Human-Centred Technology for Sustainable Development Goals: Challenges and Opportunities

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Abstract. A human-centred approach to technology design for addressing sustainable development goals demands rethinking the way technological solutions are developed and deployed, taking into account situated design solutions and their impact on the social, economic and environmental aspects. For technology designers, this provides an opportunity to bridge the gap between the real and the ideal worlds. This workshop aims at building an agenda that defines challenges and opportunities for the design of interactive technologies, which promote fairness and prosperity on the planet, and contribute towards one or more of the United Nations' Sustainable Development Goals.

Keywords: Sustainability · sustainable development goals · human-centred design · human-centred technologies.

1 Context

The 2030 Agenda for Sustainable Development adopted by the United Nations (UN) Members calls for global partnerships to achieve significant advances in fairness and prosperity in the world. This includes equal access to, and management of resources such as water, energy, climate, oceans, urbanization, transport, science and technology. These themes are addressed as a set of 17 UN Sustainable Development Goals (SDGs)[1] intended to be achieved by the year 2030. These goals should be achieved uniformly across the nations, dissolving the well-established dichotomy of *developed* and *developing* contexts [2].

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[1] https://sdgs.un.org/goals

In line with this agenda, we understand *sustainability* more broadly, beyond the environmental aspects related to solutions that do not harm the environment, to include also the social aspects related to human rights, respecting differences, and the dissemination of values that are the basis of the continuance of life in society for future generations [3,4,5].

According to [1], sustainability can, and should be, a central focus of interaction design. Initially, Blevis [1] believes that for a perspective of sustainability, "design is defined as an act of choosing among or informing choices of future ways of being. This perspective of sustainability is presented in terms of design values, methods, and reasoning".

Addressing technology design for sustainable development goals with a human-centred approach demands rethinking the way technological solutions are developed and consumed, and considering the situated design solutions and their impact in the social, economic and environmental aspects. As stated in [3], this should be used by designers as an opportunity to establish a bridge between the real-life, with its inequalities and injustices, and the ideal world, as aspired by the UN SDGs.

2   Objectives

With this broad perspective of *sustainability* in mind, the objective of this workshop is to build an agenda which aims to define challenges and opportunities for design of interactive technologies that address one or more SDGs with a holistic view.

Topics of interest include, but are not limited to:

– IoT and smart communities
– Environmental monitoring
– Design solutions that support sustainable behaviour
– Green computing
– Ethical aspects of green computing
– Equality and fairness in access to technology
– Sustainable design
– Design for sustainability

The workshop will engage the participants in:

– Discussing challenges and obstacles related to creating human-centred technology towards advancing the sustainable development goals;
– Mapping some key stakeholders, and questioning the relationships between them;
– Co-creating future scenarios where human-centred technology support individuals and communities to advance on fairness and prosperity.

2.1 Participation

The workshop is of interest to researchers and practitioners who aim to impact society through the design and development of technologies that attempt to advance fairness and prosperity through equal access to, and management of resources such as water, energy, climate, oceans, urbanization, transport, science and technology.

The call for papers will be distributed via the network of the workshop organisers, HCI-related mailing lists, IFIP mailing lists, and social media in general.

Participants are encouraged to submit a motivation paper describing their approach to design of technology aimed at advancing the society towards one or more Sustainable Development Goals, by addressing related challenges and/or opportunities.

As travelling may not be possible to everyone, online participation will also be possible.

The number of participants should be between 8 to 15, in order to keep group activities feasible and interesting.

2.2 Overall Structure

This one day workshop is structured to be engaging, practice-oriented, hands-on, and participatory.

The workshop starts with the participants' presentations, focusing on their design approaches to advance the SDGs. This is followed by a set of activities designed to create discussion of challenges and barriers, and envisioning future scenarios.

The workshop includes plenty of time for the exchange of ideas and experiences among the participants. The main parts of the workshop are:

– Short presentations of the accepted papers;
– A follow-up interactive session to allow further discussions and map the main points raised in the presentations;
– Collaborative activities, facilitated by the organisers, and involving all the participants to map challenges and barriers;
– Concluding discussions and planning of future directions and outcome.

More details on the workshop program and call for papers are available at the workshop website: https://lifes.dc.ufscar.br/HCT4SDG.

3 Organisers

Lara Piccolo is a Research Fellow at the Knowledge Media Institute (KMi) at the Open University, UK. She investigates the role of technology to engage people and communities with some global challenges, including inequalities, universal access to technology and climate change. She worked for 10 years in Brazil bridging academia, policy making and industry in Research and Development

projects targeting digital inclusion, accessibility and energy literacy and smart monitoring.

Vânia Neris is an Associate Professor working in the Department of Computing at the Federal University of São Carlos (UFSCar) in Brazil. She has been researching on Human-Computer Interaction since 1999 and now she leads the Flexible and Sustainable Interaction Lab (LIFeS). Her main current research interests include: (1) computer support for mental health and well-being, (2) sustainability in computing and (3) computer science education.

Kamila Rodrigues is an Assistant Professor at the Institute of Mathematical and Computer Sciences at the University of São Paulo (ICMC/USP) in Brazil. Her research interests include usability, user experience, accessibility, sustainability aspects, and also the study of the emotional responses of users during the interaction with interactive multimedia systems, mainly serious games. She works as a collaborator in research developed at the LIFeS lab (Federal University of São Carlos/Brazil) with digital therapeutic applications for different pathologies and in research at the Intermídia-ICMC/USP lab on data collections and remote interventions using technological infrastructure.

Masood Masoodian is a Professor of Visual Communication Design at Aalto University, Finland. His research interests include visual design, interaction design and visualization, specializing in visualization of time-based data (e.g., energy, health and environment) particularly for non-expert users. He has served as a programme chair, programme committee member, and reviewer for numerous international conferences and workshops.

4   Expected Outcome

The accepted position papers will be published in the official adjunct conference proceedings. Furthermore, the main workshop results will be further disseminated to a wider audience during the conference.

The possibility of a joint publication reflecting the workshop outcomes will be suggested and discussed with the participants.

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