Transforming Sociotech Design (TSD)

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Abstract. Transforming Sociotech Design (TSD) uncovers conceptual frameworks for designing and evaluating Persuasive Technology (PT) aimed at achieving sustainable transformations of our lives towards wellbeing. TSD explains ways how PT research can be extended beyond limitations of traditional behavioral change designs. TSD embodies fundamental understanding of the essentials for designing successful transformations, known as Socially Influencing Systems, Computer-Supported Influence, Persuasive Cities, Persuasive Backfiring, and Persuasive Design for Sustainability. TSD empowers researchers and designers to create PT that makes behavioral and attitudinal changes last. Moreover, TSD also shares the knowledge about strategies from rhetoric, psychology, and neuroscience that lead to attitudinal transformations. By definition, TSD expands the way how researchers and professionals see the potential of PT in attaining long-term permanent behavioral changes at all scales, be it an individual, group, or societal levels. Everyone interested in creating innovations that successfully transform human behavior and attitude is welcome to explore more, especially PT researchers and practitioners, including designers, developers, user experience experts, psychologists, gamifyers, and nudging enthusiasts.

Keywords: Transforming Sociotech Design, Persuasive Wellbeing, Permanent Behavior Change, Rhetoric, Neuroscience, Sustainability.

1 Motivation

Present knowledge on Persuasive Technology (PT) often reveals how behavior change designs and interventions are limited in sustaining their effects [6]. There is an increasing need for novel ways to create PT that helps people not only to achieve their goals, but also supports everyone to maintain their new habits. PT should ultimately empower people to succeed in their desired transformations. Therefore, this research uncovers conceptual frameworks for designing and evaluating PT aimed at achieving sustainable transformations of our lives towards wellbeing. Transforming Sociotech Design (TSD) contributes to the existing PT knowledge by extending our understanding beyond limitations of traditional behavioral change designs and interventions.

2   Frameworks

This tutorial is highly instrumental for researchers and practitioners designing PT, as it will provide and help internalize scientific frameworks for achieving permanent behavior change. TSD embodies fundamental understanding of the PT components that are essential for designing successful transformations, known as Socially Influencing Systems [11], Computer-Supported Influence [10], Persuasive Cities [13], Persuasive Backfiring [12], and Persuasive Design for Sustainability [8].

Socially Influencing Systems [11] describe perpetual mechanisms to foster user motivation as compared to conventional methods, such as those that are based incentives and punishments. Socially Influencing Systems harness social influence from crowd behavior to craft influential messaging aimed at shifting behavior and attitude of an individual, who naturally is an integral part of the same crowd. Such continuous interplay can ultimately result in an ongoing process that has the capacity to transform lives without any other mechanisms.

Computer-Supported Influence [10] in the realm of PT distinguishes four types of persuasion, i.e. interpersonal persuasion, computer-mediated persuasion, computer-moderated persuasion, and human-computer persuasion. This framework outlines a sharper conceptual representation of the key terms in transforming design, drafts a structured approach for better understanding of the influence typology, and presents how computers can be moderators of social influence.

Persuasive Cities [13] aim at improving wellbeing across societies through applications of socio-psychological theories and their integration with conceptually new urban designs. This research presents an ecosystem of future cities, describes three generic groups of people depending on their susceptibility to persuasive technology, explains the process of defining behavior change, and provides tools for social engineering of Persuasive Cities.

Persuasive Backfiring [12] provides tools to aid academics and designers in the study of behavior change interventions that produce unintended negative outcomes, presents a taxonomy of backfiring causes, and describes an analytical approach containing the intention-outcome and likelihood-severity matrices. This framework also introduces and locates dark patterns within the PT research.

Persuasive Design for Sustainability [8] originates from two previously established frameworks of a cognitive dissonance model for persuasive design for sustainability and a system development lifecycle (SDLC) process in design for sustainability. The established SDLC of Persuasive Design for Sustainability introduces a novel methodology for designing solutions that confront the problems of developing a persuasive system that transforms behaviors towards a set goal like sustainability.

3   Impact

This tutorial addresses highly important research direction that influences the future of PT and our ever-increasing technology-supported environments [13]. According to social sciences [1], environmental, personal, and behavioral factors are locked into

triadic reciprocal determinism, meaning that all three are strongly interconnected and continuously reshaping each other. Thus, environmental design is a strong influencer on human behavior and attitude. In other words, quite often it is merely sufficient to improve our digitally-equipped spaces to achieve better lives [10]. This is a very powerful vision as it encompasses not only behavior change but also a potential transformation of human behavior at scale [13].

This TSD knowledge empowers designers to create PT that makes behavioral and attitudinal changes last. Moreover, TSD shares also knowledge about strategies from rhetoric [4], psychology [1, 5], neuroscience [2, 5], and social influence [11] that can lead to attitudinal transformation. By definition, TSD expands ways to see the potential of PT in attaining long-term permanent behavioral changes at all scales, be it at individual, group, or societal levels.

4   Further

TSD provides frameworks and models that have been proven to be effective in helping to achieve permanent behavior changes and attitudinal transformations. Strategies from rhetoric [4], psychology [1, 5], neuroscience [2, 5], and social influence [11] can complement TSD well. The strategies can be applied hands on to learn how to achieve transformations using real-life issues. TSD expands horizons of how the frameworks connect, sometimes overlap, complement each other, and can be effectively combined to solve some of the most essential behavioral challenges we have today.

The PT community now can benefit from the advanced knowledge and immediate capacity of applying the fundamental strategies and frameworks for transforming lives. TSD is instrumental for various contexts, including health [3], education, games [7], sustainability [8], safety, wellbeing [9], emergency management, ecology, and economy. Ultimately, more refined scientific knowledge on how to design permanent behavior changes should be generated and translated into applicable guidelines to foster transformation for the betterment of our future.

Information technology and computer systems are increasingly designed to change behavior and help achieve better lives [2-6]. TSD overviews and explains how various frameworks and models can help scholars and developers to create PT that facilitates desired transformative effects on users. Persuasive technologies [6] are reshaping human behavior in countless ways and some continue to misuse strategies and fail their responsibility towards the betterment of human lives. Thus, more effort has to be put into educating and training [7] researchers and designers not only with insights on how to change behavior, but also include the responsibility and ethical mindsets that should be followed.

5   Organizers

Prof. Agnis Stibe from the world-renowned MIT Media Lab brings very fresh and novel ways for designing transformation. He established research on Persuasive Cities that empower healthy and sustainable communities. More: transforms.me

Anne-Kathrine Kjær Christensen has studied persuasive design at Aalborg University (cum laude) and was part of the Persuasive Technology community e.g. presenting at Persuasive 2007 an article she wrote with Prof. Per Hasle.

Tobias Nyström is a researcher and PhD candidate with expertise in business and information systems. Tobias research focusses on sustainability combined with universal design, gamification, open innovation, system design and PT.

6 Insights

TEDx talk on Transcending Instincts - https://youtu.be/DStzEQ1YrV0
TEDx talk on Persuasive Cities - https://youtu.be/Hy23R1GIOsQ

References

1. Bandura, A.: Social Foundations of Thought and Action: A Social Cognitive Theory. Prentice Hall, Englewood Cliffs (1986)
2. Cacioppo, J.T., Cacioppo, S., Petty, R.E.: The Neuroscience of Persuasion: A Review with an Emphasis on Issues and Opportunities. Social Neuroscience, 1-44 (2017) DOI: https://doi.org/10.1080/17470919.2016.1273851
3. Chatterjee, S., Price, A.: Healthy Living with Persuasive Technologies: Framework, Issues, and Challenges. Journal of the American Medical Informatics Association (JAMIA) 16, 171–178 (2009) DOI: https://dx.doi.org/10.1197/jamia.M2859
4. Christensen, A.K.K., Hasle, P F.: Classical Rhetoric and a Limit to Persuasion. In: de Kort Y., IJsselsteijn W., Midden C., Eggen B., Fogg B.J. (eds) Persuasive Technology, LNCS, vol. 4744, pp. 307-310. Springer, Berlin, Heidelberg (2007) DOI: https://doi.org/10.1007/978-3-540-77006-0_36
5. Cugelman, B.: Digital Behavior Change Toolkit, AlterSpark Corp. alterspark.com (2015)
6. Fogg, B.J.: Persuasive Technology: Using Computers to Change What We Think and Do. San Francisco: Morgan Kaufmann (2003)
7. Fountoukidou, S., Ham, J., Midden, C., Matzat, U.: Using Tailoring to Increase the Effectiveness of a Persuasive Game-Based Training for Novel Technologies. In: Int. Work. Pers. Persuas. Technol. CEUR Workshop Proc., vol. 1833, pp. 91-96. (2017)
8. Mustaquim, M. M., Nyström, T.: A System Development Life Cycle for Persuasive Design for Sustainability. In: MacTavish, T., Basapur, S. (eds.) Persuasive Technology, LNCS, vol. 9072, pp. 217–228. Springer, Cham (2015) DOI: https://doi.org/10.1007/978-3-319-20306-5_20
9. Orji, R. and Moffatt, K.: Persuasive Technology for Health and Wellness: State-of-the-Art and Emerging Trends. Health Informatics Journal (2016) DOI: https://doi.org/10.1177/1460458216650979
10. Stibe, A.: Advancing Typology of Computer-Supported Influence: Moderation Effects in Socially Influencing Systems. In: MacTavish, T., Basapur, S. (eds.) Persuasive Technology, LNCS, vol. 9072, pp. 251–262. Springer, Cham (2015) DOI: https://doi.org/10.1007/978-3-319-20306-5_23
11. Stibe, A.: Towards a Framework for Socially Influencing Systems: Meta-Analysis of Four PLS-SEM Based Studies. In: MacTavish, T., Basapur, S. (eds.) Persuasive Technology, LNCS, vol. 9072, pp. 171–182. Springer, Cham (2015) DOI: https://doi.org/10.1007/978-3-319-20306-5_16
12. Stibe, A. and Cugelman, B.: Persuasive Backfiring: When Behavior Change Interventions Trigger Unintended Negative Outcomes. In: Persuasive Technology, LNCS, vol. 9638, pp. 65-77. Springer, Cham (2016) DOI: https://doi.org/10.1007/978-3-319-31510-2_6
13. Stibe, A. and Larson, K.: Persuasive Cities for Sustainable Wellbeing: Quantified Communities. In: Mobile Web and Information Systems (MobiWIS), LNCS, vol. 9847, pp. 271-282. Springer, Cham (2016) DOI: https://doi.org/10.1007/978-3-319-44215-0_22