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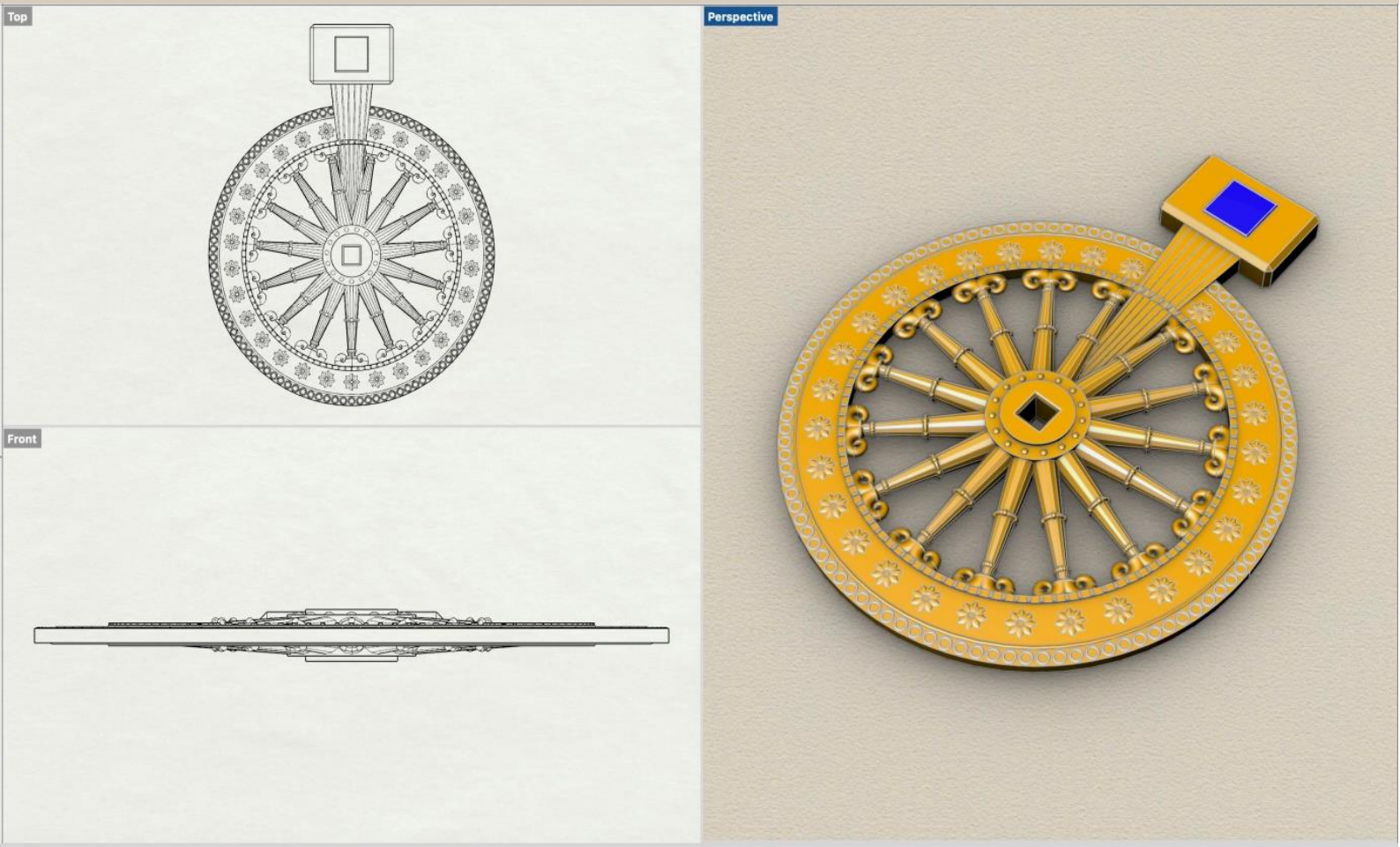

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Guest Editor:

Prof. Dr. Jurgen Faust

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Jurgen holds a PhD in Design Theory from the University of Plymouth. His international career has brought him to United States where he was serving as professor for design and as a dean. His spent as well two years in Mexico at Monterrey Tec as a professor and researcher before he moved back to Italy, being responsible for all academic activities of the IED group. Then he was teaching at Macromedia University in Munich as a design professor before he took the presidency at Macromedia University. Since 2021 he is a professor and program director at SRH mobile university.

His research and his studies have let him to focus on the changing objects and products in design, the change from material products to language like constructs. He researched design discourse and how design communities shape their dominating opinions. He has done projects in many fields in design, especially services and user experience driven applications.

His interest in teaching design and the didactics in design through the changing design artefact has let him to conclude, that there

are no limits to teaching design in a distance education setting. One of his main interests is as well to contribute to design knowledge since he thinks that there is a gap in comparison to other disciplines.

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The future of Design Education in Times of Distancing

Prof. Dr. Jurgen Faust

The Design for All Institute publishes a volume of its magazine since 2006. The topics range from general design topics with a focus on 'design for all' to practical applications. When I took the invitation to edit the July volume 2022, I have been thinking to take the chance to reflect on the future of design education, with a special focus on distance learning in design education.

Why this perspective is fitting into the overall theme of this magazine is easy to follow, since distance education in design would as well make design education more accessible and in fact it is doing so looking what happened during corona pandemic. With distance education people interested in design will be able to access and study design as if they would be on campus, where access, fees and limited study places make it sometimes difficult to enter the programs student want to enter. A remote study in design, without moving from one country to the other, design then will be not for all, but at least there will be access for some people who didn't have access before. That is not completely fitting with the expectation that there are principles in universal design, since the perspective as well includes the discourse about universality and generality.

It's far too comprehensive to present the discourse on universality in according to design in a few lines, but it is as well very refreshing to connect with the discourse we can find at the Greek philosophy (Pap, A.,1943, p. 505). At first it connects with the notion 'participation'. How can one idea have participated by many particulars? How can an idea in here in many particulars at one and the same time.

That is an ongoing question when it comes to co-designing in teams.

The idea is still the same and there are not many ideas.

The question which follows is:

If we participate in such an event, sharing one idea does it not presuppose divisibility?

And then are the parts of our participation of the universal identical, but maybe numerically or existentially different? And how does it relate to the universal itself, the adjective qua abstract noun?

The questions can go even further: are the adjectives related to the abstract noun as copies are related to their common patterns?

Here Aristotle's third man can ease the conflict since comparing the adjectives to the abstract noun the element of similarity eases the conflict. Such a ground of comparison shows the infinite reiteration possibility.

(Pap, A. (1943). On the meaning of universality. *The Journal of Philosophy*, *40*(19), 505-514.)

Let's say if we intend to participate in this idea design for all, in this idea of universal design, or design principles, we can't overcome the conflicting positions we can find at the Greek philosophy, but we can overcome it with Aristoteles third man approach, knowing the reiteration is the only possible way to align over a certain amount of time. Therefore, I see these essays as a getting closer to this idea of universal design, which doesn't mean I do agree or not agree on some statements made.

Let's say it in another way. The provided text and chapters don't claim universality or even generality. These textual explorations are perspectives, trials, summaries, outlines, and discussions of existing and future scenarios. Some are experience based, reflecting on own observations. Others are combined with

systematic inquiries into design teaching and creating knowledge about the teaching.

This various statement, these essays can be seen as base to discuss the future of design education and its relationship to universal design principles, especially with the focus of distance education.

The authors:

Dominik Dipper asks for user experience design principles for all. He is looking into the design of 'the experience' and guiding elements. For instance, he presents the five critical elements of user experience including person, system, interaction with the system, the user's perception and the users responds. Such presentations don't solve the universal question, but it allows for reiteration, which is an important position, which is a design position. What it means that such texts allow as well for iterations. He finishes his exploration looking into gamification, playful experiences and action and routine experiences. Such differentiation allows for 'designing for experiences' instead dealing with experience design.

Lisette Wagemann looks at the universal design concept with a particular view on prototyping. Since for her prototyping is an essential element in design thinking. Prototype translates the design idea into a physical or digital artefact and allows therefore for further evaluation. Prototyping can be seen as a connector between understanding design theory and practice.

She explores the different stages in the design process looks at the multi-faceted role of prototyping. Her article also covers the role of designers in various project settings and contexts and conclusions are drawn for the capabilities that will need to be addressed in future design education. She looks as well at the ecosystem in which the design takes place and the design maturity in an organization and its implications for prototyping. The

growing importance of prototyping can be recognized especially as well if we look at the increasing artificiality of our designs.

Tanja Schmitt-Fumian and Alessia Zanotti look at the challenge of design education based on the change of products of artefacts driven by digitalization. They evaluate the importance of the haptic experience, and how this haptic experience changes through changes to digital artifacts. But based on the knowledge we have gained, perception is always selective, we see and hear what we consider relevant. Since the haptic experience disappears in certain areas which have been important, the question arises how designers deal with the changing artefact and the changing interaction with the world? With the change towards artificiality, the product meaning gets more important, the processes are the key. The meaning which is key to the symbolic quality can be substituted with mental models. They assume that mental models, design, iterations of the concept are the basis of our 'new' haptic experience. We construct, deconstruct and process mental models, we are generating system purpose, form. Explanations of system functioning, system states and predictions of the future are generated by mental modelling.

Matthew Hollern looks at craft and especially at the design aspect- He looks at the studio education from a observational position and sees a need for change according to the impact of digital technology. Following his discourse the various medium of art, craft and design share the tradition of tangible-studio based education and he looks into the changes based on dislocation and distancing. As a result he see digital technologies and mediated experiences not in opposition to humanistic and meaningful design education. The elementary focus is to see it, the new as a 'Nexis' of interaction, experimentation and shared practice.

Oliver Gerstheimer and Philipp Schütz examine the actual goal and final purpose of design - the telos of design and designing. Design = "ent-werfen + ver-werfen" (creating + discard). The introduction is a position statement, combined with an outlook on what new fields of activity and challenges will arise for different types of designers. It is about a hidden potential field of the future, namely the identified goal of non-design or better the "intelligence of design avoidance". This will require a new self-awareness in practice as well as in education and the targeted revival of the design leadership capability for a more holistic and open-minded rethinking of systems. Using a variety of deliberately chosen examples from the 1970s and 1990s and from today, the urgency and necessity of the systemic intervention of design is so demonstrated in the third generation. The focus is on a new way of designing tomorrow's environmental systems that are sustainable and livable - a "design for all". Furthermore, it is shown with which mindset and goals a re-polarization from a constructive solution designer to an effective and responsible "avoidance designer" can succeed. The basis for this is four core principles - prevent, avoid, remove, and affect. Through these, a new era of social value creation and higher business value can be generated in the overall context of design.

In conclusion, the appeal to practitioners and educational institutions is: "To understand the whole as radically designable is the telos in design."

Jurgen Faust, has been evaluating and discussing the change and impact of the corona crisis on design education and what we might have been learning from this crisis. He looks at the development of the design product, changing from material artefact to language like constructs. With this change towards such artefacts teaching design online in distance education setting the distance education setting prepares students better than a

classical classroom setting. Designforall, or at least accessibility for top and contemporary design education has been increasing.

Dominik Dippner

Dominik is a design strategist with a focus on service - and user experience design supported by knowledge in project management, design management and agile software development. He is strongly interested in exploring different fields outside design to encourage ideas and strategies in order to not only anticipate but drive transformational change.

All in all, he see himself as an open-minded strategist, always looking for user problems in everyday life. Breaking them down into its parts and turn those not only into solutions but opportunities for a transformation in value creation.

In case, daily life or potential solutions are going to become confused he likes to practice yoga or to travel, especially into the mountains.

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User Experience Design Principles for all

Dominik Dippner

Abstract

User Experience Design can be described as a person's perception and responses that result from the use and/or anticipated use of a system, product, or service. As the short definition shows it is not only limited to the profession of IT. As Don Norman says, it is part of our everyday things and actions. Or as Hassenzahl (2010, Position 256) defines: „An experience is a story, emerging from the dialogue of a person with her or his world through action. User Experience is not much different from experience per se. It simply focuses our interest on interactive products […] as creators, facilitators, and mediators of experience."

Overall, user experience deals with five critical elements. (1) The person actively using the product or service is the user. (2) A system, whether viewed comparatively narrowly as a product, software, a user interface of an app, or more broadly as a service, organization, or brand. The themes, concepts, and principles of user experience apply to products and services of all kinds. (3) The use or the interaction of the user with the system. (4) The user's perceptions result from using the product or service. These are mainly psychological phenomena, like the joy of using it or physical discomfort resulting from using the system. (5) The person's responses/feedback resulting from the use of the system. Internal emotional responses are relatively hard to detect, but many responses are behavioral and can be clearly seen in the person's actions.

A term often used in combination with User Experience Design is human-centered design. It describes the ongoing process of discovering and embracing the user's perspective. It observes what is necessary to make the product usable for them. Furthermore, it deals with conceptualizing and designing for those needs while also considering the company's design goals as well as the organization's requirements for success.

But, how to design for a great experience? The article covers three possibilities. (1) Gamification. It is a term with numerous different definitions and growing practice in environments like engaging elderly citizens with routine tasks and spare-time activities or applying gamification principles to educational programs. One highly cited definition is: "Gamification is the use of game design elements in non-game contexts (Deterding et al., 2011, p. 10)." (2) Playful experiences. Experiences must: "dazzle [customers] senses, touch their hearts and stimulate their minds" (Schmitt, 1999, p. 22). Thus, customers take a qualitative, functional, and personally satisfying experience for granted. Customers always look for challenging experiences. Therefore, designers need to design an experience concept that engages users instead of designing just a service model. (3) Action and routine experiences. Following the approach from Donald A. Norman (2013). He came up with seven stages of action and three different levels of processing that describe human action and guide the development of new experiences.

Definition of User Experience Design

Let's imagine it is Monday morning you wake up to sunlight streaming in your window and wonder why your alarm clock hasn't gone off yet. You check the status of your watch and see that it thinks it is 3:24 a.m. Still, lots of time till to commute to

work. What is wrong with the daylight out there? You stumble out of bed to find another clock, which tells you that it is 8:13 a.m. If you leave in ten minutes, you can still make it to work on time.

No start into the day without at least one cup of coffee. You turn on the coffee maker before entering the bathroom. But, after getting dressed, you go to retrieve your dose of caffeine, the coffee mug is empty. Unfortunately, there is no time to figure out what is wrong with the machine since you must get to work.

Ready to take off with your car, a loud "beep" brings you back to reality. You need a gas station. Otherwise, you will not make it to work. At the station, you use the pump you are constantly using. The one which accepts credit cards. This time it won't accept yours, and you need to see the cashier inside the station.

After waiting in line to pay for your gas, you need take a detour because of a traffic accident on your route. Disastrously the drive takes longer as expected. Despite all your efforts, you arrive late on your desk. Additionally, you are agitated, harried, weary, and irritable. Remember, your day hasn't started yet, and you are still waiting for your first coffee.

Introducing User Experience

What a start to the new week. Was it only a string of bad luck? Let's rewind the series of events.

The accident on your route happened because the driver of the withe SUV took his eyes down to the radio to adjust the volume. He had to look down because it was impossible to identify where the volume control was located.

The line you had to wait to pay for your gas moved so slowly because the program at the cash register was so slow, complex,

and confusing. If the software had been more straightforward and the user interface easier to understand, the line never would have formed.

The credit card debacle occurred because you had turned the card around and swiped it on the wrong side. Nothing on the pump indicated which way the card should be turned.

The coffeemaker didn't work because you missed to turn it completely on. It doesn't do anything to let you know that it has been turned on. No visual or audio feedback at all.

The alarm clock slowed down because the battery was almost empty. Unfortunately again no visual or verbal feedback that this will happen soon. A simple battery icon would have prevented the clock to slow down, and consequently you would have been out of bed with plenty of time.

As a summary, all the previous cases could have been avoided had someone made more iterations and different choices in designing the products and services. All examples demonstrate a lack of attention in the field of User Experience Design (Garrett, 2011). "When a product is being developed, people pay a great deal of attention to what it does. User Experience is the other, often overlooked, side of the equation - how it works - that can often make the difference between a successful product and a failure. User Experience is not about the inner workings of a product or service. User Experience is about how it works on the outside, where a person comes into contact with it. When someone asks you what it's like to use a product or service, they're asking about the user experience. Is it hard to do simple things? Is it easy to figure out? How does it feel to interact with the product?" (Garrett, 2011, p. 6).

Example – Buying a ticket at a ticket machine:

First of all, you might have to wait in line while buying your ticket. This might not be necessary if the provider offers an app or an online version to buy your ticket. Secondly, after it is your turn you have to figure out which ticket is really necessary for your plan to e.g.: commute to the airport. Is it easy? Or does it take plenty of time and as a consequence you are missing the next train? After selecting the correct ticket you normally have to pay. Which options does the provider offer to pay for the transportation? Which credit cards are accepted? Where is the location to insert your card or cash? Finally, how do I get my ticket? Is it already valid or is it necessary to devaluate the ticket?

As you can see User Experience Principles and Methods are in almost everything you or interacting with. The whole process of buying a new ticket can be seen as a User Experience Project. It can also be seen as a whole Service Design Project with different User Experience parts. Like, how is the User Experience of selecting the correct ticket? How is the User Experience of paying for the ticket? To mention only two of the whole process.

Don Norman and Jakob Nielsen (n.d.) define User experience as follow: "[It] encompasses all aspects of the end-user´s interaction with the company, its services, and its products."

In addition, DIN EN ISO 9241-210:2019 (DIN, 2019) defines it: "[A person's] perception and responses that result from the use and/or anticipated use of a system, product or service."

At the most basic level is user experience a set of subjective psychological events and states (perceptions) experienced by an individual user/human. After using the product or service the

individual user might give feedback on his experience (responses). (Voil, 2020).

Moreover, user experience design takes not the only place in the profession of IT or software. Nowadays it is anchored everywhere. Allegra W. Smith (2019) discusses the profession of user experience design for adults aged 60+. Or, Iis P. Tussyadiah (2014) observes a theoretical foundation of user experience in the tourism industry. She suggests three fundamentals in tourism experience design: (1) Human-centeredness; (2) Iterative designing process; (3) Holistic experience concept as an outcome of designing.

Furthermore, her approach to experience design does not differ from the approach e.g.: solving an application interface problem: (1) naturalistic inquiries and empathic design to target experience narratives; (2) participatory design involving tourists at every stage of designing; (3) integrative design research that includes explorative, generative, and evaluative research as essential parts of designing; (4) the orientation of concepts and theories from multiple disciplines as applied to tourism contexts.

As the last example, Gianluca Brugnoli (2009) connects the dots of user experience in the area of information architecture. He says: "The user experience takes shape on many interconnected devices and through various interfaces and networks used in many different contexts and situations. To achieve their goals through the interaction flows, users tend to combine an increasing number of different applications and tools within wide and fuzzy ecosystems, where technical factors blend in with behavior and intention. The user experience itself is the result of a non-linear and occasional combination of various systems' fragments and components, which are activated and connected by users from

case to case, following their goals and intentions in specific times, situations and contexts (p. 7)." This scenario promotes new challenges and opportunities. In addition, it limits the profession of User Experience Design. Can we simply adapt all the key concepts, tenets, and tools of user experience design and analysis from one profession to the other? Or might we revise some of them? Brugnoli´s (2009) answer on that question is clear: The first shift concerns the role of the user: they are always in the center but in a different way. In the system approach, the user is the active protagonist of the experience flow, who selects and connects the dots of the interaction system making the experience alive. Nevertheless, for designers and analysts, user behavior is not always a predictable and logical a priori. On the other hand, the user action affects device's scope and features: applications and processes should be flexible enough to change roles and adapt to different action flows. Primary and secondary features switch continuously following user interaction, even without a predefined or optimal action plan (p. 7-8)."

Definition of User Experience according to Marc Hassenzahl

"An experience is a story, emerging from the dialogue of a person with her or his world through action. User Experience is not much different from experience per se. It simply focuses our interest on interactive products [...] as creators, facilitators and mediators of experience" (Hassenzahl, 2010, Position 256).

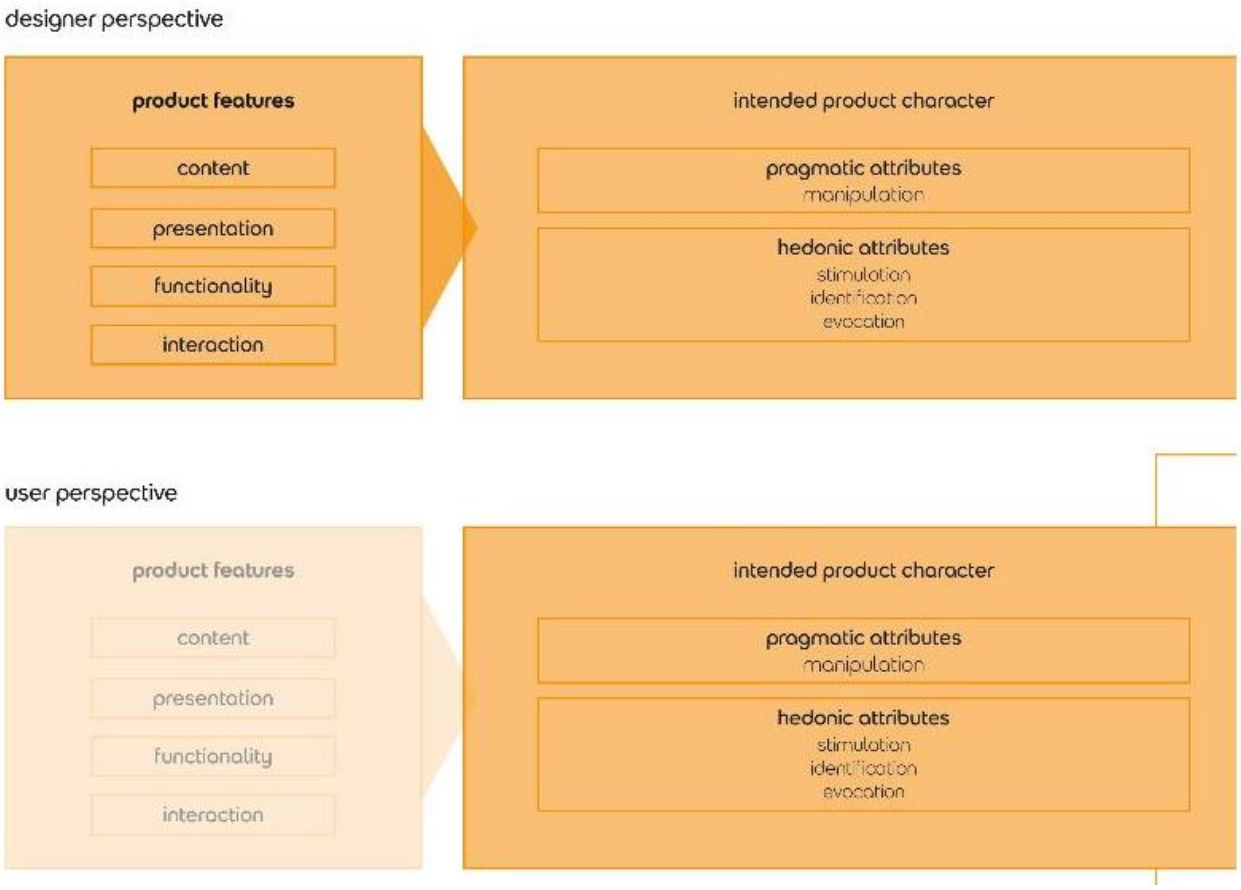

Figure 1: Key elements of the model of user experience from a designers perspective, and a user´s perspective Own figure based on Hassenzahl (2003, p.32)

As can be seen in the figure, a product has the following features: Content, Presentation, Functionality, Interaction. Taken up by a designer these are combined, in order to transport thereby a certain and planned product character (Janlert & Stolterman, 1997). This is regarded thereby as a high-level description of the product and is at each time subjective and intended by the designer. Character traits can appear useful, predictable, or interesting in this context. The function of the product character is to reduce cognitive complexity and to ensure for the user simple handling of the product (Hassenzahl, 2003). Furthermore, the character accurately describes the artifact, making it easy for the user to value the interaction with the product (Janlert &

Stolterman, 1997). The contact between user and product triggers an individual process. Initially, the product features are perceived, from which the user constructs his own personal character. This is evaluated hedonically and pragmatically, as well as influenced by known product interactions. This apparent character leads to consequences, which are either reflected in an evaluation of the product (e.g.: good/bad) or causes emotional consequences (joy/fear). This always depends on the use of the product and the given situation (Hassenzahl, 2003).

"There is no guarantee that users will actually perceive and appreciate the product the way designers wanted it to be perceived and appreciated" (Hassenzahl, 2003, p. 33).

Critical elements of User Experience Design

The definitions above, as well as the example, illustrate that we can see five key elements:

1. ***The person actively using the product or service is the user.***

2. A system, whether viewed comparatively narrowly as a product, software, a user interface of an app, or more broadly as a service, organization, or brand. The themes, concepts, and principles of user experience apply to products and services of all kinds.

3. The use or the interaction of the user with the system.

4. The user's perceptions resulting from using the product or service. These are mainly psychological phenomena, like joy of using it or physical discomfort resulting from using the system.

5. The person's responses/feedback resulting from the use of the system. Internal emotional responses are relatively hard to detect,

but many responses are behavioral and can be clearly seen in the person's actions. (Voil, 2020

2.0 Principles of Human-centered Design and Interaction Design

A term often used in combination with User Experience Design is human-centered-design. It describes the ongoing process of discovering and embracing the user's perspective. It observes what is necessary to make the product usable for them. Furthermore, it deals with conceptualizing and designing for those needs while also considering the company's design goals as well as the organization's requirements for success (Still & Crane, 2017).

2.1 Human-centered design and Experience Design

Human-centered design

People are frustrated with everyday things. From the ever-increasing complexity of the smartphone to the increasing automation in the home with its internal networks, complex music, video, and game systems for entertainment and communication. Everyday life sometimes seems like a never-ending fight against confusion, continued errors, frustrations, and a continual cycle of updating and maintaining our belongings.

Design has gotten better in the past decades. New technologies, new applications, and new methods of interaction are continually arising and evolving. Each new development seems to repeat the mistakes of the earlier ones. Each new invention of technology or interaction technique requires experimentation and study before the principles of good design can be fully integrated into practice.

So, yes, things are getting better, but as a result, the challenges are ever-present (Norman, 2013).

"The solution is human-centered design (HCD), an approach that puts human needs, capabilities, and behavior first, then designs to accommodate those needs, capabilities, and ways of behaving. Good design starts with an understanding of psychology and technology. Good design requires good communication, especially from machine to person, indicating what actions are possible, what is happening, and what is about to happen. Communication is especially important when things go wrong. It is relatively easy to design things that work smoothly and harmoniously if things go right. But as soon as there is a problem or a misunderstanding, the problems arise. This is where good design is essential to design. Designers need to focus their attention on the cases where things go wrong, not just on when things work as planned. This is where the most satisfaction can arise: when something goes wrong but the machine highlights the problems, then the person understands the issue, takes the proper actions, and the problem is solved. When this happens smoothly, the collaboration of person and device feels wonderful (Norman, 2013, p 9)."

Human-Centered Design is not about following processes. It is about being mindful of HCD principles. Keep the focus on people and the entire system to solve the right problems (Norman, 2013).

HCD: "… it can help your organization connect better with the people you serve. It can transform data into actionable ideas. It can help you to see new opportunities. It can help you to increase the speed and effectiveness of creating new solutions" (IDEO, 2015, p. 4). The process is called "human-centered" because the first step of the process is always to examine human needs, wishes, and behaviors. The aim is to understand what people

desire. Thus, "desirability – what do people desire?" is the first step. The second and third step is to view people desires through the lenses of "feasibility – what is technically and organizationally feasible?", and "viability – what can be financially viable?" The emerging solution at the end of the process should hit the overlap of these three lenses. Hence, the solution needs to be desirable, feasible, and viable. The process itself consists of three main parts. First, the "hear" phase. Researchers collect stories and inspirations from people while using techniques like observations or qualitative interviews. Second, the "create" phase in which the evaluation and transformation of research insides into frameworks, opportunities, solutions, and prototypes take part. Third, the "delivering" phase includes everything that is necessary to launch the new solution. Prototypes are getting more accurate, user testing, and iterations take part in this phase. Finally, rapid revenue and cost modeling enable the product launch (IDEO, 2015).

3.0 Designing for experiences

The following chapter examines possibilities to design for user experiences. The subchapters are (1) gamification, (2) playful experiences, and (3) action and routine experiences.

Gamification

Is a term with numerous different definitions (Deterding et al., 2011) and growing practice in environments like engaging elderly citizens with routine tasks and spare time activities (Gerling & Masuch, 2011) or applying gamification principles to educational programs (Dicheva et al., 2015). One highly cited definition is: "Gamification is the use of game design elements in non-game contexts" (Deterding et al., 2011, p. 10). To increase user

motivation, activity, and customer retention (Deterding et al., 2011). Therefore, game elements in non-game contexts should be simple, motivate, engage, and make fun (Zichermann & Cunningham, 2011). To implement gamification in other design practices (e.g. service design), designers have to follow certain principles. First of all, they have to challenge their users. Therefore, the service needs to have a goal whose result is uncertain. Also, users need the presence of performance feedback that indicates how well they are doing and how far they are from completion (Malone, 1980). Don Norman (2013, p. 52) used to say: "A lack of feedback creates a feeling of lack of control, which can be unsettling." Furthermore, clear goals should be provided by simple games and structured by complex environments (Malone, 1980). Such sub-goals are a path of fixation points, as well as concrete and simple to manage which inspires action (Rahman et al., 2008). Additionally, the uncertain outcome of the goals needs to facilitate different levels of difficulty, and multiple level targets. Thus, services should challenge users through competitions. It motivates to continue using the service (Malone, 1980) and as soon as a game is not completely automatic and invites the user to participate it becomes less predictable and more realistic (Jonsson & Waern, 2008). Further, goals are compelling because they engage a person´s self-esteem. The feeling of success in the service also increases the well-being of the person using the service. Secondly, fantasy should be included into other design practices. Therefore, the system has to evoke mental models or physical objects which are currently not present at the service. Fantasy should always be combined with emotions and metaphors. Hence, the service needs to address and satisfy specific needs of the user to derive appealing emotions (Malone, 1980). Addressing certain user needs within service experiences is crucial because the value of a service depends on how it satisfies needs in

particular situations. If services approach the desired needs accurately, services are appealing and cause emotional reactions. Though, two different emotional reactions need to be distinguished. First, satisfaction is often related to the fulfillment of expectations. Secondly, pleasure is mostly related to unexpected events within the service experience (Hassenzahl, 2005). Additionally, using metaphors which are already known to the user can support him by difficult tasks like learning a complex system. Curiosity, the motivation to learn is the third principle to add. Therefore, services should always support novelty and surprise but never complexity. Thus, the system must provide surprising, random, and constructive informative feedback (Malone, 1980). Nevertheless, the basic service system should always be self-evident, obvious and self-explanatory (Krug, 2006). Alternatively, as Steve Krug (2006) used to say: "Don´t make me think" (p. 11). The optimal environment let the user know what to expect next but only meets these expectations randomly. Also, the informative feedback can be presented through sounds, visual graphics, rewards or through cognitive curiosity that gives the user the feeling of lack of knowledge by presenting just enough information that the user feels inconsistent (Malone, 1980). A further pervasive game design principle is that the design of tangible experiences is central. Therefore, the service must provide an unforgettable feeling for the user which can be achieved through narratives and related rewards. Storytelling, another principle provides a frame for experiences to motivate users (Montola, Stenros & Waern, 2009). People are always up to look for cause and effect relations of a certain event. Therefore the storytelling principle is so powerful because they are used to form explanations and stories (Norman, 2013). Thus, the narrative develops curiosity and offers rewards for discoveries. Further, the storytelling approach immerses the user in the experience and

transfers him into the state of flow (Montola, Stenros & Waern, 2009). The concept of flow describes a mental state of a person who is fully immersed and focused on performing a certain activity (Csikszentmihalyi, 1990).

Playful experiences

Services must: ”dazzle [customers] senses, touch their hearts and stimulate their minds” (Schmitt, 1999, p. 22). Thus, customers take a qualitative, functional, and personally satisfying service experience for granted (Hassenzahl, 2005). Customers always look for challenging experiences. Therefore, designers need to design an experience concept that engages users instead of designing just a service model (Overbeeke et al., 2005). Designers must have specific knowledge about their customers and have to understand how they do and feel during their experience (Overbeeke et al., 2002). Nevertheless, while designing experiences, it is always important to remember: "... that we cannot design an experience. But with a sensitive and skilled way of understanding our users, we can design for experience" (Wright, McCarthy & Meekison, 2005, p. 52). Service users often use services that result in the enjoyment of the experience. Thus, services should be challenging, seductive, playful, surprising, and memorable. Thereby, experiences shift from a good-looking first appearance to delightful interaction and further engagement (Overbeeke et al., 2005). To design such engaging experiences, Djajadiningrat, Overbeeke, and Wensveen (2000) came up with ten rules to augment fun and beauty in interaction design. Out of this regulations, relevant for designing service experiences are: (1) Don´t think service, think experience. Thus, service designers must offer an engaging environment in which the service concept takes place. Additionally, the user should have the possibility to influence the environment and therefore the experience. (2) Don´t

think beauty in appearance, think beauty in interaction. Services should convey a feeling of appealing at first glance, but they should also engage through an ease-of-use framework. (3) Don´t think ease of use, think enjoyment of the experience. To achieve the second rule, consider designing for experiences to HCD approaches. Design challenging, seductive, and playful experiences. (4) Don´t think labels, think expressiveness and identity. Always provide multi-sensory feedback while designing for the service experience. The service user should always have a feeling of control and should know the current status of the system. (5) Don´t hide, don´t represent. Show. Never expect a service system component as self-evident. Display as much information as necessary to provide a smooth and logical experience. (6) Don´t think affordances, think irresistible. Design a service system that is compelling, desired and fulfills user needs. (7) Hit me, touch me, and I know how you feel. Applicate the HCD principles for an engaging service. Thus, as soon as a designer understands user needs, (s)he is capable of building up a comfortable environment and service context to satisfy those needs (Djajadiningrat, Overbeeke & Wensveen, 2000). Marc Hassenzahl and colleagues suggest another approach to design for experiences. They advocate separating a specific experience into three different stages, the patterns. First, the anticipation phase, which could be the trigger in case of this paper. Secondly, the event, the activity and routine phase, and third the cooling-off, the reward phase. All in all, the patterns aim to satisfy a certain need of the service user that is linked to a particular service context. Furthermore, sharing an experience intensifies the feeling of satisfaction, and it becomes more meaningful to the service user. Essential for shared experiences is that all participants share the same understanding and consumption of the event. Therefore, for designing a new service experience, a designer must implement a

service concept within the three distinct stages and use this framework to tell a new story. Nevertheless, applying the pattern to a specific service context is often constrained by the situation. Additionally, designers have to consider shaping experiences through the available material. Regarding a service concept, a material is everything (a diverse range of used technology, chatbots or intelligent systems are examples) which enables and assembles the service experience. Thus, the material represents the intended, intangible experience told through the shaped story plus the tangible configuration of technology. To conclude, the experience-patterns should come first and the consideration of the material secondly (Hassenzahl et al., 2013).

Action and routine experiences

Donald A. Norman (2013) came up with seven stages of action and three different levels of processing that describe the human action and guides the development of new products or services. First, every action consists of two parts that can affect the emotional state of humans. Second, the user has to execute the action and secondly evaluate the results. Therefore, the execution phase consists of (1) a requested goal; (2) planning the desired action to reach the goal; (3) specifying the performance of the action; and (4) performing the stated action. Additionally, the evaluation phase comprises (1) perceiving feedback of the world after performing the action; (2) interpretation of the feedback; and (3) comparing the actual output with the desired goal (Norman, 2013). Further, the three different levels of processing include (1) the reflective level; (2) the behavioral level; and (3) the visceral level, and all these levels shape the user experience. The latter one is the basic level of processing and is responsible for judging humans' environment very fast. Interpreting a service as convenient or attractive comes directly from the visceral level. By

designing for the visceral level, the service needs to have a good appearance comprises the look, feel, and sound. Thus, the design for the visceral level has nothing to do with the usability of the service. The usability is the profession of the behavioral processing level. Therefore, at this stage, appearance does not matter, but performance and usability do matter. Thus, the service needs to combine the function, understandability, usability, and natural feeling to satisfy users expectations and requirements. Thereby, good behavioral design needs to be human-centered and should support the learning curve of the desired action because behavioral states are learned states. The top processing level, reflective level deals with conscious actions of the user while the visceral and behavioral levels occur unconsciously. Thus, the experience on the reflective level depends always on the mind of the beholder, and it cannot be designed. It is more a long-term development between the customer and the service through excellent service experiences (Norman, 2004). All in all, Norman (2013) differentiates between feedback and feedforward for designing excellent service systems. The former describes information to understand what happens and the latter one provides answers to execute the action correctly. Furthermore, about the seven different stages of design, he came up with seven fundamental principles of design. First, discoverability determines the possible actions at current states of the service. Secondly, feedback is always important to convey the current condition of the service to the user. Third, conceptual models are required to design for all three different processing models and for applying the HCD approach. Fourth, affordances are necessary that the user can perform well. Thus, the service must always be straightforward and easy to use. Fifth, signifiers need to appear correctly and at the right time. Therefore, feedback and feedforward are well communicated. Sixth, mapping describes the

relationship between the action and their controls. Through proper mapping, service users always know what happens after performing an action. Finally, constraints refer to respect different cultures and use existing knowledge from the world and from the people to design services that are easy to interact with (Norman, 2013), and always consider: "Technology changes rapidly, people and culture changes slowly." (Norman, 2013, p. 282).

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The Role of Prototyping in Design Education

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Abstract

This article will focus on the universal design concept and process with a particular view on prototyping activities. Prototyping is an essential element in design thinking as it translates the design idea into a physical or digital artefact for further evaluation. Hence, prototyping activities can be seen as a connector between understanding design theory and its hands on practical and context rich application using tools and techniques and engaging with an audience to promote the design idea.

The different purposes of employing prototyping during different stages in the design process are explored. The multi-faceted role of prototyping requires design students to not only apply prototyping techniques, but also consider the wider design context in which they are operating in. As such, prototyping is invaluable in its practical relevance for transferring education insights into to business value.

The article also covers the role of designers in various project settings and contexts and conclusions are drawn for the capabilities that will need to be addressed in future design education.

The article will further investigate the role of the ecosystem in which the design takes place with a view on the level of design maturity in an organization and its implications for prototyping. In this context, we will conclude that prototyping is deeply engrained into each design project and often stipulates the tipping point in turning uncertainty into contextual understanding.

Finally, the article will cover learnings from a recent study on design competencies and how different prototyping techniques can stimulate the learning experience for design students.

Keywords

Prototyping, Design, Design Education, Distance Learning

The Role of Prototyping in Design Education

The term "prototype" derives from the Greek terms " protos " (first) and " typos " (shape, model) and describes that something newly conceived is now taking shape for the first time, e.g. in the shape of a physical model. A prototype therefore can be thought of as representing a bridge or transition between the world of thoughts and the "practice test" in real life. The Oxford Dictionary describes a prototype as "the first design of something from which other forms are copied or developed" and therefore alludes to another important aspect of prototyping, namely the fluidity of the concept with the intent to improve over time. Both interpretations are relevant for the current design theory and practice, but the understanding of the role of prototyping and the value it brings to the process is much broader. Next to the notions of describing transition and improving through iteration, prototyping is an essential element in design thinking that fosters evaluation through engaging with stakeholders and particularly users on each phase of the design cycle. This has ramifications for the perspective through which we view a prototype. If a functional perspective is taken, for example, prototyping focuses is on testing the most important functions of a future design and improve them, if required. In this case, the prototype is seen as an object. However, if a design perspective is taken, the interaction with future users is in the focus of the prototype, which produces a very concrete experience with the future system or product

(Yu/Pasinelli and Brem, 2016). This second aspect with a focus on the user experience in design enriches the context for prototyping by including the aspect of evaluation (McElroy, 2016) that can include functional elements, but also the "look and feel" and interactive elements of the design. The International Standard ISO 9241-210:2 further specifies that:

"Iteration should be used to progressively eliminate uncertainty during the development of interactive systems. Iteration implies that descriptions, specifications and prototypes are revised and refined when new information is obtained to minimize the risk of the system under development failing to meet user requirements" (Allanwood & Beare, 2019, p.10).

Finally, McElroy (2016) also describes *prototyping as a mindset of continuous learning and therefore draws attention to the cultural angle of how to translate an idea or concept into a prototype within an organization or ecosystem (McElroy, 2016).*

In conclusion, prototyping goes far beyond the traditional meaning of presenting a functional, almost market ready product for a final review by clients, but instead captures the key elements of the entire design thinking process by provoking mediation, feedback and iteration thereby continuously seeking alignment with user requirements and enabling communication patterns through prototyping that benefits every design-driven organization.

As a result, a prototype can be almost anything: a scribble on a napkin, a wireframe, a spatial model, a service blueprint and as such is a prime example for a low threshold activity enabling design capabilities for all. It is also an activity best learned through experimentation and experience. To benefit from successful prototyping practices, however, a thorough understanding of the thought and analysis process and the design

process itself including its contextual and organizational factors is of key importance and therefore a regular part of the curriculum in design education.

Practical application of the prototyping process

The first learning for design students often occurs at the point when design theory meets business practice, complexity hits and models and frameworks that look straight-forward in a theoretical way, may seem less so during practical implementation. As an example, the Design Thinking Process establishes five stages or design phases. The first phase outlines the problem space and seeks empathy from a user perspective to better understand the problem itself. In the second phase of "define", these insights combined with analysis is compiled, evaluated and synthesized. In the "idea generation" phase – also known as ideation – the design space is opened for various solution and approaches with the final selection of the design or idea that will be pursued. These designs are then translated into artifacts or other prototypes and tested with the appropriate target group.

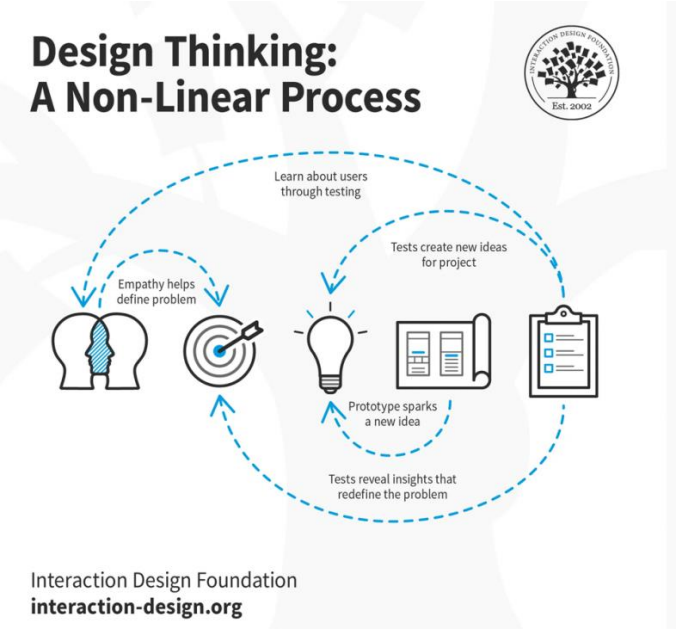

Figure 1: Design Thinking as a non-linear process
Source: Dam, 2021 (URL: https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process)

While prototyping seems to have been allocated a specific place in this model, namely the evaluation and testing phase, prototyping is in fact applied during all stages in the Design Thinking Process. During ideation, prototyping activities help to explore the problem space by considering multiple and alternative solutions. Other purposes prototypes fulfil during the design work cover:

- ***Exploring and Experimentation: The use of prototypes to explore problem space and consider multiple ideas with the intent to test out the potential impact of changes (Dam & Siang, 2021)***
- ***Learning and Understanding: The use of prototypes to comprehend dependencies, dynamics, and options for modification in prototypes (Dam & Siang, 2021)***
- ***Engaging, Testing, and Experiencing: The use of prototypes as communication tools to engage with clients or stakeholders (Dam & Siang, 2021)***
- ***Inspiring and Motivating: The use of prototypes to engage with audience, promote the design idea and motivate or inspire stakeholders (Dam & Siang, 2021).***

This requires student to determine the purpose of each prototyping activity and develop a unique approach that addresses the particular purpose regarding objective, target audience, fidelity, and process. As a result, design students need to develop competencies in the space between formal training and context-richness, an aspect that has been studied in prototyping workshops by Swedish researchers Schaeffer and Palmgren (Schaeffer & Palmgren, 2017). The quality of the prototyping process increases as information is synthesized, uncertainty is reduced and perspectives gained from prototyping participants during multiple iterations that help shape the design to be considering all user preferences and abilities.

The second key learning aspect for design student is that prototyping holds a "bias toward action" (Dam & Siang, 2021), which includes making reasonable assumptions, propelling into activity and meticulously reflecting outcomes of the prototyping effort against set objectives. This also fosters

To enable students to act and adopt a "thinking by doing" mindset is therefore an essential element of any good design education and as a result derives more value from researching, defining, ideating and testing (Dam & Siang, 2021). This implies that design education that covers prototyping ideally needs to include real-life design challenges that can be addressed in a plan / act / reflect learning cycle that focuses on practical learning outcomes.

Going back to the specific prototyping purposes, the specific goals connected to a prototyping effort will differ according to various contextual factors, such as the design approach, project progression, function or the role of the initiator.
McElroy (2016) distinguishes four main goals that prototyping may have in different project phases and constitute a comprehensive summary of all reasons why to prototype (McElroy, 2016). These four main goals comprise:

- ***To understand***
- ***To communicate***
- ***To test and improve***
- ***To advocate***

Therefore, prototyping as a process can be seen as fluid, applying a few key principles, but deploying a discovery mode during its implementation. In relation to this, in their paper Prototypes and Prototyping in Design Research, Wensveen and Matthews (2014) refer to one of four potential roles of prototypes as vehicles for design research that describes the process of prototyping itself as a vehicle for inquiry. In this context, the process of prototyping

becomes a means of inquiry and the process of prototyping focused not so much on the prototype artifact itself and its qualities and dimensions, but instead on the on the process how the prototype was created and how this drives the research direction (Wensveen & Matthews, 2014). Through this process of building, testing, refining and an understanding of the design space is gained and consequently codifiable knowledge about contributing factors such as material selection and material resistance, functional consequences and useful algorithms can be obtained (Wensveen & Matthews, 2014).

Wensveen & Matthews (2014) argue that to implement the role of prototyping as a vehicle for design research, the process of prototyping needs to become an object of analysis (Wensveen & Matthews, 2014), which provides a useful intersection between design practice and design research.

Following this line of thought, Camburn et al. (2017) in their research "Design Prototyping Methods: state of the art in strategies, techniques and guidelines" establish that developing an informed prototyping process considers five primary sections: 1) preparing to prototype, 2) enhancing design prototype performance, 3) reducing design prototype cost, and time, 4) guidelines on fabrication of design prototypes and 5) reflecting on design prototype in science (Camburn, et al., 2017).

The third key learning for design students is therefore to look at the entire prototyping activity holistically, understand the key principles and processes and gain confidence in creating or adapting a particular process to achieve the best possible outcome for their prototyping effort in addition to keep reflecting on the chosen prototyping path throughout the prototyping journey.

How much prototyping is enough?

In their research paper The Anatomy of Prototypes, Lim, Stolterman and Tenenberg (2008) propose two types of

dimensions that are relevant in characterizing prototypes. The first dimension sees prototypes as filters (filtering dimension) through which the design idea is transported (Lim, et al., 2008). The second dimension sees prototypes as manifestations of design ideas (manifestation dimension) that propose approaching the values in this dimension, such as materials, resolution and scope rationally and systematically, and therefore making the case to consider the economic principles of prototyping (Lim, et al., 2008).

The exploration of the dynamics of prototyping economies seeks to understand how the trade-off between gaining additional design information is put into relation to the resources spend in any prototyping effort. This builds on the understanding of prototypes as manifestation of design ideas as proposed by Lim, et al., 2008, which proclaims that "the best prototype is one that, in the simplest and most efficient way, makes the possibilities and limitations of a design idea visible and measurable" (Lim, et. al., 2008).

Prototyping decisions that directly affect project resources evolve around the dimensions of the value, time, cost and fidelity (Tiong et al., 2018). Research has been conducted by Tiong et al. (2018) to understand design principles that support economical prototyping and that include the full complexity of prototyping decision design practitioners face in product development (Tiong et al., 2018). The economies of prototyping as captured in this study consider fidelity (time, cost, effort) as the key input variable and arguably the value in the form of design information gained as the output variable (Tiong et al., 2018). The essence of prototyping economy can therefore be summarized as "how designers choose the cheapest (low cost) way to prototype that is still effective", and hence provides new information gains from the prototyping effort (Tiong et al., 2018).

For design students, the inherent challenge can be summarized by a statement from McElroy (2016) who observes that there is a certain balance between the time and effort that it takes to make a prototype and the corresponding value gain of testing at a specific fidelity (McElroy, 2016).

Unsurprisingly, there is a strong correlation between fidelity and value meaning that prototyping effort with high fidelity usually creates greater value but also entails higher costs in terms of time and cost expenditure (Tiong et al., 2018).

In search of this sweet spot, Tiong's study concludes from the data analysis of 50 distinct prototyping efforts, that four grades of prototyping economies exist (Tiong et al., 2018). This is an important observation for design students to consciously include the greater contextual factors onto their choices for prototyping activities, as would be expected in business life that is constantly being confronted with capacity and resource constraints and the requirements for delivering business cases for project and prototype efforts. In terms of findings Tiong's study concludes with helpful guidelines for the design practitioner to improve the value/fidelity relationship of their prototyping endeavor. These include:

- ***Aim for increased prototype dimensionality and make conscious decisions about which dimension is important for a specific prototype (Tiong et al., 2018)***
- ***Continue to test core concepts with low fidelity prototypes, especially for testing core concepts, basic assumptions and user mental models (Tiong et al., 2018)***
- ***Enrich the value of low fidelity design by leveraging DYI design principles. DYI methods, such as "Hacking" and "Basic Craft" tools that build on already available materials, components, and tools (Tiong et al., 2018)***

- ***Use high fidelity prototypes to answer specific design questions on details and features (Tiong et al., 2018)***
- ***Support physical prototypes with multi-media, such as videos, slides and virtual prototypes (Tiong et al., 2018)***

Regarding the last point, trends indicate that increasingly immersive technologies and augmented reality prototyping , such as VR, AR and mixed reality, are applied to maximize prototyping learning, particularly when applied in the early stages of the design development. Freitas et al. (2020) identified 30 artifacts that facilitate the development of prototypes in AR (Freitas et al., 2020). Their research also revealed that the level of control that can be exercised is also a factor in considering the adoption of immersive technologies, whereby the preference for virtual reality for the creation of prototypes in AR can be attributed to the greater level of control that can be exercised with VR (Freitas et al., 2020). Going forward, this could gain importance when it is required to prototype and test for audiences in the "long tail", that may be hard to achieve in an economic way at the moment.

The increase in prototyping effectiveness will be derived from the reduction of prototyping cycle through use of virtual or augmented prototyping and thus generate positive knock-on effects in reducing costs and time from conceptual design to production and consequently commercialization while also improving the quality of the design (Hall & Takahashi, 2017).

For design students, it is therefore relevant to keep on top of these developments and explore how the value of new technologies can applied into their daily work as a design practitioner with a view on greater inclusion.

Which prototyping tool is the best for me?

The large and to a degree confusing selection of prototyping tools available on the market, poses a challenge in finding exactly the right tool for the purpose at hand. From a design practitioner's

perspective, Warfel (2009) suggests the following considerations as a useful starting point to aid the process of choosing suitable prototyping tools:

- **What is the target group and what is the goal of the prototyping project?**
- **Is there any previous experience with a particular prototyping tool? What is the expected learning curve for the potential users?**
- **How is the current availability of the tools, i.e. pricing model, licenses, subscription choices?**
- **Is timing a constraint, i.e. how quickly is it required to create the prototype?**
- **To what extent is interactivity supported and how complex are the interactivity options?**
- **Which different end devices (tablets, smartphones, but also gesture-based touch screens) are supported by the tool?**
- **Is the transition from the prototype to the real system relevant, i.e. by creating source code or specification documents and how can this be supported by tools?**

(Warfel, 2009)

Further considerations of how the tools would support collaborative efforts among design team members in participatory, collaborative and crowd-based prototyping, would be critical to the entire design prototyping process. Practical aspects would include issues such as parallel work, versioning, publication and commenting functions, the support of multiple designs and different visual fidelity options and the availability of GUI widgets that enables design recycling using existing libraries or creating new ones. (EResult Agency for UX and Usability, 2020).

Therefore, the choice for tools is a complex decision that includes personal preference and organizational context and requirements alike. Regardless, it is useful to equip oneself with a foundational

knowledge of techniques, such as ideation techniques, testing techniques, etc. and build a repository of "tested and tried" methods that cater to diverse prototyping settings and goals. Regarding the selection of technical support tools, Coleman & Goodwin (2017) dedicate a full chapter in their book "Designing UX: Prototyping" to segmenting and categorizing the prototyping tool landscape. The authors build a framework that comprises three groups by which to categorize prototyping tools according to 1) design fidelity 2) tool complexity and speed of use and 3) the aim of the prototype. This provides a helpful navigation of the complex tool landscape and brings orientation to design students trying to achieve multiple goals.

Design students should, however, recognize that knowing and staying on top of the tool landscape, the application of new methods through case studies and realizing the potential of virtual and augmented technologies is a life-long learning process.

Prototyping as a social activity in the organizational context

Re-visiting McElroy's (2016) definition of prototyping as a mindset of continuous learning highlights the importance of the organizational ecosystem and particularly the adoption of design thinking and user-centered design within the organization, which can be a huge contrast to hierarchical and error-focused organizations. The organization's maturity towards the adoption of user experience design has a strong impact on the size and influence of the design team, which becomes evident in the three basic constellations that can be summarized as 1) UX Central Team, 2) Embedded UX Team and 3) UX "One Man Show" (UXpin, n.d.) and may be enhanced by external designers.

Depending on the maturity, designers may have tasks that clearly extend beyond their original scope of doing design work and can

include managerial work, cross-team communication and evangelizing the organization about the business value of design. This enhanced understanding of what design work entails requires student to be trained in handling social situations outside of the design remit and deal with complex situations where design is considered a significant part of a whole (Schaeffer & Palmgren, 2017).

The legendary designer and author Don Norman puts a high emphasis on changing the mindset of design students and to foster this founded the Future of Design Education Initiative together with Karel Vredenburg, Director of design at IBM. Norman states:

***"Designers, traditionally, sit and design something and pass it onto the next stage, then they complain it wasn't done the way they designed it,"* he says. But if they were trained to sit through the whole system, the outcomes would be better. *"Learning the political issues, and economic issues, and divergent views is a critically important thing to getting something done in this world,"* he says. (Brandon, 2021)**

This changing mindset has profound implications for the successful collaboration between designers and developers. Typically, designers are delivering the information about a project and will be explaining context and details to the development team. Considering the different mental models of designers and developers, during this communication it is crucial to make sure be understood correctly, for example through open questions like "Did I explain myself well" that stimulates further discussion (Chechique, 2021). It is also advisable to work with visual examples and use diverse documentation formats such as user flows and video, particularly for complex interactions (Chechique, 2021). Finally, both sides may refrain to their own technical jargon. For designers this could be topics "like typography x-

height, complementary color, or typeface names" (Chechique, 2021). It is advisable for both sides to speak as simply as possible and clarify any unclarities owing to technical terminology quickly.

For improving the workflow Bermon (Bermon cited in Lindberg, 2019) recommends choosing a separate delivery methodology that is suited well to the relevant discipline and keep a dual-track approach (Lindberg, 2019). A suitable methodology for designers could be based on UCD whereas developers would feel more comfortable with agile working methods that use design sprints (Lindberg, 2019). Bermon (Bermon cited in Lindberg, 2019) describes the resulting tracking options as follows:

- **"The discovery backlog: *Designers work through requirements, reframe them as assumptions, and aim to validate them. There are a couple of benefits to not forcing designers into a sprint model: It allows them to ebb and flow within the context and complexity of the requirements they're working to validate, and it encourages support from the development team. The result is validated requirements that can then be filtered into a more traditional implementation backlog.***
- **The implementation backlog: *This is where user stories, acceptance criteria, and the correct level of design documentation lives. Since designers and developers have decided what should be implemented together, and each requirement has been validated for both customer fit and technical feasibility, less context is lost and less rework is likely" (Lindberg, 2019). Finally, designers are expected to be included beyond the actual design process and driving implementation of design initiatives in the organization, which requires design students to be eloquent in business language and managerial talk alike.***

Designers must also communicate with their clients and users. Some recent work suggests that this communication may include three aspects of looking at a design process (Lawson, 2005). The first refers to the actual process as carried out and may be called design practice, much of which described as design process and design handover is included in this aspect (Lawson & Dorst, 2009). Secondly, there may be a formal description of the design process in description, documentation, contracts, terms of engagement and so on that outlines the intention of the design communication (Lawson & Dorst, 2009). This formalization is of extreme importance in large and complex organizations that follow hybrid working models. Finally, Lawson & Dorst (2009) identify a third aspect of communication process that describes the process that those involved in the design work may wish to follow, called aspiration. Organizations ideally give leeway to teams to follow their aspirations without compromising the other aspects.

The key learning for design students could therefore be that communication will be much more complex than they expect because the three aspects described may be aligned or not aligned, which may be the source of potential confusion when communicating with other stakeholders such as clients (Lawson & Dorst, 2009).

Therefore, design education should give students the chance to develop their core design competence, their expertise in navigating complex situations along with the preparation to be visionary designers (Schaeffer & Palmgren, 2017). According to Dreyfus and Dreyfus, 2005 and Lawson and Dorst, 2009 cited in Schaeffer and Palmgren, 2017:

"This includes giving them the opportunity to learn how to be highly involved in the problem, respond to a situation intuitively, finding new ways of doing things, redefine issues and be radically innovative."

Four diverse prototyping exercises were applied in the study of Schaeffer & Palmgren (2017) in order to address the learning areas of active experimentation and concrete experience as depicted in figure 2:

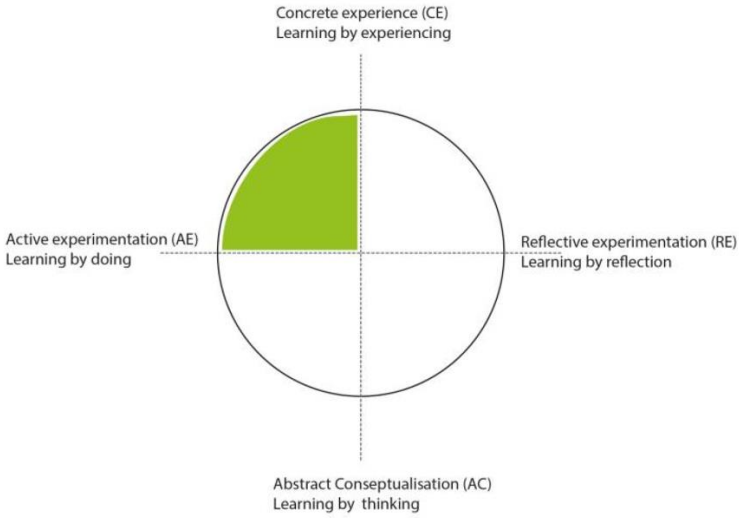

Figure 2: The Learning Cycle (adapted from Kolb and Fry, 1975 and Saloma, 2015 cited in Schaeffer and Palmgren, 2017)

The exercises allowed students to define the design problem and "were also designed to support collaborative exploration of a design scope, questioning it, and exploration of how interaction of materials and the body could influence the design process and final design" (Schaeffer and Palmgren, 2017).

The outcomes, however, were mixed and established the existence of two uniquely different attitudes in response to the challenge, namely "aversion" or withdrawal of students or "immersion". As one possible reason for aversion the authors described a potential mismatch between their skill level as novice designers and advanced expectations in terms of recognizing subtle sense of context, exploring new domains and new trajectories for design (Schaeffer and Palmgren, 2017).

Therefore, design students today require a formal basic training that equips them to capture the wider competencies related to design practice work as outlined including social, organizational and communication skills while at the same time enhancing their understanding and visionary approach to design for mastery.

Conclusion:

Prototyping in design is a very hands-on activity grounded in thorough understanding of design theory and practice. It is a key part of every design project with a low threshold for action and participation. As a result, prototyping transforms the design idea into a tangible artefact, thereby reducing uncertainty and deepening the contextual understanding, including through its experimental character and the iterative nature of prototyping a closer approximation of the design fit to user expectations and abilities. Design students are therefore challenged with dealing a much "messier" reality than models would suggest, the inherent bias towards action even if key assumptions are not yet validated and doing that all in an economical way and inclusive way. Using prototypes beyond the functional and aesthetical aspects requires superior communication skills, especially when promoting prototypes into larger organizational contexts and using prototypes to communicate with stakeholders outside of the design community. The author argues that this aspect of navigating complex scenarios and transporting the design vision inherent in the prototype to a diverse audience would be a worthwhile addition to design education. To address elements of design practice in prototyping, design curricula should ideally include practical application scenarios that represent or solve real-life design challenges and address them in a plan / act / reflect learning cycle with a focus on practical learning outcomes. Both can be achieved in a classroom and distance learning setting provided the participatory and iterative perspectives can be

addressed through work structure assignments and / or digital tools.

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Alessia Zanotti ***has just finished her communication design studies at the Macromedia University of Applied Sciences in Munich, where she studied from 2018 to 2022, one semester at the UFV in Madrid. In addition to her studies, she is always working on different design projects that bring her continuously practical experiences. During her studies, she won the 1st prize of a nationwide design competition as well as the Be Social promotional award. In her bachelor thesis, which was supervised by Prof. Dip.- Des.Tanja Schmitt-Fumian, she dealt intensively with today's relationship of children and young people to haptic as well as how today's digital world influences it. Currently she is gaining more work experience in the design field before she will continue with a masterprogramm probably in Haptic- or Eco Design next year. Haptic has always been the most important aspect in her design projects, which is connected with her passion for haptic creative work and the fascination for each individual's perception of haptic in our environment.***

Generation Z: Losing touch

A post-industrial world can only make sense if we shape knowledge, emotions, and meaning, which means improving existing situations. This cannot be achieved without critical thinking and iteration in design. Design requirements and results are determined by the skillful interplay of design processes, digital ethics, and communication to find sustainable solutions to address new kinds of problems.

Key Words*: critical thinking, design, design education, design process, mental models, haptic*

In this paper, we want to look at how the changing artifact in digitality – (1) **the condition of living in digital culture – has changed the design process, where the haptic experience is more and more disappearing. In a second step, we suggest a** (2) **process-driven simulation of this analog experience using iteration, destruction, and construction. And finally, we propose how (3) distance learning in design education trains a new generation of designers dealing with the changing artifact: utilizing the online environment as chance.**

*"**Digitization** is the process of changing from analog to digital form" (Gartners IT Glossary n.d.)*

Design is a generic term that can refer to various sub-areas, but in the following, we use the term design as we do in graduate courses in visual communication design, graphic, industrial, and product design. Besides the visual presentation of this paper, we

will first look at the analog haptic experience, which has been a main sensorial experience in earlier design education.

The haptic, the grasping of materials and shapes, always played an essential role in design. In the field of design, the work of drafting is distinguished from the work of production, which started in the early industrial revolution. In the area of craftsmanship, the material was clearly in the foreground, whereas in designing for industrial services, the focus is on forms, functions, and problem-solving, represented in drawings at first. But here, too, designers have long been dealing intensively with the material when designing, at least in prototyping. It is not empirically screened, but a statement like this: the haptic influences of the basic training of designers more and more eased out in favor of the visual training. Even Moholy-Nagy (Moholy-Nagy, 1929), a defining character of the Bauhaus, saw the sense of touch as an important part of the theory of design and form. He saw the inclusion of touch in aesthetic training as a recognition of individual inclinations and improvements in the tact of designers.

Through the establishment of tactile exercises in design education at the Bauhaus, tactile training gained a scientific position. Due to the dominance of digital design and possible de-sensualizing of material culture, the tactile experience in design education has recently experienced an intensification (Schönhammer, 2001).

Multiple haptic aspects influence design and our perception. The nature of the objects influences our perception and our different senses. When it comes to processing in the brain, only a smaller part of the information that is perceived is processed and selected. Only the content that triggers something in us personally has an effect. We only process the information that our brain considers

relevant and overlook information that we consider unimportant. It is therefore essential that designers know how the viewer conceives design and what content they process (Heimann & Schütz, 2017). Neuroscientist Gerhardt Roth states, „Als Neurobiologen gehen wir davon aus, dass unsere Erlebniswelt - also unsere Wahrnehmungen, Gedanken, Gefühle, Vorstellungen und Erinnerungen – ein „Konstrukt" unseres Gehirns sind."[As neurobiologists, we assume that our world of experience - i.e., our perceptions, thoughts, feelings, ideas, and memories - is a "construct" of our brain] (Heimann & Schütz, 2017, after Roth 2015, p.237). This means that everything we perceive is first processed and formed in the brain into a specific content that we cannot decipher by mere grasping. The processes in the brain are the basis for the inner rules according to which perception takes place and which should apply to designers as design principles.

From a purely technical point of view, we only receive all stimuli that we take in from outside via our sense organs in a certain area. Heimann and Schütz (Heimann & Schütz, 2017) argue that our human perception only includes what is important for our survival, our perception is passive, i.e., adaptive. Designers create something that the viewer, the one who perceives, creates something of their own with the help of their sense of perception. Because designers appeal to the viewer with all their senses, it is initially just a suggestion that everyone uses to create an individual image (Heimann & Schütz, 2017). The perception and impact of a design depend heavily on the tension and expression it provides. We often see ourselves in forms and images or recognize experiences that lead us to perceive designs in a certain way. Our body perception of familiar and human facial expressions and gestures as well as visual experiences of the past plays a decisive role in our inner perception (Heimann & Schütz, 2017). We

interpret feelings of balance in their different formal language and feel a respective balance or imbalance regarding the design: meaning cognitive dissonance. The effect of learned content associations is often more decisive than the formal language itself and determines the effect on the viewer. For instance, horizontal lines often appear less long (Wundt 1858) to us than a vertical line of the same length since we must expend more effort for a vertically upward movement than for a horizontal one due to gravity. Our body feeling and the associations based on our experience give us an indication of the effect of the design, which every designer should consider when creating.

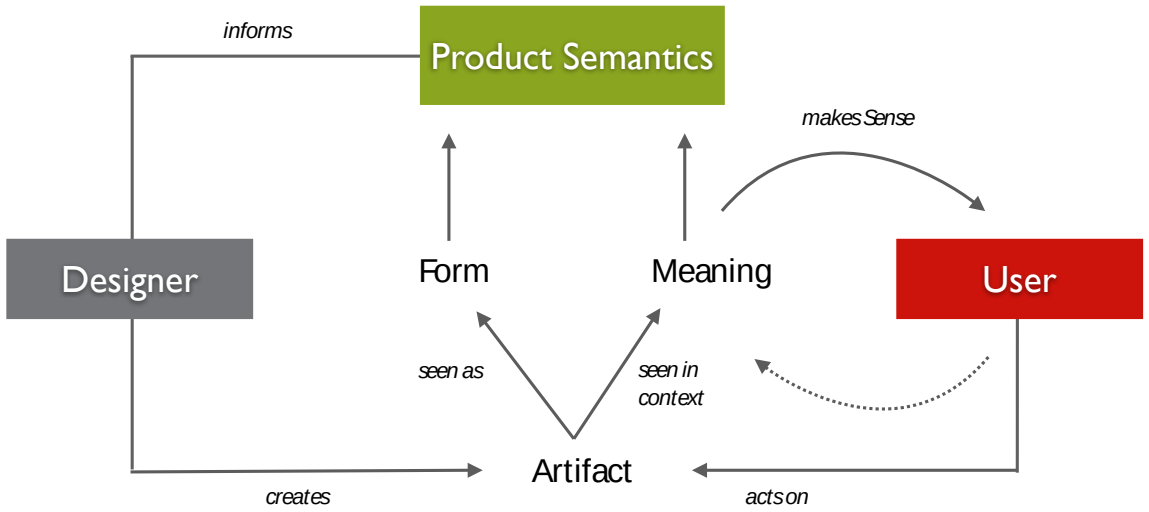
Pictures, figures, and abstract forms immediately have a certain dynamic and structure that makes us curious. This is also reflected in the design area. The perception - visual and touch - of a surface conveys a certain feeling that is automatically associated with the object (Biggs 2004). We transfer our body feeling and our state of mind to designed objects. This is how we often perceive the expression and tension based on our body's feelings. Accordingly, designers have the task of orienting themselves to the principle of ´man/woman as measure´ when designing, since effects and messages can be perceived individually by the viewer. The viewer perceives stability or instability, stillness or movement through the elements and forms he sees or surfaces he feels. Dealing with the material has a great influence on the consciousness of the viewer. By carrying out practical activities with materials, people establish contact with their environment. As Reuter summarizes, practical human activities lead to the development and change of inner structures (Reuter, 2007). It can be observed that fewer and fewer print products are being developed in design processes these days, and more and more work is being done digitally. Print products are often avoided for reasons of sustainability or

efficiency and designed in a digital version. Analog and haptic print products have increasingly shifted to digital because of digitization. They have become part of a `digital first´ strategy: allowing accessibility anywhere and anytime, independent of time and place. Examples of this fact are books that are often only published as e-book versions, travel guides that become online blogs, daily newspapers, etc.

At the same time future product designers are facing new problems, besides the question of form and function due to new technologies, like privacy, ethics, and social or security issues. Product design has gradually shifted from functional needs to human needs (Huang, Shi 2022), including ´design for environment´ approaches in the last decades.

The question arises: if the haptic experience disappears in certain areas which have been important for the designer, how do designers deal with the changing artifact and the changing interaction with the world?

Interacting with designed products influences human thoughts, feelings, and behaviors. At a basic level, such interpretations are based on form and function. More complex responses involve assessing the values that products embody and making judgments about the cultural associations they evoke. Since people attach such meanings to things, designers can develop intentions that the products they design will be interpreted in a certain way. These inclinations shape the resulting products that differ from the intention in many ways unexpected ways. (Crilly, Good, Matravers, Clarkson, 2008)



The relationship between the form produced by the designer and the meaning produced by the user.

The designer creates and the user acts on something received. The designer creates an artifact, which embodies the designer´s meaning as form. The user acts on the artifact and tries to make sense of its form, thus trying to produce meaning.

Figure 1: Krippendorff's & Butter proposed a model of the relationship between designer and user. (Sunde 2017)

In the last century, where we witness a changing artifact, moving from a manufacturing industry to a service industry, we designers see the need for human-driven tools, that enable creative processes, widening our 17inch horizon and reacting to time-based and real-time phenomena. This is when designers create value: intangible products, focusing on the levels of intangible design: knowledge, emotion, and experience.

In Design today, it's not only about products, but also about processes. Products can only meet the constantly changing demands of the world of people and of living together for a short time. They behave statically and must be renewed again and again, so our concept about products has changed since products are changing.

However, if we want to design sustainably, changes must become an integral part of creative thinking. Only then are there no longer

finished products – which nobody will need tomorrow – but connectable processes that make the world a better place in the long term, because processes always imply change and can therefore always be re-adapted to the realities of the world.

When looking at a product design process, it is far more than just looking at the product, it's part of a larger business process. After Nigel Cross the three main areas of design knowledge are People, in our case, the designers themselves – all expert professional Practice, Processes – an abstract high-level working tool to ensure the best proactive and Products, the study of artifacts may reveal the information about the processes that guided their creation. (Research & Education in Design: 2019)

Processes are the key, not the physical artifacts. In retrospect, products can only meet the constantly changing demands of the world, of people, and of living together. Repeatedly, they must be reinvented because they behave statically.

Following this idea, what would this imply for Krippendorffs model shown in figure 1?

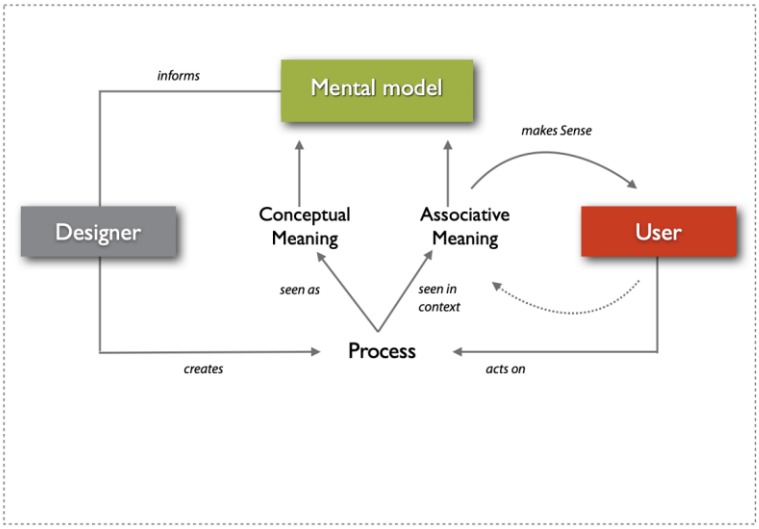


Figure 2: Own presentation adapted model based on Krippendorff's relationship between designer and user. (Schmitt-Fumian, 2022)

As shown in figure 2, "Product semantics" – the study of the symbolic qualities of a human-made artifact – is replaced by "Mental Models" – a cognitis construct built on experience and prediction of a performance (Reinhold & Schmalen 2021)

Designing user experiences with mental models is a key concept. A new workflow strategy is needed when it comes to "digital product or service development," where experience drives cognitive development. Models can be defined as representations of information provided, and design can be defined as a problem-solving process.

"I consciously include training (design education), as designing objects has a lot to do with knowledge and mindset" (Dieter Rams 2021, p. 13)

We need tools to allow the flexibility of iteration and failure and to understand the value of iteration and failure - at an early stage. We need tools to visualize or simulate the process of human imperfection, needs, and desire. There is nothing more meaningful – to us - than looking at scribbled ideas or processes on a whiteboard with tons of iterations. (Krippendorff & Butter 1984). These mental models could fill the gap in the haptic experience. A mental model is a representation of an object or process in the consciousness of a living being.

"Mental models are mechanisms whereby humans are able to generate descriptions of system purpose and form, explanations of system functioning and observed system states, and predictions of future system states." (Rouse & Morris, 1986, p.2)

Mental models are in a way as imperfect, as analog prototypes. People use mental models to understand and interact with things in the real world quickly. The touch experience, described in the first part of this paper also lets us gather information about reality.

As mentioned earlier, the major technological trend facing the world today is digitalization, one of the most significant ongoing transformations of contemporary society. Every aspect of organizational and social activities has been profoundly affected by it. Manufacturing companies must provide product-related services along with tangible products throughout the product lifecycle (PLC) to gain a competitive advantage in the digital business ecosystem. So, the artifact is much more than just a physical object (Xin, Ojanen 2017).

With the COVID-19 pandemic spreading across the globe, online distance education is now more important than ever. (Bozkurt & Sharma 2021) Finally, design education has the chance to include crucial aspects like social-emotional learning empathy, and cultural components. (Matthews, Williams, Yanchar 2017)
Through social and emotional learning (SEL), we learn how to understand and manage our emotions, set and achieve positive goals, feel empathy for others, establish and maintain positive relationships, and make responsible decisions.

Is empathy perhaps the basic ingredient to solving future problems? The complex challenges of our time will not be solved by a few, but by many, who become active with a common value and a healthy understanding of the right thing to do. (Spiegel, Pechstein, von Hattburg, Grüneberg 2021)

In design education as well as the process of learning always involves a form of interaction of our senses. Therefore, distance learning can learn and profit from the fundamental changes in Design Education: understanding the social-emotional component: creating and working with mental models which replace haptic experience.

"The design of our world of things has complex functional, psychological, social and not least political impact." (Dieter Rams 2021, p.13)

Living in a digital culture changes the condition of analog haptic experience and suggests a process-driven simulation of analog experience using iteration, destruction, and construction in a distance learning scenario.

In other words, the process of destroying old ideas and replacing them with newer ones should be the focus of creative destruction (Schumpeter 1942), to deal with the fast-changing world.

Design connects complexity to meaning

At first glance, designers may work with material products or digital interfaces that serve them as material and technical media, but at second glance, it is all about mental models, incorporating suitable representations of how things work and are interpreted.

The use and mastery of these artifacts, such as print, social, multi, or cross-media, are all located in a technical dimension (up to language constructs and codes) the mastery of which we do not count among the core competencies of today's designers. If we look for the core of this objectification to assign its essential function to the designer, we could cite the concept of interaction is

crucial. People interact with constructs, models, and artifacts to understand themselves and the world. In this interaction, we are humans. In other words, instead of modeling physical objects, future designers should model mental models. So, a mental model is nothing more than a framework that represents how the world works, while physical prototypes represent how the products feel and function.

This new sense of modeling fills the gap with the changing artifact today and should be the core focus of distance learning in design education. Taking the virtual classroom as a chance to re-think what we call ´craftsmanship`, what we can see as designing with material artifacts.

If these models contribute to understanding, then designers were at work. Designers who understand people's perceptions and provide them with appropriate means of interaction. This is where designers should learn how to construct and destruct mental models since they are beliefs formed by human minds based on experience, and observation and are always the subject of an ongoing learning process. The process of creative destruction (Schumpeter 1942) is not new, for instance in economic concepts, described by Schumpeter as a "process of industrial mutation that continuously revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one" (Schumputer, pp. 82-83) There have also been interesting theories about breaking mental models as a form of creative destruction to foster social innovation (Marcy 2015).
It means, that mental models and designs resist change as well, as material models do. Creative destruction is an essential step in the design process, as well when it comes down to mental model which has been replacing the haptic experience within the changing artifacts.

So, what is the crucial instance that brings a designer into the world?

People gain access to the world using their senses. The Greek "aisthesis" - perception – is the signifier of our current term "aesthetics". Perception - and thus aesthetics - is thus responsible for our understanding of the things that surround us. This understanding includes, in particular, the ability to orient ourselves to models and also to communicate through them. Whereas in the past it was things like maps, paintings, or visualizations of social and hierarchical identities today it is the intangible side of products like social networks.

In summary the future of design education in a distance learning scenario could have the chance to tackle these new challenges, by focusing on the *intangible* design process: knowledge, emotion, and implementation working with an in mental models, constructing and `creative´ destructing to get the 'haptic' in non-material products!

Just looking at evolution of a mobile phone or laptops, we witness that these products offer extremely similar functionality and hardware design, so the competitive advantage will lay in the intangible value. (Driskill, Bermudez, McMahon, Ullah 2015)

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Matthew Hollern

Matthew Hollern is a designer-craftsman and Professor of Jewelry + Metals at the Cleveland Institute of Art where he has taught since 1989.

He earned a BS in Art and French at the University of Wisconsin-Madison. In his junior year he lived in Aix-en-Provence, France where he attended the Universite´ Aix-Marseille, and studied blacksmithing at the École des Beaux-Arts - Aix-en-Provence. In 1989, he earned an MFA from Tyler School of Art, Temple University. He has received research and professional development grants from the Society of North American Goldsmiths, the Lilly Foundation, The John and Maxeen Flower Fund, the Cleveland Institute of Art, the Community Partnership for Arts and Culture - Creative Workforce Fellowship, and two Individual Artist Fellowships from the Ohio Arts Council. His work has been exhibited throughout the United States and Europe, and is included in public and private collections including the Renwick Gallery of the Smithsonian American Art Museum, Design Museum Helsinki - Finland, the Vatican Archive, the Ohio Crafts Museum, the Cleveland Art Association, Alcatel-Sprint, and others.

LOCUS v. NEXUS ...A Studio-Abstractum

Matthew Hollern

Abstract

Design, progressive ideologies, and recent events have combined in a redefinition of studio education, to achieve a "studio-abstractum." The many mediums and disciplines of art, craft, and design all share a tradition of tangible-studio-based education, but what does that mean in a moment of dislocation and distancing? Digital technologies and mediated experiences are not in opposition to humanistic and meaningful design education when reimagined as a 'Nexus' of interaction, experimentation, and shared practice.

Key Words:

- **Context**
- **Radical**
- **Revelation**
- **Medium**
- **Message**
- **Literacy**

LOCUS v. NEXUS ...A Studio-Abstractum

The road to teaching studio online was long, but through design, rational.

Context

As MFA graduate students we were challenged to think about the future. The "studio" was presented as a laboratory and we were

engaged in research, historical and technical. It was not just craft techniques, materials, and archetypes; it was experimentation and research in materials and processes. Objectives included discovery, innovation, and contribution to knowledge. There was a strong emphasis on the potential and the meaning of Technology. In his article "Artists as Explorers of the Technological Frontier" (1987) Stephen Wilson offered an early provocation on technology and the studio: "*The arts have served many functions throughout history. One of the most important has been keeping watch on the cultural frontier… The challenge facing artists in our technological era is unprecedented*. *They are desperately needed as interpreters of culture.*" (Wilson, 1987) In questioning the level of engagement, Wilson called for deeper knowledge and efforts comparable to advancements in the sciences and technology. He called for new contexts to explore technology, coupled with the holism of the arts. These ideas were (and are) appropriate directives. They remain essential to design, and the pedagogy of design education.

Radical

In January, 1989 computer-aided design / computer-aided manufacturing (CAD/CAM) for jewelry design was introduced by professor Stanley Lechtzin as a new course in Metalsmithing and Jewelry, a department within the Craft Area at Tyler School of Art, Temple University. It was the first of its kind in all of higher education, and it was radical. How could anyone teach craft using a computer? Craft was defined by the hand, the handmade, materials and tools skillfully applied to make things with your hands. Craft was (and is) a classification of objects, materials, and mediums. It was universally understood to be a subject taught in the studio, through lectures, demonstrations, and projects… manual, tangible, material, applied. I was a student in that course,

and the ideas we debated changed my thinking and my approach to teaching art and design.

At the time, a "hands-off" approach to making a craft object appeared to be a truly radical idea. How could CAD be applied to a world of handmade things? In the intervening years, it has been clear that the most important act was not in the specific, introducing CAD/CAM to craft education, but rather, fundamentally challenging the beliefs and conventions of generations of craftspeople and craft educators. Education is rife with beliefs and conventions, the duration of which can be detrimental to the advancement of new ideas. The German theoretical physicist, Max Planck famously addressed the nature of these beliefs: "*A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it*." (Planck, 1949) This is more than a critique of the 'opponents'. It is a useful observation on the social response to change. The observation is applicable to more than science, and by extension can be observed around "new and novel ideas." The resistance to change, to new and novel ideas, is paradoxically prevalent in teaching, in studio disciplines, in education, the place where we expect the advancement and contribution to knowledge, openness, and curiosity. As members of academia, we seek to present new ideas, methods and manifestations, derived from research, practice, teaching, and chance. The emphasis on Design, specifically Computer-Aided Design was a radical idea in Craft education in the 1980s. However, it is not radical to higher education as a matter of research, exploring new frontiers.

More than 30 years later, Design and CAD have become essential subjects and practices in craft education. And the methods have become part of the message. In a world of mass production, Craft

and Design play an essential role to advance and perpetuate unique aesthetic objects that record, interpret, reflect our time, and transcend our daily lives. Craft objects express our humanity, and serve our fundamental need for the union of art, design, and utility. Craft is interdisciplinary…hybrid… synthesis… exploring and combining elements of the conceptual, with art and design, with materials and technologies, from the most ancient to the leading edge. We encourage research, risk taking, and challenging conventions of design, materials, and technology. These ideas help to encapsulate the Craft + Design major at the Cleveland Institute of Art. We emphasize design + craft to acknowledge and address the opportunities that exist in the practices of design. And this is not new, we were very early adopters. For 23 years, CAD and digital technologies have been part of the craft curriculum in the Jewelry + Metals program. What was radical, is now integrated and simply represents a broadening of horizons.

Today there is new opposition, new things to resist, focused on distance education and online learning. For some it is a radical idea to propose to teach a studio course at a distance. This is not radical, nor is it novel. It is just adaptation, a transfer of methods from one discipline to another. Teaching a studio class online may be equivalent to using CAD in a craft course, if it changes the affordances of the process. But the bigger question is how do we change the larger context. Distance affords opportunities for something new and novel, a more experimental approach, something more radical. Teaching in the time of COVID has allowed progressive faculty to redefine "the studio." Opponents to distance education say that we cannot teach studio online. Distance education really only works for lectures and seminars… which begs the question… is that a scientific truth? Not likely! As with science, the history of craft and design includes many challenges to change, where new frontiers are explored by the few

and ignored by the many, and paradigms are slow to shift. Even so, craft and design education has benefited from many significant paradigm shifts, significant disruptions that change the norm.

Revelation

COVID-19 delivered such a disruption. The pandemic was a revelation, a massive disruptive event, a violent shift, and an extraordinary opportunity to redefine "studio", to consider "locus v. nexus." Suddenly, the classroom was unavailable, and the design studio was closed. Distance suddenly became "normal", and everywhere. Physical classrooms were abandoned. What happened next had to be radical, a rewrite of course syllabi, shifting online while sustaining objectives... at a distance... a nexus. We had to address our subjects and our mediums anew. In Abstracting Craft: The Practiced Digital Hand, (1996) Malcolm McCullough offered a novel definition of "medium", which is useful in redefining studio pedagogy, beyond the physical studio. "*The word "medium" has many meanings: a medium may be a material, such as plaster, or a means, an agency, or an instrumentality, such as the press. It may be an intervening person or thing, such as a messenger...*" Moreover, he offers an abstract set of three essential elements to define a medium: "*Engagement, Affordance, Constraint.*" (McCullough, 1996) This proposal of abstract elements asserts the essence of medium is not dependent upon locus, but can be defined and achieved by experiences that occur in virtual or tangible space, interactively, nexus.

Mediate

In 2020, progressive design pedagogy was reinvented, compelled by distance, enriched by unprecedented confluence of positive factors: extraordinary advancement of "the digital", access to production and services formerly relegated to industry, and affordability provided by massive commercialization and

competition for the market of the individual practitioner. Craft + Design exists through and between tangible and virtual, in a period in history defined by hybrid and liminal activity. Studio is not locus, defined by a physical space in which design is created, a design studio. Design and studio are collaborative, multi-modal, intersection, interaction - nexus. It is less about space and more about time, including screen time. The atelier or the studio are only part of the equation, with the addition of digital technologies that have brought greater focus and attention to collaboration, and the "studio" as any virtual intersection rather than strictly a physical tangible location.

Distance education in craft + design + technology is achieving a paradigm shift. Whereas CAD is an application that offers a mediated experience in design, digital communication tools offer new mediated distance learning experiences, within which we apply other mediating methods, applications, and tools. It is uniquely modern in extent and effect. It is rational and reflexive. A mediated education by distance on subjects that include mediated experiences and practices is rational and self-validating. Abstracting "studio" may seem like a radical change but designs to modernize and redefine "studio" as nexus will eventually simply, be familiar.

Medium

CAD is a design activity, and a mediated experience. The 3D model is virtual, and intangible. Digital technology offers a meta-medium, a means behind a means. The digital activity of design is mediated by devices of affordance, constraint, and engagement. Here again the use of the abstract provides possibilities. Design is subject, experience, and context – simultaneously. Jewelry is a medium within design. Matthew Hollern is a jewelry design professor. Jewelry 'design' is ancient. "Jewelry was the first art

form, entering the archeological record tens of thousands of years before cave paintings and sculpted figurines" (Holcomb, 2018) And beads are the earliest of all. "The earliest known beads are associated with the Middle Paleolithic people.... dated to approximately 108,000 BCE." (Sherr Dubin, 1987) Jewelry may be regarded as the first aesthetic medium of humanity, different from stone tools, which date back 2.5 million years in West Africa. By any analysis, materials, tools, and technology dominate the history of how we got here.

Before designers, before digital technology, we had needs, observations, curiosity, and ability to make things. The maker's perspective on technology and the object has evolved through thousands of years. Our perception of making and objects has been and will continue to be in flux, and yet it is sustained by an original set of influences that have always been central to what we call Design. Ancient and early works were direct, visceral, very slightly mediated by simple tools or other objects. With each advancement, we recognize the influence of materials, tools, and procedures, and the importance of skill in design.

Traditionally, jewelry is taught at a bench, with tools and materials. The emphasis often begins with technique, and moves through historical archetypes. Today, CAD, 3D modeling and 3D printing are fundamental to the experiences and the curriculum, as well as the maker movement around the world. One course in particular, offered in the spring of 2020, Stone Setting, a classic tangible subject, serves as a case study of the potential to redefine studio education at a distance. In March of 2020, all studio courses moved online. While some courses relied on video to interface with students who worked on tangible designs in physical spaces in their residences, Stone Setting was redefined with strategies to emphasize design and engineering, with

rendering and 3D printing as forms of simulation. Students were encouraged to do an assessment of their new studio, and the new shared studio was redefined as nexus. The process to change strategies was critical. We acknowledged the pandemic, and the unique situation was addressed as the new context. The most influential presentation focused on "creative process", making the case for distance, dislocation, and the abstract studio. (Hollern, 2020)

Creative Process

The creative process includes many steps and strategies. Its emphases vary from person to person, but most makers engage in a "workflow" with very similar elements. In craft education, we often emphasize the traditions of materials, process, and skills. In this new and unexpected setting, we change the focus. We redefine the "studio" and the "maker space." I am a maker. My studio is in my basement and my garage. It is also in my head, my laptop, on the dining room table, and wherever else I chose to "make". We have the power to recognize that the practice of metalwork and jewelry, and making, also requires another set of skills that are critical to successful practice as a professional. We have a significant set of elements that we can emphasize, and which can be achieved in an expanded definition of maker spaces and studios. Look at the elements of creative process. Many of them occur absent our favorite hand tool or machine.

…inspiration… subject… topic… problem… research… ideation… conceptualization… design… iteration… prototype… validation… …application… materials… techniques… technologies… documentation… presentation… (repeat)…

The nature of the work also had to change. The emphasis shifted to the creation of a collection, which provided a challenge that would focus on concepts, design, and communication. "Collection" required 10 strategies presented as "components." Words and writing were critical to bookend the process. Concepts, exploration, iteration, and simulation all contributed to the experience. (Hollern, 2020)

Conceive • Design • Present • Collection

10 Components…

WORDS – in ≈ 250 words, describe the concept for your setting collection
SKETCHES – in 40-60 thumbnail sketches, explore the components of the collection
RESEARCH – in 20 images, use captions to connect your research with your collection
DRAWING – in 4 views, create 3 technical scale drawings, to define 3 setting designs
MODELS – in 3 sketch models, use simple materials and techniques to prototype
DIGITAL – in 3 CAD models, develop the forms and details of the collection designs
RENDER – in 3 or more renderings, explore the look of materials with your design models
PROTOTYPE – in ≤ 1,000,000 polygons, make a mesh to print parts to "assemble" a setting
PRINT – in 300ppi, use CAD to make a design process poster, including all of the above
WORDS – in ≈ 250 words, describe the design process presented on your poster

Work in the abstract studio, design at a distance, required one other critical element, a focus on character. One of the most consequential subjects and expectations of the distance and dislocation was the focus on character. (Hollern, 2020)

Character

adaptability… resilience… persistence… respect… resourcefulness…reliability… positivity… discipline… ethical… moral… work ethic… leadership… vision… self-reflection… self-direction… social engagement… social skills… social responsibility…social distancing… competence… inquisitiveness… curiosity… imagination… questioning… creativity… communication… critical thinking… collaboration… sensitivity… empathy ……character.

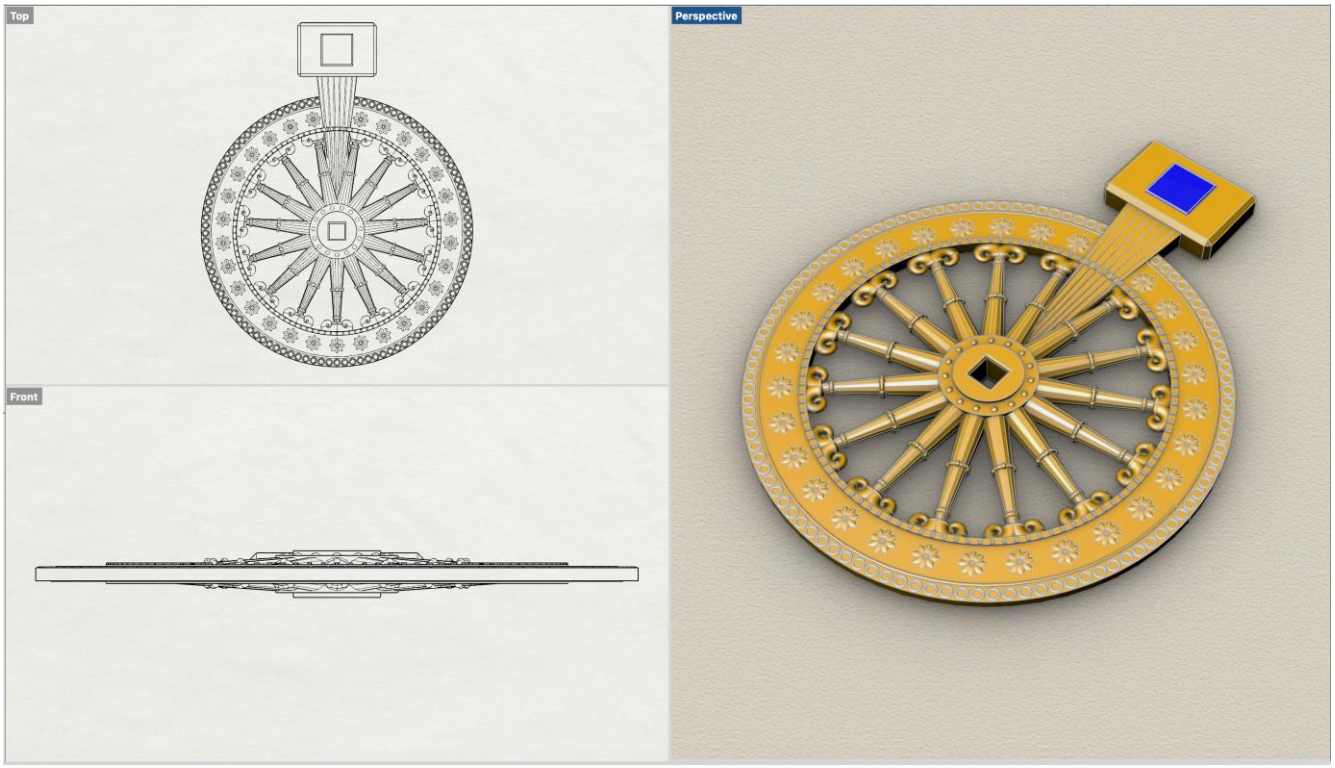
Students today understand that we "make" things in virtual space, and we print the things we make in plastics, resins, ceramics, glass, metals, and more. Designing is making, and making is thinking. Printing is material manifestation of what was made through a virtual studio experience. Additive manufacturing is the new frontier, accepted, familiar, and expanded horizon of craft, design, and making.

Message

Craft + Design coexist to be an important contributor to the Third Industrial Revolution (April 2012, Economist). "As manufacturing goes digital, it will change out all recognition." The work we are doing in craft + design, across distances, mediated by technology, and manifest by additive manufacturing and neoteric matter, converges to send the message about Design; it is essential to the liberal arts, critical to transcend our work, while sending a message. It affords opportunities for design for all, and for social responsibility.

A recent project has provided the opportunity to bring it all together. It is a medal to recognize individuals for good work for the environment, The Elisabeth Haub Award for Environmental Law and Diplomacy, recently presented to Cristiana Figueres (architect of the Paris Climate Accords) by Pace University. It is project, achieved across distance, made through a nexus of design

and technology, 3D digital modeling, online review and collaboration, additive manufacturing, and scientifically-certified recycled gold, offering the opportunity to address matters of innovation and technology with responsible use of precious metals, and environmentally responsible manufacturing. The world is developing a greater awareness and a conscience about manufacturing and materials. Today we have access to many new materials, some known as 'neoteric matter', materials of new or recent origin. These include materials that are created by additive manufacturing processes, also known as 3D printing. Individual artists and designers are successfully exploring and applying these technologies to which only the largest corporations formerly had access. These include composite and sintered metal parts, made from stainless steel, titanium, aluminum, and other metals. These processes represent the future of manufacturing and making, with a commitment to reducing the environmental impacts of manufacturing.



In this new material, printed stainless steel parts are infiltrated with bronze, to create a hybrid material that is very beautiful. My own design work with 3D modeling spans more than 30 years, and more than 20 years working with digital manufacturing. The work I am able to create carries a message that goes beyond surface and form, and is expressed by the materials and technologies. Material is part of the message, and has symbolic weight. In 1964, Marshall McLuhan presented an important idea in Understanding Media: "...the medium is the message." (McLuhan, 1964) The use of 3D printing can offer a powerful message about new technologies and the environment, acknowledging that we cannot separate the message from the messenger.

Among the many benefits of these technologies, we are seeing more efficient and effective use of materials, reductions in energy consumption and carbon footprint. These new technologies are advancing and being adopted at every level. They reduce the number of processes, and the amount of other materials consumed in the making of design products. I believe in this work as an effort to explore new frontiers, and to do so with noble aspirations. I am compelled by this new part of our world of art, design, and making. It serves to redefine a noble metal. 3D printing and additive manufacturing offer myriad options in metals and finishes, which also symbolically align with the award, and some of the best thinking about sustainability in material science.

Literacy

Finally, it is clear that design and design education provide and cultivate essential abilities, sensitivities, and attributes to engage modern society and highly mediated, contemporary cultures. In a world of distance, Design is essential to the greater complexity of literacy, and the important opportunities and demands that coexist in a world connected across distance.

> ***Beyond its conventional concept as a set of reading, writing and counting skills, literacy is now understood as a means of identification, understanding, interpretation, creation, and communication in an increasingly digital, text-mediated, information-rich and fast-changing world.*** **(UNESCO, 2022)**

Future

A theory of future practice is not conceived upon established practice alone. We must seek to reveal important new ideas and potential for the future of Design. Digital technologies continue to be a critical and influential catalyst in the advancement of material culture. Unlike any other period in the advancement of technology, within design, a digital craft will navigate a fundamental sea change that challenges the intellectual and emotional underpinnings of a former craft history. Craft + design have an unprecedented opportunity to share in the advancement of material culture, express humanity in a period of 'hybridity', offer extraordinary opportunities to makers, marked significantly by shared experimentation and collaboration, at a distance. Meaningful new practices will be defined by innovation and the promise of new materials, design methodologies, subjects, and concepts, all of which have been affected by the digital, and distance. Unlike any other new medium, the digital medium operates on a meta-level, reaching across all other mediums, offering a uniquely transdisciplinary nexus. The digital medium has been the catalyst for disruptive innovation in many parts of our lives, and while it may not be apparent, that will include digital craft + design. Finally, a theory of future practice must offer insights to shape new critical discourse, address the need for new

language, and document emerging conventions, definitions, terminology, and nomenclature.

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Dipl.-Des. Oliver Gerstheimer

Founder and design director of the digital design & innovation agency chilli mind in Kassel in the heart of Germany.

www.chilli-mind.com

Following the founding of his company in 2001 he worked intensively on a business pragmatic & methodical design process: how to create new digital services and interactive products in a meaningful and human centric way (2001-2004). This basic design research in the early phase of the digital business was awarded 2002 by the Vodafone Foundation for Research in Telecommunication (Germany).

Influenced from the long history of Systems Design at the Kassel University (since 1971) his pathway as a methodologist and system design thinker was strongly guided by the Berkeley trained Professors Dr. Helmut Krauch, Prof. Hans Dehlinger (PHD) as well by Hon. Prof. Dr.-Ing. Tom Sommerlatte, Prof. Lucius Burckhardt and Prof. Dr.-Ing. Wolfgang Jonas.

Oliver has been a passionate pathfinder and evangelist for the practice of "human centered design" and better "digital products and services for tomorrow" for over 20 years.

He gives regularly talks and publicizes papers on international platforms for design and digital transformation. Since 2002 he has taught "on site" at German and Swiss design academies and

universities for a total of 15 semesters. To that Oliver is a continuously member of the jury of the internationally renowned iF Design Award in the category Service Design and User Experience – since 2015. Together with the design team at chilli mind they have won more than 50 international design and innovation awards.

Education

- ***2001 Master degree in product and systems design; University Kassel (Germany)***
- ***2000 Additional study: new media – faculty visual communication; Kassel Art Academy 2001***
- ***Additional multidisciplinary degree: sustainability & innovation management; University Kassel***

One more thing: Oliver loves the number 42 for a special reason and he is happy every day when he sees this powerful number again. So Long, and Thanks for All the fish.

Philipp Schütz

Philipp is a passionate design professional, creative strategist and works as UX Manager for the digital design & innovation agency chilli mind in Kassel, Germany. He creates human centered customer experiences and impactful digital products for market-leading brands and DAX companies in various industries.

He successfully realized projects in ideation & innovation, digital transformation, and service- & system design. He is experienced in design strategy, project management and consulting and has strong conceptional and methodological skills.

His thinking and working focusses on what can be left out to create real impact for the user – not on what can be added on top. This mindset has led to high quality co-created projects recognized by multiple international design awards.

He holds a master's degree in Design and researches and publishes on "Rethinking Sustainability trough Avoiding Design".

Abstract

The Telos of Design – Understanding the Whole as Radically Designable

Oliver Gerstheimer and Philipp Schütz examine the actual goal and final purpose of design - the telos of design and designing. Design = ent-werfen + ver-werfen (creating + discard), but for what and whom and why. The introduction is a position statement, combined with an outlook on what new fields of activity and challenges will arise for different types of designers. It is about a hidden potential field of the future, namely the identified goal of non-design or better the "intelligence of design avoidance". This will require a new self-awareness in practice as well as in education and the targeted revival of the design leadership capability for a more holistic and open-minded rethinking of systems. Using a variety of deliberately chosen examples from the 1970s and 1990s and from today, the urgency and necessity of the systemic intervention of design is so demonstrated in the third generation. The focus is on a new way of designing tomorrow's environmental systems that are sustainable and livable - a "design for all" means definitely a "design for all humans based on a precisely ethical".

Furthermore it is shown with which mindset and goals a re-polarization from a constructive solution designer to an effective and responsible "avoidance designer" can succeed. The basis for these are four core principles - prevent, avoid, remove and affect. Through these, a new era of social value creation and higher business value can be generated in the overall context of design.

In conclusion, the appeal to practitioners and educational institutions is: "To understand the whole as radically designable is the telos in design."

The Telos of Design – Understanding the Whole as Radically Designable

"You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete." **(Sir Richard Buckminster Fuller)**

The "Telos" is an ancient Greek term and stands for goal and final purpose. In the writings of Aristotle (2004), telos was referred to as goal and good distinguishing two forms of activity. Telos here includes 1) action with goals and sub-goals, as well as 2) intrinsic passion activity. It is important for Aristotle that these activities only have a meaning if they ultimately serve a final goal. The elevation of this activity is to be achieved with the drive of passion (Eros) to achieve and implement something good in the objective and problem solving precisely through directed action and activity (cf. p. 105 –107).

What is the telos, the actual task, purpose and goal of design and designing?
What is the sense and meaning of analysis, projection and synthesis in a holistic way?

Is it the good design, the good form or the decision not to do something as the best solution but for which goal? So, the question of the final purpose and the question of the good, the bad and the irrelevant to the scope of action and engagement will be a central and ethical one. The foundation of a good design is as good as its ethical goodness.

Following Jonas' (2002) idea of an expanded concept of design, we must note that synthesis is the phase that has traditionally

been the focus. He describes this type of task-oriented design: design of the first order. "In times of accelerated technological and social change and globalized economies with saturated markets, analysis and projection are of increasing interest. It is no longer trivial to answer the question: What is the problem? (analysis), and it is equally challenging to ask: What might the future environments look like in which our solutions will have to prove themselves (projection)? It becomes a design problem to define the design problem. Systems thinking and scenario design are two main components of an extended methodological approach to design" (p. 175).

The hedonistic goal of creative minds - the passion and joy and pleasure of solving design tasks - requires a corrective to a strong, newly learned as well as practiced and consolidated overriding objective and ethical as well as sustainable attitude in the design profession. The superordinate objective meant here happens before the actual task fulfillment, it is to be seen as attitude, ductus and ethos. It is the eros, the passion of designing for the good – the systemically better and the absolutely to be avoided, which is to be consolidated.

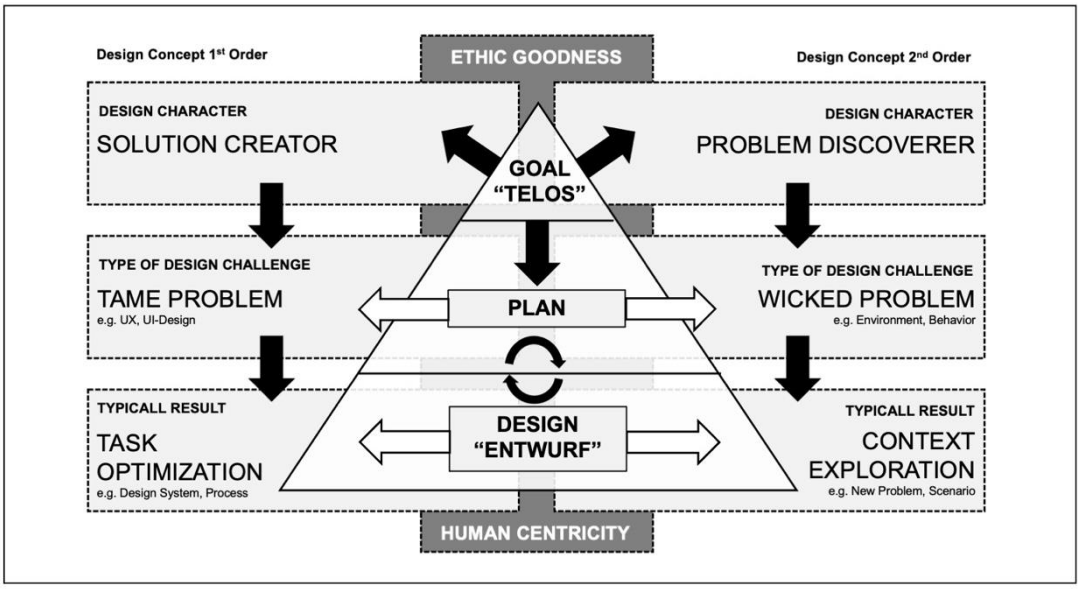

Figure 1: Influencing variables and interrelationships in goal setting, planning and the designing of design projects – with reference to Jonas (2002) and Rittel (1972 & 1992)

Social ethics and human centricity are the basis for good and socially acceptable design.

The telos and attitude are above the planning and doings in design.

Design is done by people it is a creative as well as a systemic act. Therefore, we distinguish here between two very different design types and characters if a challenge is to be mastered. The predominantly known type is the classic Designer a "Solution Creator". This one masters his craft and is classically booked on known design challenges in everyday life. The "Problem Discoverer" as a designing character is a systemic thinking type who is trained to constructively work on complex contexts and to design new open questions or undefined problems.

Good planning is about the precise definition and identification of the problem classification? Is the problem as a task already fallen from the sky and existent? Or is the central task to explore the problem and the right question in the first place? This open approach refers to Jonas and is called an extended 2nd Order

Design System (cf. Jonas, 2002, p.175-178). Depending on whether, in the sense of Rittel´s definition, "tame and wicked problems" are to be worked on, completely different results are to be expected in the design and in the "discovery", which are never standardized but unique (cf. Rittel, 1992, p. 42 – 54). Especially with the challenges of "wicked problems", it requires the open-ended "Context Exploration", i.e. the systematic and active search for the problem or the actual question. Whereas on the side of the tame "Task Optimization" the usual design results are shaped via a co-creative process.

The new market pull – same same, but different design(ers)

"Every design decision is ethical." (Mark Wigley)

Designers who earn money and create value with their profession today are called industrial, product, communication, CX, UX, UI, Usability, HMI, HC, IX, VR, AR, XR, media, system, Web3 or whatever designers. So the prefix-name is the goal and the program and the specific result. All of these "disciplinary design athletes" are trying hard doing this in an extremely careful, methodical, co-created and user-centered way, it seems. With new remote co-working capabilities, large companies are integrating legions of designers in the form of agile and distributed collaboration. Co-creation and multidisciplinary development teams are trending - compensation of e.g. UX Designers has skyrocketed and the integration as a nomadic or remote freelancer from home offices or an camper off road is becoming established as a new culture of distributed teaming and co-creation. Designers are a successful and in-demand product in the digital transformation and education market like never before.

Overall, it can be stated that the future economy and especially the digital transformation will require many new, well-trained designers in the next decade. In large companies, thanks to consulting firms, the "Business value of design" has been discovered as a driver of digital transformation and is gaining strategic importance at the C-level (Sheppard, 2018). The demand for skilled designers as a workbench for companies on the one hand and systemically thinking designers on the other hand is currently high and will continue to increase strongly in the next decade.

Type A: "Solution Creator" – task-oriented design character: one is a professional designer who is creative and specialized in tools and basic design craft of clear task-oriented optimization and typically supports low and medium complex tame development processes as an agile workbench and agile method researcher, i.e. a designer who creates design systems, user interfaces or user experiences for e.g. online services. Typical Impact: Optimized corporate products, services and systems, communication or hybrid user interfaces. This designer designs the tangible and visible interactions.

Type B: "Problem Discoverer" – exploration-oriented design character: one is a professional designer skilled in exploring, questioning, and creating or re-polarization radically new fields, technologies, running-systems, and behaviors on an open-minded strategic level. He embarks on the meandering and thought-intensive journey of discovering the problem and detecting the right question. Finding and designing the actual problem and quantifying the interrelationships is his valuable design impact. He specializes in solving highly complex and at the beginning unknown and wicked problems on a large scale with logical

thinking and systematic design guidance. This designer is more capable of designing and identifying the invisible connections, breakthrough solutions or workarounds, business models, semiotic system context, behavioral structures that are completely future and solution oriented.

Both of this outlined designer characters - type A or B - are obligated to design good or outstanding products or results in your job areas. But conversely, aren't they equally obligated to not design bad things for people? In the future, the question will no longer be how to design a product, but whether to design it at all, and how to avoid entire product-service systems with more holistic approaches to thinking and planning?

This is how Bauer (2022) summed it up with a critical look at the impact of design: "Design changes the world - mostly for the worse: In recent decades, design has become the tool of a raging global capitalism. The call for criticism in and through design, for thinking, politically acting designers fizzles out in individual actions, naive appeals and tinkering. What's wrong with design and critique?"

Monteiro (2019) takes this idea of responsibility and personal mission of the design to a far more radical point – "design is a political act." He wrote in his book Ruined by Design: "We designed the guns that kills school children. We designed shitty interfaces to protect our private information. We designed the religions that pitted us against one another. (...) We have designed the world to behave exactly as it´s behaving right now. The world is on it´s ruin and it´s happening by design" (p. 10).

Design is a resource for shaping our future. We therefore need much more "Type B – Problem Discoverer" and good trained responsible systems design thinkers. That is the demand on future-oriented educational academies. The renaissance of the

true telos, the repolarization of design forces to the right goal and the right question, and thus the forcing of avoidance in design, describes a mindset and attitude of designers that critically questions whether the solution to a design problem must necessarily end in a product.

So it would be enjoyable and fruitful if in 5 years we were talking about the following design prefixes: "Problem Design, Avoiding Design, Purpose Design, Re-polarization Design, Change Design, Savings Design, Patina Design, Content Reduction Design, Product Prevention Design, Digital Integrity Design, Material Savings Design, Behavior Change Design, Communication Halving Design, Gender Design, Doubling Value Design, Sustainability Design, Karma Design, Lifecycle Extension Design, Happymaker Design, Anti-War Design, No Waste Design, Cruel Prevention Design, Diversity Design, Organisation Design, Eco Design, Good Mood Design, Product Lifecycle Design, Planet Engagement Design, Invisible Design, Complexity Reduction Design, Factor10 Design, Anti-Capitalism Design, etc."

Designer are the new cognitive thinking athletes for "hidden undefined problems"

"A designer knows he has achieved perfection not when there is nothing left to add, but when there is nothing left to take away." (Antoine de Saint-Exupery)

Rams (2021) put it in a nutshell: „Design can only be as good as are the design¬ers themselves. For this reason, one key to the quality of how our environment is designed is well-founded and forward-looking education and training for the young protagonists of the discipline" (p.13). Aicher (1991) focus the point of view for

the designer and the reason for intensive rethinking and the mission of discovering: "We design because we are searching, not because we know" (p.60). The process of asking, searching, looking around, reflectively doubting and comparing, but also identifying patterns and exploring the task means approaching the problem-solving discomfort with thinking and questioning. This is the actual designing, based on mental models and argumentative weighing of the pros and cons, alternative solutions and variants are generated.

Design is cognitive and mental thinking athletics and does not need amateurs when it comes to solving complex tasks. The systematic doubt and thus the directive of objectification is the most important aspect for a leading role of designers in the identification and solution of problems. "Therefore, in the future, design will be more of a strategic mindset, economic problem solving, and business model than primarily an aesthetic design or entertainment tool." (Raedeker, 2020).

All planners and designers intend to intervene in the expected course of events by premeditated action. All of them want to avoid mistakes caused by ignorance and spontaneity. They want to think first, then act. Design is the creation of a plan based on alternative explorations. Since designing has an intention, a purpose, a goal, it is decisively based on thinking. The thinking of the planner and designer is a process of argumentation. The focus constantly changes between small components and the overall problem. The thinking of the planner and designer is only slightly ordered, there is no clear separation between the activities of problem definition, synthesis and evaluation (cf. Rittel, 1992, p. 135 – 139).

In order to prepare the exploration of the socio-technical influencing factors in a design-relevant way, a system model is necessary for a careful planning and thinking procedure. The

system model is an abstraction and simplification of the reality or future idea and provides generic subsystem levels and parameters, which is indispensable for the professional investigation and solution generation of complex contexts (cf. Sommerlatte, 2002, pp. 253-273). The four parameters – user, place, process and time – define contexts and support the systematic exploration of bold problem and potential fields to be identified. Especially in the analysis, projection and synthesis of typical open "wicked problems" according to Rittel (cf. Gerstheimer & Lupp, 2004, p. 1409 – 1415).

Sattler (2013) reminds the relevance of this kind of interpretative thinking and the insightful derivation in his article Quo Vadis Design: "Design is an outstanding activity of human intelligence, and it also involves the most difficult task of seeing exactly what is missing or of seeing something that is there, but which no one has already discovered" (p. 83).
Design is shared visual thinking. The prompt manifestation of ideas through a fast and first version of "Ugly Sketching" enables a new dimension of rapid perceptual exchange of ideas and thoughts, as well as visual mapping with others for an interpretive process of co-creation (Gerstheimer, 2019, TEDx). Good and brilliant thinking in design needs bold and massive sketching to reflect itself and generate a flow of alternative solutions or new questions.

Baumgartner (2021) brings to this the important metaphor of the Thinking Hands: "If we connect the conceptual duo of the Thinking Hand with the activity of the designer, then the radical mental effort inherent in the creative process consists essentially in producing actions or results that were previously unthinkable and that free man from his determinacy and contribute to the

improvement of human living conditions, but also have an enlightening effect" (pp. 139 –140).

The iF Design Foundation (2021) has summarized its core statements on the status quo of design education as follows:

- ***"The practice of design has changed rapidly. Today, it means being able to discern connections thanks to communication and to communicate solutions.Aufzählung 2***
- ***Design is the link between people and society. It starts with the needs of individuals and gives them values that fit their culture and outlook.***
- ***Design used to be a repair business. It´s becoming a reframing business.***
- ***Studies and graduation, technology and society changes extremely dynamically. That´s why designers need to be trained as thinkers" (Böninger, et al. p. 74).***

Re-Designing a new design – avoiding design

"You are responsible for what you put into the world. And you are responsible for the effects those things have upon the world." **(Victor Papanek)**

The master-quote of Dieter Rams (2021) "less, but better" teaches us that we must get away from the unculture of su¬perfluit, of waste, of cheapness in the literal sense, and in the metaphorical sense. "It means that we need more things that really do and really achieve what users hope they will: easing, expanding, intensifying our lives. In fact, in my opinion indifference towards people and their lived realities is the only sin that a designer can commit" (p. 13).

"What we choose to design and more importantly, what we choose not to design and, even more importantly, who we exclude from

the design process – these are all political acts." (Monteiro, 2019, p.11). To that, but already Burckhardt (1970) described the core challenge as follows. Design only has a function for the improvement of our environment insofar as it returns to its actual meaning: "Design = Entwurf, nicht Gestalt (Design = creation, not form). What is to be designed is not primarily the device in its artefact shape and form, but its possible use, its usability in as many ways as possible, its non-usability for chicanery and regression" (pp. 31 – 32). Jonas (2002) describes this important insight as the extended understanding of design and its processes as an interface between artifact (object) and context, between inner and outer system. The field of tension of these systems to be designed contains cultural, social, political and technical-scientific components, which lead to solutions due to the complex problems of systems thinking and scenario design (cf. p. 172 – 175).

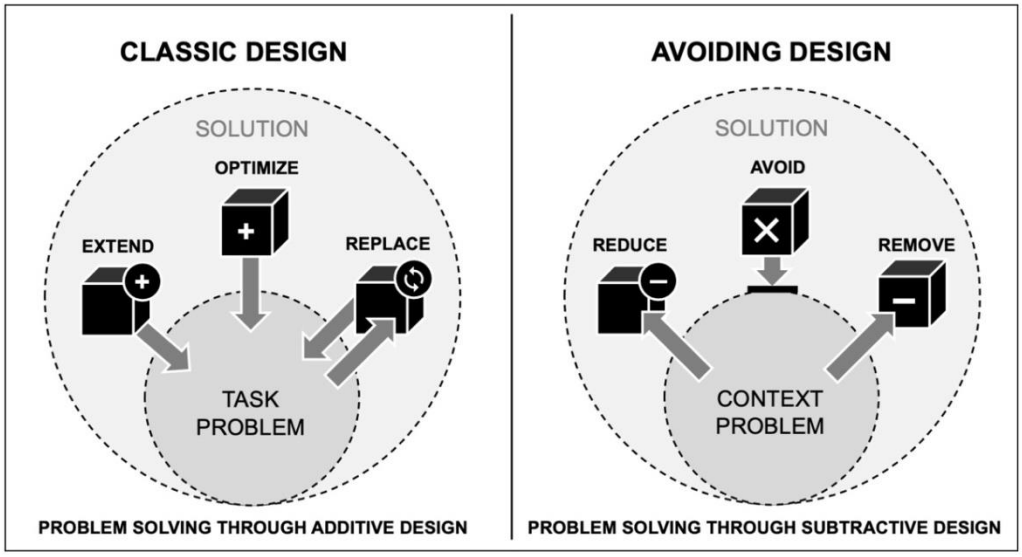

Figure 2: Comparison of typical classical design principles and the avoidance design approach (cf. Schütz et al. 2021)

How Avoiding Design is applied

"Designing any product without reference to its sociological, psychological, or ecological environments is no longer possible or acceptable" (Papanek,1985, p. 188). Avoiding Design must always

be used when negative effects on the environments would be expected as a result of the solution to be designed, or when a comparable solution already exists that makes the new design superfluous.

In doing so, Avoiding Design draws on the Sustainable Development Goals (SDG's) defined by the United Nations. Paragraph 28 of the 2030 Agenda states, "We (countries) commit to fundamentally change the way our society produces and consumes goods and services." SDG 12.5 goes on to say, "significantly reduce waste generation by 2030 through prevention, reduction, recycling and reuse" (United Nations, 2015).

"The four core principles of Avoiding Design:

1. *prevent* = *prevent, contracept, keep away - prevent the occurrence*

2. avoid* = *avoid, circumvent, evade - create new, various alternatives

3. remove* = *remove, take away, abolish, eliminate - undo something

4. affect* = *influence, change - change the user behavior (Schütz, et al., 2021, p. 463)

By looking at the entire production apparatus and all processes, designers will help to think out the existing product portfolio and align the company in the changing competitive environment. They will play a role when it comes to eliminating products that have a negative impact and and identifying new potential solutions. In this way, production processes can be optimized and costs reduced. Undoing design opens up new opportunities for sustainable design, especially for system transformation and service designers. Considering the entire product life cycle and

taking into account all the economic, social and environmental factors, it can be an advantage to undo certain things or to prevent new ones from becoming reality in the first place.
become reality. Non-design becomes a decisive competitive advantage. To achieve this, designers must establish methods and tools to prevent these products before they are created. After all, the most sustainable product is the one that doesn't need to be made" (cf. Schütz, et al. 2021, pp. 462 - 466).

Designing by Occam`s Knife

Burckhardt (1970) exemplarily asks the question of sense related to the telos – the very own product task – of the then newly introduced ticket vending machines for streetcars:

- ***Wouldn't one want to do without all this design as a user?***
- ***Is the rummaging for change in the pockets or today the booking via mobile phone and app a desired and manifest user need?***
- ***Wouldn't a municipal operator also like to save the mess with the settlements of micro payments - but also the costs of the vending machine material, the connection and installation costs of the craftsmen, the service maintenance and thus also the assignment to designers to "order a snazzy vending machine box with good function and buzzing sound" - or even today to develop an app for it.***
- ***Wouldn't it be possible to find other future-oriented jobs for the parking ticket from the public order office?***

This is precisely the idea Burckhardt put forward more than 50 years ago, calling for us to question the actual task and purpose of design. Wouldn't we like to do without this kind of design? "Wouldn't it be the very best thing to avoid fare?" Because of this error in thinking, millions of ticket machines and millions and

millions of hours of human time have been misdesigned and misdirected worldwide since the 1970s. This is how I avoid design and design value and utility. (Burckhardt,1970, p.31f)

Flusser argues that in other words: "There can be little doubt that things are less and less of interest. (...) The morality of things - creating, possessing, and preserving things - is giving way to a new kind of morality: the acquisition of pleasure, experience, possession, and knowledge - in short, of information. (Flusser, 2002, p.186)

Designing by Patina

Why design something new at all if the old works. Who decides what is old and worthy of redesign? What is the reason of the new? Can't the new be born out of the old? Aren't the stories of the existing and the habit with the old the better new? Patina gives permission and security to leave the patterns of well-trodden and practiced paths of use or behavior. (Dorley, S.; Wittlow, S. (2021) p.203). We keep forgetting how time-consuming it is for the human mind to adjust to and relearn new things, contexts and situations as well as actions and patterns. Design parameters like the well-trodden path, the pattern of habit, the beloved flow are designs that have a high potential not to be renewed. The new here is a rearranging from the old, the homage to these structures. In the digital, the content can be better, the presentation more noble, but practiced systems are sustainable and good design is the appreciation of the existing and the test of necessity.

Tanizaki Junichiro, in his book "In Praise of the Shadow," writes about the aesthetics of age patina and the homage and value of the hand-used, the hand-glossed as follows: "In the West, people use silver and steel and nickel for cutlery, among other things, and polish it to make it as sparkly as possible, but we have an aversion

to such sparkly objects. (...) On the contrary, one is happy when the surface shine disappears and they turn black with age. (...) While Westerners radically seek to uncover and remove dirt, East Asians carefully preserve it and aestheticize it as it is. (...) and when we live in such buildings, in the midst of such equipment, our hearts are soothed and our nerves are calmed in a strange way." (Junichiro, 1999/1933, p.20 ff).

This glimpse into the almost 100-year-old culture of 1930s Japan seems time-honored today, but the principle of aesthetics and the reversal of polarity in relation to the duration of use is impressively up-to-date. Patina sends its regards, is the motto here.

We throw things away too quickly. Too quickly we fall for the quick new solution, too quickly we can't stand to stay with the old existing, be it in decisions or in the lure of the new. Here we need the systematic confrontation with this powerful content knowledge about the human being and his habits and his limitations in perception and retentiveness. Here lies great potential to shape radical new behaviors in a sustainable way.

Designing by waste and avoidance

Braungart (1994) already showed in his research and investigations at the beginning of the 90s how necessary an improved design of a new economic system is. His central starting points for the design are the avoidance and reduction but also the waste as a pattern for the search for solutions and for the radical conversion to circular processes:

1. ***Thus Braungart proclaims the pleasurable process of opening an outer packaging and throwing it away somewhere arbitrarily as normal territorial behavior of man. The thinking error in it is alone that the packing is not completely compostable and nutritious, so a throwing away after gusto***

would be a blessing for nature. Thus, through normal throw-away behavior, an easy return of nutrients to the highly eroded soil would be feasible. For this purpose he recommends to take nature as a design model and shows that nature is purposefully wasted in e.g. own processes of "flowering time" for the ripening of fruit and seeds. He calls on the principle of waste to be used as a design for smart product systems.

2. *In another case it is about the principle of avoidance: in the example he points out a typical "primitive, industrial manufacturing product - namely the production of a new fashionable shoe, partly leather sneaker, in which in the leather tanning process industrial chromium (VI) salts from the 95% country of origin South Africa are used and in the sole PVC plastics. The chromium treatment and PVC sole makes the shoe hazardous waste and the chromium(VI) is also carcinogenic to the workers in the manufacturing process. As a result of this industrial production and further development, the waste incineration had to adapt to the toxic "chromium(VI) and PVC conditions, so that, for example, the hydrochloric acid caused by the incineration of the PVC shoe sole has to be neutralized by flue gas purification plants. As early as 1994, Braungart called for the following: "In the future, we will need intelligent products that are both cheap and chic, but also environmentally friendly" (pp. 46 – 47).*
3. *The dimension is again underpinned here below with current figures for the shoe market in 2021. This is about the relevance of the avoidance and reduction of toxic or contaminated ingredients, as well as a need for radical improvement and design of the overall sneaker-lifecycle-system: "Sold pairs of sneakers in 2021 - worldwide: 1.4 billion, this corresponds approx. a doubling to the year 2012.*

The producing industries generated a turnover of approx. 70 billion dollars with it. In Germany alone, over 380 million pairs of shoes are thrown away each year, almost five pairs per person" (Tagesschau, 2021)

4. *Braungart cites another example: When buying a TV set, the buyer becomes the owner of over 4300 individual chemicals and is responsible for them. "From our point of view, it is unfair and unmarketable to push about 18 g of mercury, about 30 g of cadmium," about 60 to 70 g of antomine and about 15 - 18 g of other excess metals into the hand of someone who asks for the clearly delineated service "television" and leave him alone with it" (Braungart, 1994, p. 48).*

The goal must be to prevent environmental problems from arising in the first place. Product and system optimization in the digital as well as in the analog - from the idea to the process to the return - takes on the essential role here, since some product and manufacturing overall systems must be regarded today as actual environmental pollution. Basically, it can be stated that waste is generally harmful and its disposal is very expensive. Prof. Schmid-Bleek (1994) also puts it in monetary terms: "In general, we can now reckon that disposal is between 3 and 5 times more expensive than the creation of the good. This simply means that we spend more on the waste than on the service received." (S. 17)

Designing the right things with the right people

Aral Balkal and Laura Kalbag (2015) have formulated the attitude and idea of design and the objective of what design can or must really achieve in their project of the "Ethical Design Manifesto" and refer to Shoshana Zuboff, who aptly describes the dimension

and the rossroads between capitalist surveillance and the good faith of positive design.

"The products of Surveillance Capitalism – term by Shoshana Zuboff (2018) – are our new everyday things: our phones, our fitness trackers, our baby monitors, our fridges, our cars... We've built a world where our everyday things track our every move, profile us, and exploit those profiles for monetary gain. A world with a wholly privatised public sphere. A world of malls, not parks. A corporatocracy, not a democracy. This is a design problem. At its core, what we have is the wholesale failure of ethics in design. To tackle the source of the problem, we must design alternative everyday things that respect our human rights as a core tenet" (Balkal, 2015).

- ***"Design, don't decorate - design without ethics is decoration. (...)***
- ***Be diverse, not ethnographic - design without diversity is imperialism. (...)***
- ***Design the organization, the product will follow - Ethical design is holistic or it is nothing.***
- ***Ethical design is not what ethical designers do, it is the system of values and processes that is at the core of an ethical organization. It begins with the design of the organization itself.***
- ***Design your organizations so that your core values are respect for human rights, respect for human endeavor, and respect for the human experience" (Balkal & Kalbag 2015).***

This very point should give us designers pause for thought when we see that young designers today prefer to work for the Big Data companies or even be bought out by them as an exit strategy. Far too many graduates in this world design anything, the main thing is to get the customer data for moneymaking.

What is needed here is a new generation of professors and lecturers who will bring this topic into the design academies as a relevance and not still fall for the good faith that a bit of aesthetics and digital UX-design jewelry will do the trick. It needs exactly this profound teaching of ethics in design to be able to shape an independent future proactively for people and sustainably for the environment.

Design and designing has a final (re)purpose

"We become what we behold. We shape our tools and then our tools shape us." **(Marshall McLuhan)**

Designers are always confronted with new and usually future goals and objectives, whether they are set by themselves or given by others. The goal for designers to design something needs a cause, e.g. an uneasiness and a doubt as a drive for an action - thus a purpose. This drive or trigger to fulfill the purpose is understood as the final goal or final cause. Final in this sense means purposeful, goal-oriented, or goal-directed. The path taken to reach the goal is the actual achievement and it is here that quality is achieved and conceived. With the choice of the action and the previously defined goal orientation, the designer himself becomes the originator and principle of the action as well as of all results. The same applies to groups, e.g. teams of designers or teams of problem solvers.

The goal, the telos, is radical systemic improvement through maximum avoidance of negatives. Thoughtful development creates the finished goal via action, i.e., designing and discarding (ent-werfen und ver-werfen). A goal can be reasonable or unreasonable. It can be positively sustainable or short-sighted and pernicious. But here lies the true depth and breadth of the narrative design, between arbitrariness and values, between

novelty and patina, between positive resource conservation or arbitrary consumption and selfish waste.

We live in a time when we humans are creating ever greater problems for our environment through the production of artificially created things. It is not enough to meet these challenges only with new more sustainable design products. The number of things with a negative impact on our nature must be reduced overall. In addition, the resource of design must be used more responsibly. What is the value of design if it is only about formal aesthetic details instead of enabling real sustainability?

Avoiding Design is a principle that shows concrete solutions for a more sustainable use of our resources. It describes the possibilities for discarding, preventing and undoing products and challenges us to rethink the design process.

„Do, or do not. There is no try." (Yoda – The Empire Strikes Back)

And just one more thing – thinking aloud:
"Please dear young social media design blogger, stop publishing such superficial and light fare on modern design method gossip. Avoid the repetition. Engage with the authors and the ideas of the 1st order and go into the depth of pragmatic and athletic critical thinking – the design discipline No 1. Be critical, yes please train the "Advocatus Diaboli" – and please don't just be excited that with some UXUI skinning or low complex Design-Systems you're already praised in corporate organisations out there. System design thinking and avoiding design attitude is like tea ceremony or Japanese sword fighting you do it all your life to get good. Start now. There are so many good thoughts and approaches already out and they need to be in the collective memory of serious improvers and planet engagers. Design is relevant and always seeking for brilliant new problem discovering. Design can create

much more impact if the club of critical thinkers grow. But it takes respect for planning and designing at its whole. It takes a true attitude toward ethics. Make an effort and focus on the vital design values that can create decisive impact for a better life on this planet. Read Buckminster Fuller`s – "Operating Manual for Spaceship Earth and understand Douglas Adams "Hitchhiker´s Guide to the Galaxy. So long, and Thanks for All the Fish. FIN.42.

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Does Design Driven by Language-like Artefacts Change Design Education Radically?

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From where do we start, how do we look at design?

As noted by Krippendorff (2007), the design development that took place during the 20th century is characterized by a change towards artificiality, due to which "design artefacts become language like" (p. 18). The word "artefact" refers to a piece of art or a creative product resulting from a skillful human activity. Thus, it is not surprising that natural sciences are not concerned with artefacts, as their focus is on the products of nature with the aim of explaining the observed phenomena in terms of physical causes, chemical reactions, biological processes, etc. Consequently, natural sciences stop at the point at which the artificial starts. Yet, artefacts reflect culture and are an integral part of human history. They are the primary source of information on past cultures, and archeologists use them to understand the way prior societies lived, thus creating, and developing stories of the past. However, the validity of such stories is a major concern, as the narratives about artefacts and cultures are developed when natural explanations fail. Therefore, artefacts should be seen as interfaces, as they provide a valuable link between what is observed and that which can be scientifically verified. Some prime examples of such artifacts are digital machines, Internet browsers, or even governments. According to Krippendorff (2007), "Interfaces reside between artifacts and their users. They consist of interactions, and they play out dynamic relationships" (p. 18).

Moreover, most artifacts are interconnected, forming subsystems that are part of even larger systems. For instance, a machine would have an interface through which it can be operated but can also be an interface to a much larger industrial complex. These relationships must be understood by designers, as they will also give them valuable insight into the changes which have been taking place over the 20th century. Being cognizant of past as well as current developments allows us to teach design online, in remote settings without any restrictions imposed by time and space.

According to Krippendorff (2007), this change towards artificiality comprises of three steps, and it commenced when humans started creating products, man-made physical things that served specific purpose. This stage spanned from the first primitive societies until the industrial production of complex machines.

The second step, the timing of which is difficult to establish, relates to the generation of goods, services, and identities. These artifacts are never completely physical, but might be represented by physical symbols, like services, brands, etc.

The third step, as already indicated, relates to the creation of interfaces between humans and machines. These artifacts are defined by human dialogue and interactions with and through machines. Such complex interfaces require interactive understanding of users for them to work as intended.

An example of such an interface is the smartphone, which is a physical entity, but its value extends across multiple levels due to its diverse functionalities. It can be used to make calls, send messages, take photos, search information online, etc., but its primary value stems from its role as an interface in communication among users. Through their interactions, users are self-organizing the "system" they have created within the given framework, and designers can only control that process to a certain point but can

rarely influence its outcome. As indicated in Figure 1 below, "Evidentially, the artifacts in this trajectory can be seen to become progressively more virtual, more fluid, more dependent on humans to keep them alive, more interactive, and more language like" (Krippendorff, 2007, p. 19).

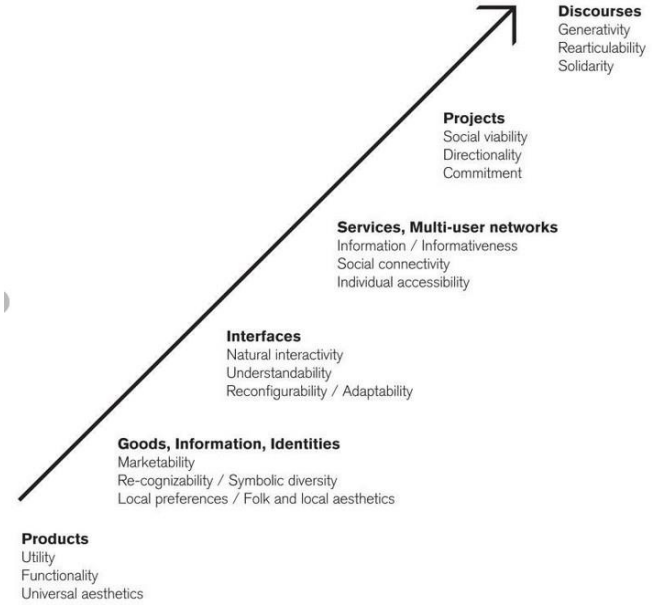

Figure 1. Trajectory of artificiality, Klaus Krippendorff

As indicated by the graph above, discourse is the ultimate step in artifact development. This discourse can take many forms, and can occur on multiple levels, culminating in institutionalized communication where reality construction occurs because of actions taken by the discourse community, like public discourse, scientific discourse, legal discourse, design discourse, etc. In such discourses, we are designing artefacts that are wording us into a specific reality. That is in fact what we are doing right now, as we are wording ourselves into a reality of design and artificiality.

As a part of this process, we make use of metaphors, generate new vocabularies, or even construct an alternative world, allowing us to teach design via any medium. Therefore, design driven by

language-like artefacts can be taught remotely in distance settings without any limitations.

As Krippendorff (2007) observed, "Virtually all artifacts emerge in transitions from one form to another" (p. 19). Although this is a general description, it is easy to follow and can be applied to any context. For example, a restaurant may be advertised online, and we can access its marketing content via our smartphones. The artefact "webpage" will guide us to the restaurant, an artefact created by its owner aided by the constructor, who used the architectural plans—as another form of artefact—created by an architect.

In the restaurant, we will receive service as an artefact performed by a waiter, who will present us with a menu, yet another artefact form. Once the desired dish has been chosen and consumed, we will pay with cash, an artefact created to facilitate an exchange of goods and services. Referring to Krippendorff's (2007) trajectory, in this everyday scenario, we can see five processes that characterize artifacts:

- **The menu will eventually get damaged, and the restaurant building and its furnishings will decay over time. Indeed, all physical things are artefacts based on physicality disappearance over time.**
- **All physical entities also malfunction or break by accident, but can also lose their utility (e.g., computers become too slow) and will need to be replaced.**
- **The context may change, so that the artifacts gain a different meaning. For instance, when a phone is presented in a museum to show the history of communication, its meaning has changed from a communication device to an exhibit. In other words, an artifact becomes decontextualized, as it serves another purpose.**
- **An artifact can be used as intended but may generate other byproducts that are not always desirable. For example, by using**

fossil fuel, we can cook, heat our homes, and operate machinery, but we also pollute our environment.

- **All artefacts are eventually rendered obsolete because they go out of fashion.**

As shown above, artifacts are not stable, for they change over time and may be attributed to different conceptual categories by their users. These unintended consequences may not be predictable but should be addressed when creating the initial artefacts.

It should also be noted that, even though crafters also produce physical objects, they are different from designers. According to Bürdek (2005), the term "designer" should apply only to individuals that use drawings and models to develop ideas, concepts, etc., with the aim of facilitating reproduction of the same object. Use of these tools was the major step towards mass production and has led to the reliance on language-like artefacts in design. For instance, production of catalogues comprising of furniture drawings allowed designers to market their products to potential customers without sending the physical goods. This practice not only marked a major step towards the key processes in design, but also allowed various alternatives to be tested without the need to produce them.

Today, a key aspect of the design process is the language-like construct of an intended artefact to be performed, produced, or constructed. That is the difference that sets it apart from the original craft design which involved shaping the material and adjusting the shape and function if needed to meet its user's requirements.

Therefore, the original craftsmen did not engage with the design artifact as a design object. Even today, prototyping can be used in the design development, especially in software design, where the artificiality between interfaces and projects is particularly evident.

In software design, the artefacts we are creating are prototypes that can be characterized not only a by their form and function, but also by their impact on communication across all levels of the organization. Prototypes can be any representation of a design idea, but they always identify only a limited subset of the whole, due to their form and medium used in their creation.

Such limiting entities are described as boundary objects, and their main objective is to enhance the understanding and exchange of design ideas in organizations. Boundary objects like language artefacts are given meaning by the community they define. They may be abstract or concrete, but they have different meanings in different social worlds (Rhinow, Köppen, & Meinel, 2012). Mark, Lyytinen, and Bergman (2007) recognize four essential features of design boundary objects, namely the capability to promote shared representation, the capability to transform design knowledge, the capability to mobilize for action, and the capability to legitimize design knowledge. For instance, if we consider a design theory as an artefact, it is bounded by an artificial system.

Mark et al. (2007) further noted that object justifies procedure choices that "inform the mobilization and integration of heterogeneous and uncertain system and domain knowledge during system design and implementation, resulting in for improved designs" (p. 547). Such boundary objects, theories, or prototypes have the capability to promote shared representation, to transform design knowledge, to mobilize for design action, and to legitimize design knowledge.

Why this detour to boundary objects, artifacts, and design?

The former discussion can be summarized as follows:

Teaching design online, virtually, in distance settings, fosters the use of design prototypes, boundary objects, and theory much more effectively than lectures given in a traditional classroom

setting. The medium forces all involved to work with documents, which are bounded prototypes or boundary objects.

Within a particular medium and a specific environment, such as online teaching setting that is driven by language artefacts, the exchange of artefacts, objects, theories, or prototypes promotes shared representation. Design knowledge is explicated for communication, and these explications have the capability to generate design actions. Such artifacts are boundary objects that comprise the core elements of design knowledge (Mark et al., 2007).

That is the foundation of a great online design program, which must also highlight the importance of studying artefacts—artefacts as designed objects, artefacts as boundary objects, artefacts as prototypes, and artefacts as theories. The designing of such projects that incorporate all the aforementioned elements is a key prerequisite for a future design program. Online design programs that do not emulate classical classroom settings have an immense potential to advance the design discipline into domains in which design has been practiced for decades, but this reality has not been reflected in the educational curricula, since there was always a strong focus on the shared experience. This shortcoming can be mitigated by the distance learning programs because they require explicit and shared representations, as well as being conscious about the need for the creation of knowledge.

How does this perspective compare to other initiatives in design education for the 21st century?

In their recent article, Meyer and Norman (2020) highlight the necessity of education designers in the increasingly complex world. They further posit that the current education cannot prepare designers for the immensely complex challenges they need to respond to, even though the essential learning happens somehow and somewhere.

The preparation for practice in other disciplines like medicine, law, and business is more systematic, as the curriculum addresses the performance, systemic, contextual, and global challenges. This same set of skills must also be imparted to design students. To emphasize this point, Meyer and Normann (2020) contrast the history of design curriculum with the evolution that has taken place in business schools since the late 1950s. Their findings indicate that most design programs to date have been conducted in a classical studio setting, where the classical design practice dominates.

While their analysis is comprehensive, the authors have failed to include in the mapped trajectory the potential progression towards distance education, where the language-like artefacts dominate the communication as well the design process, the prototyping as well as the designs as the ultimate outcome. Meyer and Normann (2020) nonetheless propose some very valuable themes which should dominate the design curriculum for the 21st century:

Design methods
Research methods
Core principles of business
Creativity Leadership Communication
Computational methods
Thinking by sketching and making Ethics
The real world

The question prompted by this list is whether thinking by sketching and making shouldn't be replaced by design thinking, since the making of prototypes for example changes if the artefacts are getting language like. In addition, the authors do not address design artefacts as bounded realities or their potential

value in responding to societal issues. In sum, in this comparative evaluation, the change towards artificiality is omitted. The proposals for knowledge and skill areas are very valuable, but remain framed by a story we have invented by looking at artefacts and documents, layers of documents, and frames, which we call history of design or business. Such a comparison is valuable, but it might miss the target if the paradigms in the field of design change.

We can also question whether all designers need to be educated in the same way. On this issue, it is worth noting Swanson's (2020) argument that, as differences in all domains are inevitable, different forms of design education must also exist. Swanson believes in the value of diversity in individual experiences and the individual viewpoints, as they promote design thinking and thus design making. We can surmise from this assertion that design making is a variation of design thinking.

The trajectory of artificiality depicted in Figure 1 can help justify Swanson's perspective, as products, identities, interfaces, systems, projects, and discourses will still necessitate product designers focusing on form and function, aesthetics, and usability, each of which may be user centered. Along this trajectory, graphic designers will still operate, but their role will be less significant than in the past, since many of the designers are now working with interfaces and networks. In their current work, they encounter system-related challenges such as how to design services for emergency departments in hospitals. Complexity of such systems is huge, and the skills and knowledge of designers require different texts and contexts.

The design of policies for political and socioeconomic systems is another domain in which growth is expected in the future and will

require changes in the design education to respond to these challenges. While some institutions may choose not to adapt and continue to practice as they did in the past, others will embrace this new landscape. In either case, design education will involve digitalized communication, as it has already permeated all aspects of our lives. Digitalization pertains to all possible artefacts we can think about. However, the relationship between the digital artefact and the intended artifact is beyond the scope of this article and its further elucidation is left for future studies.

At this juncture, it is important to consider the meaning of "design for all" if design education for the 21st century cannot be generalized to ensure that the same curriculum is taught to everyone and everywhere. Maybe we can better appreciate the reasons behind this lack of uniformity if we consider other educational domains. While it is true that certain subjects can be taught in a similar manner, such as math, biology, etc., others are very context-dependent and the curricula adopted will be tailored to different cultural settings, levels of economic development in the countries in which they are taught, or even developments in other areas. All these factors will play a role in design education and will affect the value placed on designing a discourse to extend the notion of design. Even if the global design community could reach a consensus on a certain structure and content, knowledge, as well as skills that need to be taught at different levels of design education, the inequality in place and time can never be eradicated. For instance, the COVID-19 pandemic has shown that there is no single method for responding to a specific event, as some solutions need to be local or individual.

Still, the value of such a search for design education for all does not stem from an agreement on uniformity, since all actors within the participating community will take the aspects of what has

been discussed they deem beneficial and will use them as they feel most appropriate. Such processes, just like discourses, are characterized by their own rules, including discontinuity (Faust, 2015). There might be statements which some people will agree on, and might even create a sub-discourse. But as Foucault (2013) stated, in trying to understand the formation and development of a discourse we must abandon the pre-existing notion of unity.

In an attempt to summarize the environment of design education for the 21st century, we have uncovered the complexity and simultaneity of the design education in the past, present, and future, and in so doing we have also revealed discursive views and concepts pertinent to this topic. This can be called "design for all," since all curricula have their specific weaknesses and strengths, depending on the point of view we are taking.

The author of this article was recently asked to structure and develop a design curriculum that would best meet the needs of the current market, and the result was a pure asynchronous distance learning program. Early on in this process, discussions were held on whether the "real design domains" like industrial or even automotive design should be incorporated to reflect the expertise of the university faculty.

Looking at market data to see where the interest and the jobs for graduates are, the decision was made to launch Master's in Design Management and Master's in UX & Service Design programs. This led to the question if a universal design curriculum could be created to educate the designers for tomorrow. To comprehend the professional context, the chart depicted in Figure 2 was used.

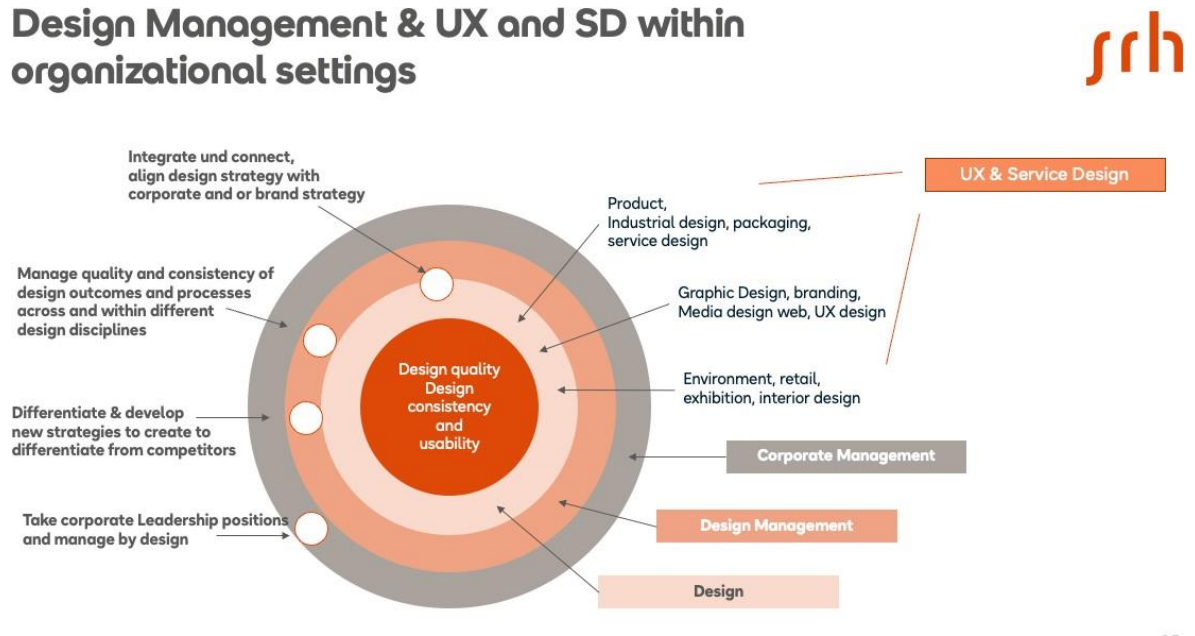

Figure 2. Design Management and UX and SD in Management Context (SRH, Mobile University, www.mobile-university.de)

Design Management as a discipline has developed to incorporate design projects, align strategies, and manage outcomes and processes to allow companies to differentiate their products from those offered by their competitors. Therefore, its goal is allowing those in corporate leadership positions to manage by design. To achieve these objectives, a curriculum for the 21st century distributed by online channels focuses on four areas, respectively related to management, design (methodology, design theory, and system design), design management (strategic design management, design management leadership, and decision making in design and management), and practical projects with companies and professionals in the industry as a part of which all these skills are applied and developed. In this curriculum based on four pillars, ethics and sustainability are integrated into all modules, especially in system design and the practical projects.

The asynchronous study program is scripted by a study path, which is guided by the pertinent scientific principles. Therefore,

explicated knowledge is the base of all modules, and is presented as text, charts, and images. A digital platform is provided to access diverse sources of information, including a comprehensive library, as well as videos and live lectures.

Practice in design is fostered through design assignments, which are sometimes broken into smaller parts, but mainly align with the duration of a particular study module. Required group work is facilitated by the use of a digital portfolio, allowing students to access their work from anywhere and provide and receive feedback on all coursework, including prototypes. As the main concern related to online teaching pertains to the loss of haptic ern related to online teaching pertains to the loss of haptic experience, we have made sure that all assignments have a practical component, and its outcome can be reviewed and qualified.

Although we are proud of the curriculum we have developed, we appreciate that it is not universally applicable. By its nature, a curriculum is an extended discourse of design only for those who will study in these programs.

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Letter from the Chairman's Desk By Sunil Bhatia PhD

Design progresses with its own character and natural pace, gradual changes are the only way that has come to the design philosophy after centuries old struggle and observations . It never entertains abrupt or artificial changes. Abrupt change is a shock for the normal course of progress and takes a very long duration to recover from its shocking effects. Gradual change is the only path that takes those products to ultimate design where the scope of improvement is not possible. Nirvana of the product where nothing can be added and deleted from the ultimate design. It is something like a person is trying to achieve nirvana and once achieved there is no scope of progress. Achieving such a stage demands strict discipline, strong passion, and a focused mindset.

Our primitive people were confined to the makeshift arrangements of finding the solution for survival. Their philosophy was as and when problems strike, find our solution from available resources. Failing means your survival is in danger. In modern times designers are defining problems and finding solutions with ease and in comfortable zone . They have advanced knowledge about the time of completion and its outcome and consequences. Ancient people were working with the philosophy of trial and error and that was the only means for progress. Perfection was achieved by working on the same design of products for making them functional . Next generations keep trying for improvised and

certain products in modern times have attained the ultimate design. Ancient people were very good at forming questions and devised the way for passing the unsolved questions to future generations by various means and never allowed to fade out from the mind of next generations for solutions. They might have attempted for centuries for arranging and upkeep the hairs in proper management and designed tools of the comb. When I look at the design of a comb I find the basic design remains the same only material is changing or tries to create new products by changing here and there but its functions in centuries-old style. You can fix the teeth for combing on cylindrical shape or use the comb as available on market. Once any product reaches where the scope of improvised is not possible. At that point, people never attempt to change for the better and their struggle is nowhere to be seen. The design of the Needle is the ultimate design. The foundation of the needle was laid with the design of knots. I have not seen any frustration in modern designers for improvement. They are calm and accepted its design as the ultimate design where the scope of improvement is not possible. The shaving tool of the razor is the same and the introduction of safety features only changes makes it a safety razor.

Human last evolution was standing from crawling. That made the people work for a new dimension that has changed the complete design process from crawling to standing. Standing posture next level was optimized by running to cover the distance. Running was the ultimate design for a standing person who sometimes feels handicapped by not running faster than others. He designed domesticated animals who can run faster than humans with their physical power and can carry the human's weight on their back especially horses for covering the distance with animal power. The design of horse riding is still in the mindset of modern designers while designing transportation means. In horse-riding person sits

on the back of it and controls by putting the nose ring by pulling with the help of an attached rope for stopping and change of direction. If you look at the design of a two-wheeler bicycle it makes us realize it has an idea from horse riding. Seats are there where it is in horseback position where the peddles are placed in same way as horse riders fix their feet. In place of four legs of horse , it has two wheels of mobile transport . Pillion riding is a place designed in the exactly the same manner as the pillion rider sits on behind of the riders sitting on the back of the horse.

Another area, our ancestors have achieved the ultimate design of cooking by possible techniques of frying, boiling, and baking. No one can design another new way of cooking apart from these in our times. No one has ever designed a fourth way. Whatever he claims it is nothing but a combination of mixes of three cooking methods. Music notes are seven and within this spectrum, all voices of nature come. The design of the pen is the ultimate design. It started with a reed pen, and quill pen and the idea of using the ink started with the dip pen. Later on, carrying two things for writing required an inkpot and a reed pen for dipping; a student in Paris, Romanian Petrache Poenaru invented a fountain pen that used a quill as an ink reservoir. The French Government patented this in May 1827. Fountain pen patents and production then increased in the 1850s. The first patent on a ballpoint pen was issued on October 30, 1888, to John J Loud. Whosoever designed no one dare to attempt a change of basic design? It is convenience that has improved the design and reached the ultimate design in modern times.

A bullock cart or ox cart (sometimes called a bullock carriage when carrying people in particular) is a two-wheeled or four-wheeled vehicle pulled by oxen. It is a means of transportation used since ancient times in many parts of the world. A bullock cart or horse-driven cart has achieved ultimate design where there is

no scope for improvement. The only possible area is a change of the material but the basic design remains the same. In the Indian Parliament, a bill was passed where they legally stopped using the big iron wheel and made it compulsory of using the air-filled tube tyre of four-wheeler automobiles. They fix the carrying load of the cart so that it should not have a weight exceeding the horizontal weight on the neck of the bullock. Out of greed owner loaded that much that pulling for bullock proved impossible and inflicts physical tortures by lashing and there were very high chances of breaking the neck that may cripple the pulling ox or bullock or may die instantly.

I am thankful to Prof Faust for introducing our readers by focusing on theme of Design for All in distance Education. I hope his efforts and contributions by other authors make this special issue a unique and our readers will enjoy.

Lambert Academic publication for celebration of 150th special issue by publishing a book by compiling editorials

"Design For All, Drivers of Design" was translated into eight different languages from ENGLISH to French, German, Italian, Russian, Dutch, and Portuguese. Kindly click the following link for the book. "Morebooks", one of the largest online bookstores. Here's the link to it:

https://www.morebooks.de/store/gb/book/design-for-all/isbn/978-613-9-83306-1

With Regards

Enjoy reading, be happy, and work for the betterment of society.

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Forthcoming Issues

September 2022 Vol-17 No-9

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***Lilián González-González** is an Industrial designer, Academic coordinator at Anahuac University of México and a Board member in the World design organization. Is a PHD candidate in Critical Theory about "Social design experience", currently is studying Disability Theory Certificate and has a Master degree in Contemporary art and a Specialist certificate in sculpture, drawing and art in Florence, Italy where she won different prizes as an artist and made individual and group exhibitions.*

She had the opportunity to work as a designer in the industry and as a professor in several Universities and cities around Mexico.

She had experience in the Mexican design industry, government and manufacturing. She also worked in General Electric Energy for 5 years, obtaining different certifications in the meantime about quality and design.

Also, was a Co-founder and organizer for various conferences, talks and symposiums about art & design. Also was invited as a speaker in different Universities and congresses nationally and internationally.

Her Design research and development expertise is in esthetics, symbolic meanings, manufacturing process, healthcare, disability, inclusion and sustainability.

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Prof Dr. Cigdem Kaya ***is chair of department and professor of design at Istanbul Technical University (ITU), Department of Industrial Design. She has been the vice director of Science and Society Research Center (2014-2017) and Industrial Design Graduate Programs Coordinator at ITU (2014-2017). She has been part of I-D team of Learning Lab by Relais Culture Europe, Paris; where she co-develops content and methodology in the field of cultural innovation since 2019.***

Cigdem Kaya received Bachelor of Industrial Design from Istanbul Technical University (ITU) in 2003, Masters of Fine Arts in New Genres from San Francisco Art Institute (SFAI) in 2006 and Ph.D. in Industrial Design from ITU in 2011 with co-supervision at Art and Design Center at Sheffield Hallam University (SHU) where she closely studied with Chris Rust. Kaya's research has been funded by Fulbright and Marie Curie programs. She has published many peer-reviewed articles in best design research journals. She supervised 3 PhD thesis about craft, critical making, use-share systems, all of which aim at social innovation and sustainability.

In 2020, she has been awarded with one of the most prestigious national research awards: scientific encouragement award by Middle Eastern Technical University Prof.Dr. Mustafa N.Parlar Education and Research Foundation in 2020 for her research on social innovation and sustainability.

December 2022 Vol-17 No-12

Ivor Ambrose

Managing Director, ENAT asbl.

Ivor Ambrose has worked in the areas of accessibility and disability inclusion for over 40 years as a researcher, university lecturer, project manager, policy advisor and independent consultant. Born in England, he has lived and worked in the UK, Denmark, Belgium and Greece. He holds a Master's degree in Environmental Psychology from the University of Surrey, UK and a university lecturer/Ph.D. qualification from the Danish Building Research Institute, where he specialised in User Evaluation of Environments and new Information and Communication Technologies.

In 2001 he turned his attention to accessibility in the tourism sector, which generally lacked awareness of the needs and specific access requirements of people with disabilities, resulting in inadequate provisions for these travellers. As a researcher and advocate of 'Design for All, which germinated in Europe in the late 1990s, and 'Universal Design' which took hold in the same period in USA, he was part of a movement which challenged policy makers and practitioners in many fields to re-think the way environments, products and services were conceived and designed. Through his research and observations of life, behaviour and cultures, Ivor has developed a driving ambition to make tourism accessible for everyone, everywhere.

In 2008 he co-founded the European Network for Accessible Tourism (ENAT) non-profit organisation (www.accessibletourism.org), with a group of European organisations active in the tourism industry and disability advocacy. He was elected as its Managing Director and has continued in that position since then. ENAT has become the premier membership association for about 300 organisations, business and individuals who support and want to learn more about this area of tourism development. As its director, Ivor manages ENAT's activities and projects including curriculum development and vocational training courses for hospitality management and staff, European and international standards work on accessibility and tourism, destination management consultancy, certification and provision of accessibility information through online platforms including Pantou, the Accessible Tourism Directory (www.pantou.org). The ENAT Board also maintains links with the UN World Tourism Organisation, the EU Tourism Manifesto Group, the International Social Tourism Organisation, Blue Flag International, Zero Project and many national and regional tourist bodies.

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Athens, April 2022

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***Dr. Soumyajit Bhar** is currently an Assistant professor of environmental studies at Krea University, India, where he offers and coordinates a course on Design Thinking. Soumyajit straddles action and academic research with more than 14 years of experience (both volunteering and full-time) working with various environmental and sustainability issues. He holds a Ph.D. in Sustainability Studies (with a specialization in ecological economics) from Ashoka Trust for Research in Ecology and the Environment (ATREE) as part of a unique interdisciplinary Ph.D. program. His dissertation attempts to understand socio-psychological drivers and local and regional scale environmental impacts of conspicuous/luxury consumption basket in India. Soumyajit is furthering postdoctoral research at the intersection of rising consumerism, sustainability concerns, and inequality levels in the context of the Global South. He is also keen to explore how design education can broaden students' perspectives and help them delineate pathways to a better world. He has published in international journals and popular media. He is also interested in larger questions of philosophy and ethics, particularly pertaining to environmental issues.*

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New Books

it is available on www.morebooks.de one of the largest online bookstores. Here's the link to it:
https://www.morebooks.de/store/gb/book/design-for-all/isbn/978-613-9-83306-1

The Ultimate Resource for Aging in Place With Dignity and Grace!

Are you looking for housing options that are safer and more accommodating for independently aging in place? Do you want to enjoy comfort, accessibility, safety and peace of mind – despite your disabilities, limitations and health challenges? The help you need is available in the Universal Design Toolkit: Time-saving ideas, resources, solutions, and guidance for making homes accessible.

This is the ultimate resource for individuals and professionals who want to save time, money and energy when designing, building, remodeling or downsizing a home. The Universal Design Toolkit will help you take the steps to design homes for your clients or yourself while eliminating the costly trial and error challenges you'd inevitably encounter if faced with this learning curve on your own.

Rosemarie Rossetti, Ph.D., teamed with her husband Mark Leder in creating this unique Toolkit. They bring ten years of research, design and building expertise by serving as the general contractors for their home, the Universal Design Living Laboratory– which is the highest rated universal design home in North America.

Within the Toolkit's 200 richly illustrated pages, you'll find: Insights that distinguish *essential* products, services and resources from the *unnecessary*.

Proven, realistic tips for finding the right home.

Home features you need to look for. Nothing is assumed or left out.

Handy home checklists and assessments.

Interview questions to help you hire industry professionals with knowledge and experience.

Photographs that provide a frame of reference to inspire, clarify and illuminate features andbenefits.

Valuable resources to save you time, money and energy.

Helpful sources of funding.

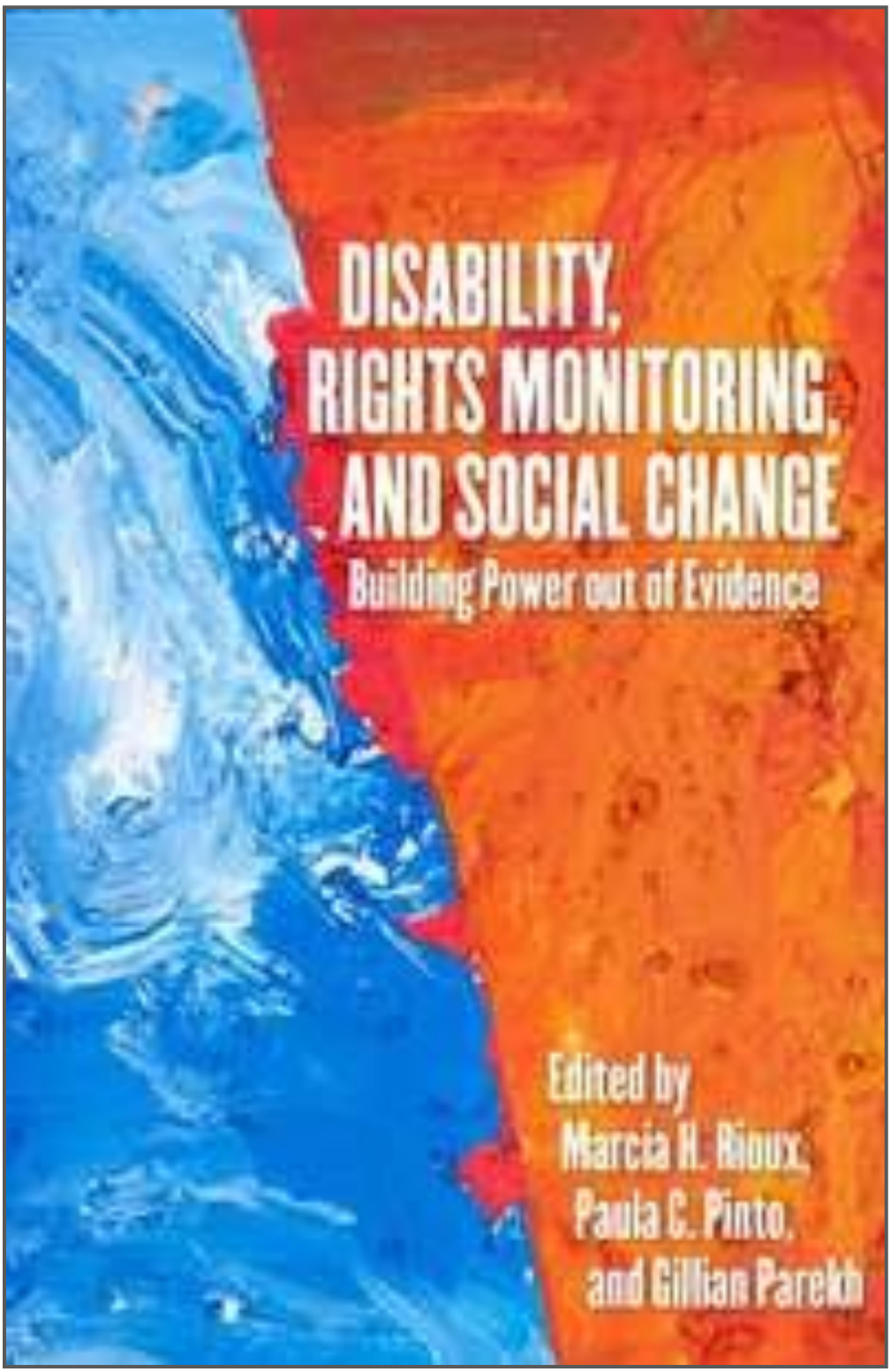
Space planning dimensions for access using assistive devices such as wheelchairs andwalkers.

And so much more!

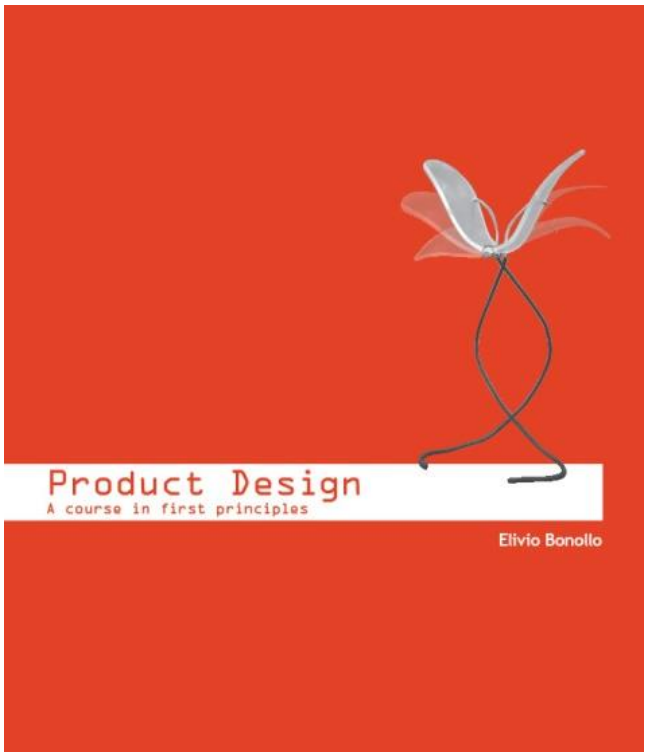
If you want useful, dependable advice and easy to implement ideas from respected experts who know the ropes, you'll love Rossetti and Leder's perspective. As a speaker, author and consultant who uses a wheelchair, Rossetti has helped hundreds of people design their ideal homes. Now her comprehensive Toolkit is available to help and support you!

Get the Universal Design Toolkit now to start your project!

Disability, Rights Monitoring and Social Change:



New Update: ELIVIO BONOLLO (2015/16) PRODUCT DESIGN: A COURSE IN FIRST PRINCIPLES



Available as a paperback (320 pages), in black and white and full colour versions (book reviewed in Design and Technology Education: An International Journal 17.3, and on amazon.com).
The 2018, eBook edition is available in mobi (Kindle) and ePub (iBook) file versions on the amazonand other worldwide networks; includingon the following websites:
ePubversion:www.booktopia.com.au
https://www.booktopia.com.au/ebooks/product-design-elivio-bonollo/prod9781784562946.html
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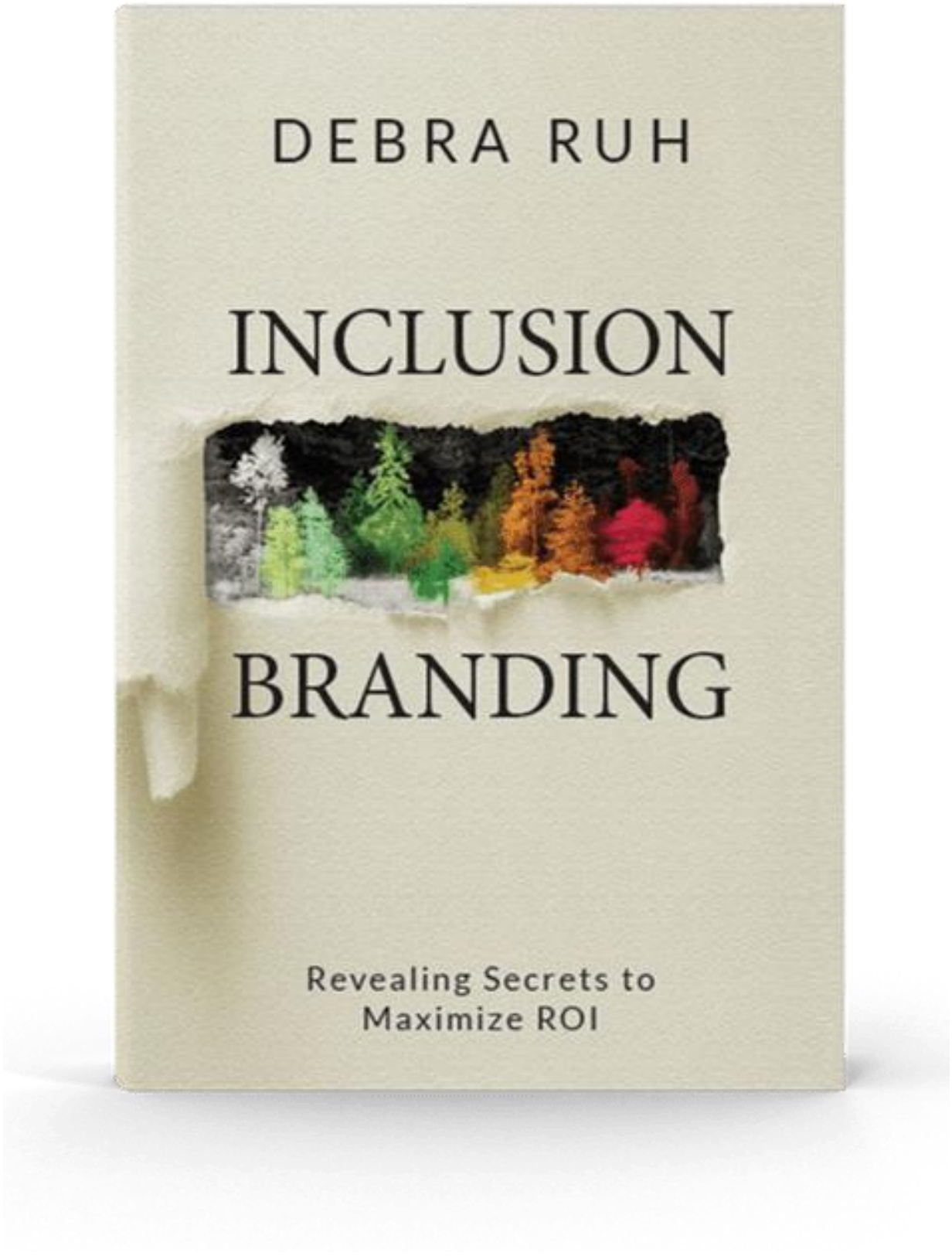
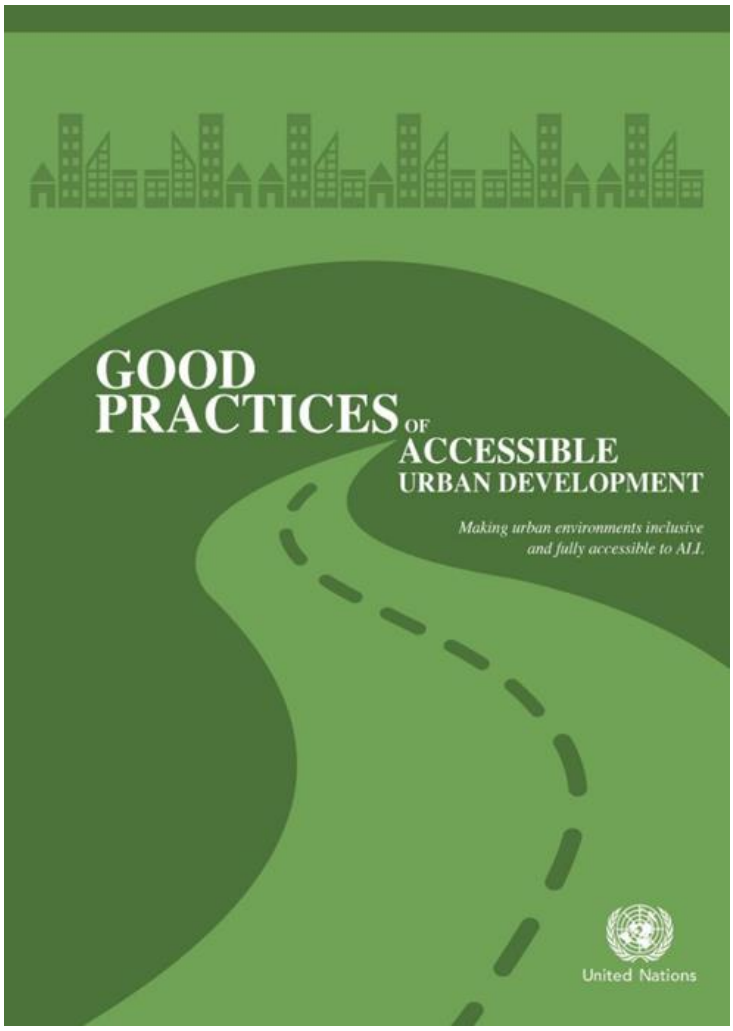
READING HINTS: ePub files can be read with the iBook app on Apple MacBook/iPad devices; ePub files can also be read on Desktops PCs, Laptops and Surface devices using readers such as the Microsoft *freda*ePub reader. The Kindle (mobi file) reader isflexible and suitable for reading the eBook on PCs;

Kobo readers can also be used to read ePub files on MacBook and iPad. All formats are very interactive with very good navigation.

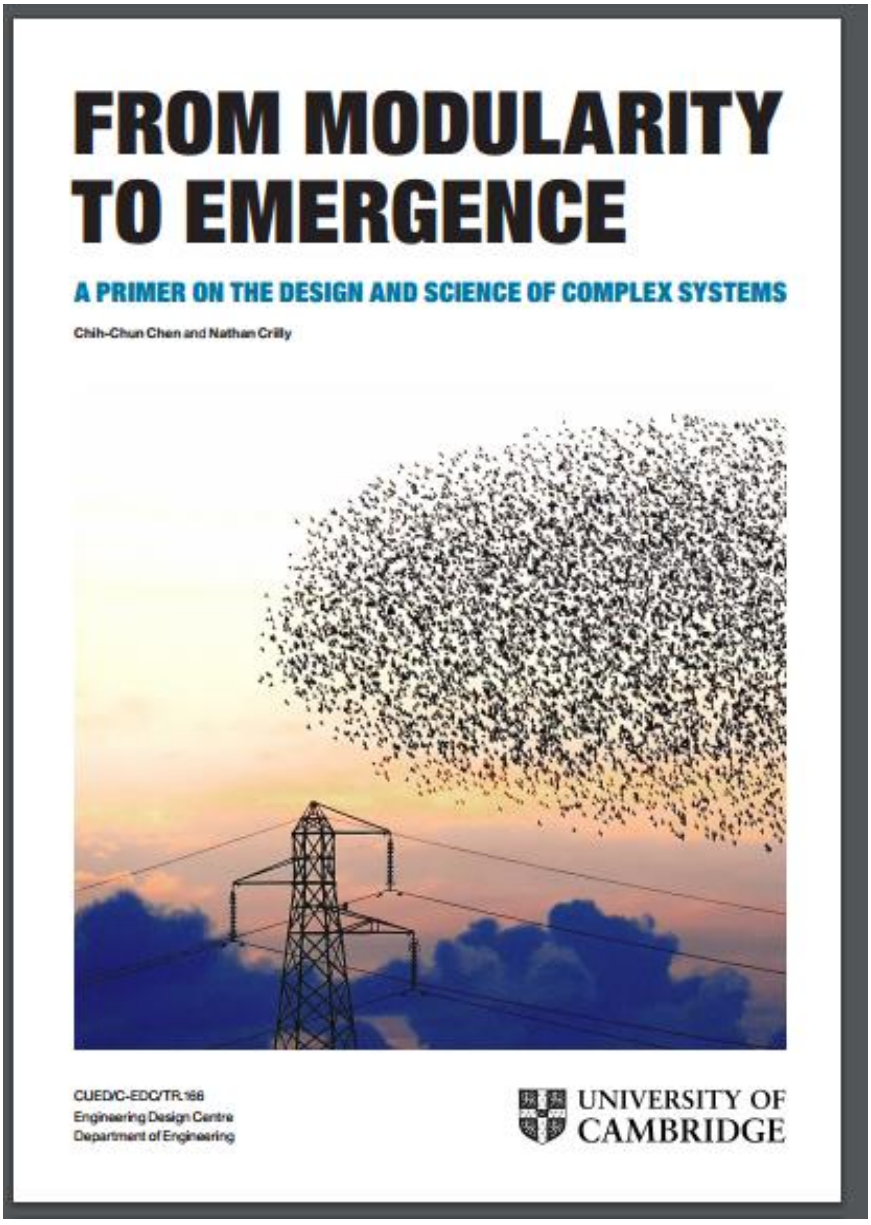




In light of the forthcoming United Nations Conference on Housing and Sustainable Urban Development (HABITAT III) and the imminent launch of the New Urban Agenda, DESA in collaboration with the Essl Foundation (Zero Project) and others have prepared a new publication entitled: "Good practices of accessible urban development".

The publication provides case studies of innovative practices and policies in housing and built environments, as well as transportation, public spaces and public services, including information and communication technology (ICT) based services. The publication concludes with strategies and innovations for promoting accessible urban development.

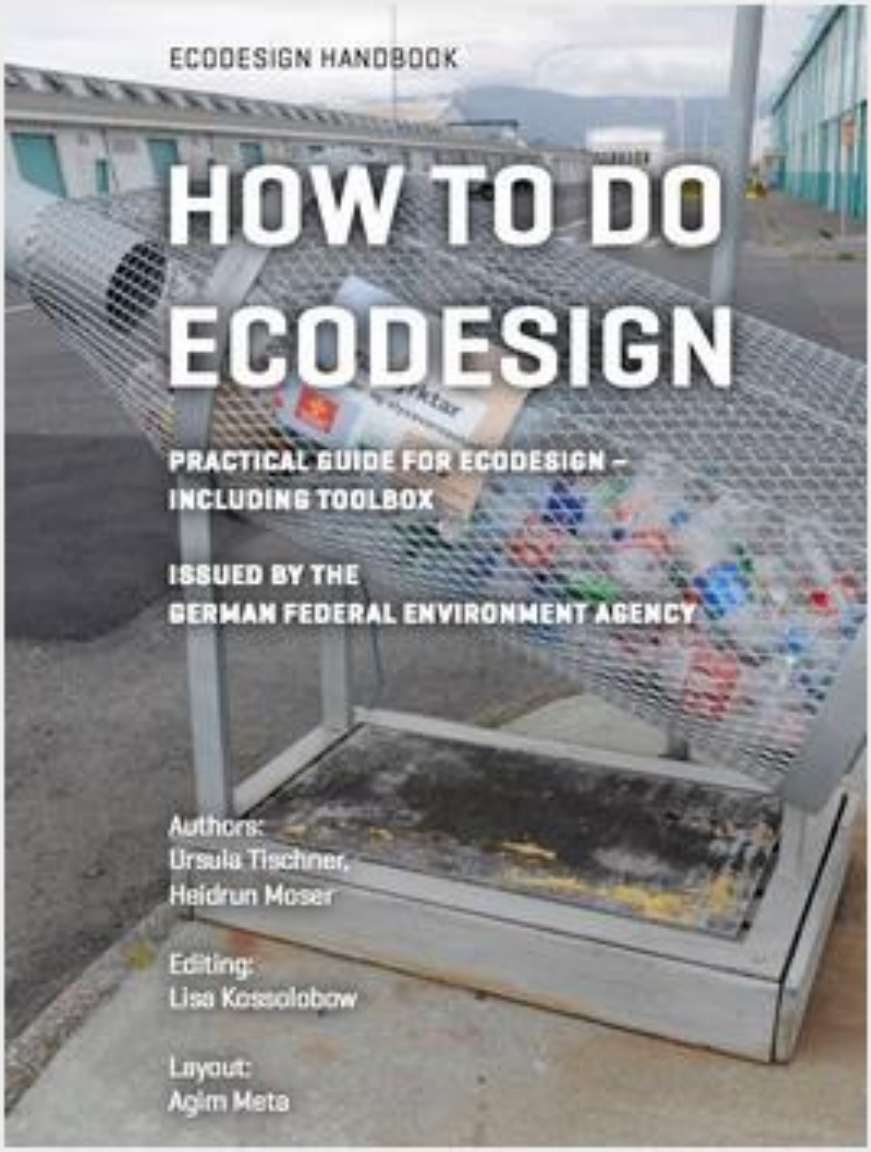
The advance unedited text is available at:http://www.un.org/disabilities/documents/desa/good_practices_urban_dev.pdf



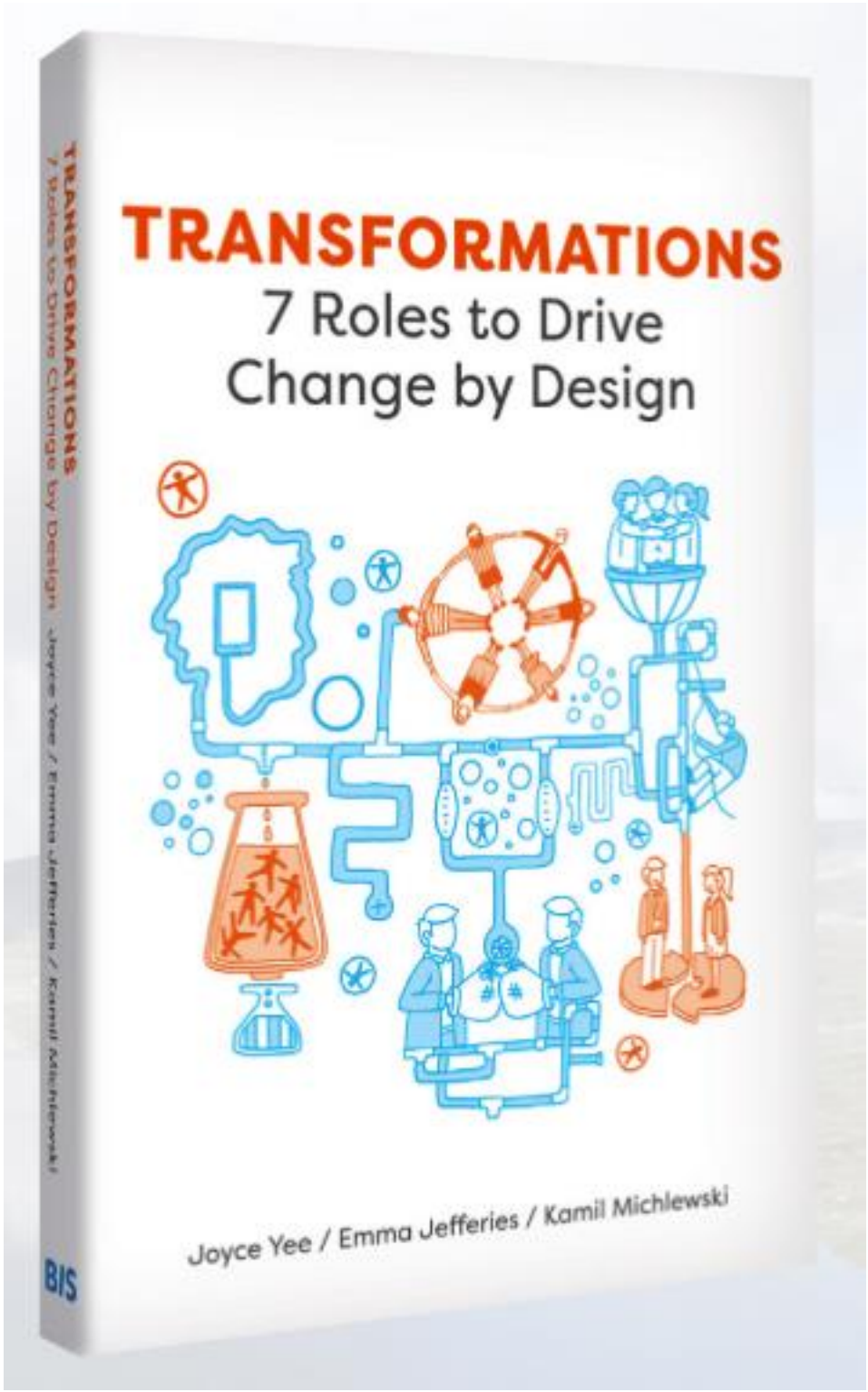
Dr Chih-Chun Chen and Dr Nathan Crilly of the Cambridge University Engineering Design Centre Design Practice Group have released a free, downloadable book, _A Primer on the Design and Science of Complex Systems_. This project is funded by the UK Engineering and Physical Sciences Research Council (EP/K008196/1).
The book is available at URL: http://complexityprimer.eng.cam.ac.uk

Changing Paradigms: Designing for a Sustainable Future

New iBook / ebook:
HOW TO DO ECODESIGN

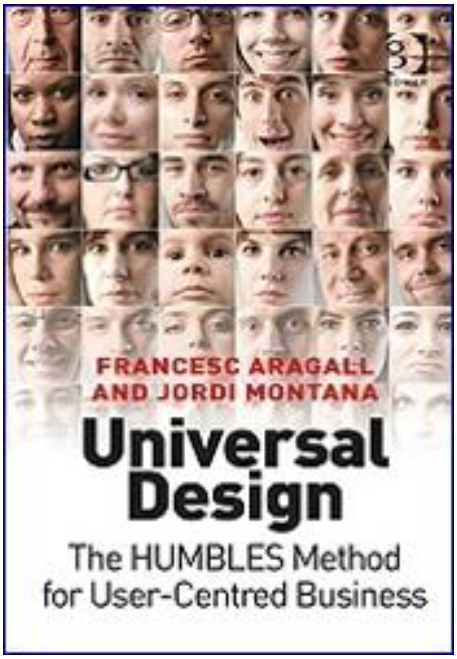


Practical Guide for Ecodesign – Including a Toolbox
Author: Ursula Tischner


TRANSFORMATIONS
7 Roles to Drive Change by Design
Joyce Yee / Emma Jefferies / Kamil Michlewski
BIS


Arnar Árnason and Sigurjón Baldur Hafsteinsson
DEATH AND GOVERNMENTALITY
Neo-liberalism, grief and the nation form

Universal Design: The HUMBLES Method for User-Centred Business



"Universal Design: The HUMBLES Method for User-Centred Business", writtenbyFrancescAragall and JordiMontañaandpublishedbyGower, providesaninnovativemethod to supportbusinesseswishing to increase the number of satisfiedusersand clients andenhancetheirreputationbyadaptingtheirproductsandservices to the diversity of their actual andpotentialcustomers, takingintoaccounttheirneeds, wishesandexpectations.

The HUMBLES method (© Aragall) consists of a progressive, seven-phaseapproach for implementing Design for All within a business. Byincorporating the user'spoint of view, itenablescompanies to evaluatetheirbusinessstrategies in order to improveprovideanimproved, morecustomer-orientedexperience, andtherebygain a competitiveadvantage in the marketplace. As well as a comprehensiveguide to the method, the bookprovidescasestudies of multinationalbusinesswhichhavesuccessfullyincorporated Design for All intotheirworkingpractices.

According to SandroRossell, President of FC Barcelona, who in company withotherleadingbusiness professionals endorsed the publication, it is "requiredreading for thosewhowish to understandhow universal design is the onlyway to connect a brand to the widest possible public, increasing client loyaltyandenhancing company prestige". To purchase the book, visiteither the Design for All Foundation website

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Appeal

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News

1.

What is Integrated Communication Design?

The nature of communication design has changed significantly in the information economy. Content production has become cross platform, ubiquitous and in many cases even measurable. The internet has given the power of creating content to one and all, consuming content has become cursory and transient. From analog print magazines to digitally enhanced videos, communication designers need to negotiate different domains – and therefore the need for an Integrated Communications Design Program.

Communication Design as a profession has moved on. Internet has given the power of creating content to one and all, and consequently consuming content has become cursory and transient, making it difficult for the common communication designer.

Communication designers dealt with pencils and picas, type and colour and created artefacts like book covers and posters, printed magazines and newspapers. They dealt with brand development and identity design. New software hit the market, making life easy for everyone. Soon these became available as templates and apps. A profusion of contents led to fake news and wrong communication. Everyone with an app now is a content creator and communicator. Canva made everyone a graphic designer and Tik-Tok made everyone a movie maker! Professional design jobs turned out to be filling up templates and anyone who knew graphic software were named communication designers! The role of getting something designed by a professional communication designer is diminishing. There is also the need to communicate with ethics. Therefore, there is enough reason to revisit communication design curriculum and make it contemporary and relevant.

The new Integrated Communication design discipline is emerging as a bridge between analogue design and digital design, dealing with effective communication that includes areas like data visualisation, writing and reporting. It includes the moving images like video and film as much as photography. Designers are visually literate but also need to communicate using the written word as much as the image.

To stay relevant, design institutes are re-imagining the curriculum and pedagogy. New institutes of design in India have these new disciplines that are integrative. This is being addressed by sensitising the students in developing empathy, equipping them with thinking tools like systems thinking and critical thinking, giving cross-disciplinary inputs, tech-embedded courses, blended learning and emphasis on excellence. New, contemporary curriculum developed with industry professionals. Repurposed contents cater to IT and digital sectors, media houses, print and publishing, branding, advertising, film and animation studios and includes traditional courses like Graphic Design, Print Design, and contemporary ones like Visual Design, New Media, Social Communication Creative writing ethics and Branding.

Who is it for?

Good at communication, through images and written word.
Curious mindset.
Ability to handle complexity.
Awareness of the design profession.
Media-savvy.
Demonstrated skills in a portfolio
Career opportunities for graduates

Students are trained to show high sense of ethics in developing responsible communication and immersive user experience with excellent end results. This may be the beginning of a new kind of designer, who will be ethical, enterprising and effective. Clearly, they need to become strategic thinkers, techno-mavericks and uber-creative professionals.

Students, on successful completion of the program me would have acquired the competencies to find placements with leading graphic design firms, Tech firms, Film and Video studios, Print studios, Start-ups, etc., working in the area of branding, publication, communication design and design for digital medium. They would also find opportunities in the social sectors, NGOs and the government projects.

They could also start their own design enterprise and can become an entrepreneur.

Author: Professor A Balasubramaniam
Director of the Institute of Design at the JK Lakshmipat University, Jaipur

(Courtesy: Times of India)

2.

'City for All?' public art festival questions who builds our cities, and for whom

STIR speaks with Swati Janu about the role of gender in shaping public spaces and the impactful initiative that travelled across 6 Indian cities before culminating in Lyon, France.

Gender-inclusive social design carries tremendous potential (and responsibility) for improving the living, functioning and breathing fabric of cities, and in turn, the people who inhabit and make them. Safe neighbourhoods equate to mental health stability, which leads to the conditioning of the citizens who are able to operate better, lead balanced lives, give back to society in wellness, and make informed decisions that are not compromised because of threats to safety, health or monetary conditions. A close-knit social realm, with access to facilities, mobility, and proper representation, regardless of gender, age, or occupation, can provide a feeling of support, and a sense of belonging, that is imperative for a society to flourish as a cohesive, well-oiled system.

City for All? **was a public art festival held over March-June, 2022 as part of the Indo-French festival *Bonjour India,* that questioned and discussed the role of gender, among other factors, in shaping public spaces and urban experiences. It also travelled to the French city of Lyon to create a cross-cultural dialogue between the two countries. Designed and curated by Indian architect Swati Janu (Founder, Social Design Collaborative) and French social anthropologist Chris Blache (Founder, Genre et Ville), it was organised by the French Institute in India and the Alliance Francaise network to travel across 6 Indian cities - Jaipur, Chandigarh, Ahmedabad, Pune, Bengaluru and Delhi - engaging online and on-ground with diverse communities, and asking an essential question -** ***who builds our cities and for whom*****?**

Logo of the travelling public art festival, *City for All?Image: Courtesy of Social Design Collaborative*

STIR spoke with Janu about the travelling public art festival, stitching together social design and the citizen health of these selected cities, *City for All?* raises questions for on the much-needed discourse about equality, and how now, more than ever, it is important to raise and address these inquiries in as much capacity as possible.

Jincy Iype: What are some insights gathered from *City for All?*.

Swati Janu: The 3-month-long project encompassed on-street discussions at the neighbourhood level, as well as public exhibitions at the city level, across selected cities in India and France. Through the neighbourhood-level discussions, city-level patterns emerged, regarding how we navigate in our towns, and what the most inclusive spaces were for all. Connaught Place and India Gate are known to be such places in Delhi, while in Bengaluru, it turned out to be their gardens, Lal Bagh and Cubbon Park. In Chandigarh, it was Lake Sukhna and in Ahmedabad, Lake Kankaria and the riverfront emerged unanimous, to be the most frequented public spaces by people of all backgrounds.

Some activities carried out as part of the initiative included interactive mapping at a neighbourhood level across each city to understand people's relationships with

their respective cities*Image: Courtesy of Social Design Collaborative*

Through these interactions, people began sharing their gendered experiences as well as the barriers faced in their mobility and safety, physical, social and economic. In Jaipur, most women shared that religious spaces were their favoured public space since that is one place they feel they are "allowed" to go to, rather than, say, a mall. Bengaluru residents felt that their city was safer than most Indian ones, but is still prone to late-night crime due to the absence of "eyes on the street" in its urban design. Ahmedabad, on the other hand, enjoys a vibrant nightlife due to its rich culture of street food and vendors who remain true place makers of public space in each city, especially in India.

Transgender persons spoke of the severe need for basic public infrastructure such as toilets for them because many have had to struggle for this. There is also a need to correctly represent their identity, through simple steps that planning authorities can take such as allocating them space on public transport or rethinking public signage, typically seen only through the binary gender lens of male and female. They shared experiences of being excluded from public spaces such as malls or being denied entry to beauty parlours due to their gender, in spite of the third gender being recognised by the Indian Constitution since 2014. Many spoke about how, despite the higher costs, they prefer taking cabs or autos instead of travelling by public transport which exposes them to daily harassment by men or stigmatisation by women. Binary, that is, male or female lines for frisking in Delhi metro stations or the binary nature of seating in buses in Bengaluru also leads to their discrimination when they are forced to fit into these spaces.

City for All?* exhibition in Ahmedabad, India was held in an old city *chowkImage: Courtesy of Social Design Collaborative

Jincy: How has the attendance and response been to the initiative? How has information been documented, and more importantly, what happens to the data collected?

Swati: The weekend exhibitions in each city were held in central and open-to-all, public venues. Through place-making, everyday public spaces such as an underpass in Chandigarh, a pavement in Pune, a *chowk* in Ahmedabad, a walkway under a metro line in Bengaluru and courtyards of cultural spaces in Delhi and Jaipur were transformed into vibrant festival spaces. People from all walks of life came together to participate in the discourse generated as part of the project, as well as in the cultural performances and artwork put up by local artists. While the public spaces such as the underpass and pavement saw a steady stream of visitors who heard of the event or curious passersby who just dropped by, at Jawahar Kala Kendra and Bikaner House in Delhi, we received an overwhelming response, with people of all ages and abilities showing up. So many young visitors, especially students came up to us to share how thankful they were for such a space, for kindling conversations which otherwise they are unable to have in public.

City for All?* exhibition in Delhi held at the Bikaner House*Image: Courtesy of Social Design Collaborative

All the 36 maps with residents' votes of their favorite public space from the neighborhoods of the 6 Indian cities were finally displayed in Delhi as well as Lyon in France, over May and June of this year. These have since been digitised, and are now available on Social Design Collaborative's website in the Open-Source section. An important outcome of the project has been a graphic novel by the Leewardists who compiled the learnings from the project in the form of an artistic narrative for students of design and architecture across India and France. Through the project, they also released a zine (or a booklet) on what role gender plays in city design and our daily urban experiences, and

another one questioning the binary approach to city planning as well as in our mindsets, in collaboration with our studio and the Mist LGBTQ Foundation.

Jincy: As a collaborative project between India and France, in what ways has *City for All?* strengthened ties between the two countries? What is the value of participatory projects such as this in building cross-country collaborations?

Swati: The starting point of this collaboration has been that gender inequality or gender-based discrimination is not just a problem specific to a country or city, but a systemic challenge for which we all need to find collective solutions together.

People gathered beneath an underpass in Chandigarh for the *City for All?* exhibition in the city*Image: Courtesy of Social Design Collaborative*

***Bonjour India* is a festival meant for cross-cultural exchange and this year, it became a great platform for collective dialogue on gender inclusion through city design. This Indo-French collaborative project helped create public discourse through online student workshops as well as in-person exchanges when the project travelled from India to France, also taking with it the work of emerging Indian artists such as Thunder Medusa and collectives such as Dalit Queer Project.**

Participants realised how similar we are, and what we can learn from each other through these endeavours with a common goal. I was glad to find that the Mayor of 1er arrondissement is already taking active steps toward gender inclusion through her recent initiatives like renaming public spaces and streets in Lyon after women. That is indeed a small, but powerful step towards the celebration of the identity and recognition of the contribution of women, transgender and non-binary people over the years. How many streets in our city do we know of that are not named after men?

City for All? **on ground engagement in Jaipur and Chandigarh, India*Image: Courtesy of Social Design Collaborative***

France too has a lot to learn from India's historically recognised approach to transgender and intersex people, specifically within the *Hijra* community, even though it is not without its own set of challenges and exploitation. Towards this, in Bengaluru and Lyon, the project screened the documentary film *Kathegala Kanive* directed by Vikas Badiger, the founder of Faces of Bengaluru, to talk about the experiences of *hijras* in Bengaluru from their own perspective.

Jincy: What can you tell us about the collaboration with Chris Blache, Institut Francais and Alliance Française?

Swati: Chris and I have known each other's work for a few years now but this is the first time we had the chance to work so closely. The collaboration with her organisation Genre et Ville (Gender and City) has been at the heart of this initiative as she brings decades of experience. Apart from being an anthropologist, she is an activist who has been integral to French radical collectives such as La Barbe. She has helped several cities in gender mainstreaming their approach over the past years, as well as gender-sensitive budgeting, and her guidance formed the thrust of all our efforts.

City for All? **on ground engagement in Ahmedabad and Pune, India*Image: Courtesy of Social Design Collaborative***

The French Institute in India and Alliance Francaise network have long been committed to equality and freedom of speech through arts and science. I am glad for their support and the incredible

efforts of their teams in each city. Not to forget, the backbone of this project has been the collaboration with local partners and universities in each city, and the involvement of students of design and architecture. In Chandigarh, students of Chitkara University engaged the public on ground, while in Pune, the students of PVP-COA themselves built and set up the exhibition as part of their course curriculum.

Jincy: Apart from the inquiries raised by the festival at its onset, what are some questions that came up from the participants themselves, over the course of the project?

Swati: For most visitors, an understanding of transgender and non-binary people was completely new. There were several innocent questions by young and old, on how gender could be seen as a spectrum, outside of the heteronormative way of seeing it as just binary. One of the best types of feedback I received was that many felt that the exhibitions felt like safe spaces for them to ask questions, without inhibitions or judgements.

Another common question that popped up often was the extent of the role design has, in addressing gender inequality, considering that it is a deeply systemic and social issue. This is a valid question, as we do not realise the tangible ways we can bring about inclusion in every field. But the moment we started showing them examples of gender-sensitive designs from public transport to toilets, they understood the value and the objective of the project immediately. Personal narratives shared by participants further helped the visitors understand challenges faced by someone due to their gender or sexuality which we otherwise might never have thought about.

City for All?* on ground engagement in Bengaluru and Delhi, India*Image: Courtesy of Social Design Collaborative

Jincy: Many who don't fall under the intended audience charted out by *City for All?* seem to believe that they have complete agency on the addressed issues and that these might not be as serious as they are projected – how can they be made aware of how dire the situation actually is, and how they have a key role to play when it comes to making an actual difference for a healthy, functioning society?

Swati: I would say that everyone *is* the intended audience - from my grandmother to your neighbour to the mayor. That is why the project has taken a dual approach - that of a convivial public art festival as well as that which is asking questions at the level of policy and governance. It became supremely important to mainstream the discourse on gender and sexuality by inviting public officials to each exhibition's opening event from the Chief Secretary of Rajasthan who spoke about the need for functional toilets for women to the local Corporator of Pune who addressed the need for facilities catering to transgender people. A discussion on the need for integrating information on transgender persons in the school syllabus was also held with the Education Minister of Gujarat, helping pave the way for hopefully, long-term change.

Jincy: What were some workable solutions that came out of the exercise? Can these be put into practice with immediate effect and will they elicit results?

Swati: Long term change is slow and complex, and definitely not possible overnight. However, I would like to think that the project helped push the dialogue forward, towards creating inclusive and equal facilities and comfort for all genders.

Some of the actionable steps that emerged from the discussions were ensuring enough toilets for transgender people in public spaces, universities and offices. Of course, the rights of transgender people need to go beyond just the allocation of toilets to issues of identity and representation as well. Ensuring more gender-neutral or gender-equal signage on streets and public facilities is another way forward. Lyon has already taken the step to start renaming its streets after women and non-binary people. Can other cities follow?

City for All? **post travelling across 6 Indian cities culminated in Lyon, France, where the team interacted with people in the well-known and central public space Place des Terreaux*Image: Courtesy of Social Design Collaborative***

Another important step some of us in leadership positions can take is hiring transgender people who continue to face discrimination due to their gender and are unable to find jobs. In Karnataka, the government has recently announced a one% reservation in the government services for transgender people. Can other states take similar steps?

While Bengaluru is seen as a much more progressive city in comparison, with a large number of women in the IT industry, only a mere 4% of board rooms have women in them. Spaces of power and visibility are to this day, occupied predominantly by men. Can we begin to change that by creating more diversity in our offices, especially at the top? What about spaces of visibility such as panel discussions or features in magazines? We would not have "manels" if more men refused to be a part of panels unless there is a fair representation of genders. These are some steps we can immediately start taking in our areas of influence.

The project has engaged deeply with architectural and design students and it is my hope that they will take the learnings forward in their professional experience as well. I strongly believe that unless we have diversity within our planning and design offices, we cannot create inclusive public spaces and cities.

The mayor involved in mapping activity (L); priests gathering to interact with the mapping initiative in Lyon (R)*Image: Courtesy of Social Design Collaborative*

Jincy: What have been some takeaways from the culminating exhibition in Lyon, France?

Swati: In Lyon, we interacted with people in the well-known and central public space Place des Terreaux and realised that there are more similarities than differences between Indian and French cities. Non-binary and transgender youth shared their daily challenges from street harassment to transphobia in society. The need for accessibility in public spaces was another issue that came up through the interactive activities. The exhibition was put up at the Maison de l'Architecture with a public discussion at the town hall of Mairie du 1er arrondissement.

The biggest takeaway for me has been the importance of public spaces as crucibles of integration within French cities, from swimming pools to libraries to public schools which bring together people from diverse backgrounds. The more such spaces we create, for socio-economic integration, the more understanding and empathy garnered between different groups. This is as much applicable to Indian cities as it is to French. It further helps to create public events and art festivals in these spaces to bring people together on important issues through placemaking, culture and dialogue.

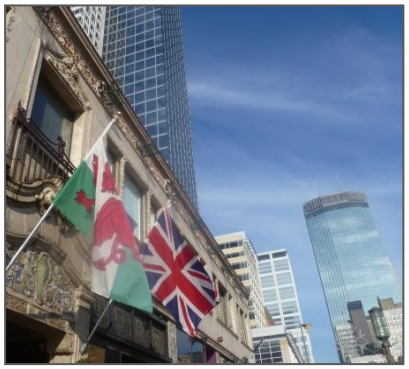
About Author

Jincy Iype

Features Writer
Jincy writes and researches content centred on the best of global design and architecture. An architect by training, she enjoys picking the minds of creatives and weaving their ideas and works onto worded tapestries.

(Courtesy: Stir world)

Programme and Events



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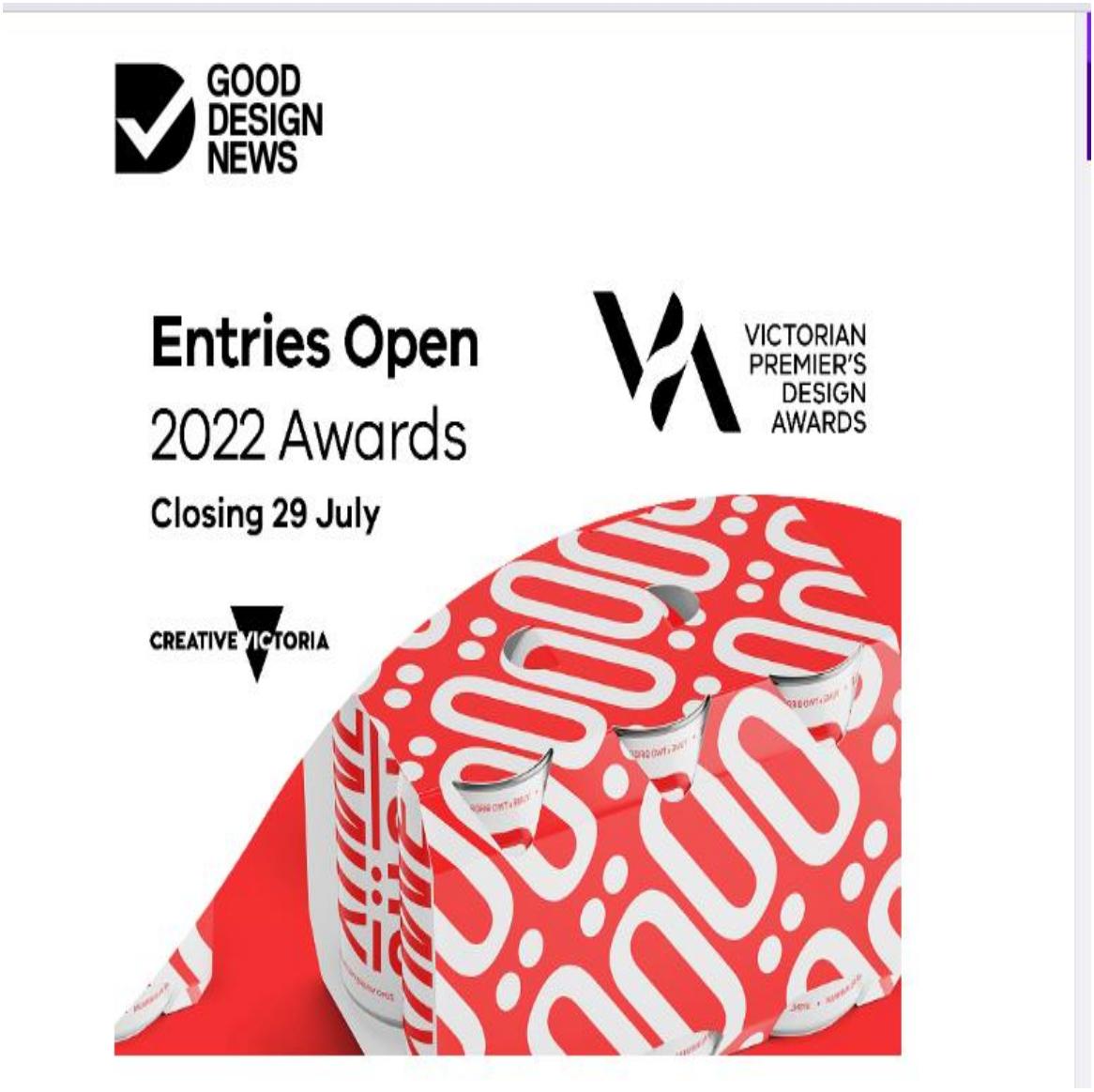

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GOOD DESIGN NEWS

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Hyderabad Regional Chapter of IIID (Institute of Indian Interior Designers), is hosting the fourth edition of its flagship event "IIID Showcase Insider X 2022

Hot News For Students and Educators!
We're on the Final Approach for this year's Spring Semester Student submissions. We only have a few days before the final entry deadline, so if you're interested in joining the competition, please complete the submission process immediately. You know where to find us: www.sparkawards.com

The last and final deadline is Midnight, California time, June 17. The jurors begin their judging on June 18.
We're delighted with the high caliber of entries we've seen this year. Recently schools like MIT, SVA, Art Center College, Tdelft, Pratt, Harvard, Tsinghua, RAC, Honglk, SADI, Savanna, RIT and companies such as Hitachi, Samsung, HP, Midea, Philips, Dell, Google, Fuseproject, Whipsaw & Pepsi have joined the participants. It will be fun 😁
All Best--Stay Well!
--Spark

TypoDay 2022
28th & 29th October 2022

www.typoday.in

Typography Day will be held online for the fourteenth time on the 28th and 29th of October 2022 hosted by IDC School of Design (IDC), Indian Institute of Technology Bombay (IIT Bombay) with support from the India Design Association (InDeAs) and Aksharaya.

The theme for this year's event is 'Typography for Children'

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