Navigating the Transformative Potential of Technologies in Design

A Conclusion

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The essays, case studies, and interviews in this edited collection explore the increasingly interconnected processes and practices across the design disciplines, brought together by digital transformation. As human interaction with emergent technologies deepens, navigating the transformative potential of digital products, tools, graphics, and artifacts, is an exciting yet urgent call to action. These chapters emphasized the importance of thinking about technology change critically, equitably, and imaginatively.

In our expanding "human-technology entanglement" there are still many "unknowns" around mass adoption of technologies, digitization, "algorithmization" and the automation of tasks, along with the ethical, economic, and social challenges that can occur after a digital transformation is initiated through a design.[1] Examining these new and "unknown" digital landscapes, educator and researcher, Amarolinda Zanela Klein wrote that challenges related to digital transformation are plentiful, including the role of AI in decision making and the "indiscriminate use of personal information."[2] Lieselot Danneels and Stijn Viaene, professors who research digital transformation in the public and private sectors, highlighted that the "disruptive potential of digital technologies" demands organizational change and requires more ways of understanding tensions related to digital transformation.[3] As we negotiate with the exciting, yet disruptive use

1 Amarolinda Zanela Klein, "Ethical Issues of Digital Transformation," *Organizações & Sociedade* 29 (2022), 444.

2 Amarolinda Zanela Klein, "Ethical Issues of Digital Transformation," 444.

3 Danneels, Lieselot, and Stijn Viaene. "Identifying Digital Transformation Paradoxes: A Design Perspective." *Business & Information Systems Engineering* (2022): 499.

technologies, it's also clear that technology brings us together in numerous ways.

In Kai Franz's case study "An Archaeology of Digital Architecture," he reflected on the conception of *disegno*, an Italian word that carries complex meaning beyond the simple translation to a design or drawing. Disegno involves the making of a design or drawing but also embodies "the intellectual capacity to invent the design."[4] Is there such a word today that can capture the myriad of ways that technology-driven designs are fundamentally "omnipresent" in much of society and "more consequential than ever"?[5] Do words like "transdisciplinary," "immersive," or "interactive," capture the depth of the shared and complicated experience of digital transformation in design?

It may once have been challenging to envision there would be a shared vocabulary among designers and their peers on the use of software, hardware and sensors, cloud computing, big data, machine learning, and artificial intelligence. This vocabulary about technologies is expressed among product designers, graphic designers, architects, textile designers, service designers, game designers, artists, and creative technologists alike. In Dr. Serena Cangiano's case study, "Design for Future Skills: Three Case Studies on the Role of Design in Shaping the Narrative of Technology Education," she recalled that computational artists and designers in the past decades have created new tools and methods for teaching technology to communities of users, but it wasn't merely about developing a skill. It precipitated "global movements of change makers in technology education", and sparked the creation of new ways of interacting with the machines.[6] These interactions play out in versatile design and technology spaces, seen throughout this collection in examples like FabLab

4 The National Gallery, "Disegno," accessed on August 10, 2023, https://www.nationalgallery.org.uk/paintings/glossary/disegno.

5 Anne Quito, "SVA Design Leaders on Their Ever-Changing Field," School of Visual Arts, February 28, 2023, https://sva.edu/features/sva-design-leaders-on-their-ever-changing-field.

6 See Serena Cangiano, "Design for Future Skills: Three Case Studies on the Role of Design in Shaping the Narrative of Technology Education."

SUPSI,[7] PETLab,[8] GovLabAustria,[9] the plopps,[10] Studio Forward.[11]At Studio Forward, which was directed by Rachel Berger at the California College of the Arts, students practiced "futures literacy" and created electronic prototypes, written narratives, videos, artifacts, and speculative mockups to envision the world they "wanted to live in."

In these rapidly evolving spaces for design and technology, new possibilities are forged. Designs can scale beyond the lab and the classroom to entire societies. The digital transformation of communications and information, healthcare, education, government, financial services, fashion, entertainment, manufacturing and consumer goods was once difficult to imagine, yet it is rapidly infusing into our everyday lives. In a 1991 publication, *Computers in Society*, edited by Kathryn Schellenberg, the contributing authors wrote about the coming of a "data superhighway," "mass customization," "electronic democracy," "adaptive technology," " virtual reality", and the "computer you can talk to."[12] Decades later, many seek out and rely on digital systems, which the authors of this book have so conscientiously explored. In their case study "Digital Transformation and Service Design Practice in Public Sector" Sahar Nikzad and Paulina Porten argued for the importance of municipal administration digital transformation, and took an active role in cultivating citizen participation in e-government with their service design project "MeinungsMobil." In her essay on "Crafted Identities: Technological Transformations in Textile Design," Nishra Ranpura observed that novel means of fabrication and e-textiles are reframing "values of crafting" while driving innovation in wellness and health industries.[13] In their case study "Designing and Digital Storytelling for Climate Change Education," Gege Dong, China, Mir Sana Ullah Khan, and Andrea Orellana examined how

7 See "Design for Future Skills: Three Case Studies on the Role of Design in Shaping the Narrative of Technology Education."

8 See Laura Scherling and Colleen Macklin, "Designing Games for Social Change."

9 Sahar Nikzad and Paulina Porten, "Digital Transformation and Service Design Practice in Public Sector."

10 Kai Franz, "An Archaeology of Digital Architecture."

11 Rachel Berger, "No Back to Normal: Studio Forward at California College of the Arts."

12 Kathryn Schellenberg, Computers in Society, Guilford: Duskin Publishing Group, 1994: 6–10, https://archive.org/details/computersinsocie0000unse_x9y9/page/n9/mode/2up.

13 See Nishra Ranpura, "Crafted Identities: Technological Transformations in Textile Design."

different design and storytelling approaches can promote critical thinking about "climate change, food insecurity, water scarcity, poverty, endangered cultures, and migration." Additionally, "NFTs between Art and Design: A Story of Digital Transformation" by Lucilla Grossi and Luca Guerrini, analyzed how "NFT provenance" has had an unprecedented impact on digital design and art communities. Without the capacity to create new designs, the aforementioned transformations would not wholly exist.

Returning to some of the risks, it is evident that along with a shared vocabulary of design and technology there are also shared concerns. In an interview for this book, Dr. John Maeda described that "transformation in the design world means we are adapting to changing tools and business models" while we are also doing the difficult work to mitigate bias and "foster ethical tech."[14] To reiterate, a bunch of sensors or an algorithm design alone simply cannot make the world a more equitable place. From mass layoffs in big tech to ethical concerns about AI, the blockchain and cryptocurrencies, and data profiling, recent developments have shown us that even an exemplary design with sound user experience is not infallible. Design critic and journalist, Anne Quito, observed there is a developing awareness among creative practitioners and the public that "decisions made at the drafting table can have immense and unintended consequences."[15]

The authors explored how a number of these inequities play out. In Dr. Jeffrey Chan's essay, "Digital Design for Trust and Trustworthiness", he called attention to the fact that "discussions on trust remain anemic in design studies."[16] At a time when cybersecurity attacks run rampant, he challenged us to contend with how digitization projects can depart from their original aims, and erode or undermine trust. In his essay "Delegated Power: The Ethics of Nudging in Building More Equitable Product Experiences", Timothy Bardlavens asked, "Where do we begin?" "How do we think about building more equitable products?"[17] In the essay "DialecTikTok: The Dynamic Semiotics of Amateur Visual Trends on TikTok," Sarah Edmands Martin delved into "trend" languages and investigated how social media platforms can enlighten,

14 See Dr. Laura Scherling and Dr. John Maeda, "Reflections on Digital Transformation in Design."

15 Anne Quito, "SVA Design Leaders on Their Ever-Changing Field."

16 See Jeffrey Chan, "Digital Design for Trust and Trustworthiness."

17 See Timothy Bardlavens, "Delegated Power: The Ethics of Nudging in Building More Equitable Product Experiences."

empower, censor, shame, and even "cancel" its users. Looking at the power dynamics in gaming communities, Dr. Zhenzhen Qi acknowledged that procedural rules in virtual environments can also "shape the identity of real players embodied in that world."[18]

Empowered by a shared repertoire on design, technology, and digital transformation, it would appear that we are in a more informed place to identify and address the inequities before us. In an interconnected world, it is the endeavor to achieve more good in the world than harm. With our expanding capabilities we can do things like create "responsive" digital typography that can support "readers who are neurodiverse", "older in age", or have "low vision."[19] We can design "community-owned Internet infrastructure" and improve Internet access.[20] We can design games to impart positive social change, improve EV car sharing, address "gender equality and bodily autonomy" in digital health apps,[21] and support childrens' development with STEM/STEAM educational tools.

Ideally what you discovered in our collection provided an exhaustive sample about the potential of digital technologies in design. As conventional design forms, materials, and modes of communication undergo digital transformation, we must stop to consider the social, economic, and ethical impacts. Is it accessible? Is it secure? Does this do more good than harm? In her essay, Sarah Edmands Martin concludes that if design is about "the health and care of people, then perhaps more oversight on the set of machines and algorithms in our virtual agoras"[22] would produce a kinder and more equitable experience.

18 See Dr. Zhenzhen Qi, "Design of Virtual Worlds."

19 See Thomas Jockin, "Equality of Fit in Digital Typography."

20 See Laura Scherling, "Equitable Digital Access in an Era of Uncertainty."

21 See Catalina Alzate, "Learning from FemTech to Inform the Design of Healthcare Technologies."

22 See Chapter 3, Sarah Edmands Martin, "DialecTikTok: The Dynamic Semiotics of Amateur Visual Trends on TikTok."