Human culture and eco-systemic needs to inform innovation within toilet design

A cultura humana e necessidades ecossistémicas como fundamentação da inovação no design de casas de banho

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ABSTRACT: Proposed paper is a part of the ongoing PhD research in design with focus on the research of existing environmental and social requirements for the sustainable innovation within urban sanitation, focused on toilet design. Main questions of the research are aiming the Portuguese environment, where we are characterizing aspects of water and sanitation through the five dimensions - culture, technology, government, economy, and environment.

In this paper the main objective is to determine systemic characteristics of the socio-cultural dimension of water and sanitation, which will be later incorporated in written final guidelines – directives raised from the research results which shall serve as operational knowledge for the ones involved in the implementation of the sustainable toilet innovation. The paper as well serves as theoretical orientation for the practical applications of the research.

KEYWORDS: Design culture, water toilet culture, toilet design, sustainable design, human centered approach

RESUMO: O trabalho proposto faz parte da pesquisa de doutorado em andamento em design, com foco na pesquisa de requisitos ambientais e sociais existentes para a inovação sustentável no saneamento urbano, focada no design de banheiros. As principais questões da pesquisa estão voltadas para o ambiente português, onde caracterizamos aspectos de água e saneamento através das cinco dimensões - cultura, tecnologia, governo, economia e meio ambiente.
Neste artigo, o objetivo principal é determinar características sistêmicas da dimensão sociocultural da água e saneamento, que serão incorporadas posteriormente às diretrizes finais escritas - diretrizes levantadas a partir dos resultados da pesquisa que servirão como conhecimento operacional para os envolvidos na implementação da inovação sustentável do banheiro. O artigo também serve como orientação teórica para as aplicações práticas da pesquisa.

PALAVRAS-CHAVE: Cultura do design, cultura do banheiro de água, design do banheiro, design sustentável, abordagem centrada no ser humano.

1. Human Culture As A Problem-Maker And Problem-Solver

The proposed paper is a part of the ongoing PhD research in design with focus on the research of existing environmental and social requirements for the sustainable innovation within urban sanitation, and with specific focus on toilet design. Main questions of the research are focusing on Portuguese environment. It is important to take into consideration that according to one of the latest studies on environmental challenges, *Future heat-waves, droughts and floods in 571 European cities* (Guerreiro et al., 2018), in the following twenty-five years, Portugal will be exposed to the extreme weather conditions: heat waves, irregular precipitation, and severe or extreme droughts. If that is possible foreseen future in Portugal and other similar countries around the world, we should credibly ask ourselves, 'How we are going to flush our toilets once we don't have drinkable water to flush it away'?

If we take into consideration the convergence of environmental global challenges we are facing at the moment, we can evidently define the most basic subliming factor for the emergence of all these issues: human factor. Problems are emerging as a consequence of irresponsible human acts, which are mostly disconnected from the needs of the natural biodiverse environments that we inhabit (Escobar, 2018).

As such, we can understand human factor ambiguously – *as a problem creator* and *as a problem solver.* We can relate human culture as problem-maker to the concept of "anthropocene", but at the same time we can consider human factor *as well as a problem solver*. In that regard we can perceive the human being as an agent of change (game-changer) (Korčulanin et al., 2016), which can create needed change for the future and common well-being. "Last, the Anthropocene construct indicates that the current global trajectory must be altered significantly enough that humans will become a positive force on Earth" (Olsoon 2017). The world we live in it's a reflection of our behavioural attitudes and life-styles, taken in this societal journey.

The concept of the "Anthropocene," whereby "the Earth has moved into a novel geological epoch characterized by human domination of the planetary system" (Malhi, 2017, p.77), captures these dynamic relations and their negative consequences (Olsson et al., 2017; Tokinwise 2015). The social drama of the Anthropocene also leads us to enter new "game-changer" times, when "humans will become a positive force on Earth" (Olsson et al., 2017, p.5). We, people, are the answer and a solution for the challenges we are facing, be it environmental per se or its micro-related components, at on stage inevitably toilet design.

Design by itself is being culturally predetermined and it also simultaneously pro-creates cultural meanings and beliefs (Cardoso, 2016). Within our research we understand that water-related behaviours and 'water culture' are being intrinsically related to the 'toilet culture' and consequently to the toilet design. Bearing this in mind, we here present short introduction to the cultural predetermination of toilet design and cultural dependency between the water problem and existing unsustainable western system, flushing toilet design. Facing eventual scarcity of water, active involvement of individuals and society at large towards sustainable future becomes a must.

Specifically, the discussion in this paper is focused on the characterization of the socio-cultural dimension of urban water management and sanitation. Five dimensions of coherently related water and sanitation aspects – culture, technology, government, economy, environment - are perceived as barriers and risks of the issues we face in western sanitation system. Furthermore, dimensions of water are understood and presented as possible promoters of change and enablers for the implementation of sustainable innovation within sanitation system in the city (Korčulanin et al., 2018).

Between March 2018 and January 2019, at Roca Lisbon Gallery, during the workshops *Aqua Labs – sobre a água nas cidades futuras*, open to the public and with invited stakeholders, general patterns, values, norms, overarching perspective of people's relation to water resource and sanitation culture were examined.

Principally, we were searching for hunches about main barriers and promoters that they are stopping the dissemination of existing western system of toilet design.

As the main objective, paper determinates systemic characteristics of the socio-cultural dimension of water and sanitation, which are later on going to be included in the written final guidelines – directives raised from the research results which shall serve as operational knowledge for the ones involved in the implementation of the sustainable toilet innovation.

2. Culture as a Future Aspiration

Social and individual realities, thoughts, actions, relationships and politics are context depended and they are always culturally pre-determinate and culturally mediated (Johnston et al. 2012; Strang, 2009). How we understand, engage, speak, express, and create our knowledge, values and belief system depends of life path - socialization and educational process (Bourdieu, 1984) and relational experiences with the society and world we inhabit locally and contextually. In this manner everything is relational and culturally predetermined. If we have a look into definitions of culture, we understand that they are plentiful:

> "They all configure relations – relations on multiple scales, among multiple planes, along multiple vectors. Heritage, traditions, habits and customs are usually emphasized, but futurity has a crucial role as well, generating ideals: culture can be seen as a capacity to aspire (Appadurai 2004). It is in a dialogue between traditions and aspirations that engagement or involvement emerges. The effectiveness of cultural diversity is predicated upon the capacity to be involved."
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> (Johnston et al., 2012, p.6)

The moment of now and the future (re)production of culture has a crucial role on how to aspire cultural meanings which are going to inform positive and sustainable future attitudes, beliefs and values towards creation of sustainable design artefacts, services and systems. Toilet culture is something naturalized and inherited through the time, and to be able to innovate in toilet design in sustainable way it's cultural and behavioural habits should be considered.

3. Cultural Determination and Design

There is a significant connection between culture and design. Design is coding and producing the cultural artefacts, meanings and values in society through its use in everyday life. At the same time, on the other hand, culture is determining the orientation of design production (Cardoso, 2016). Through design process we are coding objects with meanings, values and information, which are later on being embedded in the use and having its own existence. Though there exists a correlation between the two parts, once the design object is being normalised, its socio-cultural meaning becomes internalized, inhabited with "habitus" (Bourdieu, 1984). Bourdieu beliefs that preferences are "most marked in the ordinary choices of everyday existence, such as furniture, clothing, or cooking, which are particularly revealing of deep-rooted and long-standing dispositions because, lying outside the scope of the educational system, they have to be confronted, as it were, by naked taste" (Bourdieu 1984, p. 77). The way we relate to objects, artefacts, services, systems, nature and our resources is always predetermined by the environment and culture we inhabit.

In the origin of every design project and every design product there is a project of the narrative imbued in every production, fabrication, industrialization, distribution and commercialization with help of storytelling, marketing advertisement, and personalized approach to user/consumer in society. (Mostly) with visual part of design, we are suggesting 'right attitudes', stimulating and creating behaviours and consequently also contributing to the complexity of the positive or negative consequences (Cardoso, 2016, 118; see also Nunes, 2013), which with time become normalized.

Now the question arises on how we relate to our daily 'normalized' objects? If we take an example of baby feeding bottle (Pt. *mamadeira*) analysed and critically evaluated by the designer, Cristine Nogueira Nunes, we understand that normality of its usage within our society in first years of babies development it is being conditioned by the credibility and assumption taken over the media and pharmaceutical and food industry lobbies (2013). Consequently, the design culture of the industrial production of feeding bottle is being questioned as such. Reflecting on Nunes, we can learn that is essential to understand a design process as an action process, where we don't just satisfy existing needs as 'business as usual' but where we see a design process with holistic vision and understand it as a systemic process (2013, p. 117). We should start to think about the design process itself and not focus only on the final product (Tokinwise, 2015; Nunes, 2013; Manzini, 2015) and final results.

Though normality is being constantly produced and reproduced (Quitzau, 2004) and questioned from the different standpoint depending of the individual who is looking to them, we believe that normality of the use of western system of flushing toilets became naturalized ease through the socialization process in the society we grew up. Daily use of western system of flushing toilets is contributing to the "relational" complexity of the problem – relation between culture and design product and use of the object. 'How do we use the toilet?' 'How much water we flush down the drain?' 'Do we use the toilet paper to clean ourselves?' 'Do we sit or squat when we are defecating?' All of this it is related to the cultural predetermined behavioural patterns, values and norms.

Existence and use of unsustainable western system of flushing toilet for the last two centuries within our daily life's is being mostly overlooked and underestimated as a complex issue of today's society due to the normalization of its use and its existence. We question the normality of using the toilet design, where purified and drinkable water is wasted and discharged with every flush - we dispense between 3-7L of drinkable water in every flush, and this habit is transferred from generation to generation as regularized behaviour, imprinted as part of its cultural "habitus" (Bourdieu, 1977). It could be also translated to the (un)conscious environmental apathy: »The issue of normalization is connected to a sense of community in society. In each of our specific everyday lives we carry out normalized actions, e.g. routines. The phenomenon of normalization is shaped and re-shaped through an on-going process of co-construction between technological, societal and cultural dimensions« (Quitzau, 2004: p. 1).

To be able to overcome normalities we practice in our daily lives, we should provide conditions for the different ways of doing the same act which can/could be supported by different motivations. Common norms and behavioural patterns can/could start to change only if the norms and relational values with our resources itself change (Tokinwise 2015; Quitzau 2004; see Stebbing and Tischner 2015). It is essential to study and understand invisible forms of practice and understand where "the construction of normality and the dynamics of habit and routine" (Quitzau 2004) come from.

Also, we should put a question, 'What is the relationship with the shape and meaning of the object?' Or: 'How the concept of design can inform its use and cultural way of relating to it?' In our case, in research related to western system of flushing toilet design, we question the two possibilities: how toilet design can/could/should inform the sustainable and environmental friendly habits from users, and, on the other hand, how existing toilet habits could be re-shaped by sustainable innovation in toilet design. Furthermore, our main concerns as well are aimed to find a question on how new ways of relating to nature and natural resources could lead users to search for sustainable innovation in toilet design.

Through the general remarks about cultural meanings in connection to the water and toilets, I further discuss some general characteristics that create abstinence of innovation in toilet design.

4. Water Culture: Human and Eco-Systemic Needs of Water

Water is a natural and cultural substance at once. It is the essential resource for our existence and well-being, and probably the only natural resource to touch all aspects of human civilization – agricultural, industrial, economic, cultural and religious values. All the world cultures have evolved around it. Orlove and Caton urge that we should treat water as a "a total social fact" (2010, p. 402) and as such understand that the way we relate to water and manage water resources always depended on particular local cultures and mediated in different societies.

Strang refers to water and culture as:

> "Every social group and every actor in society has a cultural engagement with water. Some of this human/water engagement are manifested in the form of water culture: the knowledge, traditional customs, and behaviour that support the development and reproduction of a stewardship ethic, or the political organization of societies to manage and maintain water resources."
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> (Strang 2009, p.)

In this manner culture is one of the main dimensions on how we use, manage and value our water, also it is the factor that shape both, conflict and collaboration in society (Johnston 2012). To guarantee safe water for all-inclusive and sustainable water management needs to be practiced. Lately, global water initiatives are focusing on integrated water resource management (IWRM) – with multi-stakeholder approach and tools applied to it (see Korčulanin et al., 2018): "IWRM takes an ecosystem perspective of water together with its human uses; encourages broad stakeholder participation; and stresses that water, in all its competing uses, must be valued as an economic good. /.../ A core goal of IWRM is to balance human and ecosystem needs of water" and to sustain "environmental flows" (Johnston et al., 2012, p. XVI). Though IWRM approach looks into water resources mostly through its quantifying values and may in some places lack holistic approach integrating cultural differences, we find its goal and purpose unifying with our core vision within design practice – creating design strategy and design guidelines which are going to inform innovative sustainable sanitation systems within toilet design.

5. Culture and Innovation in Toilet Design

We cannot construct conscious and sustainable design solutions without understanding where the issues occur; we need primarily to understand human relation to the resources and artefacts. Body and mind are predetermined with symbols of that local contextual culture, symbol of society reflected through how we treat our body fluids, how we think about our body experience and how we think about what we see, smell and feel (Douglas 2002).

In our research toilets are observed in western urban society in Portugal, where we can observe that use and adherence of western system of flushing toilet design is conditioned by the socio-cultural relationship to it. Mostly through the existing prejudice of 'reject and taboo stigma' of human faeces and consequently of our toilets (Korčulanin et al. 2015; Douglas 2002). Pierre Bourdieu, sociologist, anthropologist and philosopher, argues that judgments of taste become embodied and internalized social meanings, which with the time become a natural entity for the individual (1984, p. 56). Prejudice of our own faeces and correlated stigma with normalization of the toilet use, observed as an artefact, is being regulated by parameters of the society, with psychological games of shame, disgust ('feeling sick'), danger and immorality (Douglas, 2002; see also Bourdieu 1984). Functionality of toilet design with its water flushing system remains (almost) the same from the first practical English patent for a flush toilet design invented by Alexander Cummings from the 1775 (Benedickson, 2007).

Slow or almost none innovation within toilet design could be attributed to the socio-cultural rejection and unacceptability of our own faeces. Also, it is related to the normalized, inhabited practice of how we use toilets and how do we relate to our faeces. It is something that we are used to do one way and not the other. We are used to flush (mostly the drinkable water) away our faeces after we use the toilet and as such we dissociate from our own resource. On the other hand, looking into example described by Mary Douglas, we understand that use of toilet and relation to it may drastically refer from culture to culture and place to place. In India "water, not paper must be used for washing after defecating, and this is done only with the left hand, while food may be eaten only with the right hand. To step on animal faeces causes impurity" (2002, p. 35).

Interesting that water and human faeces are being inherently related through many positions of its opposite. Hygienic reasons, which clean away 'the dirt' after defecation, are just one the aspects. On the other hand, there is cultural determination of what is pure and what is dangerous; what is clean and what is dirty; what is resource and what is waste. Predominate differentiation between what is a resource and what is waste is being quite clearly established from its cultural pre-determination. As Laporte discusses "to this very day, civilizations ambivalence toward shit continues to be marked, on the one hand, by a will to wash those places where garbage collects (i.e., in city and speech) and, on the other, by a belief in the purifying value of waste - so long as it is human" (Laporte, 1993, p.38). This cultural pre-determination consequently affects the whole cycle of how we understand our own defecation process – how we relate to our own feaces and resources to flush them away; to the act of doing it and to the spaces, restrooms, we visit; and how do we relate to the toilets that in most of the western societies we use in our daily lives.

Furthermore, if we look to the whole system embedded into the relationship of human feaces and water, we understand that water becomes impure and dirty just being close to the human excreta. Especially in western system of toilets, water is perceived through its binary opposition, 'dirty' faeces. Once, water is being pumped to the toilet tank it's value is being transformed into waste. We are also speaking about the psychological "yuck factor" (Schmidt, 2008), germ syndrome, shy bladder syndrome (paruresis) or pee-shyness which are all related to social anxiety disorder, sort of defecation anxiety or rejection of what happens in the act of performance meantime visiting the toilet. Anyhow, the bizarre part of the correlation is that the vital resource water is considered waste right after it is flushed down the drain. Due to the study of Maj-Britt Quitzau, about Danish bathrooms and Environmental impacts of embedded bathroom practices, environmental impact of western system of toilet design is conditioned by the normalized everyday practices of using a toilet (2004).

Combining her research with our observation we can resume that assumptions listed here are the main challenges and barriers to overcome the implementation of innovative sustainable sanitation systems: *doing as usual, uniform practices, water-flush as norm, isolated practice, distinction and separation from other functions/practices, old values stick to the toilet, hygiene, functionality and privacy, stabilized norms, bathroom space infrastructure as predetermination for wasteful actions*. Once the subject and object is normalized within our society and also taken out of our view/perception, it becomes invisible and unwanted subject for the discussion and as such conditioned to be addressed as an urgent place for the intervention of design.

6. Creating Conditions for the Dissemination of Toilet Design

All civilizations were developed by and with the culturally specific use of water. Our own civilization as well established specific ways in dealing with resources and created kinds of biomimetic environments to sustain our way of living. Today we should reconsider and re-design our ways of being, thinking and essentially our way of living at this planet.

Regenerative, restorative and sensitive urban water design are essential approach for the inclusive and sustainable cities, which should start to intervene on both sides – micro-scale of our case study – toilet design and macro scale of re-designing infrastructure of urban water management in cities.

Innovation in toilet design should be always context-dependent and focused on environmental impacts considering natural resource flow (Quitzau, 2004). The focus is not on production of more high-tech solutions for toilet design, ergonomically friendly seats or visually trivial appearance, but on understanding of how to overcome the non-use of existing sustainable technologies and how this is conditioned by the cultural habits and practices and prejudice of existing culture. Innovation in toilet design should be based on established 'normalized' practices in the particular culture and shouldn't interfere to much with the way we are used to 'do it'. It should happen as a natural adaptation to something that we are accustomed with doing. It should integrate naturally and locally determinate practice within the individual daily use of their toilets. Simultaneously we focus on the innovation, which should satisfy users' need and be recognizable to their established practices and act of defecation in the local culture. We learned by now that innovation in toilet design is going to be accepted and disseminated, only if people identify with it and adopt it as part of their own cultural habit and norm. "The whole universe is harnessed in the trials of human beings to force each other how to be a good citizen" (Douglas 2002, p. 28).

Human factor is part of the existing problem in Western system of flushing toilet design, but it is also the main factor for the change to happen towards sustainable paradigm within urban sanitation in our lives.

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References

Benedisckson, J. (2007). The culture of flushing: a social and legal history of sewage. Vancouver, Toronto: UPC Press.

Bourdieu, P. (1984). Distinction: A social critique of the judgement of taste. London: Routledge & Kegan Paul.

Bourdieu, P. (1977). Outline of a Theory of Practice. Cambridge: Cambridge University Press.

Cardoso, R. (2016). Design para um mundo complexo. São Paulo: Ubu Editora.

Douglas, M. (2002). Purity and danger: an analysis of the concepts of pollution and taboo. London and New York: Routledge.

Escobar, A. (2018). Designs for the pluriverse: Radical interdependence, autonomy, and the making of worlds.Durham: Duke University Press.

Fry, T. (2009). Design Futuring: Sustainability, ethics and new practice. Oxford, New York: Berg.

Fuad-Luke, A. (2009). Design Activism: Beautyfull Strangeness for a Sustainable World. London, Sterling: Earthscan.

Fuad-Luke, A. (2008). 'Slow Design', p. 361-363 in Erhlof and Marshall eds., Design Dictionary: Perspectives on Design Terminology, Birkhauser, Basel, 2008.

Guerreiro, B. S., Dawson, R. J., Kilsby, C., Lewis, E. and Ford, A. (2018). "Future heat-waves, droughts and floods in 571 European cities", Environmental Research Letters, Bristol: IOP Publishing Ltd.

Johnston, B.R. et al. (2012). *Water, Cultural Diversity, and Global Environmental Change: Emerging Trends, Sustainable Futures*? Doredrecht: UNESCO.

Korčulanin, L., Ferreira, A.M. and R. Muršič. (2018). "Active Design Method for Sustainable Urban Water Management", Design Doctoral Conference'18: TRANScendency. Proceedings of the DDC 5th Conference, online source (in publishing process). Lisbon: Edições IADE.

Korčulanin, L., Fereira A.M. and Rajko, M. (2016), 'Design and anthropology in collaboration: The Give aShit Project', Design Doctoral Conference'16: TRANSversality. Proceedings of the DDC 3rd Conference,online source. Lisbon 144-151.

Korčulanin, L., Barbosa, C. And A. M. Ferreira. (2015), 'Placing Toilets in Sustainable Design – The Need For Social And Technological Innovation', In Proceedings Of 8Th Senses&Sensibility – Design As A Thrade. Lisbon: IADE – Creative University/Edições IADE, p. 204–211.

Laporte, Dominique. (1993). History of Shit. London: The MIT Press.

Manzini, E. (2015), Design, When Everybody Designs. An Introduction to Design for Social Innovation. Cambridge, Massachuttes: The MIT Press.

Malhi, Yadvinder. (2017), 'The Concept of the Anthropocene', Annual Review of Environment and Resources. Available online: https://www.annualreviews.org/doi/pdf/10.1146/annurev-environ-102016-060854 (accessed 10 February 2018).

Norman, D. (2011). Living with complexity. Massachusetts: The MIT Press.

Nunes, C. N. (2013). Amamentação e o desdesign de mamadeira: por uma avaliação de produção industrial. Rio de Janeiro: PUC-Rio; São Paulo: Reflexão.

Olsson, P., M.-L. Moore, F. R. Westley, and D. D. P. McCarthy. (2017), 'The concept of the Anthropocene as a game-changer: a new context for social innovation and transformations to sustainability'. Ecology and Society 22(2):31. Available online: https://doi.org/10.5751/ES-09310-220231 [accessed 15 April 2019].

Orlove, B. and Caton, S. (2010) Water Sustainability: Anthropological Approaches and

Prospects. Annual Review of Anthropology 39:401–415.

Schmidt, W. C. (2008). 'The Yuck Factor When Disgust Meets Discovery.' Environmental Health Perspective. Online journal source. 116(12), 524-527. Available online: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2599783/ [accessed 15 April 2019].

Shove, E. (2003). Comfort, cleanliness and convenience: The social organization of normality. Oxford: Berg.

Stebbing, P. And U. Tischner (2015). Changing Paradigms: Designing for a Sustainable Future. Mumbai: Vedanta Art.

Strang, Veronica. 2009. Gardening the world: Agency, identity, and the ownership of water. Oxford/New York: Berghahn Publishers.

Tonkinwise, C. (2015). 'Radical Sustainable Innovation.' V: Changing paradigms: Designing for a Sustainable Future. Stebbing Peter and Ursula Tischner, ed. Mumbai: Vedanta Arts. Page. 284-296.

Quitzau, Maj-Britt (2004). Danish bathroom stories – a socio-technical study of what the present renovation boom is about. Paper at: 4S & EASST Conference 2004: Public Proofs - Science, Technology and Democracy, Paris, 25-28th of August 2004.

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