

**Value Considerations in an Information Ecology:
Printed Materials, Service Providers and Homeless Young People**

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We demonstrate how value considerations can be used to analyze an information ecology that has emerged to help homeless young people. We studied the information ecology of service agencies that assist homeless young people, age 13 to 25. We focused on printed materials used at the agencies and employed surveys and semi-structured interviews to gather data. Of the printed materials considered, a flier with a map of all programs was reported to be most important and distributed most frequently. Future work would further investigate distribution and usability of these portable information sources and the values they embody.

Introduction

Ensign (2003) found that firsthand accounts can provoke strong emotions and curiosity about the culture of homelessness. For example, consider the following account, "I was soon kicked out of the house; my family who I loved to no end could no longer support me no matter how hard I tried to make it a light job. And in my heart, I knew that my brother and sister deserved the attention that I had robbed from them when my parents were so preoccupied with my mental problems and my drug addiction" (Lucky, 2007).

The circumstances of homeless young people age 13 to 25 are particularly troubling. Research by Wingert, Higgett & Ristock (2005) showed that these individuals are negotiating the transition from child to autonomous adult as well as coping with issues such as mental illness, drug addiction, and physical/emotional abuse. Wingert, et al. (2005) also revealed that many of these young people leave home before acquiring the resources necessary for employment (e.g., a fixed address, identification, and education), and so engage in a day-to-day struggle to meet basic needs of food, shelter and safety. This struggle can lead to illegal activities, which then lead to criminal histories and increased risk of victimization. These circumstances make it ever more difficult for homeless young people to become autonomous adults and transition out of the homeless state.

As researchers and designers of Information Systems, how might we apply our "know-how" to improve the day-to-day lives of homeless young people? To answer this question we needed to answer a more fundamental question: How should we define the purpose of our research? That is, the "know-what" as discussed by Norbert Wiener (1950), so that we would know "not only how to accomplish our purposes, but what are purposes are to be" (p. 210)? In fact, the contribution of this paper is to show how value considerations can be used to analyze an information ecology that has emerged to help homeless young people. Through this analysis and process of appreciating the information ecology, we become clear on our purposes, which must be understood before we can propose technological solutions of any kind. Otherwise, we risk damaging, rather than improving, the lives of homeless young people.

We begin this short paper, which provides a proposal for a poster presentation, by introducing the information ecology of the Homeless Youth Alliance (HYA) and the value sensitive design research approach. Then, we present initial results. Lastly, we discuss how these results could lead to improvements in HYA's information ecology.

The Information Ecology of HYA

According to Nardi and O'Day (1999), an information ecology is "a system of people, practices, values and technologies in a particular local environment" (p. 49). The HYA, a pseudonym for the collaborating organization in this work, consists of nine interconnected service agencies that strive to improve the lives of homeless young people age 13 to 25. These agencies provide a range of services for young people including shelter, food, drop-in programs (e.g., using hygiene resources, congregating for recreational activities, and so on), healthcare, counseling, case management, educational assistance, and arts programs. Eight of the nine service agencies are located within an eight-block area (walking distance). The locations and hours of operation of the agencies, which are staffed with a few paid staff and many volunteers, vary from day to day, partly because of limited space availability at churches, clubs and other hosting organizations. Recognizing the autonomy of the service agencies, lack of top-down control, and notably the importance of agency-specific leadership, we decided to represent this system with the information ecology metaphor.

Each agency promotes the services of the others by providing brochures, maps and other printed materials that are displayed at each service location (Figure 1, 2 and 3). Thus, homeless young people can become familiar with all the alliance's full range of services by accessing individual agencies. How homeless people move through the network of services is unknown, but the availability of the printed materials and oral communication between the homeless young people, staff, and volunteers is undoubtedly crucial. So, the printed materials and the interactions surrounding them provided the focus for our research.

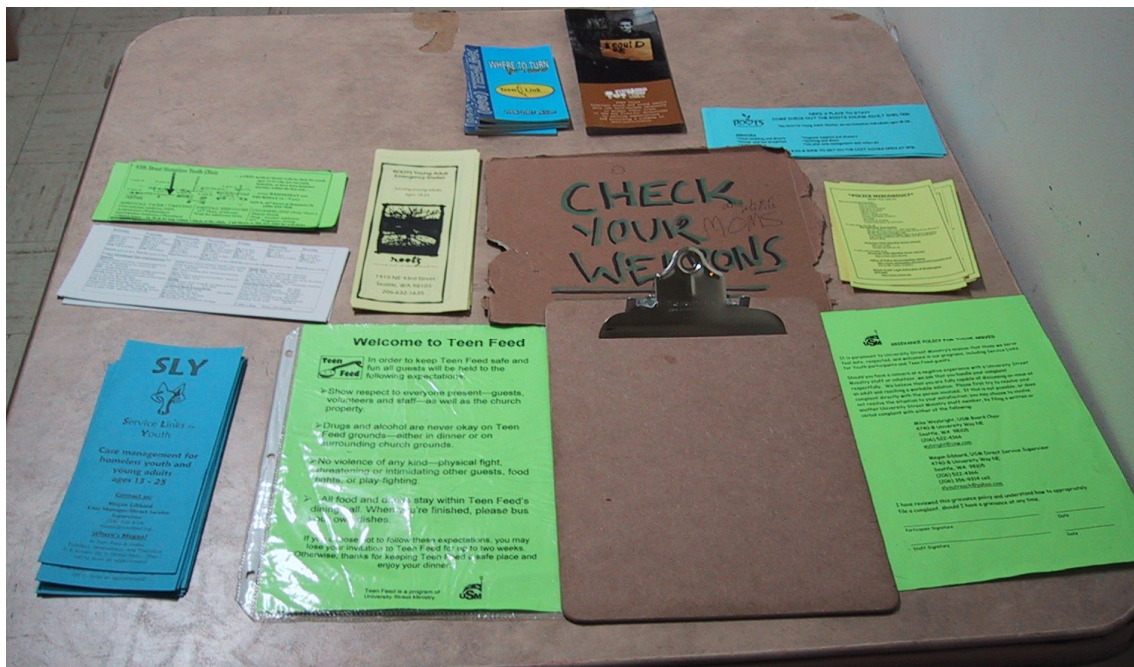


Figure 1. Temporary, self-service displays are more common



Figure 2. Permanent, self-service displays are less common.



Figure 3. Graffiti on this sign lists weapons (e.g., big muscles, knives, bat). By continuing to display this sign, staff show respect for the autonomy of the homeless young people.

Value Sensitive Design Research Approach

Drawing on Friedman's (2004) formulation of Value Sensitive Design, we sought to develop a basic understanding of the structure and operation of this information ecology. As part of our conceptual investigation, we analyzed the direct and indirect stakeholders, shown in Table 1.

Table 1. Direct and Indirect Stakeholders

Direct Stakeholders	Indirect Stakeholders
Homeless young people	Program donors and funders
Service agency staff and volunteers	Community members, including home and business owners
	Hosting organizations, including churches and clubs
	Government agencies, including city county, state and federal agencies
	People with sanctioned interest, including relatives and caregivers of young people
	People without sanctioned interest, including pimps, drug dealers and pedophiles

This work led us to recognize the importance of the indirect stakeholders, those people who are significantly affected by the information ecology but do not interact directly with it. This raised a key question. Perhaps, we conjectured, the information ecology has evolved to address the constraints that are imposed by the indirect stakeholders. For example, the ecology is the way it is because it must i) Draw in volunteers, but ii) Present a low profile to business owners who may be hurt by the presence of homeless young people, but also iii) Resist people with malicious goals, such as pimping or drug dealing.

Orienting Considerations

At the outset of this project, we participated in Homelessness 101, a course taught by the Executive Director of the HYA. Reflecting on what we had learned, the values of the stakeholders, and our responsibility as researchers, we decided that it would not be feasible to make a meaningful change to the information ecology and to evaluate its impact. The following issues led to the decision not to instigate changes before our purpose was well understood:

- As demonstrated by Ensign (2003) and Wingert et al. (2005), the vulnerability of homeless young people is widely recognized, and heightens the responsibility to do no harm to homeless young people.
- Identification of a specific client was difficult due to the autonomy of each of the service agencies, and the agencies' complex interrelationships.
- Problematic engagements between service agencies and inexperienced researchers have occurred in the past. Time and care were needed to establish and maintain a sound working relationship.
- Appreciation of the virtues of the information ecology was key. The impact of our design decisions would be "widespread, emergent, and intricately linked to other changes in society" (Nathan, Friedman, Klasnja, Kane & Miller, 2008). So, we resisted drawing conclusions before the ecology was understood.

Research Questions and Methods

We decided to ask three types of questions based on Friedman's (2004) core methodology of Value Sensitive Design:

- Technical investigation - What is the structure and purpose of the printed materials? To answer this question, we inventoried the printed materials from four of the service agencies and analyzed them.
- Conceptual investigation - Who are the stakeholders and what are their values? To answer this question, we sought to describe how the values of trust, autonomy, and human welfare (reported in the literature) were represented by stakeholders, in the printed materials, and in agencies' mission statements.
- Empirical investigation - Given the technical and conceptual investigations, how are the values represented in the actions and beliefs of the direct stakeholders? To answer this question, we developed anonymous surveys for homeless young people and service agency staff/volunteers and semi-structured interviews for staff.

Results

With these orienting considerations and research questions in mind, we proceeded with our investigations and analyzed the results.

Technical investigation – Printed Materials

In conducting an inventory of the printed materials at four of the nine service agencies, we collected and photographed 250 paper fliers, signs, and brochures. While we did not perform a systematic usability analysis of the materials, some usability issues were immediately obvious. For example, materials lack a common style: maps are not formatted in a consistent comprehensible manner, and materials are displayed in various arrangements from one location to another and one day to the next. Furthermore, the printed materials are not always written specifically for the needs of the homeless young people (e.g., the literacy level is too high, and some of the materials

are written for indirect stakeholders such as donors or community members). Of the 250 printed materials, eight canonical materials - which we termed cornerstone materials - were selected for further analysis (Table 2) and were then used in the conceptual and empirical investigations.

Table 2. These cornerstone materials were selected using the following criteria: Provides overview of agencies' services, Covers transitional activities (e.g., getting identification), Appears most frequently in service agencies' displays, Prominent in displays (i.e., center)

Cornerstone Material Title	Description
Services Flier	Provides a map and schedule (time, location) for all nine agencies' services
Case Management Brochure	Explains how to get a case worker and how they help homeless young people
Basic Food Flier	Explains the state run food stamp program
Working Program Brochure	Describes 10 week internship programs and how to apply
Medical/Dental Clinic Flier	Provides a map and schedule (time, location) for the clinic
Emergency Shelter Brochure	Provides program rules, a map and schedule (time, location) for the shelter
Art/Music Program Flier	Provides a map and schedule (time, location) for the program
Dinner Program Flier	Provides program rules, and schedule (time, location) for the program

Conceptual investigation – Stakeholder Values

The interests of direct and indirect stakeholders with regard to the eight cornerstone materials were analyzed in order to elucidate the values represented by these printed materials. Values were seen to fall into three categories focused on human welfare as defined by Friedman & Kahn (2003). Physical Welfare – Four of the eight materials describe programs concerned with basic human needs (i.e., food, shelter, medical, etc.). Material Welfare – Two of the eight materials describe programs that assist homeless young people in their search for employment. Psychological Welfare – Four of the eight materials describe programs that link homeless young people with mental health resources or encourage them to become involved in artistic endeavors. In addition, an analysis of the mission statements of the nine service agencies showed that the need to honor the autonomy of the homeless young people and to build trust-based relationships are among the predominant agency values. In summary, this work showed that human welfare, autonomy, and trust are key values of the service agencies.

Next, we asked ourselves if these values are also held by homeless young people and found a key study confirming that they are:

- Human Welfare – “As documented in the literature, once on the street, meeting basic needs becomes the primary goal for most youth” (Wingert et al., 2005, p. 75).
- Autonomy – “Youth portray themselves as agents, not victims. Service providers who were perceived as not respecting the autonomy of street involved youth were often avoided unless absolutely necessary” (Wingert et al., 2005, p. 76).

□ Trust – “The results of this study suggest that homelessness is the outcome of a process whereby youth increasingly become disconnected from the systems [that] support them, such as family, school, and community” (Wingert et al., 2005, p. 75).

Clearly, these three values are shared by the service agencies and homeless young people. It is also clear that the value of human welfare is instantiated in the printed materials and service agency missions. How does the information ecology support these values? This question led to the empirical investigation.

Empirical Investigation – Anonymous Surveys and Semi-Structured Interviews

Two anonymous surveys were distributed at four of the service agencies. The first survey was completed by homeless young people. Fifty-four surveys were returned and analyzed. The survey, which was one page long, focused on practices and contained questions regarding age, last year completed in school, and the order in which the service agencies were accessed. The results of this survey showed that the young people ranged from 18 to 32 years old with an average age of 20. (Due to time constraints for human subjects approval, no one under 18 could be surveyed or interviewed.) The average grade completion was 11th grade with a range from 8th grade (the grade just prior to high school) to 14th (completion of high school and two years of college). About 15% of the young people accessed the programs in the order of shelter, dinner, and then drop-in and 80% reported making first contact with one of these three programs.

The second survey was completed by staff/volunteers and 53 surveys were returned and analyzed. The goal of this survey was to determine which of the printed materials were most important and most frequently distributed to direct and indirect stakeholders, how they were distributed, and how they could be improved from the service providers’ perspective. The results of this survey showed that the services flier, which has a map with hours and locations of all the agencies’ programs, is considered most important and distributed most frequently to direct and indirect stakeholders. In response to a question regarding potential changes to the materials, most often mentioned are maps on the materials, material size, and readability (Table 3). Respondents also suggested that displays could be re-organized by subject, or that a fixed place for each of the materials would make them easier to find. Staff and volunteers also believe that face-to-face communication between young people is the most common way that those who are new to the area find out about service agency programs.

Table 3. Two Important Cornerstone Materials’ Usability Findings and Values

Cornerstone Material Title	Usability Finding	Values Represented
Services Flier	Negatively affected by map and key of agency acronyms	Human welfare, Autonomy
Case Management Brochure	Negatively affected by lengthy text which accounts for the needs of indirect stakeholders rather than the needs of homeless young people	Human welfare, Trust

Finally, we conducted semi-structured interviews with three staff people, asking questions about usability of materials, how they are displayed, and how they prompt conversations with homeless young people. The results from these interviews are

consistent with the results of the anonymous surveys. In addition, we learned that young people rarely use the self-service printed material displays without assistance. Rather, because many of the materials are designed for indirect stakeholders (e.g., potential donors), staff hand out materials and help young people understand them.

Design Options

This research has uncovered three increasingly complicated levels of intervention. First, the usability of individual printed materials could be analyzed and improved. For example, the presentation of the maps and operating schedules could be improved. Second, the distribution of the materials could be improved through the use of consistent schemes for organizing and displaying the materials. A key constraint is that these schemes need to be portable but also flexible enough to handle the needs of different service agencies (e.g., temporary vs. fixed location). Third, a more substantive approach would use participatory design methods to develop a print architecture. To be successful the architecture would need to re-conceptualize the complete set of printed materials, their content, format, organization and display, extensibility, sustainability under conditions of limited funding, and reuse and versioning. One perspective on this architecture, which captures the values of human welfare, trust and autonomy, is presented in the following use scenario.

Use Scenario – Mike Feels Better

Mike is feeling better. He arrived in the neighborhood recently. He likes being independent but he doesn't feel safe sleeping outdoors. A cop and a lady with a little girl glared at him as they walked by him on the sidewalk, so he didn't want to ask them for help. He hung out at the bus stop with some kids who told him about the shelter. He got a bed for the night, ate dinner and breakfast, and got his clothes washed. The staff person also gave him a small packet with cards that homeless kids had helped design. The packet fits in the pocket of Mike's backpack and the cards are easy to read. One of the cards has a map of the area and the other cards refer to the map and have information about drop-in programs and a place to get dinner every night of the week. There were also cards about education and arts programs that he could pick out of a display on the wall. When Mike left the shelter, he knew where to go that afternoon for drop-in and for dinner. It was great to know that he had a choice about being outside all day.

With this first iteration of the research complete, it is now possible to more clearly see several potential purposes. Yet, no matter what direction this work takes, it is important to leverage current practices and to honor the shared values of human welfare, trust and autonomy that are facilitated and sustained through the current information ecology.

Next Steps

Value considerations allowed us to analyze and form an appreciation for the information ecology and develop a perspective regarding our purpose. Moving forward, we plan to study the most salient aspects of the information ecology that this work has begun to shape. Use scenarios will aid our investigations, but value scenarios as defined by Nathan, et al. (in press) will be more helpful as we consider the needs of indirect stakeholders and try to assess the impact that changes to the information ecology may have over time. Finally, we intend to continue our work and to address issues raised by our orienting considerations.

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References

- Ensign, B. (2003). Ethical issues in qualitative health research with homeless youths. *Journal of Advanced Nursing*, 43(1), 43–50.
- Friedman, B. (2004). Value sensitive design. In W. Bainbridge (Ed.), *Berkshire Encyclopedia of Human-Computer Interaction*, vol. 2, 769-774. Great Barrington, MA: Berkshire.
- Friedman, B., & Kahn, P., Jr. (2003). Human values, ethics and design. In J. Jacko and A. Sears (Eds.), *The human-computer interaction handbook: Fundamentals, evolving technologies, and emerging applications*, 1177-1201. Mahwah, NJ: Lawrence Erlbaum Associates.
- Lucky (2007). *Cold Summer [Msg 200]*. Retrieved November 22, 2007, from http://home.roaddawgz.org/stories/view_article.html?article_id=c507877cdc563cba496af46ae4cad6a4&this_category_id=200
- Nardi, B., & O'Day, V. (1999). *Information Ecologies: Using Technology with Heart*. Cambridge, MA: MIT Press.
- Nathan, L. P., Friedman, B., Klasjna, P. V., Kane, S. K., & Miller, J. K. (2008). Envisioning systemic effects on persons and society throughout interactive system design. Proceedings of the *ACM Conference on Designing Interactive Systems (DIS'08)*.
- Wiener, N. (1950). *The Human Use of Human Beings: Cybernetics and Society*. Boston, MA: Houghton Mifflin.
- Wingert, S., Higgitt, N., & Ristock, J. (2005). Voices from the margins: Understanding street youth in Winnipeg. *Canadian Journal of Urban Research*, 14(1), 54-80.