



# Digital Experience Theatre Ideation Tool for Designing e-things

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**Abstract.** Is the incorporation of technology in digital devices based on sustainability principles, considering economic, social, environmental and cultural dimensions? Can a specific UX/UI ideation tool leverage technological and social innovation design? Is Human-Computer Interaction and Design in this sphere still too focused on breaking down problems into smaller, more easily understood components and using logical reasoning to arrive at solutions instead of a holistic understanding that balances logical and emotional reasoning for decision-making and problem-solving? These are some of the issues tackled within the Digital Experience Theatre (DXT), the title of a research project and a new ideation tool for conceptualising e-things and defining innovative solutions that can be simultaneously technology-based and humanity-centred. The paper delves around significant subjects that inform the research, such as Augusto Boal's Theatre of the Oppressed and the Image Theatre, the concepts of co-creation and participation, image-making through AI technology, and the notion of designing e-things for the pluriverse with more-than-human care. The DXT first workshop and iteration are also described, aiming to work as a metaphoric rubber band ideation tool that pushes dystopias to micro-utopias.

**Keywords:** Participative Design · Design & Innovation · Interaction Design

## 1 The Digital Experience Theatre

The Digital Experience Theatre (DXT) research starts from the observation of a major problem in society concerning the unsustainable relation between design and technology – the fact that digital products, although more and more omnipresent in the mediation of human actions, are not so efficient acting as a medium for the ecological and socio-cultural mapping of a community in a glocal sphere. At the core of the issue is the relationship between design and technology, which has contributed to the development of unforeseen electronic devices, but this development has not always supported an integrated model of sustainability at various levels.

The research aims to systematise a UX/UI design approach that supports the development of sustainable digital products. It also strives to encourage community empowerment and holistic growth while reflecting how different places and communities evolve and are given more value by their histories, interrelations, memories, and rituals. A more specific goal of the project is to leverage alternative UX/UI designs for the development of e-things that are simultaneously based on technological and societal innovation. This approach represents a worldview that is not only focused on humanity but also on other phenomena that go beyond the notion that the human being is at the centre of life and the measure of all things.

The main question is how Human-Computer Interaction (HCI) can be expanded from a human-centred logic to a more-than-human or humanity-centred development. As a secondary issue, the study aims at the development of a UX/UI methodology that enables the conceptualisation of digital products/services for mobile devices.

The DXT is inspired by the Theatre of the Oppressed (TO) developed by Augusto Boal from Paulo Freire's philosophy. According to this approach, users of digital products are regarded as vulnerable citizens who must contend with a plethora of disruptive solutions. The DXT, adopting the TO methodology for the conceptualisation of e-things, seeks the development of an ideation tool with the capacity to operate with participant designers and creatives in the field of digital technologies in order to contribute to the transformation of this reality by promoting the creation of innovative solutions that are simultaneously community-based and humanity-centred.

## 1.1 The Theatre of the Oppressed

Augusto Boal (1931–2009) was a Brazilian dramatist and political activist who, throughout his career, always thought of art and theatre as never dissociated from social and political reality and, therefore, as fundamental in processes of participation and engagement. He developed the Theatre of the Oppressed methodology in the 70s and 80s, during his political exile, and designed it along the lines of what was the Pedagogy of the Oppressed developed by educator Paulo Freire (1921–1997).

Freire's pedagogical proposal can be summarised as a process of critical awareness of the social reality that allows the subject the ability to intervene in it and, ultimately, their emancipation from relations of oppression. Freire developed his ideas in the 60s and 70s against the backdrop of literacy programs in Brazil. For him, literacy would only work if the relationship between educator and student was dialogic and if the acquisition of technical skills was accompanied by the questioning of the context (social, cultural, professional, economic and political) – for him, problematisation is what allows liberation [1].

From a practical point of view, Freire's technique involves three interdisciplinary moments that follow each other through dialogue between the educator and the student: thematic investigation (with the selection of terms and words around a theme); thematization (with the encoding/decoding of social meanings); problematisation (with the development of a critical vision) [2].

Augusto Boal also developed his methodology based on the desire to contribute to the resolution of social and political problems. He thought of theatre as a tool available to everyone (not just to those working in the field) to develop strategies to escape

oppressive relationships. He developed a series of formulas, techniques and theatrical games embodied in more complex systems such as the Journal Theatre, the Invisible Theatre, and the Image Theatre. The objective would be to make the subjects go from being simply spectators to being spect-ators. In order for the spectator to be transformed into an actor, they have to know their own body and make it more expressive through the mastery of the tools of theatrical practice [3]. According to Boal, this is a process for transforming the subject from a witness to a protagonist.

The TO is naturally an important contribution to contexts of artistic creation, but it always has, in any context, a component of citizenship and strong participation because of its genesis. The TO is a proposal very much defined by a turbulent socio-cultural, economic and political context, by a particular non-democratic society dominated by elites situated in history, but that does not mean it is not adaptable for application in other contexts. In fact, in recent decades, it has been applied in various fields through socio-cultural, educational, and therapeutic/psychological approaches, among others.

## 1.2 Participatory Design Methodology

Framing the DXT research is the fact that Freire and Boal's proposals are methodologies that allow the development of a degree of awareness of relations of force and power (even if not necessarily of oppression) and the acquisition of critical analysis skills and consequently of the capacity for agency – not just for reaction but also for action. We are not focused on the acquisition of technical skills but on literacy skills – in our case, cultural, media, technological, and digital literacy – and ultimately on the possibility of empowerment.

Methodological support for designers and creatives of digital products developed through the DXT research aims to help them gain consciousness of the experience of others, namely the users of digital products, and, more widely, of the reproduction of contradictions and inequalities in society. The methods developed are conceived as facilitating instruments for approaching problems of a technological, design and usability nature through questioning mechanisms and co-creative and constructive interaction. In the same way that literacy was for Freire, a process of politicisation and acquisition of citizenship skills, the process of creation also has for us a component of participation and an active relationship with social reality.

The DXT ideation tool has so far been tested with two workshops, the first in November and December 2022 involving design students from IADE - Universidade Europeia, in Lisbon (Portugal), and the second in April 2023 with Exergames students (design and sports students) from the Hochschule der Medien (HdM), in Stuttgart (Germany).

DXT workshops used a participatory design methodology through an empathetic approach and interaction between all the participants involved. Assuming that reality is relational and that individuals do not exist separately from their other (non-human) surroundings, then humans may be said to exist in continual connections with each other and with the rest of the environment, which can extend to any human group [4].

The dialogical approach of DXT, inspired by the TO methodology, promotes reciprocal relationships through listening and dialogue, extending beyond individual experiences to the collective community. This process culminates in the construction of identities based on intersubjectivity's communicative process. Collaboration techniques

use intersubjectivity to illustrate how diverse experiences replace individual subjectivity [5]. An empathic approach fosters a more sustainable community by promoting mutual recognition, an ecological society, and equality of cultures and expertise [5, 6].

In this context, participatory design DXT workshops based on dialogical practice aim to influence the socio-cultural framework and promote innovation for a sustainable society. In doing so, participatory design workshops generate social innovation through a process and consequence focused on the transformation of the socio-technical system, focusing on real problem-solving and promoting the common good [6].

## 2 AI Collage to Explore Other Realities up to Come

Conceiving and analysing an image is a key element of the process that lies in the activation of the spectator. When invited to participate in the process, attendees are led to leave aside their ideas on what's happening and shift the focus to what they can prospect in the future. The strategy of Boal's Image Theatre, which integrates the TO and the DXT aesthetics, assures that each one can expose his ideas in the forum before they come into the discussion. That way, no exogen inputs interfere in the building of the individual images until entering the collective discussion and merging their differences at a further level and, eventually, leading to one single group image. The process of image-making enables discussion and confrontation of single viewpoints. That's part of its potential interest in promoting a genuine and singular expression and enhancing a participatory standing through subject activation.

Boal's strategy considered the idea of an image that relates to the constitution of a physical representation. One could say that in its process, what's meant by image is the ability to create a living kind of image because it implies the presence of the body, performing in the way of creating a sort of imaginary, convening a primer notion of image: the representation of an idea, according to Plato's image theory [7].

Within the DXT framework, Boal's method plays an inspirational role, and the former idea of the image is updated to the bi-dimensional level. But more than this formal change, what's most challenging is the non-mimetic nature of it. These images detach from Plato's conflict between appearance and essence to shift their attention to a different approach, much closer to the simulacrum concept as conceived by Baudrillard [8]. They don't depend on any kind of iconic recognition as they don't refer anymore to an existing object. They explore other realities up to come through processes of montage, be it collage - analogue or digital -, computerised or cybernetic work, including AI technologies.

The ontology of the collage kind of work reveals a powerful tool already explored in the 1910s and 1920s by the Dada, the surrealist, and the constructivist artists. The fragmented structure contributed to freeing up from the constraints of the common thought to explore different correlations and achieve new standards. It was a manner to get far from the limitations of abstraction and, at the same time, avoid coming back to figurative [9]. The collection of different fragments coming from distinct provenances and carrying diverse symbology and reading possibilities leads to a chaotic place where new conceptions may arise.

In turn, AI technologies contributed to expanding the former idea of montage based on an analogue collage of referential fragments. The potential of the new tools made it

possible to gather non-real and unforeseen image pieces and exponentiate their creative and meaningful possibilities, as stated by Lev Manovich in his latest essay [10]. What probably one should consider the most striking point when considering AI tools, echoing Manovich's writings, lays on its great accessibility to generate images, disregarding the so much appreciated "skilled artistic act". In this new image creation stage (the fifth, according to Manovich), democratisation and automation go side by side, shifting the core of the creative process to a new paradigm based on the strong ability to "predict" instead of mimitize. Founded on a rich and powerful network of images and data, AI-generating tools became the ideal domain to create without any kind of constraints. The process of creating these new images-to-come is particularly receptive to different contributions and languages, they may receive contrasted and mismatched inputs and cross quite distant knowledge areas. Surely limited in multiple aspects, such as details, they ensure the possibility of free and uncompromised creation, expanding the way images can be part of the game within multiple challenges.

### **3 Engaging Communities with Digital Devices and Connecting Them with the Natural Environment**

The DXT approach to the HCI domain aims to frame the computation and design of digital products, services, and experiences in a more-than-human sphere, to the detriment of the human-centred logic that characterised the development of HCI over the last three decades. Ron Wakkary [11] defines the practice of more-than-human design through the expression "design-with". Due to the impact of the Anthropocene and the devastating consequences on different ecosystems caused by climate change, it is essential to rethink the transdisciplinary sphere of Design, which is based on human beings' needs and desires, to leverage processes of interaction with non-human entities. The designer should be an assemblage of human and non-human processes, creating conditions that allow the participation and collaboration of non-human entities for the design of things.

Conventional design practices have been founded on a Western-centric vision that presupposes a single, unchangeable reality. The variety that exists in the world has frequently been disregarded in favour of designing solutions that match this viewpoint. The homogenisation of cultures and the marginalisation of varied populations are the results of this design philosophy. According to Escobar's [12, 13] idea of design for the pluriverse, an entirely new perspective on design and its impact on the world is required to establish a mode of design that recognises the variety of cultures, ontologies, and assumptions currently present in humanity and demands creating solutions that are responsive to this diversity. Many cultural, social, and ecological settings call for adaptable strategies for dealing with various circumstances. Increasing community autonomy and self-determination through a pluriversal design approach can result in more social and ecological fairness. Communities have the freedom to choose their answers to a variety of local issues, and such solutions should be founded on the cultural and ecological environment of each community.

Humanity-centred design must be integrated and sensitive to a context where little adjustments to different processes influence the planetary system. To address biodiversity

loss and climate change, a humanity-centred logic should be established from the still-dominant human-centred design paradigm. This logic should focus on primary threats, such as unsustainability, inequality, and discrimination, aiming for a holistic perspective of progress and future possibilities. The humanity-centred design follows the same fundamental tenet as human-centred design, which is to find solutions for the root causes of issues rather than just the symptoms. Nevertheless, it goes further in other assumptions: considering the environment and all living things as a whole alongside people; viewing the situation from a systems perspective with a long-term effect rather than a short-term one; testing and refining the suggested solutions over time to ensure that they address the problems of users and the ecosystem as a whole. Humanity-centred design is an alternative paradigm that improves community involvement by having designers supporting community-generated designs [14].

“Designing with” more-than-human entities for the practice of creating things is a process where humans participate in an “ecologically interdependent and humbled” way, in which the designer represents a structure that combines the human and the non-human, being their ability to verbalise what concerns non-human entities, assuming a role of “speaking subject”. In this understanding of the post-humanist designer, they simultaneously function as the voice of human/non-human synergy and as the facilitator that enables the creation of these joint actions. In this context, the designer must understand how to act, collaborate and communicate in partnership with non-human entities to leverage and maintain the possible relationships between things [11]. The concept of thing is informed by mediating technologies, the assembly of vital matter, and matters of concern and care.

In mediating technologies, the idea of how different technologies are intertwined with the human being for the creation of “prosthetic creatures” is explored [15]. It alludes to the notion of culture and technology and the human perception of the natural world, which never exists independently of human activity but is constantly influenced by social structures, tools, and technology. By recognising that the human being’s understanding of the natural world is always prosthetically mediated, it is possible to think more broadly about how nonhuman creatures are also prosthetically constituted. The relationship between humans and things influences the development of both [11].

In the assembly of vital matter, it is essential to understand the relational character of things in the sense that they belong to structures and are not separate elements, as well as the fact that they have the intention and purpose of generating other things. Finally, the idea of matters of concern and care is based on “thing politics” [16, 17] and “more than human care” [18].

Regarding Latour’s concept of “thing politics”, the point is the notion that politics is not just about how people engage with one another but also encompasses how people connect with things, technology, and the natural environment. These non-human entities have agency and actively influence social and political dynamics rather than being inert objects. This means that humans also need to consider the networks of connections and interactions involving non-human entities. Humans may develop a more complex knowledge of how power is distributed and used in society if they approach politics from a “thing-centred” perspective. By expanding the definition of politics to include

non-human actors, humans may design more efficient and just institutions that consider the intricate and intertwined interactions between people and the environment [16, 17].

Puig de la Bellacasa created the idea of “more-than-human care”, alluding to the notion that care strategies should incorporate the larger web of life, which includes animals, plants, and the environment, in addition to just people. Conventional care methods frequently ignore the needs and considerations of non-human things and restrict themselves to the context of relationships between people. More-than-human care recognises the interconnectedness of all living beings and emphasises the importance of caring for the broader ecological community [18].

Recognising the agency and worth of non-human species and how human behaviour affects the environment are all part of this caring philosophy. It also entails creating new methods and tools to promote more fair and long-lasting interactions between people and the rest of nature. Puig de la Bellacasa contends that by extending care techniques to non-human animals and the environment, human beings may build more durable and equitable systems that promote the flourishing of all life.

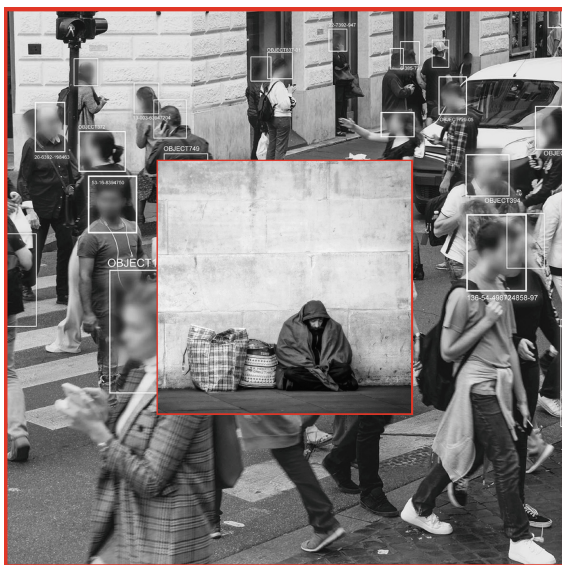
## 4 Rubber Band Ideation Tool from Dystopias to Micro-Utopias

In November and December 2022, the first DXT workshop involved Design students from IADE - Universidade Europeia. The aim was to delve into problems and find solutions for creating innovative services and their respective digital touch points (Apps) related to Clube de Futebol Os Belenenses, a Portuguese sports club from Lisbon, best known for its soccer team. The first version of the workshop used the digital collage process to create images. Very significant images were generated for the discussion of identified problems. Searching for relevant images to create the digital collages, followed by using software to edit them, proved to be time-consuming. However, it was possible to meet the objectives of the DXT ideation tool, namely to intensify the discussion of different design problems and stimulate the creation of innovative solutions (see Fig. 1).

Subsequently, the DXT tool was subjected to a critical analysis, namely an exploratory interview with interaction design professors from different universities: CODE University Berlin and Eindhoven University of Technology. All of them found it interesting to explore the TO concept as a leitmotif of the DXT ideation tool. Also, they said that it would be pertinent to create a specific design method with these characteristics. They unanimously considered the collage method based on web images limited and not very stimulating. In this context, one of these Professors said it would be interesting to include paper cuttings from magazines, newspapers, and other publications. Another Professor suggested the use of Apps such as Instagram because they allowed students to create their own photographic images, taking on a more performative character, which they could digitally manipulate and add textual content with key ideas.

This critical analysis of the DXT ideation tool proved extremely useful in providing relevant iteration. Collecting these observations, alongside attending the lecture performance */imagine an overheated debate: #AIart, trending on Twitter, 4K render*, by Florian A. Schmidt and Sebastian Schmieg, as part of the Transmediale 2023 Festival, had a transformative effect that led us to explore image generation with AI, as an alternative to creating collages with digital images (see Fig. 2). Schmidt, Professor of conceptual





**Fig. 1.** One of the collage images created in the first workshop explores the downside that the use of machines and AI have in society, replacing human interactions.

design and media theory at the HTW Dresden University of Applied Sciences, spoke about the potential of AI-assisted image synthesis and the discourse surrounding it, in particular symptomatic opinions about the disparity of positions and what it means to have machines now able to create photo-realistic images of everything imaginable. The lecture explored the central conflict lines of image synthesis by relating the issue to other external factors to reflect on the creation of realistic images.

In April 2023, the first iteration of the DXT workshop took place at the Hochschule der Medien (HdM) in Stuttgart, Germany, namely in the Exergames course, which brought together sports and design students to develop projects in a collaborative environment (Fig. 3).

Exergames, also known as exercise games or active games, are a category of video games that combine physical activity with digital interaction. This type of digital game aims to promote physical exercise and movement while providing entertainment and a playful challenge for players. Exergames generally use motion sensors, cameras or other devices to track and incorporate the player's movements into the interaction. The Professor from HdM, who is responsible for the Exergames curricular unit, considered the DXT tool to be a stimulating approach to the ideation process, saying that it was a good strategy in combination with the methodology she has been using, mainly because it contributes very significantly to deepening design problems. Her main suggestion was about explaining the tool to the students, whose complexity takes some time to fully understand, considering that it would be helpful to deepen the concept of dystopia in parallel with adapting the methodology of the TO.

Another critical aspect raised by the HdM Professor is related to the type of tools used to represent dystopias, which use artificial intelligence to facilitate and improve





**Fig. 2.** AI image generated with Midjourney, with a prompt taken from one of the topics explored by students in the first DXT workshop.



**Fig. 3.** AI images generated with Midjourney during the DXT workshop, within the Exergames course, with the prompt “Parkinson person turning into a robot”.

the process of creating and editing images. In this regard, the importance of explaining in more detail the concept of a prompt for generating images with AI was mentioned.

This is a text input or instruction provided to an artificial intelligence model, which describes the image to be generated in textual form. Prompts are essential for directing the generation of images by language-based AI models. In this way, it is essential that users communicate their visual ideas through text in a specific way and use clear-cut semantics to enhance image creation digitally.

Based on experimentation with various AI models, it was possible to verify that the effectiveness of image generation depends on several factors. Still, the choice of adequate semantics has practical results in image creation. The main approaches include: (1) Providing fertile and detailed descriptions of the desired image tends to generate more meaningful results. The more specific the prompt, the better the understanding of the image that is expected as a result. (2) Choosing specific keywords or terms that clearly represent the desired visual elements contributes to guiding the model to create more accurate images. (3) Combining the textual description with visual references can improve the understanding of what is expected. (4) Refining the prompt based on the results obtained, i.e. if the first image generated does not fully correspond to what is desired, adjusting the prompt and iterating the process to improve the quality of the image generated. (5) Find a balance between providing specific details and allowing room for the creative solutions proposed by the AI model, taking advantage of this symbiosis to generate more unexpected and innovative results. (6) Use an experimental approach with different prompt approaches to better understand how the models respond to different semantics and improve the ability to generate the desired images.

The sports and design students who took part in this workshop at HdM also commented on the DXT tool. One of the design students highlighted the fact that it was a different approach to other design thinking methods. He considered it useful to take a more abstract and subjective approach to exploring the design problem prior to the ideation and solution development phases. He also suggested that the tool should be simplified to avoid repetition. However, we believe that the tautological nature of both Boal's Rainbow of Desire (the TO selected approach) and the DXT ideation tool is an essential feature, the aim of which is to delve deeper into a given design problem so that it can lead to a more disruptive solution.

## 5 Discussion

Design is a creative field with great potential to influence humanity in multiple aspects related to social, ecological, economic, and cultural issues. It is a holistic area of knowledge that considers the interdependence of these aspects, allowing human beings, individually and in collaboration, to plan a harmonious and resilient global system. However, regardless of the increasing availability of innovative technologies with the capacity to significantly contribute to solving this puzzle, design keeps being a field of certain inertia to envision meaningful and efficient solutions to tackle the planet's urgencies in tandem with societal needs. Speculative practices within Design can contribute to stimulating a better mindset for designers focusing on the world as it could or should be. It's based on the principle of creating futures, with spaces, objects, and experiences that serve as propositions for alternative realities. The idea is to conduct design speculations not as narratives or coherent worlds but through an experimental fictional practice that contributes to holistic thinking about difficult hurdles.

A dystopian society is one marked by repressive governmental control, social degradation, and an omnipresent sense of hopelessness. It is a hypothetical and frequently terrifying concept. As an alternative to utopia, which is an idealised and peaceful society, dystopia warns viewers about the possible repercussions of unbridled authority, cutting-edge technology, or extreme social trends. Dehumanisation, surveillance, censorship, and frequently a strict social order that marginalises or takes advantage of particular groups are characteristics of dystopian societies. Dystopian fiction frequently deals with themes like the loss of personal freedoms, environmental damage, and the deterioration of moral principles. The idea of dystopia is used by the DXT to elicit reflection on the frailty and perversity of human society, where design has a long responsibility, exploring the effects of unbridled authority, the significance of preserving individual liberty, as well as the importance of proposing sustainable design solutions for human and more-than-human realms.

Through the DXT workshops held so far, it has been possible to confirm the usefulness of an ideation tool that delves into the design problem, which is an unavoidable phase of the ideation process, before looking for solutions that are in perfect harmony with what all the member states of the United Nations consider to be the main sustainable development goals. It is a methodology that operates at the level of emotional reasoning in order to stimulate the designer to seek the development of digital products that are not reduced to Human-Computer Interaction but that value a logic centred on humanity as a whole.

In the iteration of the DXT, it was possible to correct some aspects that proved to be less fruitful, namely the simplification of some of the tool's steps in order to provide more fluid participation. Nonetheless, it is essential to maintain a tautological approach, which, like the notion of iteration in the design methodology, makes it possible to make the problem more specific with each dystopian image that is introduced into the dynamics of the DXT.

As with each design iteration, the dystopian AI images generated incorporate the idea of repetitive refinement and improvement in the creative process. In the realm of design, whether graphic, product or user experience, iteration involves a cyclical approach to problem-solving and improvement. Designers create an initial version, a prototype, or a draft and then systematically revisit and revise it based on feedback, testing, and evolving insights. Each iteration brings incremental adjustments, allowing flaws to be identified and rectified, functionality to be improved, and the overall design to be optimised. Iteration is a fundamental aspect of the DXT design process, promoting adaptability and responsiveness to problematic situations and how they relate to humanity's needs. It encourages designers to see their design problem as a continuous and dynamic evolution rather than a static endpoint, which ultimately leads to more thoughtful and effective solutions. This concept is essential for achieving innovation and ensuring that the final design aligns closely with its intended purpose to solve a problem.

## 6 Conclusion

In conclusion, the DXT is characterised as a rubber band ideation tool from dystopias to micro-utopias. A website is being developed with resources for the development of post-humanist UX/UI design concepts, focusing on a step-by-step method inspired by

Boal's TO, The Rainbow of Desire, and the Image Theatre method, where designers of e-things start by exploring dystopian HCI speculative scenarios through digital collage and AI image creation, ending with concepts for sustainable, holistic, and humanity-based digital products. Either through collage or with any AI tool support, the process of creating the image focused on the subject prompted allows creatives using the DXT to explore unexpected formulations and dare to enter a representational dystopian domain. This new groundbreaking standard of images creates adequate conditions to discuss with no prejudices or pressures about what might be innovative solutions for the real needs of the pluriverse.

The DXT plans new workshops with Portuguese and international students in the short term to allow significant future iterations. It is also foreseen that including speculative design as another lens will deepen the research reflection.

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