
Ecovillages, Values, and Information Technology: Balancing Sustainability with Daily Life in 21st Century America

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Abstract

This project seeks to provide a rich account of the adaptive process that occurs as individuals with explicit value commitments interact with information technology. Specifically, ethnographic methods are being used to investigate the information technology adaptive process as it unfolds in the daily life of two ecovillages, communities made up of individuals striving to balance their use of technology with a lifestyle that is environmentally, socially, and economically sustainable. Anticipated research outcomes include: (1) an analytic description of information technology adaptive process; (2) a categorization of technological functionalities which support or constrain certain values, (3) an empirical extension of Value Sensitive Design, and (4) an analysis of the negotiation around tensions which emerge as a community's values influence the use of information technology features and, reciprocally, as information technology features influence a community's values. Most broadly this work contributes to our larger understanding of how the information technology adaptive process influences the human experience.

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Balance	Beauty
Compassion	Courage
Creativity	Curiosity
Empathy	Equality
Flexibility	Forgiveness
Generosity	Harmony
Health	Honesty
Humility	Humor
Inclusiveness	Inspiration
Integrity	Interdependence (on each other and the land)
Joy	Justice
Respect	Responsibility
Reverence	Simplicity/Frugality
Spirituality	Sustainability
Trust	Wisdom

Table 1: Raven ecovillage's consensed values. Note concern for social and economic sustainability issues (e.g., equality, inclusiveness, frugality) as well as environmental sustainability.

Keywords

Sustainability, Ethnography, Value Sensitive Design, Values, Adaptation

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI) [Miscellaneous]: K.4.0 Computers and Society [General]: K.4.1 Public Policy Issues [Ethics]

Introduction

Do interactive technologists and designers shape the human condition? According to Winograd & Flores "...in designing tools we are designing ways of being" [8, p. xi.] Their work suggests that telephones, radios, televisions, cell phones, and laptops are far more than bundles of predetermined functions. The tools that interactive designers create can become deeply embedded in our environment, entrenched in daily work routines, rooted in how we strengthen relationships with loved ones, and part of how we define and express our individual identities. Nardi & O'Day shift some of the responsibility to end users by claiming that it is possible for groups of individuals to consciously guide their use of and adaptations to information tools [5]. They claim that critical reflection on a group's values and goals can enable the group to actively direct the evolution of their information "ecology". Are information technologies contextually malleable? Is it the case that individuals attempting to live by a set of values can shape their use of information technology to better fit their local environment? This study investigates the negotiability of interactive technology through the following questions: (1) how do individuals explicitly trying to live by a core set of values adapt and adapt to information technology? (2) how do specific features of an IT

support and/or constrain community values? (3) how is tension negotiated by community members between explicit community values and individual goals as information technology adaptations take place over time? The data addressing these questions come from long-term, deep engagement in the daily life of an ecovillage. Drawing on the ethnographic tradition [2,7] as highlighted by Dourish [1],

Specifically, the project draws on Value Sensitive Design [3] to investigate the IT adaptive process as it occurs in two ecovillages, communities that have made a purposeful decision to live according to a set of core values while remaining active participants in mainstream American society. Phase 1 is a year-long period of data collection from a forming ecovillage. Findings from Phase 1 will be corroborated through comparison with data from Phase 2, a one-month investigation in a long-standing, established ecovillage.

Values, Technology, and Adaptation

This project was conceptualized from an interactional perspective, postulating that it is through interactions between the values of a social milieu and the features of a technological artifact that societal adaptations become manifest. The methodology of Value Sensitive Design keeps the interactional perspective salient by providing approaches that focus on: (1) the values of import to an individual or group of individuals, (2) the values implicated by use of a technology, (3) the features of the technology under study, and (4) the psychological, social and cultural influences of a specific context.



Figure 1: Example of alternative building material (cob) used to build bench and bread oven during ecovillage workshop open to the public.

Research Setting and Rationale

An ecovillage is an intentional community comprised of individuals who have chosen to live together with a common purpose: to support a set of shared values concerning environmental, social, and economic sustainability [4]. The ecovillage for this project, "Raven" (pseudonym), is particularly well suited for a value-oriented ethnographic investigation for the following reasons: (1) community members have reached agreement upon an explicit set of core values (Table 1), thus the community serves as a critical case example for investigating the role of values during the IT adaptive process [2], (2) community members are not separatists but rather want to serve as active role models of sustainability within mainstream Western society (Figure 1), and (3) there is a commitment to full consensus during decision making. The consensus process they use (Non-Violent Communication [6]) often requires long discussions, positioning the researcher to hear members' concerns without overly perturbing the process.

Phase 1 of this project consists of an ongoing year-long, ethnographic case study within a forming ecovillage in order to capture the IT adaptive process as members establish their information sharing practices. During this highly transitional time period the forming community is actively creating and refining their vision statement, purpose, goals, procedures, legal documents, and site plan while attempting to attract, integrate, and retain new members. The ecovillage for Phase 1, Raven, is located on 7.5 acres in a small city in the Pacific Northwest. As of this writing there are 16 adult members and 2 children. The goal is to expand to approximately 34 full members. Phase 2 of the project will take place in an ecovillage that has

been established for over ten years to provide a point of comparison for the findings from Phase 1. The site for Phase 2 is still in negotiation.

Ethnographic Methods

Role of Researcher

During the past two years the project researcher assumed a role similar to the frequent guests that visit the community, participating in a variety of community events (e.g. work parties, workshops, group dinners, and celebrations), but not contributing to discussions during weekly business meetings. Participation in these activities has nurtured a relationship of trust between the researcher and community members.

Data Collection

During the approximate 12 month duration of Phase 1 and the one month duration of Phase 2, data collection methods include: (1) participant observation of business meetings, work parties, community meals and celebrations, (2) informal and semi-structured interviews with adult members, (3) an anonymous survey of IT ownership and usage, and (4) artifact collection including images of information sharing mediums such as paper calendars, cork bulletin boards, along with copies of meeting agendas, minutes, proposals, handouts, pages from website, and the community listserv. To date, data consists of fieldnotes from over 150 hours of participant observation, over 50 informal interviews, an IT survey completed by 12 adult members, 5 audio recorded interviews, and weekly images of community message boards, community emails, handouts, and other artifacts.



Figure 2: Example of modified, reused mechanical technology. Refrigerator converted to a passive solar food drier. Note the lower panel angled off of the refrigerator is a heat collector, not a solar panel. Illustrates commitment to environmental, social, and economic sustainability.

Preliminary Analysis and Results: Resistant IT Paradigms, Saliency of Values, Awareness of Digital IT Environmental Costs

Ongoing analysis of the data includes coding interview transcripts, observation notes, and artifacts based on themes drawn from the project's research questions. Preliminary themes included: stated values of the ecovillage, individuals' descriptions of community's stated values, community decisions concerning IT, individual member's IT ownership and use examples, tensions between community consensed values and IT ownership and use. Themes are added and modified as they emerge during analysis.

Emerging Themes

Allowing for space constraints, a condensed list of three emergent themes is provided below, followed by examples from the data.

RESISTANT IT PARADIGMS: Members often state that they chose to live in community in order to receive and provide support for experimenting with new practices that are perceived as more sustainable (environmentally, socially, or economically) than current mainstream options. Indeed this is the case for the community across a range of mechanical tools. For example, a modern refrigerator was converted to a community owned passive solar food drier built during a workshop held on the property (Figure 2). For the community, the conversion models the three areas they are attempting to support through living together. First, the tool itself was modified to no longer require electricity to "run" (environmental sustainability). Second, the conversion required a group to work closely together, building relationships as well as modifying a tool (social sustainability). Third, the tool

supports the practice of storing the garden's summer harvest for winter use (economic sustainability).

Intriguingly, this finding does not appear to extend to information tools, digital or otherwise. Evidence suggests that for information technologies (especially the more technologically complex), less support exists for shifting use away from the mainstream paradigm. Often the ecovillage actually reinforces mainstream expectations and practices.

As an example of a digital technology paradigm that has resisted adaptation, consider the tacit expectation that all members have access to and check email at least once a week in order to receive village-critical information; business meeting agendas, proposals, and minutes. According to a key member of the steering committee, "email is much more efficient". Yet during each meeting there are now members who have not received the information because: (1) email was not addressed correctly, (2) attachments were missing, or (3) email was not read by recipient before meeting. When asked about their typical email use, members independently list many social, economic, and environmental concerns. Members have also heard from an individual who is unable to afford a computer and for over a year had to visit the local library to check email, often unable to print all the documents because of fees. However, there are no plans to change the practice of sharing village-critical information exclusively through email. To date, towards the end of their comments about email, each member that has participated in a semi-structured interview has stated a version of the statement: but email is how things are done today (e.g., "Every successful organization today uses email.") Note that



Figure 3: Information overload. Plastic ribbons denoting watering, weeding, and harvesting information.



Figure 4: Pervasiveness. Plastic ribbons "bloom" in garden.



Figure 5: Hidden costs. Bucket filled with worn plastic ribbon harvest, with a note asking what to do with them.

no other tool use is required for full participation in community decision making.

Resistance to change does not appear to be limited to digital information tools. For example, in the village garden a decision was made to use blue plastic ribbons tied to wooden stakes to mark beds that needing daily watering. Soon, other colors were used to mark beds for: 1) different watering requirements, 2) harvesting, or 3) weeding (Figure 3). At the peak of the growing season, multi-colored plastic ribbons were pervasive across the garden and members began complaining that instead of a breath-taking garden at the peak of harvest, their view was a field of multi-colored plastic ribbons flapping in the wind (Figure 4). At the end of the season, the ribbons were removed, but there was no place to put them but the trash (Figure 5). The ribbons were too ragged to be reused for another purpose and were not recyclable. Members are still trying to figure out a way to asynchronously communicate information in the garden in a manner that they feel is sustainable, but continue to conceive of the tool as something tied, stapled, or painted on a stake.

VALUE SALIENCY: Although the community spent months creating, modifying, and finally reaching consensus on a list of core values, they view the work of manifesting these values as a challenge that they are just beginning to face. A specific illustration of the difficulty in making values salient arose from the weekly business meetings. During these gatherings, various proposals are brought forward for consideration, modification, and possible approval through consensus. Through the proposal process, members are constructing the foundational structures of their ecovillage, from the

legal framework to the specifics of food production. Over the past few months, a concern has grown that a number of previously passed proposals were in conflict with the community's values. A decision was made to make the values more salient during the decision making process. To address this issue, large pieces of paper were printed listing community values, principles and actions. When a new proposal is put forward during a business meeting the value tables are literally put on the floor in the middle of the room (Figure 6). The meeting facilitator asks the group to speak to how the proposal supports or conflicts with community values. It remains to be seen whether the practice will be modified, the practice drops out of favor, or the practice is deemed helpful in making values salient during the decision making process.

AWARENESS OF ENVIRONMENTAL DIGITAL IT COSTS: How does the carbon footprint of 1 person printing out 16 copies of a document compare to 16 people booting up 16 computers and monitors, using remote servers, and perhaps each printing out a copy of the document? During Raven business meetings, this topic has not arisen. Although members are attempting a significant lifestyle change based on their concern for sustainability issues, when it comes to modern IT prevalent in North America (e.g., cell phones, personal computers, printers), awareness of the environmental issues of IT appears to lag behind that of other technologies. Community members share ownership of an electric car, glean fruit from abandoned lots, re-use lumber, pick-up discarded produce from the local co-op for composting, and have logged hundreds of hours researching alternative energy sources, building materials, and building designs. However, I have not found evidence of similar efforts in terms of exploring

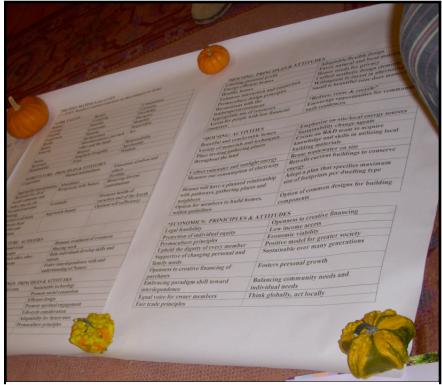


Figure 6: Tables of values shown displayed on the floor during discussion of a new proposal. Garden produce used to hold down the pages.

the environmental effects of or finding alternatives to digital information tools.

Future Work and Anticipated Contributions

Future work consists of approximately six more months collecting and analyzing data from Raven, continuing to add to and iterate on themes. Preliminary findings from Phase 1 will be corroborated during Phase 2, specifically investigating whether or not there is evidence to support the claims that: (1) information tools are particularly resistant to changes in practice, (2) if not made salient, values are often forgotten during the decision making process, and (3) that there is less awareness in terms of digital IT environmental issues. Findings from Phase 1 and 2 will be drawn upon to develop an analytic ethnography [7]. The ethnography will report on how ecovillage members balance (or not) their information technology ownership and use with their community's shared values.

Anticipated research contributions include: (1) a rich description of the IT adaptive process at it unfolds in two ecovillages; (2) a categorization of IT functionalities which more readily support or constrain certain values; and (3) an analysis of tensions which emerge as a community's values influence the use of IT features and, reciprocally, as IT features influence a community's values. Most broadly this work extends Value Sensitive Design and contributes to our larger understanding of how the information technology adaptive process influences the human experience.

Humans adapt values, behaviors, and social structures to the environmental conditions we create through our tools. However, whether we are able to guide the adaptive process through explicit choice is not clear.

Most broadly, it is hoped this work will make that process more transparent.

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