
Designing Tools & Services For Gleaning In Food Systems

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Abstract

Gleaning is the practice of salvaging food left over from its intended use. In this proposal we present research into the activities of gleaning with an emphasis on the tools used in gleaning. From this research we identify a series of design opportunities. Perhaps the most fertile opportunities are related to socio-technical networking: the processes and infrastructures for providing information about the availability of food for gleaning and access to the actors who can move and store gleaned food. This workshop brings together researchers and practitioners in public policy, logistics, agriculture, health, design, social justice, and HCI for development to collaborate on the design of tools in the U.S. and abroad.

Author Keywords

Gleaning; food systems; food insecurity; ethnography;

ACM Classification Keywords

Human factors; design;

Introduction

In 2013, an estimated 14.3% of Americans had inadequate access to food sufficient for an active and healthy life [2]. Yet 31% of the food supply at the retail and consumer levels went uneaten [1]. This imbalance suggests inefficiencies in how the country's food

systems are managed on an institutional level. On an organizational level, food banks and similar entities are effective at reducing food insecurity by diverting some of the safe, edible food that would be wasted by grocers and restaurants to the organizations' food-insecure clientele. However, these services are limited by their operating capacity. On an individual level, people who pick up already wasted food from dumpsters and bins are limited by their means of transportation, knowledge of what food is still edible having been thrown away, and the social stigma of dumpster diving. These efforts by both organizations and individuals are known generally as "gleaning," "food recovery," "food rescue," or "food salvage." This variation in terminology is evidence of a spectrum of perspectives and activities. In this paper, "gleaning" refers to practices of salvaging food left over from its intended use.

Gleaning has long been a common post-harvest activity, where seasonal farm cycles would signal locals to glean leftover crops from the fields. Today over 80% of Americans live in urban areas, away from not just the fields that produce food, but from the grocery stores that distribute it; over 11 million people in these urban areas live in "food deserts"—low income areas where access to large grocery stores is limited [12]. As our food systems take shape in more urban contexts, it becomes more appropriate to consider gleaning as a post-distribution activity.

Related Work

Over the past decade there has been an increased interest in food and food systems within the human-computer interaction design community. The approaches to food and food systems are diverse,

expressing the pluralism of the HCI community. We situate our research in relation to work on food waste [3,7–9] and food justice [5,10]. Gleaning is a practice of making use of food waste, or rather, of keeping food from becoming waste through inventive means of recovery and use. To date, most studies of food waste and practices and tactics for recovering food waste have emphasized the domestic sphere and individual or small group dining [3,5,6,9]. Our work adds to that by exploring practices, tactics, and opportunities for food waste recovery at two other scales: the scale of the individual gleaner and institutional/organizational gleaning.

In addition, we draw inspiration from work exploring issues of food justice, or the intersection of food and food systems and social justice [4,5,10]. As became apparent through our research, so much of the activities of gleaning are rooted in beliefs about sustainable and fair distribution and redistribution of resources. For many, gleaning is a way to work against injustices in the food system and contribute to the food security of a community. As such, emerging research at the intersection of food justice and HCI continues to motivate our work.

Among other literature reviewed, there was no research that modeled the complex interactions between actors, policy, and the food itself. Without better understanding how these factors interact and conflict, we are left with an inadequate picture of the design space for gleaning, which would seem to be a promising practice for addressing some issues in community food systems. Our research, then, was motivated by a hope to articulate this design.

Design Implications

The problem space framed by this survey is the disparity between food access and food production. Gleaning has long been an existing solution that salvages surplus, but it could be improved by better designed tools and services. Existing tools have largely been relatively simple digitizations of previously non-digital technologies, like maps and information repositories. Many have also leveraged internet and inter-community networking technologies to increase the accessibility and speed of gleaning.

The problem with gleaning network technologies in Atlanta is not the quantity of food to glean, people to mobilize, or places to find food, but the availability of each of these at certain times. More abstractly, there are issues and inefficiencies in node discovery and path cost optimization. Food is the information being shared in a peer-to-peer (P2P) food network, where nodes are actors and organizations that face some cost of moving food between each other. The proliferation of peer-to-peer civic technology [13] suggests there could be systemic optimizations in a digitally mediated network and user-centered design opportunities to contextualize the system to a public. In order to entice people to join this network, the participants seemed to rely on strong philosophical convictions to participate in food systems this way, as well as getting a cut of the gleaned items. They may have direct access to the gleaned items via traditional gleaning and dumpster diving, common sharing spaces, or organizations' programs.

CropMobster and Food Not Bombs are constrained by geography and tight personal networks, respectively. Mesh networks [11] could eschew these constraints while preserving many of their benefits. For example,

the messaging application FireChat uses a topology that accounts for a dynamic set of available peers to move information. As peers join and leave FireChat's network, each message is still able to hop through them until it reaches its intended recipient. Similarly, a reliable set of organizations like food banks and their contacts form a predictable, semi-permanent network, whereas actors like dumpster divers and occasional volunteers provide more ephemeral connections within the network.

In addition to timing, mobilizing people in the first place could scale more easily if trust and education issues were resolved. Dumpster diving and explicitly leaving food out to be gleaned tend to raise suspicion, borne out of legal and safety precautions. However, as the participants and literature have related, these suspicions are poorly founded and at times counter-productive to gleaning practices of community food security. By raising awareness through more widely trusted channels, like social media and more direct forms of ICT, it may be possible for a hotter medium to educate and engage non-gleaners. For example, a service that suggests picking up food from a common gleaning source and moving to a common destination, both on or near a route they frequent, would both directly contribute to gleaning efforts as well as more comfortably introduce non-gleaners to the practice.

This Workshop

In this workshop we will first discuss this research into the practices of gleaning in Atlanta, with an emphasis on the tools used in gleaning and how those tools work to structure a socio-technical system of exchange. From this research, we will then seek insight from attendees to identify and articulate issues in contexts

other than Atlanta and opportunities for design interventions.

The most common issues in Atlanta are related to networking, particularly in discovering new sources and destinations of food and the capacity and availability of actors to move food between them. Since food gleaning sources (e.g. restaurants) and destinations (e.g. food pantries) are rarely co-located in the U.S., moving food is almost always necessary and often occurs in amounts that require a vehicle. This leads to another issue of being unable to access proper means of transportation, leading to food waste even when the people involved intend to salvage it.

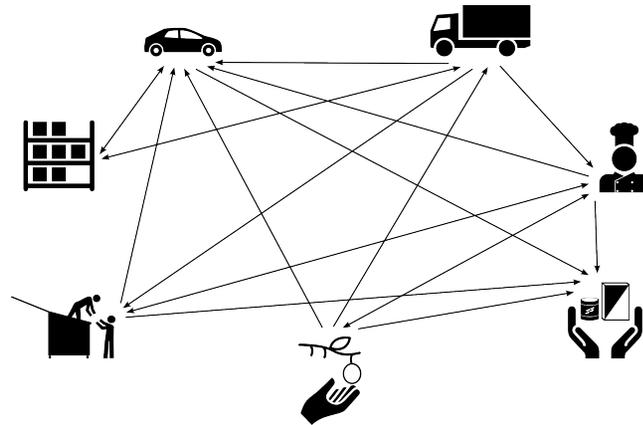


Figure 1: Flow direction of food between activities involving gleaning, clockwise from top-left: small-scale transportation, large-scale transportation, preparation for consumption, food pantries, post-harvesting (traditional gleaning), dumpster diving, and storage.

We would particularly like to seek extant instances of such gleaning systems in operation in developing countries. One example is Mumbai, India's "Share My Dabba"¹ initiative, where the extremely efficient food deliverers (*dabbawalas*)² give leftovers from *dabbas* (food containers) marked with "share" stickers to food-insecure children. Another example is the open-source Kenyan crisis mapping platform "Ushahidi" that has significantly addressed key information gaps in Kenya and other countries. From these developing world innovations in food recovery and networking, we seek ways that issues have been handled with limited resources, as is the case for many gleaning programs in the U.S.

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1 <https://www.youtube.com/watch?v=EZC1czZofyY>

2 <https://www.youtube.com/watch?v=ftkGDXRnR9I>

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