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# Using Stories to Understand Technology Needs and Technology Reuse by Rural Communities

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## Abstract

Designing technology for rural application is often perceived as designing for solving a problem, in contrast to the emphasis on technology to support urban communities. This is counter to the ground truth where we find that there are numerous opportunities unveiled when we focus the lens on designing from the rural communities. I use feminist HCI and postcolonial computing lenses to explore, understand, interpret and replicate the online stories told from the rural, and how we can translate these experiences into design recommendations. I seek in my dissertation to understand the people who tell these stories, why they tell them and how they tell these stories, working towards how we can uncover ways that technology can empower and play a (respectful) role in helping the rural communities and other communities the margins to (re)tell their stories in their own voices.

## Author Keywords

Rural Communities; Rural Computing; Storytelling; Post-colonial Computing

## CCS Concepts

•Human-centered computing → Human computer interaction (HCI); User studies;

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## RESEARCH QUESTIONS

*Study 1: Role of Technology in Supporting ICH (Completed)*

**RQ 1:** Who tells the story?

**RQ 2:** How is sense of community expressed **with** ICH technology?

*Study 2: Rural Groups vs Communities (Ongoing)*

**RQ 3:** Why are stories told?

**RQ 4:** How is sense of community expressed **through** the stories?

*Study 3: Online Communities and their Stories (Forthcoming)*

**RQ 5:** How are community stories told (and shared)?

**RQ 6:** What makes a story compelling?

*Study 4: Supporting Storytelling (Proposed)*

**RQ 7:** How can we use technology to sustain sense of community?

**RQ 8:** How do we tell new stories?

## Introduction and Motivation

### *Problem Statement*

How do we define a respectful technology space to design tools to support rural and under-served communities tell their own stories in their own voice?

### *Motivation*

I focus on rural communities as a center for design because it encompasses a rich demographic that is woefully under served by current approaches that focus on rural areas [4]. Designing technology for the rural has the added benefit of presenting opportunities for design and lessons learnt from technology (re)use. I use storytelling of the nature of its importance in conveying nuances about experiences, needs and opportunities. While focusing our lens on technology use in rural communities, I consider stories told about the technology, the planning involved, the lessons learned and fundamentally and what makes a story compelling. What I learn from these stories will influence the recommended technology designs. I leverage feminist HCI and postcolonial computing to provide supporting framework on how to design these technologies from the rural areas. My contribution is compelling in both highlighting the opportunities that lie in the rural areas to influence design, and also in providing evidence in defining new technological approaches to design.

## Background Research

Rural communities are important and provide innovative lens and technology (re)use that are not visible when designing for rural areas. They also provide a lot of new opportunities such as rich grounds for (re)considering tech performance [4, 7].

My work builds upon others in postcolonial computing research because of the importance this approach important

that voices are understood, so that we are not designing *for* the people but *with* and *from* those communities [2]. With other Feminist HCI approaches, I leverage postcolonial computing lens [5] to inform my approach to design and especially in the first half of my dissertation to establish the ground rules for respectful space that the technology is useful without encroaching on personal agency [8].

When considering technology use to support rural community, my use case follows upon previous work on the technology design for the rural that sought to probe the positive and negative consequences for designing for a particular community on the trail [9]. I leverage stories as a conduit to study the community presence online and from these elicit design needs and design goals. Stories are useful in revealing communication strategies [1] and have also been proven to be useful as design tools [3] and help to inform our understanding of decision-frameworks.

## Approach and Methods

My research follows a mixed method approach that includes both the field deployment and rural stakeholders:

### *Context Analysis*

I use grounded theory analysis on discussion by long distance hiker community on Reddit (Table 1) in order to understand emerging themes around trail stories, who tells these stories, why they tell them and the implication this has on the group composition.

### *Design and Build*

I conduct interviews with various participants and stakeholders to better understand technology needs, story goals and (un)met needs. I also conduct formative investigation of the field to augment found (un)met needs. This design approach is also informed by domain experts in the field (expert hikers, museum curators, sociologists, communica-

tion experts among others). I design and build application that is informed by insights from the interviews.

*Evaluation:*

After deploying the applications and having the target demographic have a sustained use, my plan is to evaluate its effectiveness through surveys and further qualitative interview debriefs. Through these interviews, I will also measure how well the application affected user(s) behavior triangulated with data from application logs and field observations.

**Dissertation Research**

My current dissertation is segmented into four studies following four elements of storytelling. I detail them below.

*Study 1: The Role of Technology in Intangible Cultural Heritage*

*Question: Who tells the story?* Using post-colonial computing lens, I approached the power-relationships when considering how intangible cultural heritage is passed between an indigenous community, compared to the colonial narratives presented in museums. This study highlighted the need for “going to the source” of story beyond simply accepting the “official” narratives as gospel. My contribution in this study was to propose/define a typology for *Respectful* technology space. In it we showcase how technology can help and harm the telling and preservation of intangible cultural heritage (and oral histories).

*Study 2: Group vs. Community Technology Needs*

*Question: Why are stories told?* For the second phase of the dissertation I would like to have a better understanding of rural stakeholders through the lens of the “trail” [9]. Through a series of three workshops, I first identified the stakeholders and their goals, and made a distinction between transitory trail users (e.g. Hikers) from permanent trail inhabitants (e.g. farmers) [6]. From these groups and communities, I identified conflicting and symbiotic goals and

design technology that mitigates conflict while elevating the symbiosis between and among groups/communities [7]. From this work I will make contributions to how these offline communities manifest and share information online, the importance of the distinction between groups and technology and how this revises the *Sense of Community* framework [10], that goes on to inform the design for groups and communities on the trail.

*Study 3: Online Communities and Stories*

*Question: How are stories told (and shared) between and among communities?* This phase of the dissertation is planned to extend my phase 2 study by interviewing long distance hikers about their technology use on the trail, how they form community both on-and-off the trail, and how they curate the stories they tell online. I intend to consider how different platforms are leveraged to tell different stories. Through these stories, beyond showing the evolution of the storyteller and what makes a story compelling, also allows us to consider the importance of the storytelling in informing community membership. I also aim to propose a replication framework that can be used to help communities tell unique and interesting stories.

*Study 4: Applying frameworks: Supporting Storytelling*

*Question: How can we tell new stories?* The proposal for this phase of the study is involved in formalizing the system of storytelling and how technology can be used in telling these new stories, and/or intervene in assisting the users to tell their stories. The design and/or tool will leverage respectful space from phase 1, geared to the community in phase 2 to assist them in telling new stories online from phase 3. This approach beyond providing new guidelines for designing tools for the rural communities, will also serve to be an effective conduit to provide a signal boost for communities in the margins.

SubReddits	Mem.
r/Appalachian Trail	67000
r/Pacific Crest Trail	25000
r/CDT	3000
Total Members	95000

**Table 1:** The SubReddits that I perform context analysis. I use this data primarily in Phase 3 of my dissertation.

## Contributions and Next Steps

My overall research will advance HCI knowledge by (1) contributing to the empirical knowledge about the importance of storytelling, (2) highlight the importance and opportunities for designing from the rural and (3) in presenting frameworks and tools that transcends the rural to help other communities in the margins tell their stories effectively.

The doctoral colloquium provides an opportunity to discuss the strengths of the storytelling approach (and the sub-fields that I rely upon in this research such as postcolonial computing and community theories). It will also provide an opportunity to discuss consider the strength of my contributions to the larger HCI community.

## REFERENCES

- [1] Benjamin Bach, Natalie Kerracher, Kyle Wm. Hall, Sheelagh Carpendale, Jessie Kennedy, and Nathalie Henry Riche. 2016. Telling Stories About Dynamic Networks with Graph Comics. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16)*. ACM, New York, NY, USA, 3670–3682. DOI : <http://dx.doi.org/10.1145/2858036.2858387>
- [2] Nicola J. Bidwell. 2016. Moving the centre to design social media in rural Africa. *AI & SOCIETY* 31, 1 (01 Feb 2016), 51–77. DOI : <http://dx.doi.org/10.1007/s00146-014-0564-5>
- [3] Thomas Erickson. 1996. Design as storytelling. *interactions* 3, 4 (1996), 30–35.
- [4] Jean Hardy, Chanda Phelan, Morgan Vigil-Hayes, Norman Makoto Su, Susan Wyche, and Phoebe Sengers. 2019. Designing from the Rural. *interactions* 26, 4 (2019), 37–41.
- [5] Lilly Irani, Janet Vertesi, Paul Dourish, Kavita Philip, and Rebecca E. Grinter. 2010. Postcolonial Computing: A Lens on Design and Development. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '10)*. ACM, New York, NY, USA, 1311–1320. DOI : <http://dx.doi.org/10.1145/1753326.1753522>
- [6] Lindah Kotut, Michael Horning, Derek Haqq, Shuo Niu, Timothy L. Stelter, and D. Scott McCrickard. 2018a. Tensions on Trails: Understanding Differences between Group and Community Needs in Outdoor Settings. In *Rural Computing Workshop at CSCW 2018*.
- [7] Lindah Kotut, Michael Horning, Steve Harrison, and D Scott McCrickard. 2018b. Opportunity in Conflict: Understanding Tension Among Key Groups on the Trail. In *HCI Outdoors Workshop at ACM CHI 2018*.
- [8] Lindah Kotut, Timothy L. Stelter, Michael A. Horning, and D. Scott McCrickard. 2020. Willing Buyer, Willing Seller: Personal Data Trade as a Service. In *Proceedings of the 2020 ACM Conference on Supporting Groupwork (GROUP '20)*. ACM, New York, NY, USA, 10. DOI : <http://dx.doi.org/10.1145/3323994.3369899>
- [9] D. Scott McCrickard, Michael A. Horning, Steve Harrison, Ellie Harmon, Alan Dix, Norman Makoto Su, and Timothy Stelter. 2018. Technology on the Trail. In *Proceedings of the 2018 ACM Conference on Supporting Groupwork (GROUP '18)*. ACM, New York, NY, USA, 365–368. DOI : <http://dx.doi.org/10.1145/3148330.3152161>
- [10] David W McMillan and David M Chavis. 1986. Sense of community: A definition and theory. *Journal of community psychology* 14, 1 (1986), 6–23.