Critical Computing, Sustainability and Social Justice (pt2)

Josahandi Sherman &
Sohyun Shin

CHI Subcommittee Overview

Core Research Questions & Topics

Critical theory is a way of thinking about the world that analyzes power dynamics in society and aims to bring about social change.

RQ: How computing and computing research contribute to fair and just relations between individuals, social groups, and whole societies, locally and globally—all in the pursuit of fulfillment.

Welcomes HCI Research connected to :

- Social justice
- Global sustainability
- Critical-reflective research practice
- Artful and aesthetic experiences
- Critical computing

Actively supports diverse forms of scholarly expression:

- Critical essays
- Research through design
- Practice-based research
- Design fictions
- Commentaries

All in pursuit of meaningful alternatives to the status quo

CHI 2024
Surfing the World

Going back to Topics of Subcommittee

- **Gender & Sexuality**

→ Feminist HCI: Taking Stock and Outlining an Agenda for Design

- **Ethnic Studies**

→ Deconstructing Community-Based Collaborative Design: Towards More Equitable Participatory Design Engagements

- **Sociology & Political Science**

→ CHI4Good or Good4CHI

- **Environmental Science (esp. Sustainability)**

→ Related 2024 CHI Session: Environmental Activism

- Eternagram: Probing Player Attitudes Towards Climate Change Using a ChatGPT-driven Text-based Adventure
- Technical Mentality: Principles for HCI Research and Practice
- Promoting Eco-Friendly Behaviour through Virtual Reality - Implementation and Evaluation of Immersive Feedback Conditions of a Virtual CO2 Calculator
- From Surplus and Scarcity towards Abundance: Understanding the Use of ICT in Food Resource Sharing Practices
- Post-growth Human–Computer Interaction

Unpacking Sustainability in Physicalization Practices : Objectives

- Explore universally accepted definition

"We did not find a universally accepted definition for sustainable physicalization, nor did we discover an objective set of guidelines to ensure sustainability."

- Provide comprehensive & systemic analysis

"no comprehensive work has systematically explored how to promote sustainability and embed it into future practices"

- Expand research in sustainable data physicalization beyond artifact alone

"A lot of work in Data Physicalization addresses the issue of sustainability directly through the physicalization artifact itself"

- Develop physicalization framework and guidelines specific for data physicalization

"While these frameworks and guidelines offer insight into sustainability within various domains, they often overlook specific aspects crucial to Data Physicalization. Hence, there is a pressing need for a specialized framework addressing the life cycle of physicalizations."

Unpacking Sustainability in Physicalization Practices : Related Discipline

Reviewed existing frameworks inside & outside HCI

- SUSTAINABILITY:
  - Life Cycle Assessment (LCA)

    extensively used across various disciplines to compare the environmental impact of products
- ART:
  - A Guide For Artists: Greening Arts Practice
  - Exploration of Waste Material in Sculpture Using Crown Corks
- HCI:
  - Sustainable Computing Evaluation Framework (SCEF)
  - Sustainable Prototyping Life Cycle for Digital Fabrication

    Within HCI but not particularly about data physicalization

Unpacking Sustainability in Physicalization Practices : Contribution

- EMPIRICAL RESEARCH
  - Interview from practitioners:
    - Current practices
    - Challenges practitioners face

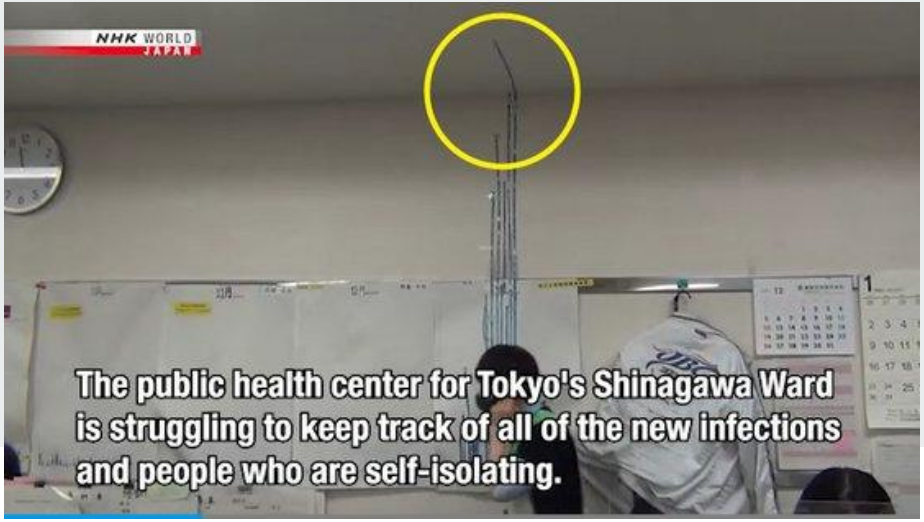
- ARTIFACT ? METHODOLOGY?
  - Sustainable Physicalization Practices (SuPPra) Matrix
    - set of prompting questions as a practical tool to assist designers to plan and make choices
    - a generative lens through which a designer can view, and perhaps reconsider, their approach to sustainability, with each dimension offering a different perspective on the many decisions that make up the creation of a physicalization

Unpacking Sustainability in Physicalization Practices : Main Takeaway

- Sustainable Physicalization Practices (SuPPra) Matrix
- Dealing with the transience of data:
  what differentiates physicalizations from other physical artifacts

⇒ Application of physicalization in other fields

W/ consideration for specific challenge of data physicalization



Unpacking Sustainability in Physicalization Practices : Sohyun's comment

How common is the data physicalization?
How much resource is used for such practice?

- Provide insight into some kind of quantitative impact/importance of research

Cosmovision Of Data: An Indigenous Approach to Technologies for Self-Determination

"Cosmovision, integrated in Tosepan's technological appropriation, is a synonym for self-determination, resistance and ecological balance."

Contribution : A case study of the Masewal community's approach to technology, highlighting their concept of **Cosmovision** and its implications for **decolonial technology design**, through the development of **Micro-, Meso-, and Macro-lenses** that can guide future work in HCI

Author: Carlos Guerrero Millan et al. Published: CHI 2024

Cosmovision Of Data: An Indigenous Approach To Technologies For Self-Determination

Carlos Guerrero Millan, Design Informatics, University of Edinburgh, Edinburgh, UK, cg.millan@ed.ac.uk
Bettina Nissen, Design Informatics, University of Edinburgh, Edinburgh, UK, bettina.nissen@ed.ac.uk
Larissa Pschetz, Design Informatics, University of Edinburgh, Edinburgh, UK, l.pschetz@ed.ac.uk

ABSTRACT

This paper analyses practices of data perception and usage, as well as ongoing and envisioned community technology projects carried out by a Masewal Indigenous group in Mexico through their union of cooperatives, Tosepan. Through fieldwork interviews, Masewal participants expressed how they have been appropriating existing technologies for their people's self-determination. During a workshop, they imagined how diverse knowledges and lived experiences of their worldview, passed down through generations, could be represented and translated into digital practices more broadly. We draw considerations for the HCI community to embrace novel approaches to data and information systems from the community's concept of Cosmovision, and develop Micro-, Meso- and Macro-lenses within it. Through these lenses, we discuss how technologies could be designed for specific individual practices and connections with nature (Micro-cosmos) while supporting communal actions for autonomy and self-determination (Meso-cosmos), and considering broader worldmaking processes and implications for identity, prosperity, ecology and plural representations (Macro-cosmos).

CCS CONCEPTS

• Human-centered computing → HCI theory, concepts and models.

KEYWORDS

Decoloniality, Pluriversality, Cosmovision, Latin America, Self-determination, Design research, Community Technologies, Cooperative data systems, Indigenous technologies

ACM Reference Format:

Carlos Guerrero Millan, Bettina Nissen, and Larissa Pschetz. 2024. Cosmovision Of Data: An Indigenous Approach To Technologies For Self-Determination. In *Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI '24), May 11–16, 2024, Honolulu, HI, USA.* ACM, New York, NY, USA, 19 pages. https://doi.org/10.1145/3613904.3642598

1 INTRODUCTION

Decolonial and non-Western frameworks have been integrated in cross-disciplinary proposals that aim to pluralise current dominant models [56]. From the perspective of HCI, this redirection of attention and widening of concepts are shifting particular technological, data and information-driven dynamics, challenging Global North and Western perspectives.

Our work provides an example that situates and extends such theorisations in practice, with particular focus on values and respective appropriation of technology within an indigenous group in Mexico. For HCI, the integration of Indigeneity in the digital context has raised claims for respectful frameworks and methods [39, 74] that can lead to collaborations where groups and their knowledges can reframe computing paradigms from their perspectives [1, 20, 43, 58]. Indigenous cultures, however, vary widely even within the same country or territory they occupy; and it is exactly this range of perspectives that can help HCI achieve the ultimate goal of pluralising approaches. Contributing to this plurality, our research focuses on Masewal knowledges, particularly due to their ability to syncretise local traditions with Western concepts of technologies. Reaching far and wide in understanding how different indigenous groups approach, repurpose and use technology could not only lead to greater diversification of perspectives, but also, as Escobar [25] notoriously framed, to more sustainable and relational approaches to design.

With this in mind, we present and discuss how members of Tosepan, a union of cooperatives integrated by Masewal individuals, reinterpret practices of data in their everyday lives and how the different cooperatives have been appropriating technologies such as radio, databases and mobile telephony to align with their ancestral traditions and worldviews, as well as how they envision tools for people in the territory to contribute, adapt, repurpose, and ultimately empower their community identity.

Following fieldwork consisting of 18 interviews and a co-design workshop with 46 participants, we draw from the indigenous concept of Cosmovision and develop Micro-, Meso- and Macro-lenses within it to be considered in HCI. Within these three lenses, we present considerations for the design of technologies to co-exist with traditional and personal practices, material and embodied connections (Micro-cosmos), to support community-led actions for autonomy and self-determination (Meso-cosmos) and to lead to rethinking the bigger picture, engaging in resistance, prosperity and representation in worldmaking (Macro-cosmos).

Present in many Indigenous cultures around the world [15], Cosmovision, from the context of the Indigenous Peoples of Latin America, can be understood as *"the structured vision in which the members of a community coherently combine their notions about the*

Core Topics related to CHI Subcommittee:

-Decolonial Computing
-indigenous people knowledge
-Postcolonial analysis of design
-Pluriversal knowledge and methods
- Community-based participatory design

Cosmovision : “the structured vision in which the members of a community coherently combine their notions about the environment in which they live and about the cosmos in which they situate human life”

Three specific technologies for self-determination used by the Masewal:

-Radio Tosepan Limakxtum: A **radio station** that broadcasts in both Spanish and Nahuatl, which helps to preserve their language and culture.

- Serves as a voice for the community to counteract discrimination and to discuss their history and current struggles.

-Wiki Katat: A cooperative **mobile phone network** aimed at giving the community control over their information and resources.

- It uses local servers to ensure that the money and data stays in the community.

-Taewaloni: A planned **local database** that is intended to store, share, and preserve Masewal knowledge and practices.

- It aims to keep a record of their connections to nature, self-organization practices, and ancestral knowledge.

Methodology :

18 semi-structured interviews with Tosepan members

- Diverse participants: activists, farmers, leaders
- Focused on cooperative practices, values, technology use

Co-design workshop with 40 participants

- Exploring ideas for Taewaloni (local database)
- Prototyped 2 "Magic Machines"

Data Practices: Embodied and Communal

-Logs and records: used for agricultural activities and community meetings

-Embodied data: knowledge embedded in daily life, farming practices, and interactions with the environment

-Communal knowledge practices: passing down knowledge through generations and between peers

-Emphasis on experiential knowledge

-Data as relational, community-based, organic, and localized

Technology Appropriation: A Tool for Self-Determination

-Critical view of mainstream technologies: seen as "consuming," "dominating," "invasive"

-Colonialism in digital media: reinforces power imbalances

-Re-appropriation of technologies: Radio Tosepan, Wiki Katat, and Taewaloni are tools for self-determination

-Focus on local servers and community control of information

-Technology as a means to preserve legacy, identity and values

Taewaloni & Workshop Insights

-Taewaloni: Intended as a local database for sharing knowledge about nature, self-organization, and cultural preservation
-Workshop: "Magic Machine" activity to envision physical representations of Taewaloni
-Machine Prototypes focused on:

- Broadcasting knowledge (Machine 1)
- Preserving and sharing data (Machine 2)

-Technology as legacy: a way to pass down knowledge and values to future generations
-Technology as a tool: supporting self-organization, empowerment and community goals

Cosmovision Lenses for HCI

Micro-cosmos:

- **Technology coexisting with traditional and personal practices**
- Embodied connections, material and relational data
- Data as non-extractive, community-based

Meso-cosmos:

- **Technology as a mediator for self-determination and autonomy**
- Community-led, owned and controlled
- Challenges data colonialism

Macro-cosmos:

- **Technology for worldmaking and plural representation**
- Intercultural epistemologies and co-existence of knowledge
- A vision of technology integrated with their vision of prosperity, *Yeknemilis*

Discussion :

How does the Masewal unique perspective of data and technology challenge conventional views on data ownership, storage, and access?

Beyond theoretical discussions, Can the Masewal approach to data and technology actually inform practical applications and innovations in HCI??

Thank You

Class Name

Student Name