialisation, Progress and Capitalism' demonstrates the way our capitalist system, in which industry is embedded, has evolved. Perceptions on 'money', 'property' and 'freedom' are discussed, that have led to a modern economic system that requires and produces rational models. These models make our world predictable and adaptable to multinational enterprises, who use 'globalisation' to expand more and more, in order to achieve 'progress' and compete with other multinationals. This is steered by marketing and branding.

Part II, 'What is design?', proposes a definition of the 'Core of Design', by evaluating 'qualities' and 'traps' of technology and art – a combination of the initial sources of design. The 'qualities' and 'traps' of technology include its instrumentality and the way that covers up technology's origin. For art, the 'qualities' and 'traps' include its easy value judgements that cover up the art creation process. Subsequently, a definition of the 'Core of Design' is suggested, and two views on design are advocated, in which 'common' design is based on the 'traps', and 'core' design includes the 'qualities' as well.

Part III, 'How do we design?', endeavours to show how we practise design today. Firstly, in 'The Peels Around the Core of Design' it is explained how superficial differentiations within design lead to consumerism, which conceals what design could be really about. The 'Intermezzo – the Consequences of

Capitalism on Nature' shows the harsh effects that natural resource extraction and use have.

Part IV, 'How should we design?', summarises and tackles 'design dogmas' in 'Dismantling Design Dogmas', by reflecting on the socio-cultural, economic, technological and natural perspectives. In 'Recommendations for Higher Design Education' the way Industrial Design Education (IDE) is based on 'design dogmas' is discussed. It is proposed that by involving more critical and reflective thinking on fixed design methods, and by including a broader design context, IDE could be enriched and resonate the demands of the real world.

Finally, a 'Dogma Overview and Alternative Approaches' is presented, which outlines the way 'design dogmas' have been derived from general dogmas. In addition, it includes alternative approaches towards design dogmas.

Samenvatting

Het begrip 'ontwerpen' is niet eenduidig: in verschillende contexten heeft het een andere betekenis. Hedendaagse ontwerpers hanteren zogenoemde vuistregels waar ze in hun werk houvast aan hebben. Met deze vuistregels dichten industrieel ontwerpers de kloof tussen industrie en consumenten en voeden ze daarmee het kapitalistische, geglobaliseerde systeem van massaproductie. Aangezien dit economische systeem, waarop de cultuur van de westerse maatschappijen gebaseerd is, zware consequenties heeft voor de aarde en haar bewoners, is het belangrijk om te begrijpen hoe deze vuistregels zijn ontstaan, en hoe ze ontwerpers precies beïnvloeden. Dit essay is een poging deze vuistregels te doorgronden, in perspectief te plaatsen en vandaaruit een tot een alternatieve visie op ontwerpen te komen. Om hiertoe te komen, wordt ontwerpen op een kritische wijze benaderd volgens de volgende structuur: 'Waarom ontwerpen we?' (Deel I), 'Wat is ontwerpen?' (Deel II), 'Hoe ontwerpen we?' (Deel III), 'Hoe zouden we moeten ontwerpen?' (Deel IV). In deze delen worden de volgende perspectieven in overweging genomen: het sociaal-cultureel-, economisch-, en technologisch perspectief, en het perspectief uit de natuur.

Deel I, 'Waarom ontwerpen we?' begint met 'Een Korte Geschiedenis van Massa Ontwerp Cultuur en Productie', waarin wordt ingegaan op de ontwikkeling van de 'ontwerper voor industrie', die in opmars kwam tegelijkertijd met de industrialisering. Na de Industriële Revolutie probeerde men om de uitgevonden productietechnieken rendabel te maken door industrieel vervaardigde producten aan het grote publiek te verkopen. Het tweede onderwerp, 'Industrialisering, Vooruitgang en Kapitalisme'

laat zien hoe het kapitalistische systeem waarin deindustrie (van multinationals) verankerd is, zich door de jaren heen heeft ontwikkeld. Hier komen de begrippen 'geld', 'bezit', en 'vrijheid', die ons hedendaagse economische systeem tot stand hebben gebracht, aan bod. Daarbij komt dat het kapitalistische systeem baat heeft bij het modelleren van de werkelijkheid. Modellen zorgen ervoor dat onze wereld voorspelbaar en aanpasbaar lijkt te zijn. Modellen helpen bij het ontwerpen van groeiscenario's voor nieuwe merken (branding) en markten (marketing). Onder het mom van 'vooruitgang' gebruikt de industrie (van multinationals) globalisering om te blijven doorgroeien.

Deel II, 'Wat is ontwerpen?' geeft een definitie van de 'Kern van Ontwerpen' vanuit kunst en technologie. De kwaliteiten en de valkuilen van zowel kunst als technologie vormen samen de basis voor wat ontwerpen in de kern is. De valkuil van het gebruik van technologie is dat dit gebruik zo vanzelfsprekend wordt, dat de inspanning die nodig is om de desbetreffende technologie tot stand te brengen, niet meer opgemerkt wordt. Bij kunst is de valkuil dat er snel een waardeoordeel over het kunstobject wordt gegeven, zonder oog voor het (creatieve) totstandkomingsproces. Bij huidige ontwerpprocessen komen beide valkuilen voor: technologie wordt puur als instrument gezien en de vormgeving wordt alleen op smaak beoordeeld. In dit essay wordt een ander (nieuw) perspectief op ontwerpen gegeven en wordt een definitie voor gesteld voor wat beschouwd kan worden als: de kern van ontwerpen.

Deel III, 'Hoe ontwerpen we?', schetst een beeld van de manier waarop er tegenwoordig wordt ontworpen. In 'De Schillen om de Kern van Ontwerpen', wordt er uitgelegd hoe een kunstmatige gelaagdheid in ontwerpen tot consumentisme aanzet. Deze gelaagdheid verhult waar ontwerpen echt om zou moeten gaan. In het 'Intermezzo – de Consequenties van Kapitalisme op de Natuur', komen de ongewenste effecten van extractie en gebruik van natuurlijke grondstoffen op de natuur aan de orde.

In deel IV, 'Hoe zouden we moeten ontwerpen?' vindt synthese van het voorgaande plaats. 'Ontmanteling van Ontwerpdogma's' geeft een beeld van de vuistregels, beter te bestempelen als ontwerpdogma's, en belicht de schadelijkheid/ eenzijdigheid hiervan door in te gaan op de vier perspectieven (sociaal-cultureel, economisch, technologisch, natuur). In 'Aanbevelingen voor Hoger Onderwijs voor Ontwerpen', wordt aangetoond dat dit onderwijs is gebaseerd op ontwerpdogma's. Er wordt aanbevolen om studenten te leren om de bestaande ontwerpmethodes in een breder perspectief te plaatsen en meer context bij het ontwerpen te betrekken. Uiteindelijk wordt er een overzicht van dogma's en hierbij aansluitende alternatieve aanpakken geboden. Eerst worden specifieke 'ontwerpdogma's' afgeleid van de algemene dogma's en vervolgens wordt er een andere kijk op deze ontwerpdogma's gegeven.

Preface

Over the time that I have studied my Bachelor Industrial Design at the University of Twente a personal awakening has taken place. This started when I began as a freshman in 2012, and it slowly came to stream during the recent years of education. Of course, I had all kinds of vague expectations, but what would really intrigue and absorb me in 'the world of design' was completely open. During the past years, I was introduced to many fields of design, thanks to all teachers that I have had.

For now, I would like to very much thank my supervisor, Robert Wendrich, who has played a major role in the – ever unfinished – exploration of my personal aspirations as a designer and the composition of the essay. A few years ago, the first thing he taught me during one of his lectures was to question everything, and to behave independently. He triggered me to get a hold onto topics that I found truly interesting, by encouraging me to actually use my brain, to read and to write.

In the meantime, there were certain events I attended (the Dutch Design Week, the Expo Milano, and the Venice Biennale); and I completed several design-courses (at the University of Twente, and at Budapest University of Technology and Economics). Importantly, I have realised that these institutes raise (design) values that are often highly contradictive to the values that really matter to me, because they are very disproportionate to the global context they appear in.

In my optimistic view designers, in their own way, should be able to contribute more to humanity and earth, than they do now. The numerous conversations I have had with Robert Wendrich have inspired me to keep myself motivated to indeed contribute something from my own designer perspective, and this essay is one of the first real attempts.

Having said that, I would finally like to pay thanks to my beloved-ones, for all their great support, and for listening and putting up with me.

Contents

Foreword for Designers

This essay is directed at you: the Designer, you act, feel, live, play and work as a 'Designer'. During your working life, you often bumped into systematic design methods, such as described by e.g. Pahl&Beitz (1995). These methods attempt to encompass the complete Product Development 'Cycle', by initiating a 'design-demand' that should be investigated and developed according to an established sequence. In general it resembles the following: planning, target group investigation, market analysis, brainstorm, concept generation, concept elaboration, prototyping, testing, and evaluation.

Turning to present-day design topics that you might have heard of, you may conclude that those topics do not resonate with these systematic design methods. The international platform 'What Design Can Do'[1], discusses "design as a catalyst of change" and wants to address "societal questions of our time". For example, Thomas Rau[2] is designer of a new economic system in which the consumer changes from owner to user: the consumer buys cooling instead of a refrigerator; she or he buys light instead of a lamp. The 'Ocean Clean-up'[3] is an initiative to develop "the first feasible method to rid the oceans of plastic". Design for longevity[4] and durability[5], is addressed more and more often, for instance by the Stanford Centre of Longevity[6]. The previous examples indicate that traditional design methods, addressed as 'fixed design loops' are not applicable to many present-day design dilemmas. The 'Introduction to a Broader context of Design' will introduce the bigger picture that encompasses design's relation to societal questions.

To elucidate, this essay will *not* explain ways to get more creative, it does *not* give you insight in new target groups, it will *not* reveal exclusive ways of brainstorming, it will *not* show how to better visualise your designs, it *cannot* lead you to new ways to choose the best concept, it is *not* about making a test set-up, it does *not* tell you how to find the most high-tech solution and it certainly does *not* explain how to make designs in the most cost-efficient way.

More importantly, this essay is about asking questions before the other questions. It wants to broaden your scope on design ideology by examining the embedment of design in society. It attempts to show how traditional design values have emerged through the 20th and 21st century, and it challenges you to overview and rethink

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[1] 'What Design Can Do': http://www.whatdesigncando.com/

[2] Thomas Rau, architectect RAU B.V.: http://www.rau.eu/

[3] 'The Ocean Clean-up': http://www.theoceancleanup.com/?gclid=CNCxv6K4-coCFYkBwwodNXYMNA

[4] 'longevity': something that has a long life, existence or service (Oxford Dictionary)

[5] 'durability': the ability to withstand wear, pressure, or damage (Oxford Dictionary)

[6] Stanford Centre of Longevity: http://longevity3.stanford.edu/

these values. It is about the reason before and the consequences after 'design'.

No matter which 'type' of designer you think or feel you are, this essay applies to you. As a designer you (are) ought to be creative and free thinking, however, if it is your profession, you follow certain standardized rules and fixed ideological ideas. These rules you have at first come across while entering design education, and you have had to adapt to business goals once you get your diploma. This manifest attempts to address your curiosity towards the way these rules were shaped and the way they influence you, as a person and as a designer, in hyper-modern society, upward mobility culture and progress-based civilisation.

To get a hold on this theme, four main questions will encompass the matter; 1)Why do we design?, 2) What is design?, 3) How do we design?, 4) How should we design? These questions are approached from different societal aspects that are either entangled, crossed over or stand alone. The rough sketch of the focus within the different parts is presented in Figure 1.

Within every topic, several 'unwritten design rules' will be discovered while unravelling the developing and evolvement of design, which is of major importance, since these rules regulate design today.
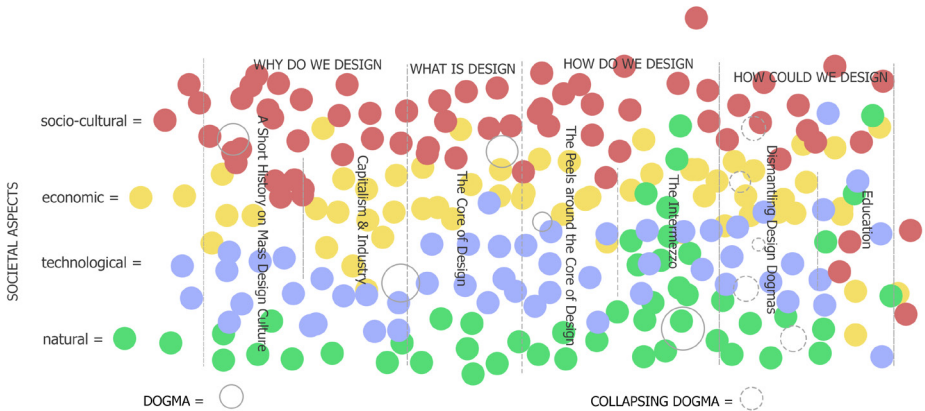
Figure 1: arrangement of perspectives within essay content

The first leading question is 'Why do we design?', which is elaborated in 'A Short History on Mass Design Culture and Production' and 'Industrialisation, Progress and Capitalism'. The first clarifies the need for design, and its development at the beginning of the 20th century. The latter explains the fundaments of this need, which lay within our economic system. The final topic is: how does this economic system have consequences for our designing and for our world?

The second leading question is 'What is design?', which is particularly investigated in 'The Core of Design': how does it relate to technology and art, and

how does that influence the way it is practised? The third leading question, 'How do we design?', does not unravel existing design methods, but it debates the particular consequences that derive from the way we practise design.

'The Peels around the Core of Design' discusses design diversification, and the 'Intermezzo - the Consequences of Capitalism on Nature' dives into the major consequences. The last leading question, 'How should we design?', tries to get rid of the common 'design rules' by broadening the scope within different fields. 'Dismantling Design Dogmas' announces the dogmas within the entangled economic, socio-cultural, natural and technological fields, and 'Recommendations for Education' provokes our current higher design education.

A Broader Context of Design

Close to all human earthlings depend upon industry through its means of production, meaning: basic sustenance products, fuels, medicines, jobs, cities, etc. Whereas governments claim to be in control, the industry establishes life's replenishments that get more and more common every decade.

At least, this commonality counts for Western-styled countries. There exists a huge inequality in wealth. Globalisation is driven by these rich countries in favour of themselves, to sustain and grow their wealth. As stated by Sloterdijk (2004), 'globalisation is the result of commercial transactions that lead to distant consequences'.

Our capitalist driven society affects Earth, and all other earthlings critically. Our globe is the only habitat we will ever have (the latter is opposed by e.g. Stephen Hawkings, who claims that humankind has to leave Earth within 1000 years, and colonize another planet, or face extinction). Many argue that the globe will not withstand, but it is more likely to presume that all living species on earth – plants, animals and humans – are increasingly unbalanced within their habitat. What we need is a global paradigm shift that encompasses the hybridisation of human nature and human culture: two entities that have been diverting for a long time. This has resulted in human intervention on earth, which is embodied by industry that patronises consumers.

What can design do? Design closes the gap between industry and consumers, it is the lubricant for industry. Design might provide an approach towards more responsible behaviour, because in the core, design provides solutions, design can fulfil a functional purpose within a certain domain. It is the domain's context that we have lost track of: everything we do as designers, has far reaching consequences.

For designers, a notion of a global context is hard, because it is too vast. What has become of design, is that it inflicted far reaching consequences, such as forced labour, resource exploitation, extensive use of energy and production of enormous amounts of waste. Effectively, designers influence the way industry uses our common habitat for its resources, and designers are being influenced by industry.

Common Frameworks for Designers

Designers are susceptible to many internal and external influences such as their own motivation, ambition, and wellbeing (internal), but also to things that appeal to their emotion, such as the people they meet, events that occur, and economic welfare (external) – the latter is their frame, which defines the way they behave and design. This determines their own perceptions of design and of being a designer. A certain group of designers may have a common frame. This frame could involve a certain time-period, continent, region, school, gender and these concepts always interfere, which creates a new frame: anything that classifies a group of designers within a specific natural, geographical and cultural sphere. Personal attitudes towards design are 'coloured' by those frames, which encourage special adaptation and integration towards them.

If the common frame has a certain influence, this influence will evolve into a set of 'common rules', which describe important values that 'should' be obtained/ executed/fulfilled by other designers. It will eventually outgrow the initial frame, and when it does, it turns into an ideology, because the appearance of the frame has dissolved.

"According to our common sense, we think that ideology is something confusing and blurring our straight view: ideology should be glasses that distort our view, and the critique of ideology should be the complete opposite: taking off the glasses so that you can finally see how things really are. This precisely is the ultimate illusion. Ideology is not simply imposed on ourselves. Ideology is our spontaneous relationship to our social world, how we perceive its meaning. We, in a way, enjoy our ideology. To step out of ideology, it hurts" (Žižek, The Pervert's Guide to Ideology, 2012).

In this essay, common (design) frames that exist in 'First World societies' will be addressed. To shortly indicate, in the Netherlands, there exist fuzzy perspectives on the essence of design, which has found its way to the Dutch Van Dale Dictionary. Whereas 'design' in English means 'the plan/idea for an object before it is made' or 'the arrangement of the features of an artefact, , as produced from following a plan

or drawing' (Oxford Dictionary), the Dutch meaning of design is briefly stated as 'form-giving'. This represents a Dutch common understanding of 'Design'.

Either way, we will abolish 'form-giving' as the only explanation for design. Therefore, this research will use a universal understanding of design, design as a means for solution, in order to create an analytical space for investigating if and how common frameworks in Design manifest themselves, whether they can be announced as 'dogmas', and if they affect designers in such a way that their creations follow from those dogmas.

To summarise, through investigating dogmas, by asking the four questions as mentioned earlier, I would like to make novice and expert designers aware that if they recognise frameworks they are subservient to, they will be more open-minded to all varieties of perspectives for design that will arise by this awareness, which could ultimately lead to a shift in the perception and purpose of design today.

Rules-Of-Thumb?

Design fulfils needs

Design needs to be functional and aesthetic

Design can serve as an instrument or a mediator

Design should leverage profit

Design requires technology to solve a problem

Design requires the use of standardised algorithms or models

Designers choose materials that balance costs and functionality

Part I

Why do we design?

A Short History of
Mass Design Culture & Production

"Like Janus, design looks in two directions at the same time: as a silent quality of all mass-produced goods it plays a generally unacknowledged but vital role in all our lives. As a named concept within the mass media it is, however, much more visible and generally recognised" (Sparke, 2004)

The Era of Modernity

Due to technological and scientific progress at the beginning of the 20th century, new attitudes towards a modern life were established. It was the start of the new era of Modernity. According to Marx(1867) "what was the basis of Modernity was the emergence of Capitalism". "The fundamental impulse to modernity is rather industrialism accompanied by the new scientific forces" (Larraín, 2000). Scientific forces inflicted indeed that trust in God and religion had been shaken. Next to religion a second "faith" appeared: scientific faith. Due to this scientific faith, the belief in technological progress, and therefore, of parametrising life increased. This parametrising of life meant that commodities could be parametrised as well, in order to eventually be available to 'everyone'. The same rationalism underpinned the process of industrial production, and it was linked to the concepts of objectivity, collectivity, universality and utility (Sparke, 2004). These terms have a close connection with the neo-liberal ideology, as will be explained in 'Capitalism & Industry'.

"Modernism was essentially conceived of as a rebellion against 19th Century academic and historicist traditions and against Victorian nationalism and cultural absolutism, on the grounds that the "traditional" forms of art, architecture, literature, religious faith, social organization and daily life (in a modern industrialized world) were becoming outdated" (Mastin, 2008).

In design, modernism was at last reduced to 'form follows function'[7] , which played a key-role in functionalism, which in the end diluted to a mere visual style. It is important to acknowledge that modernity and modernism serve as foundations for designers' historical framework.

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[7] 'Form follows function' is appropriated to Louis Sullivan for his Autobiography of an Idea (1924). However, it is derived from Sullivan's initial 'form ever follows function' (p.108) which he explained as a distilled – natural – law.

The Rise of The Industrial Designer

The industrial revolution, that took place after the mid-18th century in the United Kingdom, manifested ways of industrial manufacturing, which could replace the work of artisans, due to new technological inventions. Although faith in science and industrialisation increased, industrial manufacturing was not sanctifying in itself, because it still was very expensive. A new strategy was needed to compensate for all costs: people simply had to swap handicraft for industrially produced goods.

The key was to create products, such as furniture and domestic appliances, that were as good as their handcrafted predecessor, and which were industrially feasible. These products could help in fulfilling basic tasks in the domestic environment. In the beginning, there was no such thing as a 'designer', so many different existing creative and technical professionals (architects, decorators, technicians etc.) (Sparke, 2004) took responsibility for varying products. "The need to make decisions earlier represented an important paradigm shift from the working process of the artisan, who had depended upon tacit skills, to that of the designer for industry, who had to undertake more self-conscious, rational planning"(Sparke, 2004).

According to Sparke (2004), architects ruled the world of product design until the late 1920s. They thought that 'creation of the forms and decoration of the banal goods that made up the everyday environment' was a part of their work in the built environment. Later, the "graphic designer, defined as someone who would receive instructions from a client, devise drawings and plans and then instruct technicians, typesetters and printers to realise the designs"(Sparke)(Aynsley, 2001), translated 'craft' to 'industry'. The invention of electric lighting had activated a shift from people's acting mainly inside a domestic environment towards acting inside a public environment as well (Sparke, 2004). Moreover, shop owners permitted themselves to create attractive shop windows to be able to sell their industry-made products. In that time, 'shop designer' and 'shop window display artist' were important professions (Sparke, 2004).

Significantly, women functioned as the primary target group.
The established 'designers' were men, who believed that women should be in control of their household, for which they would need all kinds of devices and appliances. The 'designers' would provide them with these, since they were under the impression that men were in charge of everything outside that domestic environment. Their practised design-credo was: "selling Mrs Consumer"(Sparke, 2014).   Today, marketing is still led foremost by men, only 3% of American creative directors are female (Dishman, 2013).

In the years between the two world wars, the products within the shop windows

evolved and diverted to 'live up' to the consumers 'desires'. Within these years, the concept of the consultant designer for industry came of age (Sparke, 2004).The American consultant designers of the 1930s created what we now know as 'designer-culture'. This is because they showed the way a commercial design process and profession was dependent on background skills that were influenced by commerce and spectacle. The 'designer-culture' can be described as "the attribution of value, both cultural and economic to an object, image or environment because it had a well-known designer's name attached to it, in emulation of the importance of attribution to the value of a work of art" (Sparke, 2004).

In twenty years from now, the 'industrial designer' has existed for 100 years. It is interesting to see how the tasks of an industrial designers have changed so little over almost a century. Among several tasks, such as filling the gap between the demand of the customer and industry; combining visual arts and technical solutions; their most important task was to make sure that manufacturers could remain in business (Sparke, 2014).

Aesthetics, Style and Brands

To be able to sell an ever increasing amount of products to their consumers, a strategy was conceived that was not based on the product's functioning, but on the consumer's possibility to distinguish themselves from others, whereby exposing their good taste (Sparke, 2004). This strategy is called 'branding'. Multinational corporations have put an increasing emphasis to producing brands instead of products, which has a great cultural influence (Klein, 1999). Each brand develops a specific graphical language, and therefore: brands were (and still are) the perfect reaction to the 'need' of being able to identify yourself to certain products (Sparke, 2004). However, while multinational brands "sell diversity", what they want is quite the opposite: by launching their shop or restaurant within a certain area, they have the immediate power to out-perform their local equivalents (Klein, 1999). In this way, they impose a standardisation of products, which makes the world significantly more homogenous (Klein, 1999).

Industrialisation, Progress & Capitalism

"All of economics is, in the end, economics of good and evil. It is the telling of stories by people of people to people. Even the most sophisticated mathematic model is, de facto a story, a parable, our effort to (rationally) grasp the world around us" (Sedlacek, 2011)

This section will describe how the emergence of (neo)liberal ideologies throughout the centuries has encouraged desire for property and freedom, by treating humans as 'Econs'[8] and the Earth as a regular model, and confirms capitalism which induces globalisation. These subjects will be elaborated by 1) addressing the concept of money as a means for trade; 2) weighing freedom as a matter of property by reflecting on this using the mental legacy of Rudolf Steiner; 3) examining how desire is a driving factor; 4) introducing Adam Smith and Ayn Rand – two thinkers that have greatly influenced neo-liberal ideologies; and 5) mentioning parametrisation of humans and their environment. Combined, a broader framework is suggested for the everyday designers who are embedded in the design industry.

The Concept of Money

Let us start by touching upon the key-issue of Capitalism: money. The concept of money started when our ancestors evolved from hunter-gatherer nomads into farming domesticated villagers. At first, money was a means for trade in order to be able to postpone a paying back in goods (Achterhuis, 2010).For example, when a shepherd liked to trade one of his sheep with a baker for bread, it would be uneasy to donate ten loafs at one time, since the bread could not be preserved. In this case, the baker would give 'money' to the shepherd, so that he could buy an amount of bread if he needed to. Because money is an abstract construct, it is not bound by matter, space or even time. This means that it can travel in three dimensions: "vertically (those who have capital lend to those who do not), horizontally (speed and freedom in horizontal or geographic notion has become the by-product – or driving force? – of globalisation) and in time" (Sedlacek, 2011). Georg Simmel (2006), calls money common, (which means vulgar in this context): "Objects themselves are devalued of their higher significance … Money is 'common' because it is the equivalent for anything and everything. Only that which is unique is distinguished; whatever is equal for many is the same even for the lowest among them, and for that reason it

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[8] 'Econ', coined by Thaler (2008) is a rational version of a human, who calculates and maximizes utility for its own optimal benefit.

pulls even the highest down to the level of the lowest. That is the tragedy of every levelling process: it leads directly to the position of the lowest element."

Freedom and Property

Money buys you time. Time is one of the most important things in our lives. Through centuries we have been favoured with a little more, yet we are highly concerned about our short time on earth. Does this mean that the more money we have, the more time can be literally saved, in such that the more options we have, 'the freer we are?' This reasoning has been illustrated in Figure 2. Rudolf Steiner's understanding of freedom could not be a bigger contrast to 'freedom of choice by buying what you want', because the want is steered by perceptions that were arranged by big commercial enterprises.
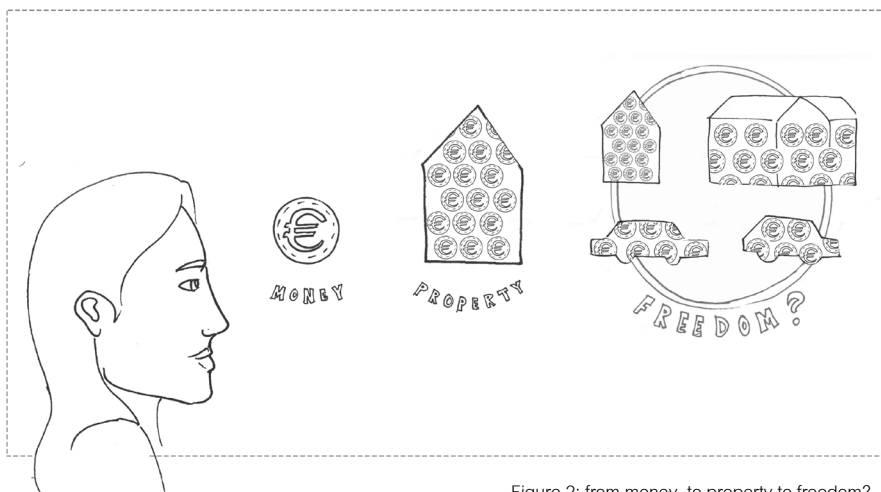

Figure 2: from money, to property to freedom?

RUDOLF STEINER (1861-1925)

Rudolf Steiner (1921), wrote "Die Philosophie der Freiheit", which touches the fundamental concept of freedom. "Trotzdem richten sich bis zum heutigen Tage die Hauptangriffe der Freiheits-gegner nur gegen die Wahlfreiheit" (Steiner, 1921). Steiner immediately opposes the idea that freedom cannot merely exist of our freedom to choose the most preferred option from a certain set. He claims that before we know what is truly free, we have to separate terms ("Begriffe") and ideas ("Ideen") from the more original thinking ("das Denken"). This is because terms and ideas are shaped by our combined thinking and perceiving (Steiner, 1921). The immediate understanding or perception [the perceptual framework] creates the reason for the want; the character defines whether new activities are aimed for in

favour of that reason (Steiner, 1921). This describes why the thinking on its own is purer than perceiving, because perceptions are framed.

In my view, pure thinking means that you are able to zoom out and reflect on the context in which things are happening, so that your actions always relate to that context with awareness of the context. Figure 3 illustrates this for the bigger scope of money and property. The influence of pure thinking leads to actions that are less dependent on immediate perception. Freedom of thoughts leads to freedom of actions and free people: "Leben in der Liebe zum Handeln und Leben lassen im Verständnisse des fremden Wollen ist die Grundmaxime der freien Menschen" (Steiner, 1921).

Humans are free if they can realise the same "Seelenstimmung" (that lives within them) in their wants, when they are conscious of the arrangement of their absolute ideal (mental) intuitions (Steiner, 1921). To reach this state, it is required that people are more autonomous by nurturing their individuality, which makes it unnecessary to keep hold on their framework that is created by their membership of a certain group (Steiner, 1921).

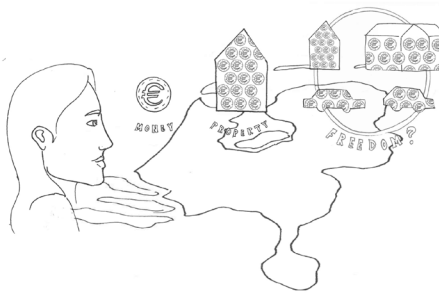Figure 3: a broader context of 'freedom' and 'property'   Figure 4: a limited context of 'freedom' and 'property'

However, we can conclude that we are not free in the way Steiner proposes, since it is very hard for us to rely on our pure thinking, since we are so much involved in the context (Figure 4). Our freedom is most of the time limited to our freedom of choice. This freedom of choice is closely connected to demand and supply, which is related to a perceived scarcity. In design, this 'scarcity' is artificially constructed, and tries to work on the human psyche. In the human psyche there always exists a certain discrepancy between demand and supply. There are two ways of tackling this problem: either decreasing demand, as the Stoics declared, or increasing supply, as the Epicureans argued (Sedlacek, 2011). Diogenes, a Stoic, considered himself a 'free man' when he got rid of all his belongings, including one of his last ones, a jug, which he did not need because water could be held within one's hands. Unfortunately, in

our present society, such people would be known as 'hobos' or homeless people. As well as the moneybags of our society, people who give less power to profit and money agree with a hedonistic[9] rather than a Stoic approach. The question remains, are we really 'free' if we would be able to buy any conceivable property, or, would we be free if we would have no possessions at all, is questionable: within this range there is opportunity for differentiation. Subsequently, "the ends justify the means" has become the most worldly-practised credo. Sloterdijk (2006), summarised today's freedom in a pungent way: "people's minds are not boggled by scarcity and need, but they are boggled by choices. After this change, weak arguments like pure whims and personal tastes have taken over strong arguments, like scarcity and need. This is what we call freedom."

Figure 5: the difference between needs (necessities) and 'needs' (desires)

Thesaurus for Need, Want, Desire and Demand

Sloterdijk's words also show the present meaning of desire. "It appears that 'the effort to constantly be dissatisfied and want more' is a natural phenomenon – and lies at the very heart of our civilisation, of being human" (Sedlacek, 2011). The key concept of desire is that it is never ending, since fulfilling desires will create new ones. Therefore, desire is one of the driving factors for the materialism, and therefore of market-capitalism (Sedlacek, 2011) (Barthes, 1983). "From the outset, design was characterised by its dual alliance, its main *raison d'être* being its role within industrial production but its primary function being that of stimulating desire"(Sparke, 2004). Whereas industry uses and invents people's 'desires', those 'desires' are often asserted as 'needs', 'wants' or 'demands'. To be able to understand these terms better, the

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[9] Hedonistic – related to the way Epicurean way of thinking: engaged in the pursuit of pleasure; sensually self-indulgent (Oxford Dictionary)

following explanation is proposed.

1) A 'need' has never been totally absolute (Whitely, 1993): different cultures have different needs. Once, a 'need' was close to absolute: a 'need' followed from 'necessity'. Nowadays, a 'need' used in design, is the consumer's 'wish' that is induced by marketing. This wish is based on infinitesimal, relative variances in goods or products, that have been greatly inflated.

2) The 'needs' we try to fulfil are actually 'desires'.

3) A 'want' can either be a 'need' or a 'desire'.

4) 'Needs' and 'desires' could all be captured under 'demand', however, 'demand' is also misused. 'Demand' creates the illusion that people are actually requesting the products that industry fabricates.

5) To suggest, 'demand' and 'supply' do not exist, instead 'supply' and 'eat' are more applicable. If 'the supply' appears to be 'inedible' or 'indigestible', the product has failed.

6) 'Scarcity' can either be (close to) absolute or relative. To propose, 'scarcity' is close to absolute if within a society there is a lack of basic necessities. In design, 'scarcity' is mostly relative: 'scarcity' is constructed by marketing that fakes 'desires' and turns them into 'needs'.

In short, absolute scarcity creates the want for 'necessities' – the 'need', yet in design, 'scarcity' is a construct. The construct aims to arouse 'desire', which is announced as 'need'. This, we call 'consumer demand'.

The Neo-liberal Construct: An Introduction to Adam Smith and Ayn Rand

Views on freedom, property and desire are part of a mental legacy that goes beyond the Ancient Greeks. However, in the last three centuries these ideas made a leap towards the rise of Capitalism, which has been shaped by many influential thinkers and philosophers. In the following, Adam Smith and Ayn Rand will be discussed, since they can be found at two ends of a chain of development that concerns the present view and implementation of neo-liberal ideologies. A more detailed elaboration has been done by Achterhuis (2010), who presents many intermediate philosophers. The explication in this text will show how today's neo-liberal ideologies, such as propagated by Rand – the driving ideology for Capitalism – have been finally derived from the ideas from Adam Smith.

ADAM SMITH (1737-1790)

Adam Smith is often called the 'father of economics', and this is due to one the most influential books on our present economic discipline: An inquiry into the Nature and Causes of the Wealth of Nations (abbreviated by "The Wealth of Nations"), written in 1776. The Wealth of Nations contains some very fundamental neo-liberal ideas, that without considering the ethical nuances of his other works, such as The Theory of Moral Sentiments (1759), has led a life of its own.

In the Wealth of Nations, it seems that Smith appoints humans as individuals whose motives are guided by self-interest. In addition, he used the notion of the invisible hand, which has been used as a reason for market-capitalism by other neo-liberal thinkers ever since. He used it once, which adds to a total of three notions, spread over three of his books in three different contexts: "First, as a coordinator of the individual pursuit of self-love, second as the collective hand of redistribution, and third, as a mystical, godlike power" (Sedlacek, 2011,). These three contexts have caused confusion, which clarifies that there is no such thing as a true interpretation. Therefore, it is peculiar that today it is thought that the invisible hand prevents our society from collapsing (Sedlacek, 2011). Moreover, as clarified by Smith (1776), he did not believe in an Open Market, he was aware of dangers and wanted to curb the banks' scopes and interests.

In contrast to Wealth of Nations, his first work The Theory of Moral Sentiments – which he kept working on and republishing all his life – focuses on ethics rather than economics. In this book, humans are not described as rational actors, but are creatures led by emotions. The main principles of human behaviour are described as "loving benevolence" and "fondness" (Smith, 1776). Interpersonal relationships specifically inhibit these principles, which turns a society of people into a particular society (Sedlacek, 2011). So, Adam Smith's basic principle of self-love cannot be

considered without his principle of loving benevolence. Hence, this leads to the core of the reason why today's strong belief in some invented interpretation of 'the invisible hand' could be brought into question: what if we chose the ethics instead, as dominant belief-set?

AYN RAND (1905-1982)

Among many things, Ayn Rand was an American novelist and thinker. She made up her own philosophy – Objectivism – in which she treats humans as 'self-serving rationalists'. As said, such theories have developed themselves ever since the Wealth of Nations, and Rand takes it to the extremes. She believes that there exists an objectively perceivable reality which is understandable by human rationing. In this rationing, choosing for oneself is the most reasonable and therefore objective choice; there is no subjective reasoning (Achterhuis, 2010). This 'Objectivism' is the driving force of her bulky novel Atlas Shrugged (1957), in which she describes the United States of America (USA) as a dystopian Welfare State, and in which she introduces Atlantis: her capitalist Utopia.

Together with Milton Friedman and Friedrich Hayek, Ayn Rand has been a master for influential American people, such as Alan Greenspan – who has been the chairman of the American Federal Reserve Bank. The monetary system belonging to that bank has affected every person, which was shown by the Financial Crisis in 2008 (Achterhuis, 2010).

"Utopian ideas are often a handsome cover-up for a dystopian reality, so is this Rand's. The dystopic features of the neoliberal utopia show up more often over the years: People's interrelations shrink because the whole world is reduced to an open market, violent expropriation and uprooting of large groups of people, increased social inequality, exclusion of civilians that cannot live up to the market, and disruption of governmental influence are just examples" (to paraphrase Achterhuis, 2010).

Humans and Econs

Not only Ayn Rand has treated humans as self-serving rationalists. The 'homo economicus'[10] is a pure rationalist with an endless intelligence, memory and determination (Thaler, 2008). Thaler (2008) makes a difference between econs – the homo economicus, and humans – the homo sapiens.

"The Econs of the rational-agent model do not resort to mental accounting: they have a comprehensive view of outcomes and are driven by external incentives. For Humans, mental accounts are a form of narrow framing: they keep things under control and manageable by a finite mind" (Kahneman, 2013).

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[10] A discription of the Homo Economicus was first published in John Stuart Mill's essay "On the Definition of Political Economy, and on the Method of Investigation Proper to It" in 1836.

"Econs live in the land of theory, Humans live in the real world" (Taleb, 2008). 'Humans' and 'Econs' are so opposing, that mixing up the two has far reaching consequences, when they are applied to economic models. To make our world understandable, econometrists and mathematicians make up algebraic representations for the many instances our world consists of. By seeking validation for our biases, we try to describe the world in such a way that it becomes predictable.

According to Taleb (2008) a world can be approached in two different ways. On the one hand, there is the world of 'Mediocristan', in which particular events do not add much individually – only collectively. By using large samples, no single entity will significantly disrupt the combined or the total. "The largest observation will remain remarkable, but eventually insignificant, to the sum" (Taleb).
On the other hand, there is 'Extremistan', in which "inequalities are such that one single observation can disproportionately impact the aggregate, or the total" (Taleb).

The land of theory can be described as 'Mediocristan', however, our practical, physical world looks a lot more like 'Extremistan', because it mainly grew from rare events. Height, calorie consumption and age belong to 'Mediocristan', but wealth, natural disasters, assaults and inventions are the property of 'Extremistan'. Tomas Sedlacek adds to this "It appears that economic (and other) model prophecies work "well" when reality (randomly or coincidently?) behaves according to those models (therefore [they work] if they do not vary too much from the previous observations the models are based on)" (Sedlacek, 2011). In addition, not only the world is parametrised, but humans are parametrised as 'Econs'. So, our 'Mediocristan' is filled with rational 'Econs', which the models try to describe, and the Real World, alias 'Extremistan' is filled with humans, and we do not get a good and firm grip on those!
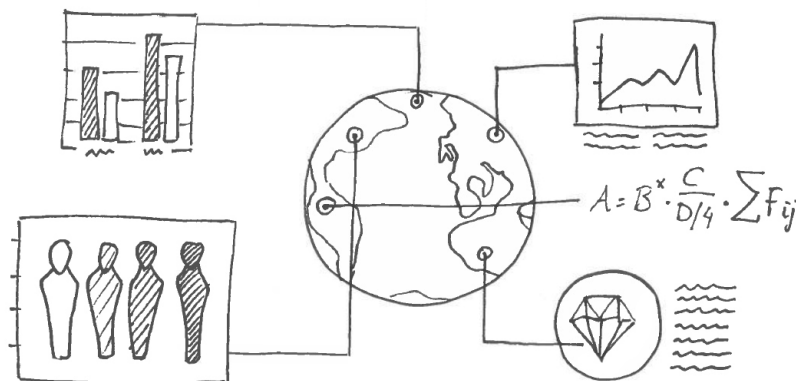

Figure 6: parametrisation of the earth

Multinational Enterprises, Profit and Production Processes

The parametrisation is done by scientists, engineers, designers (everyone who is trying to get a grip on 'reality'), and within the current economical context, it is done by multi-national enterprises. Planning is a form of parametrisation, and it is one of the driving factors of large enterprises that produce or use advanced technologies. The following paragraphs will briefly describe how this works.

Planning and Advanced Technology

"Planning exists because [it] has ceased to be reliable. Technology, with its companion commitment of time and capital, means that the [desire] of the consumer must be anticipated - by months or years" (Galbraith, 1967). "As viewed by the industrial firm, planning consists of foreseeing the actions required between the initiation of production until its completion and preparing for the accomplishment of these actions. And it consists also of foreseeing, and having a design for meeting, any unscheduled developments, favourable or otherwise, that may occur along the way"(Galbraith, 1967). So, the more complex technology becomes, the more planning it needs. It is important to recognise the influence large enterprises have on many levels because of their planning.

Whereas scientists persistently describe and predict what is happening, multinational corporations plan and prescribe what will happen, in order to keep up their sales, maximise their profits, and keep the enterprise going (Galbraith, 1967). "It is a feature of all planning that, unlike the market, it incorporates within itself no mechanism by which [want] is accommodated to supply and vice versa. This must be deliberately accomplished by human agency" (Galbraith, 1967). In short, within our economic system, demand (or desire) and supply is a farce. Corporations use it as a tool to justify their profit maximisation: they pretend to "react to global market challenges" by "predicting what the consumer [desires] in the future".

According to Dorfman (1964), the maximisation hypothesis that assumes that profits need to be maximised, is not founded as thoroughly on facts of life as a fundamental scientific hypothesis should be. He adds that differentiations of that 'profit-maximising' behaviour are extremely rare, especially when industries have many participants.

To conclude, corporations need their planning in order to be able to use and produce technologies, that have to be 'ready' for the market, in order to maximise profits. Therefore, corporations have to secure their markets – by product and production planning. Multinational corporation's influence exists of the fact that they have induced advanced technology, they are the motor to spur and drive

technology to get increasingly more advanced, and while proceeding this they need ever more human and material resources, which are found all over the world.

Globalisation

"The first attempts to globalisation originate from the rationalisation or blue-printing of the world by ancient cosmologists, who have tried to cast the wholeness of being, with theoretical, or rather morphological seriousness, into a spherical shape, and who have presented this edifying arrangement to the intellect" (to paraphrase Sloterdijk, 2006).

As we have seen in the former chapter, the apparently descriptive scientific models narrows our sight on the real world. Furthermore, they prescribe a certain progress, expressed in economic growth, which 'requires' globalisation.

"Within the capitalist framework, economic facts take precedence over mundane facts – however those facts include intrinsic world politics, to be more precisely: they have a geopolitical character, because the Enormous Greenhouse cannot function without security of resources and management of peels that cover it (to paraphrase Sloterdijk, 2006). The core of the Enormous Greenhouse is protected by cultivation of its boundaries. Analogical to that, it is the cultivation of an onion's peels that protect, and more important, withdraw from the core.

Eventually, due to European colonialism and technological progress, earthly distances could be diminished in time, which increased control. By plane, any place in the world can be reached. "If you take away the dignity of distances, earth and her local ecstasies shrink to an almost nothingness, until her majestic elaborateness is reduced to a worn-out logo" (to paraphrase Sloterdijk, 2006).

In this way, desired entities can be obtained from and transported to any place in the world. This outlines the problem domain – which is created by globalisation – at its best.

Preliminary Conclusion

First, we have seen how our original concept of money has changed through several instances and eras. Moreover, we have seen how new values and ideologies were created, by studying influential thinkers over different periods. We have seen how Capitalism has entered our world, how it regulates our eco-system, how it is supported by neo-liberal ideologists and how much it needs "globalisation" to work.

By studying the framework of globalisation through the economic perspective, the following dogmas that belong to our First World society have been brought out: the means of progress are economic growth and globalisation, and profits need to be maximised by developing advanced technology designs.

Part II

What is design?

The Core of Design

"We pre-suppose labor in a form that stamps it as exclusively human. A spider conducts operations that resemble those of a weaver, and a bee puts to shame many an architect in the construction of her cells. But what distinguishes the worst architect from the best of bees is this, that the architect raises his structure in imagination before he erects it in reality" (Marx, 1867)

Humans have been able to develop from their ancestors, because they were capable of manifestation[11]. The intrinsic urge of externalisation of 'thoughts' and eventually 'ideas', resulted into the act of creation (Koestler, 1964). This act of creation made us produce artifacts: objects [and processes or events] that have been intentionally made for some purpose (Aristotle, Physica, Book II) such as tools (technology) and artworks.

As revealed in 'A Short History of Mass Design Culture', technology and art were the sources out of which 'design' developed. Today, 'design' is still understood in multiple ways. By examining its sources – technology and art – and by means of discussing different philosophers, I suggest options for augmented layers on the core of design.

Technology

The first concept that I will discuss, which relates to design is technology. technology has been discussed by numerous philosophers and opinions exist in a highly diverted range. To know what signifies design, we have to know what defines technology. The foundations of technology are based on the fact that a piece of technology serves as an instrument to solve a problem or to serve as a solution.

In *Die Frage nach der Technik*, Heidegger (1954) argues, that when goals have to be reached and means are being used, technology cannot just serve as an instrument. To discover what technology really is, Heidegger uses Aristotles perception of causality, which can be divided into four causes: I) the 'causa materialis' – the material; II) the 'causa formalis' – the shape or appearance; III) the 'causa finalis' – the final goal that defines the shape and material; and IV) the 'causa efficiens', the effect that the object brings about. It seems obvious that these causalities provide a reason for any artefact to come into existence. Heidegger says that technology's tendency to put extreme emphasis to the causa efficiens, is a trap. After long reasoning, he says that this results into the following. "Technology enables and drives us to obtain earth's natural

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[11] Manifestation: An event, action, or object that clearly shows or embodies something abstract or theoretical (Oxford Dictionary)

resources, from wherever and whenever we want, in order to store it and have access to it at any time and place." Heidegger calls this "Bestellen aus das Bestand", in which 'Bestand' stands for a the acquired unlimited guaranty of a possibility to be realised. For instance, an airplane counts for 'Bestand' rather than an object. The airplane (Figure 7) as an object would give you the possibility to fly over long distances, this cannot be denied. However, within the context of aviation, the airplane as 'Bestand' secures the unlimited traveling and transportation to any place in the world. The fact that the airplane and aviation as a whole belong to 'Bestand', indicate that we have lost track of their origin, and this counts for many other technologies, artifacts and systems. They are dissolved into application.

Figure 7: airplane dissolves into application
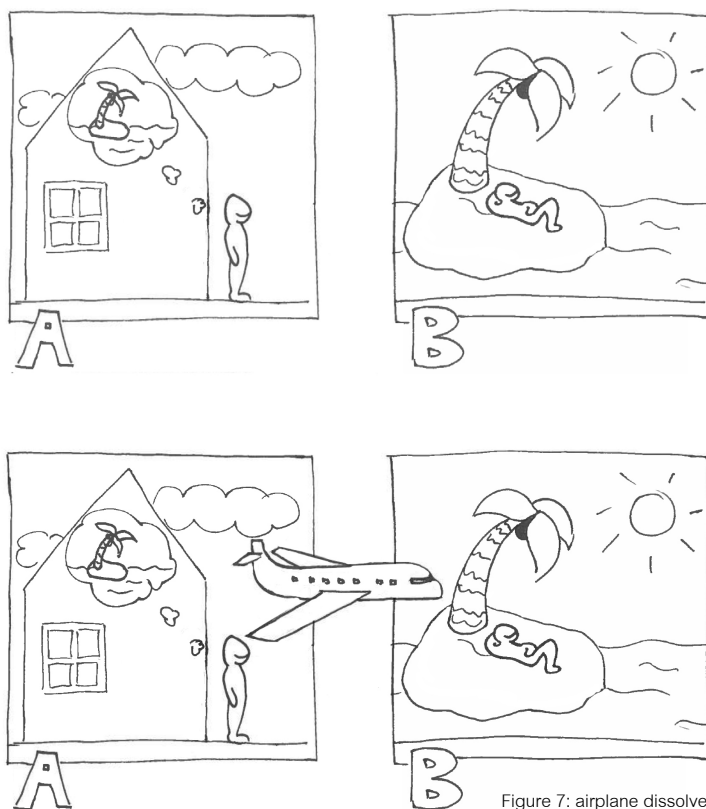
Whereas Heidegger claims that in this way technology changes the way humans see and use the world, Verbeek (2000) negates this, he states that "to understand technology, we have to prefer concrete objects to ontological ideas: for reasoning, we need utilitarian objects and appliances." Verbeek uses Don Idhe's (1990) classification of human-technology relations to provide for this reasoning. Ihde distinguishes four human-technology relations: 1) embodiment relations, 2) hermeneutic relations, 3)

alterity relations and 4) background relations (Ihde, 1990). Using these relations, Verbeek states that the most important is to look at the way technology 'mediates the way humans experience the world.'

By comparing Heidegger's and Verbeek's views, it is clear that the intrinsic approach on technology and what it does differs from the perspective one takes. In this text it is suggested that technology drives us to 'Bestellen aus das Bestand'; along with that, a piece of technology mediates the way humans perceive the world. Technology, if designed well, does this mediation in a transparent way: it dissolves into application.

For consumers it is hard to see, understand and recognise how technology is a mediator: technology's origins have disappeared from sight. We do not recognize how technology drives us towards using the world as a palette with unlimited paint.

Art

The matter of paint will take us to the following subject: art. Art has always required craft and manufacturing. It is the outcome of the human characteristic to express oneself. Nevertheless, art defines itself in a completely different way than technology.

"Design, the work of technology, stops, and art begins, when we are unable to take the background of our familiar technologies and activities for granted,"
Alva Noë (2015) writes. Walter Benjamin (1977) agrees and writes that the value of a unique piece of art is founded on the ritual of creating (Benjamin, 1977). This is illustrated in Figure 8. Indeed, art is not made for the purpose of being embedded in our lives in a transparent way, because according to Noë (2015):"the measure of art is rarely how well it is made, or how effective it is in fulfilling this or that function", "it wants to disrupt plain looking". Art imposes creativity, wonder, and profundity; and accomplishes what technology fails to do.
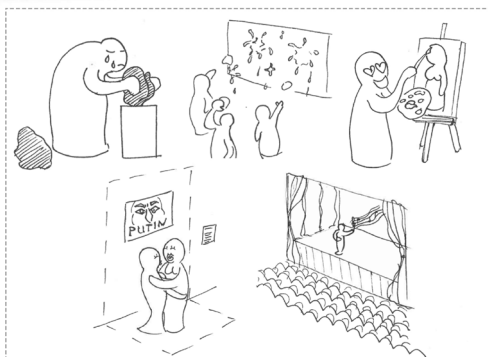

Figure 8: no process, no art

Art is an Endangered Species [12]

Unfortunately, art has a hard time to appeal to a broad public these days. This is more or less induced by technology. Technology made it possible to make art reproducible, that is, photography and film are types of reproduction as well. In *Das Kunstwerk im Zeitalter Seiner Technischen Reproduzierbarkeit* Benjamin (1977) states, that the reason to make art reproducible results from the larger public's longing for filling gaps between citizen's classes, and their passionate efforts to erase the uniqueness of every reality. Furthermore, whereas art requires concentration, today's larger public is constantly craving for distraction (Benjamin, 1977) The role of art today has changed with this yearning for entertainment. There has emerged a leisure culture in which museums and art-fairs battle to acquire the most popular works in order to draw large audiences. For those audiences, art needs to be clear-cut, by which it easily degrades into terms of beauty and ugliness and loses its origin. Hence, art is endangered by aesthetics, for it is easier to grasp.

Design: What Does It Mean?

By comparing technology to art, the sources that have played a role in the emergence of design, an outline is presented for the meaning of design.
The act of designing is in all steps a creation process. The establishing of the plan for creation, as well as the act of creating raises new questions and requires choices. A century ago, there was more emphasis on the act of an artisan's/artist's creation. Since industrial manufacturing of a product required a plan, the emphasis of design has shifted towards the creation of a plan.

The 'core' of design, is that design bridges the act and ritual of creation which belongs to art, and the instrumental utility of technology. A design can inhibit the qualities of technology and art ('core' design), such as shown in Figure 10a, but it is even more prone to fall in the accompanying traps ('common' design, Figure 9a). Especially 'designing for industry' tends to venture these traps, because it depends on both industry and the bulk of consumers. Driven by capital and planning, mass production is the embodiment of 'Bestellen aus das Bestand', which is hidden because it dissolves into application and it is distracted by aesthetics. To get a better understanding of the so-called 'core' and 'common' design, two examples are provided.

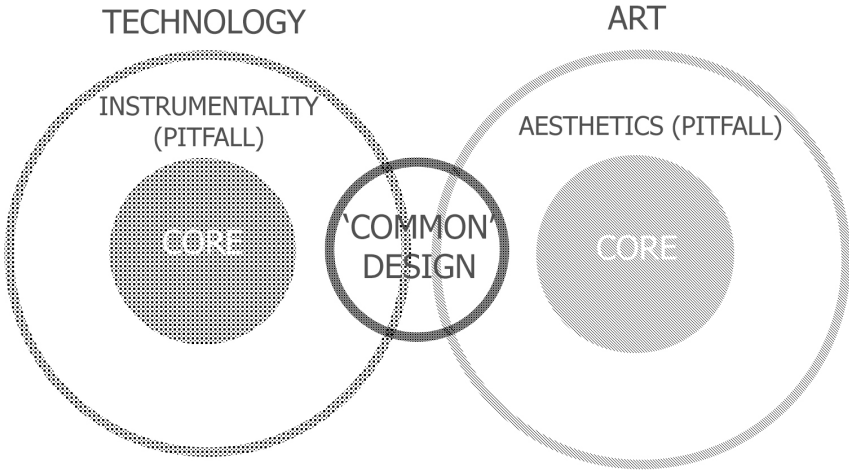[12] Art is an Endangered Species: A History of Western Art, Paleolithic-Romanesque (2013) By Zaho Margaret Ann
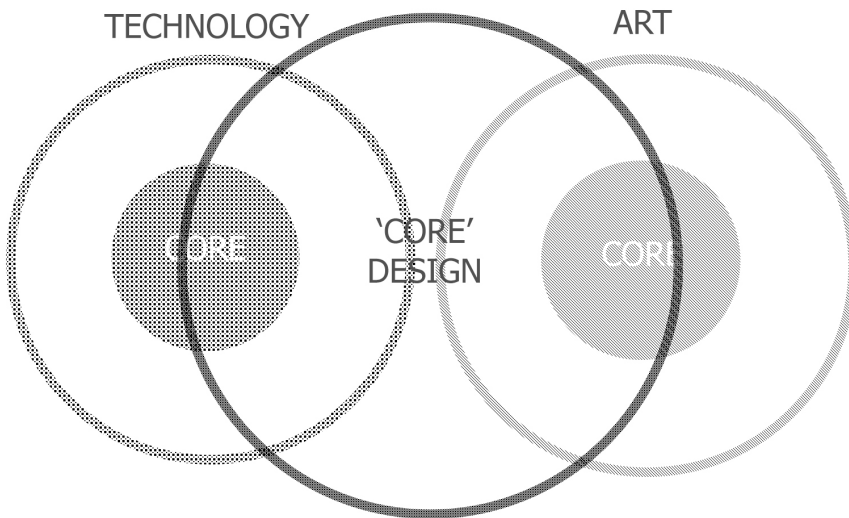
TECHNOLOGY   ART

INSTRUMENTALITY   AESTHETICS (PITFALL)
(PITFALL)

CORE   'COMMON'   CORE
            DESIGN

Figure 9a: 'common' design

TECHNOLOGY   ART

                    'CORE'
CORE   DESIGN   CORE

Figure 10a: 'core' design

TECHNOLOGY ART

CORE

SMARTPHONE

CORE

production process is concealed

attractive appearance

high functionality

materials are extracted unresponsibly
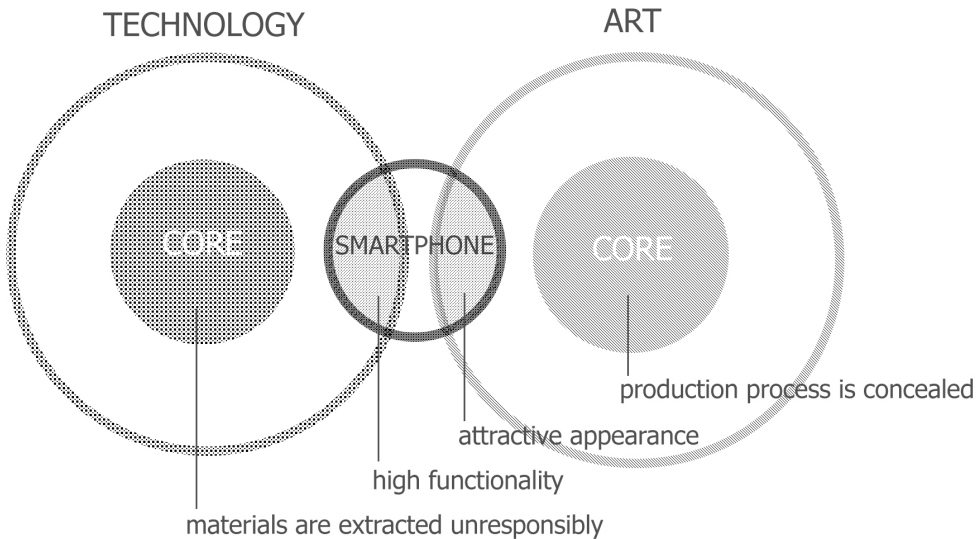
Figure 9b: 'regular' smartphone fit to 'common' design

TECHNOLOGY ART

NUDIE JEANS

CORE

CORE

known origins
(certified cotton)

high functionality

supervised production

jeans ages through years
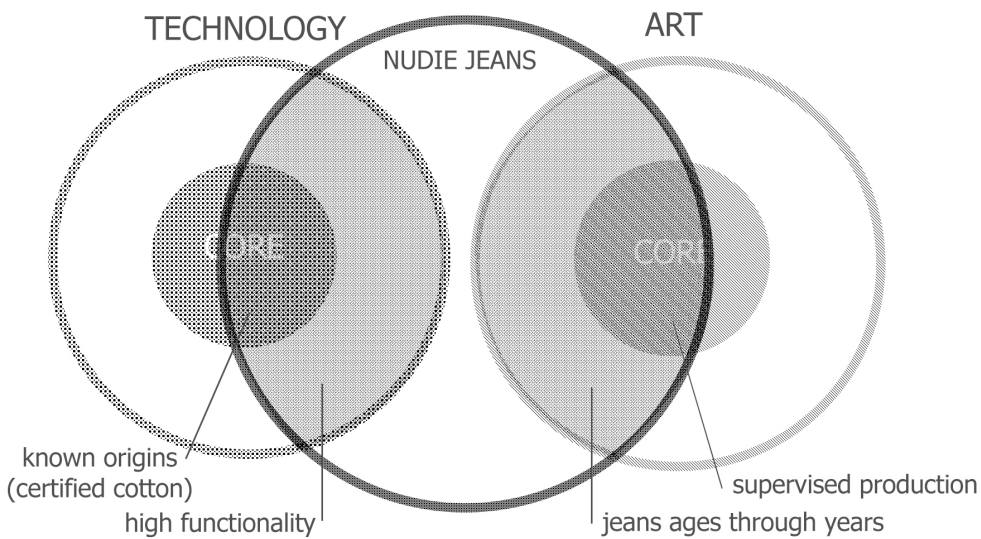
Figure 10b: Nudie Jeans' fit to 'core' design

'COMMON' DESIGN

Any regular smartphone serves for the indication 'common' design, since it combines both 'pitfalls', instrumentality (technology) and aesthetics (art), without considering the cores: material origin and extraction (technology) and process of creation (art) (Figure 9a). A smartphone (Figure 9b) serves many functional purposes: apart from calling and texting, one can make photos of high quality, use social media, watch high quality movies, play games, check emails, etc. In addition, its appearance is ought to be 'attractive' and 'high-end'. However, because both the functional and aesthetic features are satisfying, the 'core' stays concealed. There is no sight on the origin and extensive extraction of its materials, and current production of smartphones, such as iPhones by Foxconn[13], is misty as well.

'CORE' DESIGN

'Core' design refers to products that do not dismiss the 'core of technology' and the' core of art'. Such a design goes beyond pure instrumentality and appearance and takes its origin (materials) and (production) processes into account. For example, 'Nudie Jeans'[14] (Figure 10b) produces jeans that are quite wearable pants, and their appearances evolves because of the wearing. The initial 'dry denim' looks 'used' and 'acquires history' over the years, so the owners should get more attached to their jeans. That is not all, in addition, Nudie Jeans claims to be in control of the materials' origin (certified organic cotton), and supervise the jeans' production (Nudie Jeans, n.d.). Of course, it is hard to exactly verify, but if it is, it is a good example of 'core' design.

Preliminary Conclusion

Within the search for the 'Core of Design', the 'design dogmas' have been emanated through the exploration on thoughts of the cores of technology and art that resulted in an interpretation of the 'Core of Design'.
Firstly, while investigating technology, it appeared that technology serves as an instrument, and technology is a mediator, these attitudes cannot stand on their own, which is in contrast to what is thought in general. Indeed, they seem to explain the full definition of technology, actually this is exactly the reason to address them as dogmas.
Secondly, 'design needs to be functional and aesthetic' is a belief-set that is

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[13] Article about Foxconn: '1 Million Workers. 90 Million iPhones. 17 Suicides. Who's to Blame?' http://www.wired.com/2011/02/ff_joelinchina/

[14] Nudie Jeans official website: http://www.nudiejeans.com/

illustrated by exclamations such as 'form follows function' (Sullivan, 1924) and 'form follows fun' (Peter, 2007).

In the eyes of designers, industry and consumers, products seem to require functional and aesthetic values that are mostly inspired by the functionality of technology and the poor but accepted views of art. This obviously overlaps another well-known credo 'design fulfils needs', which demonstrates that we have lost track of the difference between needs and desires, as explained in 'Thesaurus for Desire, Want, Need and Demand'. In the next section, more thought will be given to consumerism, which describes First World consumptive behaviour as a culture, which has everything to do with gratifying desires. Continuing from that point The Peels Around the Core of Design, will explore how 'application' and 'aesthetics' define new niches for design, and how these niches create the illusion of their importance, in order for consumers to desire them and to subsequently fall into consumptive behaviour.

Part III

How do we design?

The Peels Around the Core of Design

"Stanley slowly peeled an onion. He liked eating them one layer at a time" (Louis Sachar, *Holes*, 2003)

Consumerism

As shown in 'A Short History of Mass Design Culture and Production', company's effective branding and design strategies have led to a phenomenon that is called 'consumerism'. Miles (1998) states, that consumerism is a way of life, rather than an act of consumption. Therefore, consumerism is a cultural expression and manifestation of the apparently ubiquitous act of consumption. Miles (1998) suggests, that design maintains consumerism as a way of life. This is because "consumers are encouraged to become members of a consumer society by purchasing goods primarily through the attraction of superficial differentiations in design" (Miles, 1998). These superficial differentiations in design, is what I call the 'peels' around the 'core' of design, a concept which will be elucidated in the succeeding text.

peels of design 'augmentation' that emerged through time

core   cover up   uncovering
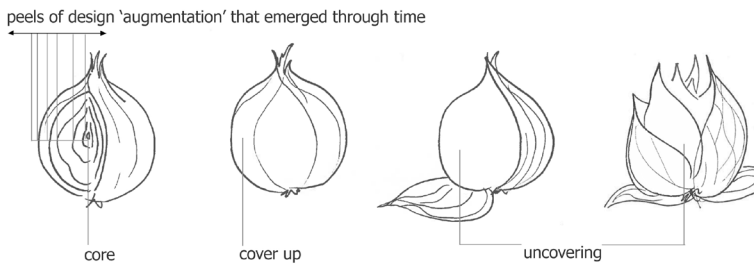
Figure 11: peels of an onion cover up its core, design peels cover the 'core' of design

Design Niches as Peels

To paint a picture, the Netherlands counts more than thirty different 'creative' educational programmes. This is to provide all creative branches with creative professionals. According to Centraal Bureau voor Statistiek (2011), 42% of the creative industry exists of professionals occupied with 'creative commercial services', which is a total of 71.000 workers. 20.000 people have an architectural or engineering profession, 15.000 work for the graphical industry and 12.000 people work at advertising agencies (Urlings & Braams, 2011).

These numbers indicate only the top layer of the vast amount of niches that exist within design, that needs professionals. The niches or rather 'peels', have emerged around the 'core' of design. These peels cover up the 'core' of design, by focusing on the extreme detailing of within design areas, which is illustrated in Figure 11. The moment that a plan, draft or process is needed to create an artefact, there is the tendency to call it design. Despite this, the purpose of design has shifted throughout the centuries, which is partly explained in 'A Short History of Mass Design Culture and Production'. Before 'mass design culture', the creation of useful solutions to fundamental problems provided a reason good enough to create a tool or appliance in the first place. What's more, the creation of appliances/devices was not the monopoly of designers – since so-called 'designers' did not exist – but it was done by anyone who had insight into solutions and had the skills to execute her or his ideas.

Industrial Design, as it came into existence during Modernity, has an intrinsic commercial value. This exact commercial value is the reason for the development of the enormous amount of niches. To illustrate this range: today's design engineering explores extraordinarily advanced territory, such as aerospace, nanotechnology and virtual reality. In contrast, design that is closely connected to styling, is occupied with the graphical language of products and packages. For every layer, the growth of new peels around the core increased differentiation and augmentation. It seems that being a designer means that one is part of the league, in which income is based on what Sloterdijk (2006) calls 'non-performance'. A profession of 'non-performance' is indicated as a job that has no specific purpose other than to earn a living.

Precisely because of these grown and bulged peels, and because of the emphasis on commercially viable design niches, we have lost sight of the functional, fundamental purpose of design. Especially this type of fundamental core-design is what our globalised society is actually craving for. We can only reach this by considering different perspectives that will help us to peel off to the core.

Intermezzo - The Consequences of Capitalism on Nature

"The asymmetrical world occupancy has its fundaments in the harbours, courts and ambitions of Europe" (to paraphrase Sloterdijk, 2006). Firstly, this asymmetry is represented within the world's population progress: "of the now seven billion people in the world, one billion people live in the Americas, one billion in Europe, one billion in Africa and four billion in Asia" (Rosling, 2014) . By the end of the century, Africa's population will be four billion people, and there will be five billion people in Asia (Rosling, 2014). Secondly, this huge population increase has a clear correlation to extreme poverty within those areas (Rosling, 2014). These facts indicate how wealth is unevenly distributed, which is an asymmetry that is expressed in First and Third World living standards, and the efforts of Brazil, Russia, India and China (BRICs) and other developing countries to close that gap. This has big consequences that unfortunately are usually ignored (Diamond, 2005).

These countries try to live up to a modern society, which does not lean on the "liberation of humans from unproductivity of which they are guilty themselves" (Dostojevski, 1992), as it does on the fact that the "space for action and experience is constantly overflowed by undeserved richness and energy" (Sloterdijk, 2006). This means that there exists an aspiration for a modern society, like ours, in which people do not contribute to the wealth that was once acquired for them, of which they are not aware.

"The prohibition of squandering has been replaced by banning frugality" (to paraphrase Sloterdijk, 2006). Because the appearance of motors gave a new meaning to power, energy, expression, operation and freedom (Sloterdijk, 2006), "the exploitation of humans by humans has been replaced by systematically exploiting the earth by humans" (Sloterdijk, 2006). "In the past, the complete human had to make a long journey to get access to scattered, esoteric and expensive sources of development, whereas in the present it is sufficient to learn how to use productive access-technologies" (to paraphrase Sloterdijk, 2006).

Purpose of the Intermezzo

The 'Intermezzo' demonstrates the scope of the material extraction, use and disposal problems to designers particularly, since every design – product, system, machine, technology, whatever – needs natural resources to be materialised, the

'causa materialis' (Aristotle, Physics Book II, 350 B.C.E.). In the use of resourcesfor any design, the most important part of the word, 'source', is easily forgotten. This 'Intermezzo' elaborates how the extraction of non-renewable and renewable resources affects our planet. First, we will address the extent of the problem, by revealing the way it disturbed our planet already. Then, the effects caused by act of extraction itself will be presented. Subsequently, we will turn to the problems caused by the use of the extracted natural resources for products.

The Magnitude of the Problem

Global material extraction has grown by more than 90% over the past 30 years and is reaching almost 70 billion tonnes today (Giljum et al., 2014). This has major consequences: the extraction and use of many resources as well as the release of waste and emissions from their use have exceeded crucial ecological limits (Giljum et al., p. 319). In the past, some societies – Societies on Easter Islands and Pitcairn Islands, the Mayas, the Vikings on Iceland, and the Norse on Greenland (Diamond, 2005) – have even collapsed precisely because of natural resource depletion. These societies were very remote and were unable to adapt to the (new, acquired, colonised) habitat. Traditional values were one of the causes of this inability to change. Nowadays, not so accessible societies, such as Rwanda, Australia, India and China cope with the consequences of this resource depletion directly, not to speak of all other societies that depend upon both non-renewable natural resources (like oil and metals) and renewable ones (like wood and fish) extracted from more remote areas (Diamond, 2005). Proceeding extraction of non-renewable resources requires increasingly extensive ways to obtain them, which implicates higher environmental burden (Mudd, 2009), and various renewable resources are extracted at a much faster rate than what our global ecosystem can regenerate (WWF, 2012).

In short, the eco-systems that contain flora and fauna are being destroyed, and
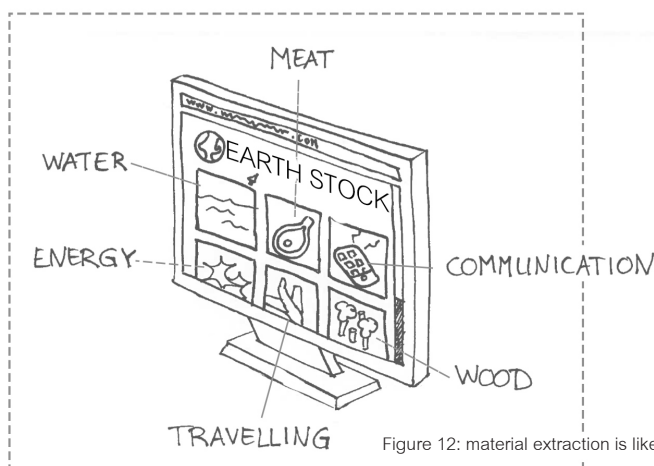

Figure 12: material extraction is like treating earth as a webshop

eventually eco-system earth will be demolished if depletion will last until the end. The following section will elaborate on the extraction of non-renewable and renewable resources respectively. Furthermore, it will describe the material consumption that belongs to material extraction, which can be related to consumption of products and therefore to design.

Extraction and Usage of Non-renewable Resources

"Since 1980, global material extraction grew on average 2.4% per year, with an aggregated growth of 93.4%, from around 35 billion tonnes in 1980 to 67.6 billion tonnes in 2009. The share of non-renewable materials (fossil fuels, metal ores and minerals) in global extraction increased from 61% in 1980 to 71% in 2009" (Giljum et al., 2014). Non-renewable resources do not reproduce themselves, and they are not an important part of the environment. They become formed over long geological times, but that is much too slow to balance our pumping extraction rates (Diamond, 2005).

First, we will discuss non-renewable resources that are extracted through mining. For hard coal and hard rock mining, the act of extraction leads directly to land degradation and therefore soil erosion (Diamond, 2005), which hugely affects the ecosystem, since flora needs the fertile soil to grow on and fauna needs flora and ground for food and shelter. In addition, the environment gets intoxicated because hard rock mining creates a lot of heavy metal waste, which is dumped on the grounds and the rivers (Diamond, 2005). Of all fossil fuels, hard coal is extracted the most often: it encompasses 46% of all fossil fuel extraction (Giljum et al., 2014) (The Guardian, 2014). The drilling of crude oil (27% of all fossil fuels) and natural gas (17% of all fossil fuels) does not directly rupture the whole surface, since an oil well can access the source at one place, but drilling can eventually cause earthquakes (Smith, 2015). Furthermore, oil and gas leakage caused by accidents is extremely damaging.

The main purpose of fossil fuels such as gas, oil and coals is to be used as a source of energy (The Guardian, 2015). Apart from the act of extraction, the eventual use of these resources has significant effects on earth, its eco-systems and its earthlings (The Guardian, 2014). Fossil fuel combustion is the most important source for greenhouse gas emissions (IPCC, 2013)[15], therefore, its combustion is clearly linked to climate change (350.org, 2014)[16]. The consequences of climate change are numerous, and they will be noted shortly: world's water resources are affected by melting of glaciers; marine, freshwater and terrestrial species have shifted their geographic ranges, seasonal activities migration patterns, abundances, and species

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[15] Intergovernmental Panel on Climate Change

[16] '350' "is building a global grassroots climate movement that can hold our leaders accountable to the realities of science and the principles of justice"http://350.org/2014-report/

interactions in response to ongoing climate change; there is depletion and extinction of biodiversity and species; there are increased negative impacts on crop yields; climate related extremes are likely to be even more extreme, which causes more bad effects for ecosystems and human systems; climate-related hazards exacerbate other stressors; violent conflict increases vulnerability to climate change (IPCC, 2014). If climate change is not slowed down, we could reach an average increase of four degrees Celsius by 2070, which would mean catastrophe (Marshall, 2014). "The difference between two and four degrees is human civilization" (Schnellnhuber, 2011 in Marshall, 2014).

Extraction of Renewable Resources

Renewable resources differ from non-renewable resources in two different ways: first, renewable resources, like trees, can reproduce themselves. Second, in the logging – or other extracting industries – the things that you are removing are valuable parts of the [ecosystem] (Diamond, 2005). Therefore, its extraction causes major problems. Renewable resources include all flora and fauna, but since the topic is related to design, we will stick to the extraction of timber. Timber provides for many products, among which are firewood, office paper, newspaper, paper for books, toilet paper, construction timber, plywood, and wood for furniture (Diamond, 2005). An increasing amount of timber is illegal, and the EU is a major importer of such timber (WWF n.d.).

The extensive logging of timber leads to deforestation, which is extremely harmful. Forests function as the world's major air filter; trees keep their soils moist – which are a major sink for carbon as well; they protect the land surface against landslides, erosion and sediment runoff; and forests provide the habitat for most other living things on the land: for instance, tropical forests cover 6% of the world's land surface but hold between 50% and 80% of the world's terrestrial species of plants and animals (Diamond, 2005). The collapsing of societies due to natural resource depletion especially concerned deforestation (Diamond, 2005).

Waste and Disposal

The extraction and usage of natural resources clearly is a problem. The final topic within this intermezzo relates to design because it encompasses the end of any product life. The moment a product, package or any other designed object becomes unwanted or unusable, it is disposed and turns into (solid) waste.

The plastics that many products are made of are rarely recycled, often burned

and even more often randomly disposed: About 8 million tons of plastic enters the ocean every year (Jambeck et al., 2015). At least 5.25 trillion pieces of plastic are currently in the oceans (Eriksen et al., 2014). These microbeads inflict damage on the environment – such as the endangerment of 100 marine species (Gall et al., 2015); and health – plastic adsorbs toxic chemicals (Mato et al., 2001), which enter and bio-accumulate in the food chain, resulting in an even higher concentration of pollutants in fish (Tanaka et al., 2013).

Summary

Driven by economy, the world's natural resources are being extracted which harasses the planet and its inhabitants. The belief that *we need to have access to anything and everything at any time and place*, is proved to be a very destructive dogma. Importantly, there is a strong urgency for rethinking material use in design, by which we do not depend so much on material extraction. We could reach this by diving into nature's perspectives and apply those to design.

Part IV

How should we design?

Dismantling Design Dogmas

"Questioning what we believe and want is difficult at the best of times, and especially difficult when we most need to do it" (Kahneman, 2011)

The phenomenon of design dogmas has been thoroughly investigated, by researching highly intertwined frameworks for designers on economical, socio-cultural, technological, and natural level. Design is not doomed by dogmas, but it is blurred. If we manage to leave some dogmas behind, plenty of space will be set free to tweak our thinking, and release us from strangulating traditions held by established designers that dominate a big branch in the field of design. If we give space to other design perspectives, we will find definitely better gains than the profits that we are seeking at present.

By dismantling design dogmas on the described four levels that are embedded into the framework for designers, the opportunities for new design perspectives are suggested. The first remark, is that all perspectives (socio-cultural, economical, technological and natural), are eventually human-oriented perspectives. These perspectives see humanity as a species from nature that has evolved through culture. Three perspectives are cultural (socio-cultural, economic and technological perspective), whereas the fourth makes the way for nature (natural perspective).

Socio-Cultural Perspective

"Culture consists of patterns, explicit and implicit, of and for behaviour acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiment in artefacts; the essential core of culture consists of traditional (i.e. historically derived and selected) ideas and especially their attached values; culture systems may, on one hand, be considered as products of action, on the other as conditional elements of future action" (Kroeber & Kluckhohn, 1952).

Culture distinguishes one society from another. Culture makes members of a society define what is needed. Design plays a major role in fulfilling the needs in terms of material requirements . The real distinction between a need and a comfort (or desire) could be asserted as quite obvious (without having your needs fulfilled, you die; without having your desires fulfilled, you will eventually die), but in First World societies, this is effectively disguised. According to Whiteley (1993), there is no single answer to the question 'Do I need this product or service?' because people have differing values, expectations and visions of material and non-material standards, and this is exactly why these questions need to be continually asked

(Whiteley, 1993).

There clearly is disparity between the needs of First World societies and Second- and Third World societies. "Even when comparing ourselves to other cultures and countries, citizens are cognizant that what Western consumer culture deems 'necessities' are in fact luxuries for others, and therefore symbolize our 'progress', " (Lunt & Livingstone, 1992). This, we have seen in 'A Short History of Mass Design Culture'. The Second- and Third World societies are in a 'rat race' for achieving this type of progress; the First World societies create the illusion that this is a real progress. Veblen (1899), called our related behaviour 'conspicuously consuming', which means consumption for the sake of status and leisure. "It is not a person's absolute income, but their relative income that becomes their measurement of success. When needs become relative, they become infinite in theory, and thus ultimately insatiable" (Daly, 1977) (Layard, 2009).

The dogma that is tackled here, is that *design fulfils 'needs'*. In reality, rather 'desires' than 'needs' are lived up to, in order to create a dishonest feeling of progress. The difference between 'desire' and 'need' was discussed in 'Thesaurus for need, want, desire and demand'. We have to acknowledge that within any specific culture, *design facilitates*. This will unmask the fact that 'freedom' cannot be bought, since our spending makes us subdued to consumerism, which is rooted in our First World culture, and which tries to take root in other cultures. Therefore, we are 'trapped' rather than 'free'. As shown in 'Freedom and Property', Steiner (1921), stated that the basics of being free is to live and act the way you love to, and let others live by understanding their wants (Steiner, 1921). To paraphrase Nelson Mandela on freedom: "For to be free is not merely to cast off one's chains, but to live in a way that respects and enhances the freedom of others"(Mandela, 1995). With this in mind, as fairly stated by Schumacher(1973): "How can rampant consumption create peace if there exist the exploited poor?"

To conclude, if designers acknowledge the way consumerism is embedded into our culture, and if we keep questioning what is truly needed, we will hopefully be less attached to the needless needs, which give us the feeling of (albeit false) progress. In addition, we could use globalisation for broader purposes. Instead of the prescription of a consumer culture in Third World societies, we could open up to those other cultures. We could learn something from their systems by true interaction with them, and combine our knowledge, or ways of thinking into 'multi-faceted design'.

Economic Perspective

"The progress offered by design is a false one. Consumer goods may be superficially improved through the efforts of designers but, far from promoting the progress of an ecologically aware and ethical humanity, design is likely to continue to promote consumerism as a way of life, as consumers continue to be seduced by the constant turnover of consumer goods" (Miles, 1998).

This exclamation brings us to the following dogma: *the means of progress are economic growth and globalisation.* Economic growth is based on the creation of wealth by making products that usually involve a high matter of resource depletion, transport and waste. According to Miles (1998), "the pivotal role of designers as a focus for social change is undermined by the fact that they are equally vulnerable to commercial reward as the rest of us." Especially because "Designers operate in a world where the creation of wealth (Smith, 1776) is a prime motivation" (Miles, 1998).

"Above all, a new macro-economics for sustainability must abandon the presumption of growth in material consumption as the basis for economic stability" (Jackson, 2009). Different attitudes towards growth and profitmaking will have to arise to be embedded in the capitalist system, since it is hard to get rid of, as we have seen in 'Industrialisation, Progress and Capitalism'[17]. "Instead of creating something that spurs consumption, which is the status quo, true business innovation in the future will be that which [creates awareness], reduces consumptive behaviour and creates a self-limiting principle" (Schumacher, 1973). If we replace 'economic growth' by 'economic stability' and reframe 'profit' as 'gain', thought can be given to new perspectives. For example, gain can be accomplished when at first things are saved, such as water, energy and nature, because at some point there will be a deficiency. This could be achieved by finding alternative sources of energy. Secondly, the obtaining of products or the fulfilling of 'needs' does not always involve buying new things: it can be achieved by simply exchanging goods or providing services for maintenance. Thirdly, products that have a long life-span and that are more or less oblivious to obsolescence could be prioritised to products that become obsolete very quickly.

"One of the main challenges for industrial designers is to create products with longer lifecycles so we can buy fewer things" (Durning, 1992). 'Future Proof Design' is one of the attempts to succeed in providing "an alternative growth-based consumer culture; it is a method of designing that ultimately strives to encourage people to acquire less stuff, by creating objects that create more value for the purchaser. Such objects will encourage consumers to keep and cherish their

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[17] 'Industrialisation, Progress & Capitalism'

things for longer" (Kerr, 2010) and in doing so, it provides "capabilities for people to flourish – and in particular to participate meaningfully and creatively in the life of society – in less materialistic ways" (Jackson, 2009).

"Growth for the sake of growth is the ideology of the cancer cell" (Abbey, 1977).

In brief, the foundations of our Capitalist economy system need to shift from the dependence of material consumption towards a more sustainable situation which is based on economic stability and endurance (Sedlacek, 2008). This can be provided by either altering our economic perspectives, in which immediate profits should not be the driving force, but in which gaining in different ways, such as saving, should have the upper hand. One of the possibilities is to design products that are unsusceptible to obsolescence.

Technological Perspective

"We begin to confront the thingness of objects when they stop working for us: when the drill breaks, when the car stalls, when the windows get filthy, when their flow within the circuits of production and distributions, consumption and exhibition, has been arrested, however momentarily" (Brown, 2001).

With this in mind, we only realise that objects have a certain instrumentality if they stop functioning. Nonetheless, the following dogmas – *technology serves as an instrument* and *technology is a mediator* (Bolter & Grusin, 2000) – which appeared in 'The Core of Design', have to be liberated for the following reasons.

"There remains a persistence of the designer fallacy, that in some way 'intent' determines, however successfully or unsuccessfully, outcomes. My argument is directed against this framing and description of the design project. What I hope to establish is a description which recognises much more complex relations between designers, technologies and the ultimate uses of technologies in variable social and cultural situations" (Ihde, 2008).

Concurring with Don Ihde, the designer's intent is a fallacy, and therefore technology cannot serve as an instrument for specified purposes only, neither is it a precise mediator.

Second, the apparent instrumental or mediating characteristics of a technology hide the origins of the technology, which was presented in 'The Core Of Design'. To conclude, in addition to the fact that technology can serve as an instrument and as a mediator, t*echnology through function can blind us from its 'origin'*.

The dogma that arose in 'The Era of Modernity'[18], *Technology will solve all our problems*, is either untrue, and keeps up the tendency for designers to refer to a piece of more advanced technology when something needs to be solved. However, including advanced technology in a design, goes beyond really searching for the

18 'The Era of Modernity', see page 8.

problem.

To illustrate this, an experiment performed by Kasparov (2010) is presented. Kasparov describes how comparative tests on chess games done by a combination of human, a machine and a certain process, show the way in which human intelligence and a machine's calculating powers can be combined to give the best chess performance. "Weak human + machine + better process was superior to a strong computer alone and, more remarkably, superior to a strong human + machine + inferior process".

Brynjolfsson&McAfee (2012) provide for an approach for possible application of this human superiority to machines, and they state that "The solution is organizational innovation: inventing new organizational structures, processes and business models that leverage ever-advancing technology and human skills" (Brynjolfsson&McAfee, 2012). This does not necessarily mean that human labour should be taken over by machines, but it pleads for "creating processes that combine the speed of technology with human insight." Moreover, to tackle significant problems, certain human skills are essential. The list of human skills that will remain in demand as presented by Brynjolfsson and McAfee contains "Applied math and statistics, negotiation and group dynamics, good writing, framing problems and solving open-ended problems, persuasion, and human interaction and nurturing" (Brynjolfsson&McAfee). These are indeed very sensible skills within our world of climate change, ecological disruptions, overall human inequalities, wars, etcetera. Technology on its own will not be the saviour. However, technology will have an impact on the future of employment, "most workers in transportation and logistics occupations, together with the bulk of office and administrative support workers, and labour in production occupations, are at risk, due to computerisation" (Frey&Osborne, 2013).

To summarize, if on the one hand, we dare to look beyond dogmas related to technology's functioning, and if on the other hand, we release our science-based belief in technology, design and designing processes will be unrestricted from the fallacies of diverse intentions, whereby design and production techniques are allowed to be more flowing, flexible, adaptable and adapted to our world, in which the present division of labour does not depend on exchanging humans for machines, but by collaboration between the two to extract the best from all worlds.

Natural Perspective

"In a growth economy, nature is treated as the ultimate source of 'income' for our economy, since it provides 'unpaid' inputs, when in fact these resources come from the capital of the earth" (Schumacher, 1973).

As 'The Core of Design' and the 'Intermezzo' showed, the fact that *we need to have access to anything and everything at any time and place (instant gratification)* refers to our present-day behaviour in general, as well as it illustrates the way companies, manufacturers and designers use the earth for its natural resources. This behaviour has proved to be very harmful for our living habitat, so instead of observing nature as a direct source of income, it should be observed as a source of information. Nature has had 3.8 billion years to develop, which is a period of time that our current scientists and engineers will have a hard time to reach the same level of ingenuity. Unfortunately, designers tend to be 'technocentric', and therefore technology "[takes] centre stage at the expense of other less tangible, though equally potent, creative considerations" (Chapman, 2005).

The framework of 'Biomimicry', "the conscious emulation of life's genius" (Benyus, 1997, p.2), is one of the circa hundred ecological views (Esbjörn-Hargens, 2005) on the natural environment, and it provides a possible methodology to learn from nature by unravelling and copying biological systems, that have evolved over a time-span of 3.8 billion years. Importantly, there are plenty of analogies to draw between nature and technology. On all levels, from nano-sized systems to biomes, and from a low level of imitation to a high level, nature's functioning can serve as an inspiration for design. One of the key reasons covers that the amount of energy used within technological and natural systems is highly contrasting. "Whereas technology solves 70 per cent of problems in the general area of material processing (taken to be in the micrometre size range) using energy as a control parameter, in biology energy is the least significant control parameter over the entire size range" (Vincent, 2009). "To make a material like e.g. metals, ceramics, polymers and composites, ingredients are put together, and undergo at least one – if not all – of the processes of heat, beat and treat" (Benyus, 1997). Vincent and Benyus indicate that production (and use) of human made systems rely on energy, and nature's systems rely on information, presented in DNA. The emulation of natural materials in particular will open up a new world for exploration, since its components and structures require a new way of looking at composing new materials, production techniques and the final design's purposes. Biomimicry can provide a possible answer to our urge for direct resource accessibility, however, it does also rely on a scientific approach towards nature that uses algorithms and systematics. Through the notion of 'Econs' and 'Humans'[19],

19 'Econs' and 'Humans' see page 16

and 'Mediocristan' and 'Extremistan'[20], we have become aware of the fact that there exists the following dogma: *humans are rational beings and earth and nature can be parametrised*. As Latour (1987) in the study of science and technology has shown, that hard sciences are assembled, not discovered, and they achieve their objectivity through the process of assembling alliances of human an non-human actors and translating their interests to strengthen the alliance (Latour, 1987).

By opening up to nature's perspectives, we should humbly acknowledge, that although we try with all means to fully grasp nature's ingenuity, we still have a very long way to go. Solutions that were shaped over 3.8 billion years have not been straightforward decisions, but they had everything to do with context and coincidence. We have to acknowledge nature's 'Black Swans', nature's irregularities and rare events, and that design too, is "…neither orderly nor linear; it implies continuous and active search to resolve trade-offs and satisfy changing constraints" (Dalcher, 2006).

Reconsidering all, we can strive for the allowance of different, creative approaches towards product and system development, which could be inspired by nature itself. Subsequently, our 'designs' can be as flexible, ephemeral, permeable and evolvable as 'Nature itself': this requires a hybridisation of our culture, technologies and nature.

20 'Mediocristan' and 'Extremistan' see page 17

Recommendations for
Higher Design Education

"If [people] are for a long time accustomed only to one sort or method of thoughts, their minds grow stiff in it, and do not readily turn to another. It is therefore to give them this freedom, that I think they should be made to look into all sorts of knowledge, and exercise their understandings in so wide a variety and stock of knowledge. But I do not propose it as a variety and stock of knowledge, but a variety and freedom of thinking, as an increase of the powers and activity of the mind, not as an enlargement of its possessions" (Locke, 1764).

Figure 13: a way of teaching product design

Critical and Reflective Thinking as a Goal for Higher Education

Critical thinking is one of the most frequently discussed higher order skills, believed to play a central role in logical thinking, decision making, and problem solving (Butler, 2012; Halpern, 2003). According to Facione (2000): the ideal of the critical thinker refers to common curiosity, being well-informed, verifiability of reason, openness of thoughts, flexibility, straightforward thinking in evaluation, honesty and confrontation with one's own personal prejudices, caution in decision making, industriousness in searching for relevant information, responsibility in classification of criteria, focus on examination and persistence in searching for solutions which are as precise for the subject as for the circumstances allowing the investigation. The Bologna process in 1999 – a European agreement on higher

education – addresses the importance of critical thinking in Higher Education. In addition of the critical thinking goals, the 'Dutch Strategic Agenda for Higher Education (2011)' states that: "research, education and entrepreneurship create the basis for Dutch welfare. Interaction between these fields increases the economic growth capacity and finds answers and possible solutions to great societal issues of today and the future."

Educational Programs of Industrial Design Engineering within the Netherlands

In the Netherlands, there exist three academic educational Industrial Design Engineering (IDE) programmes, provided by Delft University of Technology, Eindhoven University of Technology and the University of Twente. First, a brief description of the Universities' current educational content is presented, then it is compared with existing goals for higher education as declared by governmental organisations. Furthermore, it is suggested why and how, Industrial Design Education could be changed.

At the University of Twente, that boasts to be "the most entrepreneurial University [of the Netherlands]", attempts to educate Industrial Design students who are able to: 1) analyse the market and user's needs and whishes, and relate them to technological and social voids; 2) create their own vision on design issues and problems; 3) generate ideas and design concepts that are relevant to the problem; 4) apply their own knowledge and experience to new problems; 5) elaborate concepts and create a working model or prototype; 6) include an approach for the market, domain or niche; 7) consider the product's sustainability and lifecycle; 8) perform a critical evaluation of the design (University of Twente, 2015). Secondly, Delft University of Technology (2015) states that Industrial Design students learn how to integrate "functionality, use, construction, shape, production, market, consumer, business management and environment" in product design. Lastly, Eindhoven University of Technology (2015) declares that "This field is all about innovation, creativity, technology, user needs, aesthetics, societal and business interests. The attractiveness of a product is determined not only by the aesthetics of the interaction but also by the user-friendliness and intelligence contained in the product".

Whereas the different universities try to present different images to attract students, the content provided is comparable. In general, within these design education programmes the following sequence is taught: 1) conduction of a market research; 2) conduction of a user research; 3) product analysis; 4) concept generation; 5) concept elaboration; 6) concept prototyping and testing; 7) concept evaluation (Eger et al., 2004).

Technical academic education within the Netherlands focuses on studying and designing technology, encouraged by its 'entrepreneurial character'. Therefore, technology design solutions are taught to be economically viable. This combination of a focus on technology through economical perspective has shaped the way Industrial Design Education is set-up. In this extract, it is suggested how IDE could be improved by pinpointing on the way technology, and IDE's position within a university of technology, has influenced IDE. After that, the way economic benefit influences the way education is practised, is elaborated. This defines how IDE is continuously adapted to the economic 'markets'.

To start, in the IDE exists the tendency to treat design as an instrumental entity. The instrumental character can be declared by the fact that IDE is the property of Universities of Technology. As demonstrated in 'The Core of Design'[21], the pitfalls that come with the instrumental character of technology resemble those of Industrial Design. To repeat, these pitfalls make it easy to avoid criticism and continuous reflection on the complete process of designing. To illustrate, the current IDE programs as presented by the three Dutch universities, leads the student through the above described process, (project planning, market analysis, user analysis, idea generation, conceptualisation, prototyping, evaluation). The presented method prescribes a specific systematic way of creating a consumer product, and it does not give space to any other perspectives. Before designers get involved in using such methods that result in a typical product design, they could ask themselves many other things: What is being asked for, by whom and why? Is there a problem at all? Does the solution require a product? Do I need the presented method for tackling this problem? Are there other approaches or alternatives (Figure 14)?

This is closely connected to questions that add to a personal – critical – vision on design. 'What is a design? Why do I design? What is the context of my designing?', involves critical thinking. By critical thinking, creativity is stimulated and leads to a quest for different approaches, which either or not could lead to a new product. These questions are the exact questions that belong to academic education that strives for educating people, who are able to tackle problems, rather than merely educating workers for industry who focus on designing products based on 'consumer demand'. This last remark points at the 'economic growth capacity', competitiveness of the Netherlands, and the 'entrepreneurial' side of technical universities, such as the University of Twente. Economical, societal and environmental entities are not necessarily incompatible. However, the means that are used in general to make a product that is economically viable, are often a mismatch for societal and environmental sustainability. The fallacious idea (Ihde, 2008) that underpins this, is

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[21] 'The Core of Design' see page 21

that the means for economic feasibility can only be reached through the use of new materials to create ever new products, whereas a 'super service', a 'timeless classic', an 'object developing along the owner' could be cherished and rated very high as well. Such objects or services combine economical, societal and environmental viability (Jackson, 2009).

In short, academic education's focusing on technology and economy does not encourage wider views on the subject matter. This also counts for Industrial Design, in which advanced technological and economic issues encourage going deeper and thereby specifying (or narrowing down) your views, instead of being critical for the methodology that has created the foundation.

Concrete Educational Suggestions

"Regardless of the subject area, students should be encouraged to be curious, to raise objections, ask questions, point out difficulties in the instructor's position. These objections and questions should be clarified, interpreted, and examined objectively. Students should be given reasons for doing things a certain way, rather than being dogmatically told how to do them" (Facione (1990).

By taking the current Dutch IDE's into account, as well as the goals for higher/academic education, and the economical, societal and environmental aims that are resembled within academic education, some concrete propositions, will be put forward, by revising some accepted subjects and courses.

- First, **design-processes as prescribed by IDE deserve a critical, reflective view**. This means that as well as traditional design processes, new approaches could be offered in the beginning of the program, e.g. 'Future Proof' or 'Biomimetic Design'. Students will be immediately made curious about what the world of design has to offer them. They have the choice and chance to open up their views and ask for more, instead of to ignorantly accept what is taught.

- Second, **perspectives towards the use of materials should be altered**. Materials are now observed for their properties: most of the time, materials have to be as lightweight, strong and cheap as possible. It is proposed that it is important to learn about the origin of materials, the impacts of extraction, and to provide for alternatives.

- Third, **education on production-techniques could merit from more information about the consequences of using them**. Present-day production techniques are being taught, such as casting, moulding, forming, machining, joining and Additive Manufacturing (AM). There is a strong focus on manufacturing preparation and

planning, which leads to the cheapest production cycle as possible. However, there could be given more attention to amount of energy that is needed for these techniques (eventually, energy is an engine for costs), and to the impacts that different types of manufacturing have on the environment, so that more sustainable production techniques are highlighted as well.

- Fourth, **the strong belief in high-tech equipment, such as drones, 3-D AM and Virtual Reality could be refined**. Whereas nowadays there is the tendency to designate them as future-changing equipment, they are in fact tools, and they should be treated like tools. There is nothing wrong with using them, but a disproportionate belief in them does not solve anything.

- Fifth, **there could be a 'course' or sequence of lectures/workshops that puts design into the world's perspective**, in order for students to make up their context, and to increase critical thinking on design. Development-related History as well as Economics, Nature and Art could colour the framework of design, and give impulse to this critical thinking. In addition, this course should be filled in by alternating inspirers: they could be educators, students, entrepreneurs, philosophers or people on a mission. To effectively create an expansion of a student's context, there could be given more attention to exchanging knowledge between different cultures, by visiting them, interacting with them and considering them when designing.
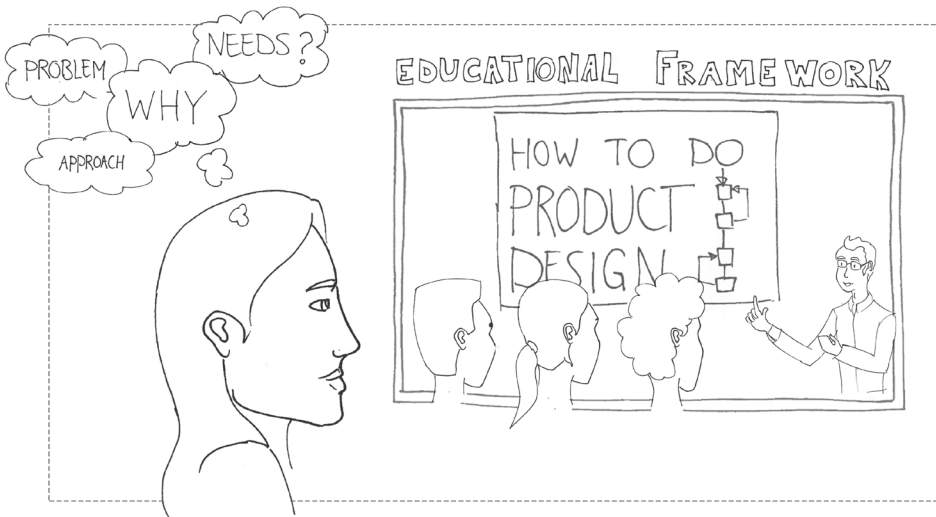
Figure 14: critical thinking that is required for design education

Dogma Overview & Alternative Approaches

The dogmas that we encountered all concern the way we 'do design', which is the reason why it is so relevant to remark and unravel them, to break them. Along the way , we have encountered and revealed several dogmas that have emerged within their specific design framework. These dogmas and the way we should approach them differently as designers are now shortly summarised.

'A Short History of Mass Design Culture and Production'	GENERAL PERSPECTIVE	DESIGNER PERSPECTIVE
Dogma	Technology will solve all our problems	Technology in design helps to solve problems.
New approach	The creation of processes that combine the speed of technology with human insight *could* help us to reach new solutions, however since technology is also a product of large corporations, its purpose will never be in the first place solving problems, but maximising profits.	Since technology will not solve all our problems, we could ask ourselves: how to solve it with less technology.
Dogma		Design fulfils 'needs'.
New approach		Design facilitates. Start searching for the real needs and fulfil the wishes.

'Industrialisation, Progress & Capitalism'	GENERAL PERSPECTIVE	DESIGNER PERSPECTIVE
Dogma	The means of progress are economic growth and globalisation, profits need to be maximised by developing advanced technology designs.	Designs should leverage the company's profits, the design costs should always be earned back.
New approaches	Replace 'economic growth' by 'economic stability' and reframe 'profit' as 'gain'	Translate profits to gains, and see what you gain when your focus is not limited to profits.
	Gain can be accomplished when at first things are saved, such as water, energy and nature.	Long-term savings on materials and energy will bring more gain in the end than instant gratification by cashflow.
	Exchange goods or provide services for maintenance.	Think of ways to make your designs 'serviceable' and maintainable, or make it easy/attractive to exchange, readapt or reuse them.
	Create goods with longer *lifecycles*.	Think of ways to make products with longer lifecycles, longevity, durability beyond sustainability.

'The Core of Design'	GENERAL PERSPECTIVE	DESIGNER PERSPECTIVE
Dogma	Technology serves as an instrument, technology is a mediator.	Design can serve as an instrument and design mediates.
New approach	Technology through function can blind us from its 'origin'.	Design, through function can blind us from its 'origin' .
Dogma		Design needs to be functional and aesthetic.
New approach		Design could be functional and aesthetic, and it should focus on the origin and process equally.

'Intermezzo'	GENERAL PERSPECTIVE	DESIGNER PERSPECTIVE
Dogma	We need to have access to anything at any time and place.	For designs should always be used the materials and processes which are the perfect trade-off between costs and functionality.
New approach	Instead of a source of income, nature is a source of information.	Nature is a source to base our designs on, to learn from, instead of using it as a source for our materials and designs.
Dogma	Humans are rational beings and earth and nature can be parametrised.	Design can be applied to humans based on a rational model of the human. Design can be applied to our world, based on an algorithmic model of that world.
New approach	Context and coincidence is all that defines the current matter on earth.	Design involves context and coincidence, just as all matter on earth. If models and methods are used, models and methods should always be criticised and revised, because they are ever-changing.

For Your Consideration...

In this final chapter, we will reconsider our four main questions – Why do we design? What is design? How do we design? How could we design? – and the answers given so far as to be able to draw a conclusion, we will summarize the connections between the proposed design-questions and the in-depth study, and we will compare this content to the answers that resulted from a series of interviews with young designers. The complete review of the interview-sessions can be found in Appendix A.

WHY DO WE DESIGN?

As indicated by 'A Short History on Mass Design and Production' and 'Industrialisation, Progress and Capitalism', the need for industrial design origins from the fact that the invented production techniques had to be payed-off by the consumer. This is highly contrasting to young designer's views:

Why do you design? "to think freely and include all aspects around me", "to mean something to our fellow-creatures", "design my ideas", "there are many things inside my head that have to get out", "a human quality is to design together", "to make products so that the lives of people will be easier", "to realise my ideas", "to solve problems", "to be creative", "to make the world a little bit better", "to make people act more sustainable", "for kids, because they are our future", "to help people that suffer from impairments", "to give people the means to create something", "to make tools that make people move forward", "problem solving for people", "physical instantiation of my ideas", "I have many ideas, it is cool to innovate", "to connect all odd ends", "I think that we should do things differently", "not necessarily change the world", "expressing creativity".

As it appears, young industrial designers have an individual urge to realise their ideas, which encompasses several types of problem-solving, and by attending design education they attempt to build the fundaments for doing this as their profession. Unfortunately, when they are into business, personal goals often have the tendency to adapt to commercial goals (Galbraith, 1997). Education should encourage their individual critical attitude, and nurture their enthusiasm audacity, and vivacity of which they still can make the most.

In 'The Core of Design' we have found that design comes in all types of combinations of technology and art. This means that design could have the same benefits, such as control of and insight in the creation process, and that design could fall into the same traps: it is likely to dissolve into application (linked to technology), or it is blathered by aesthetics (linked to art). In addition, designing is a very loose term that is about any type of designing action. According to young designers:

What is design? "Trial and error", "puzzling and investigating", "expressing and accomplishing ideas", "creativity is intelligence having fun", "to have human's interests at heart", "consideration", "problem solving through systematic approach", "improving physical and non-physical entities", "use your own vision to make up ideas that change your environment", "chaos of ideas through exploration and alter them to useful solutions", "solve the problem for everyone", "the sparkle", "a sum of actions that eventually lead to a solution", "collaboration for the better", "creativity", "cross-disciplinary working", "thinking beyond boundaries", "investigate, consider, visualise and solve", "creating, creating, creating", "inventing combinations", "create value", "dare to look back to regain course".

It is clear that every person expresses her or his personal nuances and subtleties to the meaning of design. Whereas there exists a great diversity within use and interpretation of 'design,' education, because of business, centres on a relatively narrow part. By stimulating personal views, changing perspectives and critical thinking, the focus of education could be enriched.

HOW DO WE DESIGN? / HOW SHOULD WE DESIGN?

'The Peels around the Core of Design' has shown how designers practise design today. The 'Intermezzo' has specified how the earth is being used for realising designs, without considering Earth. Through the whole essay we have seen that design methods have followed from uprooted dogmas, and that these influence the way we design. Accordingly, the interviews clarified that young designers find it hard to recap on the 'how'. They do recognize a pattern in the way they make choices within their design process, which ranges from following systematic schemes to finding inspiration while wandering through the woods. In contrast, it became evident that, while asking them about any awareness of context, they found it difficult to respond.

To recognise that you are a part of a greater whole – such as: 1) the fact that you are a designer, and an employee within a business that competes with other

businesses which impacts on the globe, or 2) the fact that you are a designer, and a student from a Dutch university, which is a part of the capitalist system, and in order for them to get enough money, they have to connect to business – is hard. So, the core of evaluating 'how do we design' lies in the fact that we are informed and aware of our context, so that we recognise it, and question the dogmas that guide us through this context.

Finally, we have come to where the rubber meets the road. 'Why do we design?', 'What is design?' and 'How do we design?' have to be reconsidered as long as we design. To be able to be critical, designers have to learn to look upon and be aware of the context that they design in, and the conventional processes have to be evaluated and readjusted. If we, designers dare to question these processes, we are able to break free of the framework – which is jam-packed with dogmas – that has condemned our First World Design society.

As for designers, feel free to embed this critical thinking into your working life. As for educators, embed this type of critical thinking into your design education, for the reason that it will unleash a student's curiosity and involvement, which society needs when they get provided with the first straws to hold to a future in design.

Now, we have come to some final remarks. Designers do not want to escape pleasure that comes from designing, and designers cannot escape profit-making or income that comes with designing. Humans make artefacts, and the capitalist system requires us to have an income. 'Designing' simply is – for us designers – one of the more satisfying jobs to do, because no matter in which way we design, the satisfaction comes from the pleasure of having solved, created or made something. Nevertheless, we can rethink materialism in design, and incorporate earth and human exploitation within these thoughts. Designers do not have to lose the ecstasy that comes from designing: we will be even more satisfied when we beat the greater challenges.

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Appendix A – Investigating Designers – A Review

In the former section, a broader framework for the present industry, and therefore design-industry and designers has been outlined. This broad framework is needed to fully grasp the development of certain 'common rules' that designers make up unintentionally. From this point, additional, narrowed-down frameworks can recognised, since there are plenty that influence the individual. To get a slightly better view on these additional frameworks, I have dived into the individual designer's minds. These explorations might help to define if, and which 'common rules' exist. During the exploration I did not aim for those common rules.The aim of this review, is to analyse and compare the way the investigation was set-up and the type of responses it evoked.

The Plan for Investigation

The main focus of the investigation was to discover how a range of designers considers and reflects on design and their own 'designerly ways'. The investigation consists of five questions (Figure 1): why do you design, what is a design, what is a design process, what is the context of which you design, what is the effect that your designing will have on the world? The questions should be answered by choosing and interpreting freely one or two images. The purpose is not to guess the image's meaning, but to use them as a guide for answering. All images are shown in a random sequence. The answers should be given within a deliberate amount of time, so the answering is done intuitively instead of well-reasoned.

Interview's Set-up

The investigation exists of 16 shaped images. In the next section, I will elaborate why these particular images were used, and how they were constructed. First, I will discuss the reasons for using images instead of texts; for capturing the images on A5 sized cards; for making black and white outlines; for using the amount of five questions and 18 cards. Second, I will describe what I had in mind drawing each individual image.

The choice for conducting an image-based interview instead of a text-based interview has been made because images evoke interpretation, expressed in direct feedback. Words do not exist without interpretation either, but they can be used and mirrored without revealing their direct connotations and interpretation. Since the investigation is aimed on exploring Designer's thoughts, loose interpretation is the best means for uncovering them. The choice for A5 sized cards was made, because it allowed a convenient way for investigating. The cards were big enough to contain a certain amount of detail, and they were small enough to be carried along and spread out over a considerable area. By drawing black outlines, I have tried
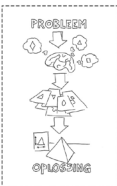
to put the focus onto shapes instead of colours. Colours highly affect people's choices and interpretations and distract them from the object itself. The amount of questions followed from the construct of key concepts that I tried to investigate. The amount of cards per question was loosely determined during the creation process.
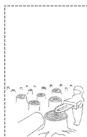

1) WHY DO YOU DESIGN?

2) WHAT IS A DESIGN

3) WHAT IS A DESIGN PROCESS

4) WHAT IS THE CONTEXT IN WHICH YOU DESIGN

5) WHAT IS THE EFFECT THAT YOUR DESIGNING WILL HAVE ON THE WORLD?

Figure 1: cards that belong to questions

Interview Results

Twenty-eight designers have undergone the interview. On average, it took ten minutes to do the interview. The first couple of interviews were written down; the most have been recorded. The goal to make this an intuitive interview was slightly disrupted by the 'need' for people to think over the answers. Eventually, it did give more insight into the whereabouts of their brains, so they were pardoned. Some people could not stop talking about the subject – once they were involved, and most people showed more than ordinary interest. They also thought it was a pleasant way of being investigated.

Responses – the most and least popular

The responses and comments of 28 designers have been recorded and documented. In the following section, these will be further analysed. Per question, the most and least popular results will be presented, accompanied by frequently recurring comments.

Why do you design? (pick one or two cards)
Image 1 was the uttermost popular image. Of the 48 answers, it was chosen 19 times. Very often people recognised themselves as creative beings, who are in need of uttering their ideas. Image 3 was also very popular (10/48). "To help people" and "To solve problems" was generally answered. Image 5 (11/48) provoked "improving the world" and "combining human's forces". The least popular image 2, was only chosen once.

What is a design? (pick one card)
Image 7 was the most popular image (15 out of 28 answers). This could indicate that many people have a broader understanding of the word "ontwerp" – which means design. The understanding is not limited to 'finished' or 'iconic' objects, but it can be extended to schemes, natural objects, brainstorm output and drawings. Some people argued that image 7 was the combination of images 6 and 8 (both 7/28 answers). Image 6 was often observed as the starting point, the 'idea', whereas image 8 presented a limited kind of output.

What is a design process? (pick one or two cards)
Image 10 was chosen the most often (16/33) by people who noted that designing is not a linear process, but that it involves "changing direction", "looking back and

forth", "wandering through possibilities", "observing" and "just creating".

The runner-up (image 11, 12/33) was chosen because people thought that "a problem is always the starting point", and "a structural approach towards a solution is needed". Image 12 was never chosen, image 9 only rarely (5/33).

What is the context in which you design? (pick two cards)

Image 19 definitely was the most popular image (15/40). "to bring people together" and "To have a heart for the people", were the most uttered reasons. Image 14 was a second-best (9/40), "keeping earth in mind", "having bad consequences as little as possible". Image 15 was avoided by everyone. "Money is not the most important" was their explanation.

I noticed that these answers do not really encompass the question. This means, that a large portion of people had difficulties interpreting the question.

What is the effect that your designing will have on the world (pick two cards)

Almost everyone started answering this question by stating that one's effect on the world is utterly small. Then, they continued by declaring which effect they hoped they would have on a local scale. As a result, the images chosen were often the exact same images as for the former question. Image 19 was chosen 15 out of 40 times, and image 14 was chosen 11 out of 40 times. The preference for the other images was more or less equally spread.

There were only a few people who acknowledged that one's designing could also have bad implications. They knew to tell a difference between the effect a design can have, and the effect the whole process of their designing has on a wider scale. For example, images 15 (2/40) and 16 (4/40) were only chosen by those people. The other people simply ignored the more negative images. One person said there was a high amount of "nightmare scenarios", and with her, many people could not imagine why on earth somebody would choose one of those.

What is design? (pick three cards)

The investigation ended by picking three cards of all, that would answer 'What is design?' The top 6 of most chosen cards is the following:

1) Image 1, picked fifteen times
   "putting ideas into practise", "idea-chaos", "designing is inside you",
"being unique", "expression", "observing the world", "inspiration"
2) Image 4, picked nine times
   "design to help others", "solving problems", "doing it for the people",
"enhancing of entities", "finding problems", "intelligent solutions".

3) Images 10, picked eight times
    "A non-linear process", "exploring the world", "finding your own way",
    "multi-disciplinary approach", "creation, creation, creation", "dare to look
back".
4) Images 7, 11 and 19, picked seven times
    7) "deliberation", "collaboration", "realising objectives together"
    11) "structural approach", "a puzzle", "solving the problem"
    19) "to have a feeling for humanity", "for each other and the earth", "for
    all that is better", "physical contact", "connection and interaction"
The other cards were picked five times or less. The most popular category was the
"why do you design" question, which delivered 33 cards of the total amount of 82.
In addition, the category about the design process was chosen the most often, which
seems logical since for many designers, design does not exist without a process.

Interview's content

Since people's responding is highly influenced by the content they are offered,
the interview's content is analysed. To start, the interview exists of six questions of
which each addresses different levels of understanding, depending on the interviewee.
The first question "why do you design?" is easy to interpret, but nevertheless caused
exclamations like "nobody has asked me ever before!" and "pfff…" This is very
interesting to me. Some people first denied the fact that they are designers, but after I
had convinced them that the act of designing is not merely restricted to asymmetrical
multi-coloured sofas, they were willing to proceed the interview.

The second question "what is a design?" did not raise any real difficulties. "What
is a design process?", the third question, was clear as well. The fourth question
undeniably was the toughest to answer. "What is the context from which you design?"
was clear for a very small part of people, who actually saw themselves as part of
a context, which they therefore extended beyond their direct habitat. The largest
sum of people changed "context" into "motives", by which it turned into the "why"-
question. It can be argued that this was a "wrong" kind of question. On the other
hand, the few people who did comprehend this one, showed that it was possible to
explain the context if they were already aware of their context.

The last question "which effect does your designing have on the world?" was
understood in two ways. The biggest part of people neglected fact that there were
two sides of the same coin. They approached the question by imagining the positive
impacts their designs could have. A small part of people acknowledged that by a

design's production – and maybe theirs – the negative impacts could overrule the positive.

Apart from the questions, the images influenced the answers in an even bigger way. The exclaimed interpretation of some of the images has already been described in the former section. In this section, the 'other' reasons to choose certain images will be explained. 'Other reasons' include the impact of collections, abstract versus concrete images, and personification.

The first type of images, contain images containing a collection of objects. Collections involve multiple objects that can be attractive or negligible. On the one hand, they have a bigger chance of including any image that attracts people, because there are more of these images. On the other hand, collections indicate that there is not one possibility for answering, which allows people to be uncertain. Images 1, 4, 7, 8 and 10 are examples of collections.

The second distinction between images, is the difference in including recognisable, concrete, archetypical objects or abstract sceneries. Images showing concrete objects and archetypical sceneries were chosen more often over abstract images. Archetypical images were 2, 5, 8, 11, 14, 19. I tried to put in one abstract image per question, to see if there would be a significant difference. Abstract images were 3, 6, 9, 20, and they were chosen less often than concrete objects.

The third influence of the images, depended on whether they included human effigies. During the creation of the cards, I had tried to make a precise distinction between human-like humans and non-human humans: by including some detail in the former and diminishing the human to a pawn in the latter. It was astonishing that this did not have any effect on the personification done by the interviewee. In any human effigy, they placed themselves. For example, image 15 was meant to show 'low-wage situation or slavery', but it was translated very often to "I don't do it for the money".

The effect of this personification is quite big. By personifying horrific situations, like 'slavery', people respond with "I do not want to do any harm", which means that they neglect the image. They do not recognize this image as a broader context of which they are somehow part of. Eventually, this means that many people distinct positive and negative images, and by personifying, neglect the negative.
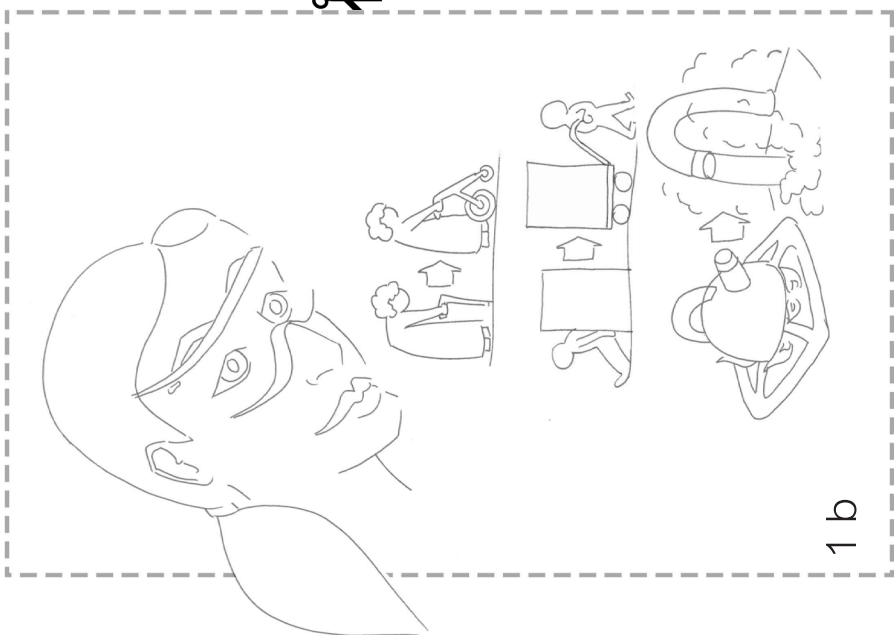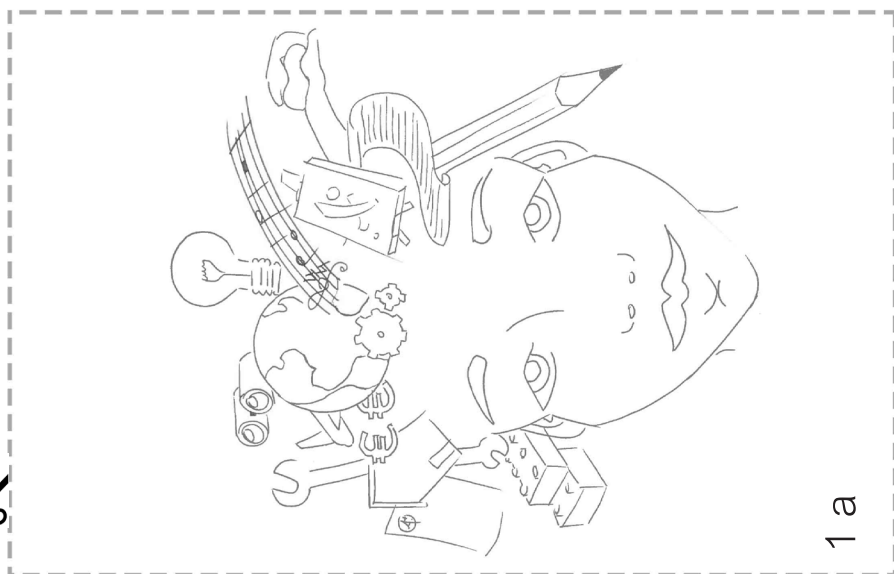
Appendix B – Play the Game

Would you like to get involved into the matter, and compare yourself to others who were curious about their 'design thinking'? Play the game!

- Cut out the cards and distribute them over the questions (1 to 6).
- Each card has a letter (a to r) and a number, the letter is its individual feature, the number means that it is part of question 1, 2, 3, 4 or 5.
- For question 6, all cards can be used.
- Some cards have two numbers, which means that they belong to more questions.
- Make sure that all images are faced downwards.
- Invite somebody to 'play' with you.
- The interviewer sets the timer to a maximum of 10 seconds, asks the questions one by one, and reveals the cards that belong to the question.
- Per question, after a quick glance (within 10 seconds) the interviewee chooses one or two cards, which provide for an answer to the question.
- Switch roles, feel free to discuss you anwers and argue about them.
- Keep track of your records, put them on www.designdogma.org, and compare them with other people.

Questions

1. Why do you design?

2. What is a design?

3. What is a design process?

4. What is the context in which you design?

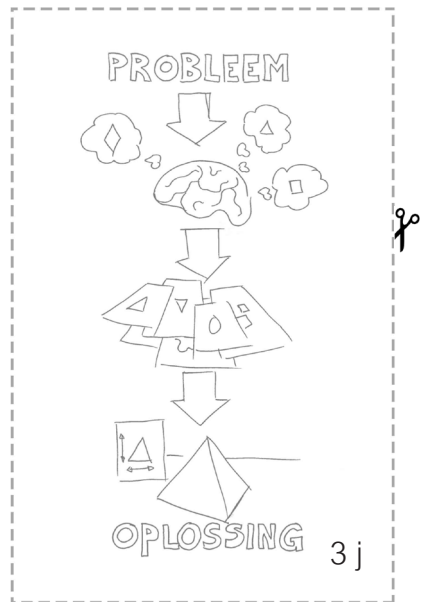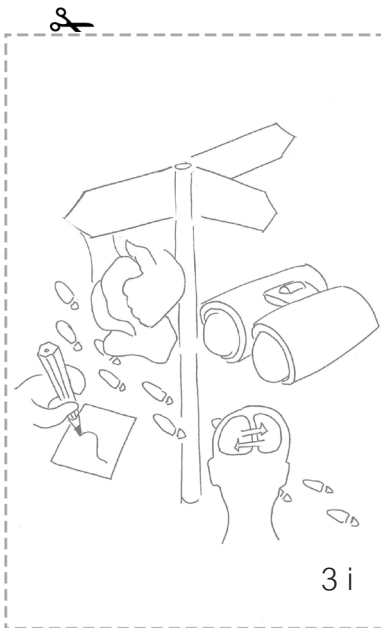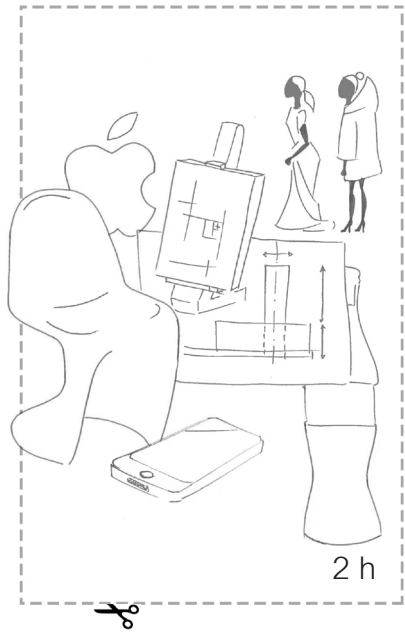5. What is the effect/impact that your designing will have on the world?

6. What is design?
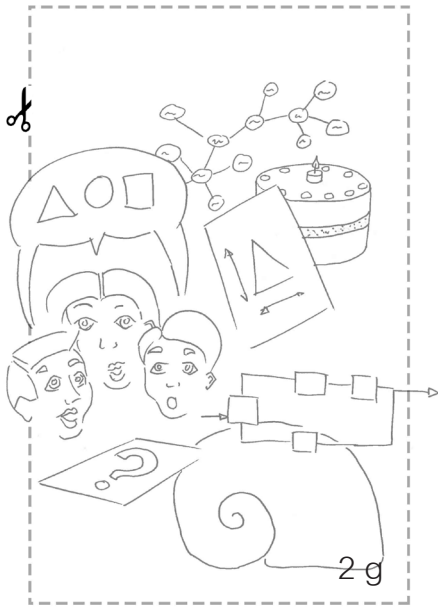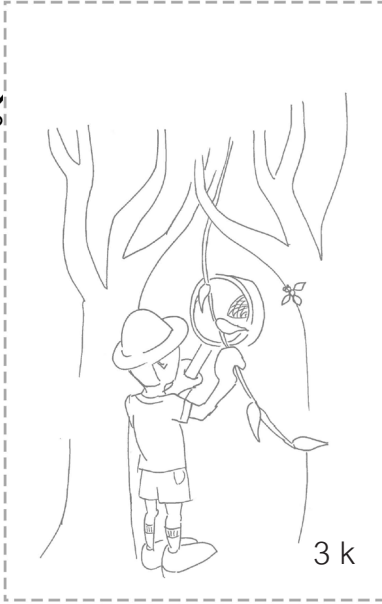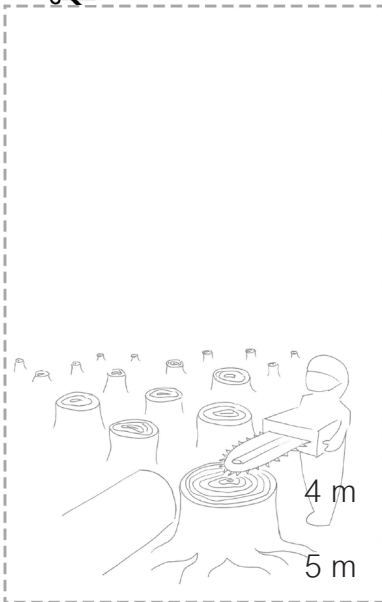
1 a

1 b

1 c

1 d

1 e

2 f

3 f

2 g

2 h

3 i

PROBLEEM

OPLOSSING   3 j

3 k

4 l

5 l

4 m

5 m

4 n

5 n

4 o

5 o

4 p

5 p

4 q

5 q

4 r

5 r