THE FOOD SYSTEM:
INNOVATION AND TECHNOLOGY

HOW CAN TECHNOLOGY HELP THE FOOD SYSTEM?

NEW YORK CITY FOOD POLICY CENTER AT HUNTER COLLEGE

This report is the first in a series about innovation and technology
in the food system.

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About These Reports

About the New York City Food Policy Center at Hunter College

The New York City Food Policy Center at Hunter College develops intersectoral, innovative and evidence-based solutions to preventing diet-related diseases and promoting food security in New York City and other urban centers.

The Center works with policymakers, community organizations, advocates and the public to create healthier, more sustainable food environments and to use food to promote community and economic development. Through interdisciplinary research, policy analysis, evaluation and education, we leverage the expertise and passion of the students, faculty and staff of Hunter College. The Center aims to make New York City a model for smart, fair food policy.
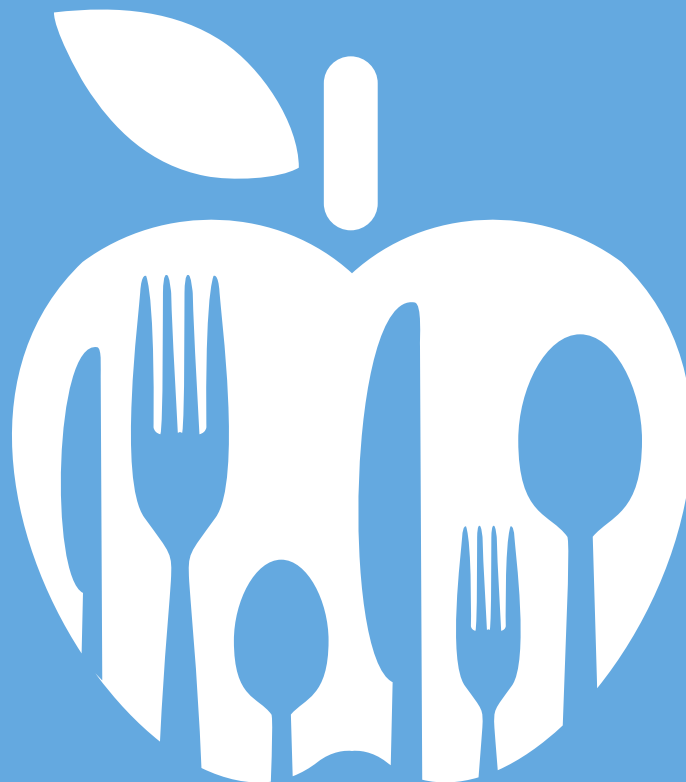
Goals

The goal of this report is to inspire readers — including academics, researchers, community-based organizations, funders, social entrepreneurs, policymakers, government agencies and others involved in the food movement — to think about innovative, technological ways to overcome the challenges facing the food system. These challenges include food insecurity (i.e., hunger), access to healthy food, food waste, food safety and food-related chronic diseases.

By describing the ways that technology has been used to find new solutions to long-standing food system problems and by identifying areas where technological development is lagging, the New York City Food Policy Center at Hunter College hopes to also encourage those in the tech industry to partner with food system influencers to drive increased innovation in this important sector.

This report focuses on food insecurity and is the first in a series of five reports the Center will release over the next six months.

Subsequent reports include:

- Feeding an Urban Population (e.g., Food Deserts, Logistics, Urban Agriculture)
- Food Waste
- Food Safety
- Nutrition and Diet-Related Chronic Diseases

Because the Center's focus is New York City, these reports highlight challenges faced by urban food systems. However, the reports provide examples from a varied set of technological food system innovations nationally and internationally as well. Food system challenges specific to countries that are primarily rural are outside the scope of these reports.

> *The goal of this report is to inspire readers to think about innovative, technological ways to overcome the challenges facing our food system*

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Methodology

This review was conducted by triangulating searches for food- and technology-related keywords across Google Scholar, Google and PubMed between July and November 2016.

The research team met to discuss potential search terms. Due to the rapidly changing nature of the tech world, articles published in 2012 or later were prioritized, and in some cases, secondary sources, such as newspaper articles, were the only sources of available information about an app other than a product's website.

Search terms:

- Food system–related search terms included: *food; nutrition; food system; food policy; food insecurity; food security; food assistance; food bank; food pantry/pantries; EBT; SNAP; WIC; agriculture; urban agriculture; food desert; food hub; food logistics; farmers market; grocery; food waste; food recovery; food safety; obesity; weight loss; meal planning; diet tracking; nutrition tracking; nutrition promotion; diabetes; etc.*

- Technology-related search terms included: *technology; mobile; application; internet; online; web; software; mHealth; big data; crowdsourcing; internet of things; sharing economy; social media; Facebook; Twitter; Instagram; YouTube; GIS; smartphone; text messaging; SMS; etc.*

For identified peer-reviewed literature:

- Research manuscripts were reviewed for relevant points including background and outcome data

- Reference lists were reviewed to identify additional sources

- Google Scholar's "cited by" feature was used to review citations from other peer-reviewed journal articles or reviews.

For identified apps, websites and other forms of tech:

- Apps and websites were evaluated to identify key features and review basic usability; whenever possible, team members downloaded and tested the apps

- Google searches for product names helped identify related articles and available outcomes

- Google Scholar searches for product names helped identify any research on a particular app or other technology's feasibility or efficacy

- App store reviews and comments were briefly evaluated

- In some categories, there were numerous apps, many of which were similar; those apps deemed by the research team to have stand-out features, significant reach or a unique draw were highlighted

How to Navigate This Report

This report is intended for audiences with various levels of knowledge about the food system, in all its complexity. Background information about food system issues, controversies, programs and challenges is provided to give context to discussions about existing technologies and the need for future innovation; however, this basic information is likely not necessary for all readers. Please use headings to navigate the report, skipping Background, Research and Statistics sections as desired.

Readers may also use the following icons to jump to sections relevant to their interests:
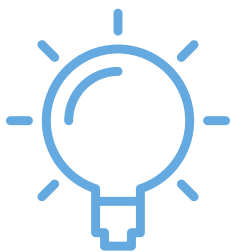
Tech Innovation:

Discusses innovative apps or other technology that addresses a food system challenge.

Innovation Needed:

Presents a food system challenge where technological development is lacking; new ideas and innovation could prove beneficial.
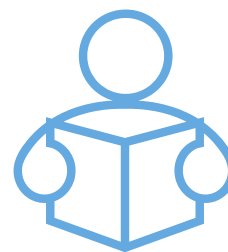
Learn from Other Fields:

Highlights technology used by other industries that may be used as a model to address a food system challenge.

For readers unfamiliar with technology terms, phrases and concepts, please see Appendix 1 for definitions and explanations.

Technology as a Force for Change

The digital revolution over the past 25 years has transformed the way people communicate, learn, conduct business, purchase goods and obtain information.[1-5] Industrialization, urbanization and market globalization have led to significant shifts in lifestyle, eating behavior and food choices worldwide.

Trends in technological innovation have created an insatiable desire for high-tech solutions to daily problems. Modern technology, most of which can be classified as "digital," incorporates the use of software, web and mobile applications, plus devices and hardware that help users complete a task or solve a problem.

Technology can make processes and workflows more efficient in a variety of ways. Technology can streamline tedious or complex processes, including the collection of data, which can then be used to inform and automate decisions. Furthermore, the design and development of the internet and the creation of networks between individual computers allow billions of users to connect and share information.

Internet access (via a computer, smartphone, tablet, e-reader, etc.) provides an essential means of communicating, connecting, learning and, increasingly, performing day-to-day activities, such as banking, research, shopping and entertainment.

The ability to instantaneously look up information on any comprehensible topic has sparked what many deem an "information revolution."[6]

Current Stats: Mobile Phone, Smartphone, Internet and Social Media Use

Mobile technologies and the internet are becoming increasingly ubiquitous; in 2000, an estimated 738 million people used the internet. By 2015, that number increased over 7-fold: a total of 3.2 billion people used the internet globally (2 billion of whom live in developing countries).[7]

In the United States, as of 2015:

Adults have high rates of **mobile/smartphone ownership** and technology usage:[8-10]

92% have a Mobile Phone

84% use the Internet

68% have a Smart Phone

65% use Social Media
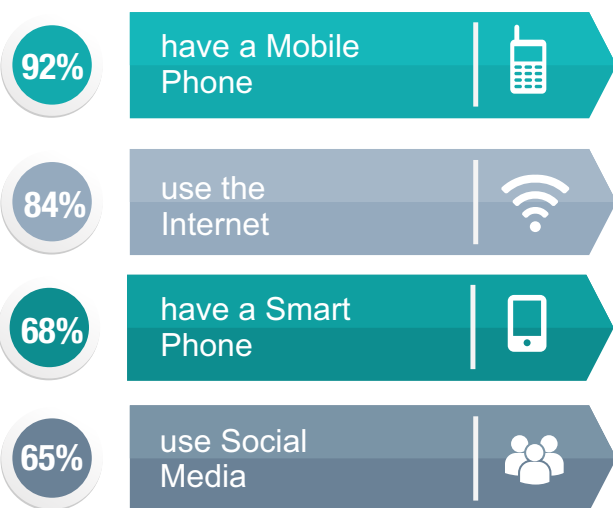
Minorities have high rates of **smartphone ownership**:[11]

71% of Hispanic adults

70% of non-Hispanic black adults

61% of non-Hispanic white adults

Technology is expanding its reach in older poulations as well. **Among adults** older than **65**:[10,11]
- **58%** use the internet
- **27%** own a smartphone

However, these numbers vary significantly by household income bracket:
- Of seniors with household income of **$75,000 or more**, **90%** use the internet, while among seniors earning **less than $30,000**, only **39%** use the internet[12]

Of **individuals** who use the **internet** and **smartphones**, **72%** and **52%**, respectively, have gone online or used their phones to **seek health or medical information**[11]

Globally, as of 2015:
- **32%** of the population use mobile phones[13]
- **46%** of the population use the internet[14]

Smartphone Use in Underserved Populations

With the decreasing prices of smartphones and pay-as-you-go data plans, an increasing number of individuals are using mobile technologies to connect to the internet. In fact, for many Americans, smartphones have become the least expensive way to access the internet.
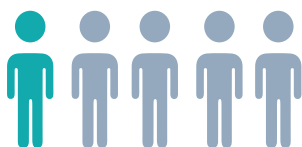
One in five adults rely on **smartphones** as their primary means of accessing the internet **and 7% have no alternative** for going online, a group referred to as **"smartphone-dependent"** users by the Pew Research Center.[11]
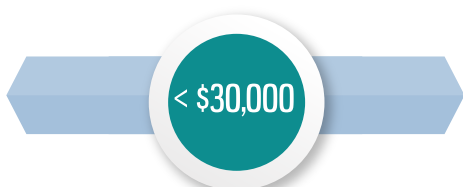
< $30,000

15% of households earning **less than $30,000** per year are **smartphone-dependent**, as are 13% of **Latinos** and 12% of **African Americans.**

Of those who are **smartphone-dependent:**[11]

62% have used their smartphone to obtain information about a health condition

44% have searched for housing options

43% have looked up information about jobs

30% have taken an online class or accessed other educational content

30% have used smartphones to look up government services

18% have applied for jobs on their smartphones

Social Media Use as of 2016:

has more than **1 billion active users**[15]

has more than **500 million users**[17]

has more than **4 billion daily views**[16]

has **317 million active users**[18]

Technology as a Force for Change

The Lifeline Program:

Providing Phone and Internet Access for Low-Income Americans

As the use of the internet becomes increasingly commonplace, there has been a push by the Federal Communications Commission (FCC) to consider the internet as a public good and utility. The Lifeline program, which was started in 1985, provides discounted telephone service to low-income households who qualify.[19] Despite the fact that 84% of adults in the United States use the internet,[10] 20% do not have broadband access at home, and 40% of households earning less than $25,000 a year do not have an internet connection at home. Yet, 70% of schools assign homework that requires using the internet and the majority of jobs are posted online, with an increasing number accepting applications only through the internet.[20]

An FCC vote in March 2016 approved a broadband (internet connection) subsidy of $9.25/month for low-income households and, beginning in December 2016, for households with income at or below 135% of the federal poverty guidelines and/or who are eligible for other public benefit programs such as the Supplemental Nutrition Assistance Program (SNAP), Medicaid, and tribal and veterans benefits.[19]

Companies like Access Wireless, Safelink Wireless and Reachout Wireless provide free phones to those who qualify for the Lifeline program, and offer free plans with a designated amount of talk minutes and text messages per month. These providers do not generally give out smartphones, although users have the option to upgrade to a smartphone for a low price and use their free talk and text messaging plan on that smartphone in combination with the Lifeline subsidy, towards a plan with additional data.

Cities are also seeking new ways to extend internet access to more individuals. The LinkNYC program is an innovative initiative by New York City that installs free, fast public Wi-Fi kiosks in defunct telephone booths throughout the city. The kiosks also have charging ports and a tablet with maps and information about city services. These developments are important examples of ways to expand the reach of innovative digital technologies to solve problems experienced by the underserved.

Technology as a Force for Change

The Current State of Innovation and Technological Development within the Food System

The food system is composed of the entire infrastructure around feeding a population, including growing, processing, distributing, selling, preparing, consuming and disposing of foods. In the United States, the food system contributes nearly $1 trillion to the gross domestic product and food accounts for close to 13% of average household spending.[21]

Unfortunately, many sectors of the food system have been slow to innovate using technology. The history of the Electronic Benefit Transfer (EBT) card illuminates this slow evolution. A system for electronic funds transfer and early models of the debit card were invented in the mid-1960s;[22] yet, the EBT card was not piloted until 1984.[23] EBT cards were not widely adopted until the early 2000s, in response to a 2002 mandate for states to digitize their then long-antiquated paper "stamp"-based model.[23,24]

> *The food system is influenced by complex logistics, generally low profit margins and entrenched politics that may contribute to the slow pace of innovation; as disruptive technologies revolutionize other industries, the food system often lags behind.*

That said, this report and upcoming reports include many examples that demonstrate creative solutions to complex food system issues, and also identify areas where new technological developments are needed.

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Food Insecurity/Hunger

Background

Food Insecurity in the United States

Food insecurity describes the limitations or uncertainty experienced by households in having enough nutritionally adequate and safe food.[25] Based on a population survey from 2015, the USDA estimates that 12.7% of American households are food insecure, representing over 42 million people and 15.8 million households.[26,27]

Food insecurity is associated with a variety of adverse outcomes, including poor mental and physical health, increased risk of chronic disease and obesity, poor cognitive function, difficulties in learning among children, and low economic performance.[27-31]

Federal Programs that Address Food Insecurity

A number of federal food assistance programs help low-income individuals and families access affordable food. This report focuses on the largest programs and those that have had the most significant adoption of technology.

The largest domestic safety net program is the Supplemental Nutrition Assistance Program (SNAP).

- In July 2016, more than 43 million people received SNAP benefits, which are issued through an Electronic Benefits Transfer (EBT) card (which works like a debit card).

- Benefits funds are loaded onto EBT cards monthly, averaging $125 per person and $255 per household in Fiscal Year (FY) 2016.[32,33]

- Three-quarters of households who receive SNAP benefits have a child, elderly individual or person with disabilities in the home.[32]

- SNAP benefits remain an important resource for vulnerable households (such as those headed by a single parent), which experience much higher rates of food insecurity than the general population (35% v. 14%).[34]

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is an assistance program for low-income pregnant and postpartum women and infants and children up to age five that provides around $43 per month per household for over 8 million individuals.[35]

The Emergency Food Assistance Program (TEFAP) is a program that purchases surplus food and distributes it to state agencies (typically food banks) that provide the purchased food free to low-income Americans by either distributing items directly to households or providing cooked meals (e.g., at soup kitchens).[36]

The National School Lunch Program is a federally assisted meal program operating in public schools, nonprofit private schools and residential childcare institutions.

In FY2012, the program provided nutritionally balanced, reduced price or free lunches to more than 31 million children each school day.[37]

The School Breakfast Program operates similarly to the National School Lunch Program.

In FY2012, nearly 13 million children participated in the program every day, more than 10 million of whom received free or reduced price meals.[38]

The school meal programs also supplement nutrition education and provide schools with support for their food service staff to promote healthier meals.

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Gaps in the Current System

Low-Income But Not Eligible for Benefits

Nationally, households at or below 130% of the federal poverty level qualify for SNAP benefits[33] (if they also meet additional resource, employment and other eligibility requirements)[39] and those above 130% but below 185% of the poverty level qualify for other food benefit programs (such as WIC and TEFAP). However, there are many people who experience food insecurity who do not qualify or who do not apply for food assistance benefits.

- **In 2014:**
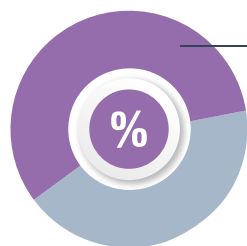
  56% of people experiencing food insecurity had incomes **above the poverty level.**[40]

- **In 2014:**

  Of the more than **48 million people** (15% of the population) experiencing **food insecurity** in 2014
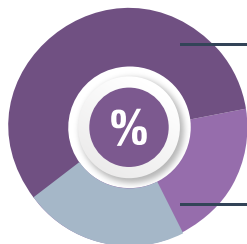
  only **54%** (nearly 26 million people) qualified for **SNAP benefits**

  26% (12.5 million people) were above **185%** of the poverty level and thus did **not qualify** for any **food assistance programs.**

- **A U.S. Census Bureau** survey asked households receiving **SNAP benefits** how much additional money they would need for food each week, and on average, food-insecure individuals reported needing **$16.82 extra** each week (per person).[41]

Some states have expanded eligibility criteria for **SNAP**, like New York, where households at or below **150%** of the poverty level are eligible for benefits.[42]

Food Insecurity/Hunger

Insufficient Benefits

While SNAP is intended to supplement a household's monthly food budget, rather than provide full coverage for a nutritionally balanced intake, many households rely on SNAP to cover all of their food costs.

- Food assistance recipients often run out of benefits before the end of the month.[43,44]

- On average, households that receive SNAP use more than 75% of their benefits by the middle of the month. More than half of these households redeem all or almost all of their benefits in that time period.[45]

Furthermore, an association has been shown between the timing of SNAP benefit distribution and poor dietary quality. Recipients consume foods higher in calories, total fat and saturated fat close to the end of their benefits period.[46] Running out of benefits before the end of the month is associated with reduced caloric intake (e.g., skipping meals) and other markers of food insecurity.[44,47]

Food Insecurity/Hunger

Filling Gaps: Emergency Food Providers

Food banks, as part of a network of emergency food providers (which includes soup kitchens, food pantries, shelters, senior centers, etc.), often fill in the gaps left by SNAP, WIC and other federal nutrition assistance programs.

For example, Feeding America, the country's largest domestic hunger-relief organization, is a nationwide network of 200 food banks, providing an essential service — feeding over 46 million people through 60,000 programs, which include food pantries and meal programs.[48]

However, food banks are not equipped to ameliorate long-term food insecurity, in part due to the discrepancy between need and supply, including

- inconsistent donations,

- limited storage (especially important for fresh produce),

- limited healthy food donations due to the high cost of healthy foods.[49]

Feeding America:
a network of 200 food banks

feeding over 46 million people

through
60,000 programs

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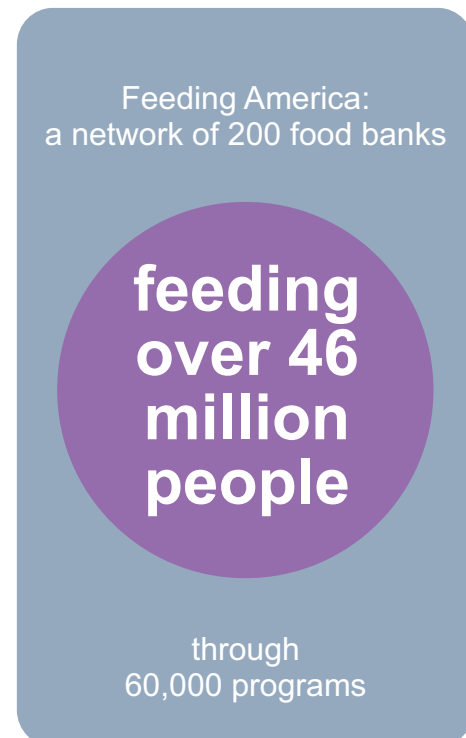
What the Research Shows:

Low-Income Populations Use and Are Engaged by Tech

Studies have shown that parents and caregivers under 45 years of age with low socioeconomic status can be engaged through email, Facebook, texting and other smartphone applications,[50] although those in Hispanic communities reported less interaction with these technologies.[50]

Technology use is prevalent among low-income women who receive WIC benefits. A study in the Western WIC region found that 92% of participants owned and used a cellphone and 52.4% of those participants used a smartphone.[51]

Food Insecurity/Hunger

How Technology Works
to Help Food-Insecure Households

There are a variety of ways that technology can help food-insecure individuals access and afford food. Though not a solution to poverty and the other root causes of food insecurity, technology can make it easier for people to sign up for and use federal food assistance benefits, learn about resources in their communities, access nutrition education, plan low-cost meals and save money while grocery shopping.

Federal Food Assistance Programs: What Technology Currently Exists and How Innovation Can Help

Increasing Program Participation

Basic websites and mobile apps can increase enrollment in federal food assistance programs by helping people learn what programs they are eligible for and by facilitating the application process. The process of applying for SNAP, and food assistance programs in general, can be cumbersome and stressful, requiring several steps, a considerable amount of time and significant paperwork.

Background: Existing Barriers

Individuals applying for SNAP benefits often have trouble obtaining the required paperwork (e.g., a landlord statement for proof of residency) and may lack understanding of application documents themselves.[52]

Also, many states require an **in-person interview**, which can be a barrier for **single-parent**[52] **households**; although a waiver can be granted, this is rare.

Many non-profits and other community-based organizations have stepped in to provide one-on-one support for individuals seeking benefits, but it is impossible to reach everyone in need.

For those who do successfully apply, there are often delays in issuing EBT cards, with some clients waiting over a month to receive their benefits.[52]

Accompanying what can be a tiresome application process in some states is a faulty renewal process that mistakenly drops 20% of food stamp participants from the program every year.[53]

Online and mobile resources make it easier for potential benefit recipients to **learn** about existing programs and to determine their eligibility through convenient **access to information** and streamlined **screening questionnaires.**

Simple Tech Tools and Informational Websites Make It Easier for People to Apply for Benefits

SNAP is Moving from Paper to the Web

As exemplified by the timeline of the EBT card versus the debit card (as discussed on p. 14), the United States federal and state governments have historically been slow to adopt technology.

The Center on Budget and Policy Priorities (CBPP), a nonpartisan research and policy institute, conducted a review of state SNAP websites in March 2016 (see box p. 27). The review found that all states (with the exception of Kansas) allowed users to download and print a SNAP application, and 44 states accepted online application submissions; since the publication of CBPP's report, Kansas has made an online application available for download.

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Online Applications

Having easier access to the application itself can eliminate barriers by helping to familiarize applicants with the process and required information.

CBPP notes that online applications fill an important gap by allowing people to submit applications at a convenient time and place, and thus apply earlier than they might have in person or by mail. Because benefits are issued retroactive to the application date, the earlier the submission, the better.[54]

Web-Based Eligibility Tools

Other useful website features include eligibility screening tools and benefits calculators, which can help potential SNAP applicants understand how much they might receive each month. Individuals often cite that they have not applied for SNAP because they do not know how to, or because they assume that they would receive only a small amount of support, and therefore, assume the hassle of applying is not worth it.[55,56]

Of note, the **state SNAP websites** have **no "new" technology features**, nor do they represent any major **innovation**, as web-forms are nearly as **old** as the internet itself.

However, the fact that there are still states in 2016 that do not accept online SNAP applications is an indicator of the need for further innovation in this realm.

An example of an online SNAP application (and portal) is New York's mybenefits online portal, where individuals can learn about eligibility criteria for assistance programs including SNAP, WIC and Temporary Assistance, complete an online pre-screening tool, apply for benefits, track application status and check EBT balances.

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Apps for SNAP Applications

The state of California's SNAP program, known as CalFresh, partnered with Code for America (a program that places cross-functional technology teams in local government and community organizations for a paid one-year fellowship) to transform their online SNAP application process. Their previous online application was over 50 web pages long, took up to an hour to complete and was not mobile-responsive.

The revamped GetCalFresh.org does away with the lengthy, jargon-loaded application and streamlines the entire application process through a series of simply designed, easy-to-read screens that walk users through each part of the process.

1 **Apply online**: in just 10 minutes, on a smartphone or computer

2 **Interview**: schedule an eligibility interview
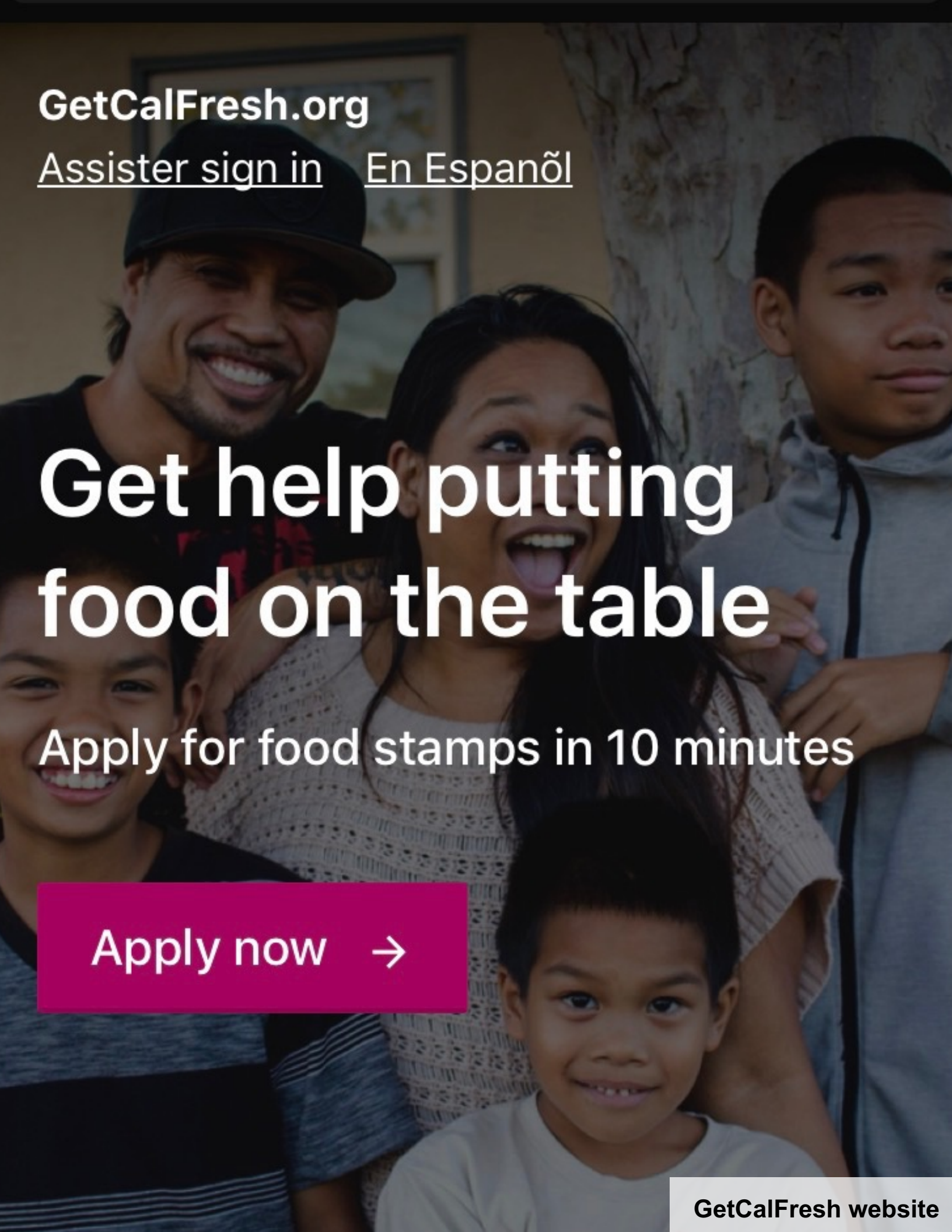
3 **Send your documents**: documents can be photographed and sent directly from a mobile phone

GetCalFresh offers customer support via text message and email, and they have an expedited service option with a 3-day turn-around time for particularly vulnerable households.

The tech start-up Propel has also sought to transform the process of applying for SNAP benefits through a clean-looking, easy-to-use, free mobile-responsive website, easyfoodstamps.com.
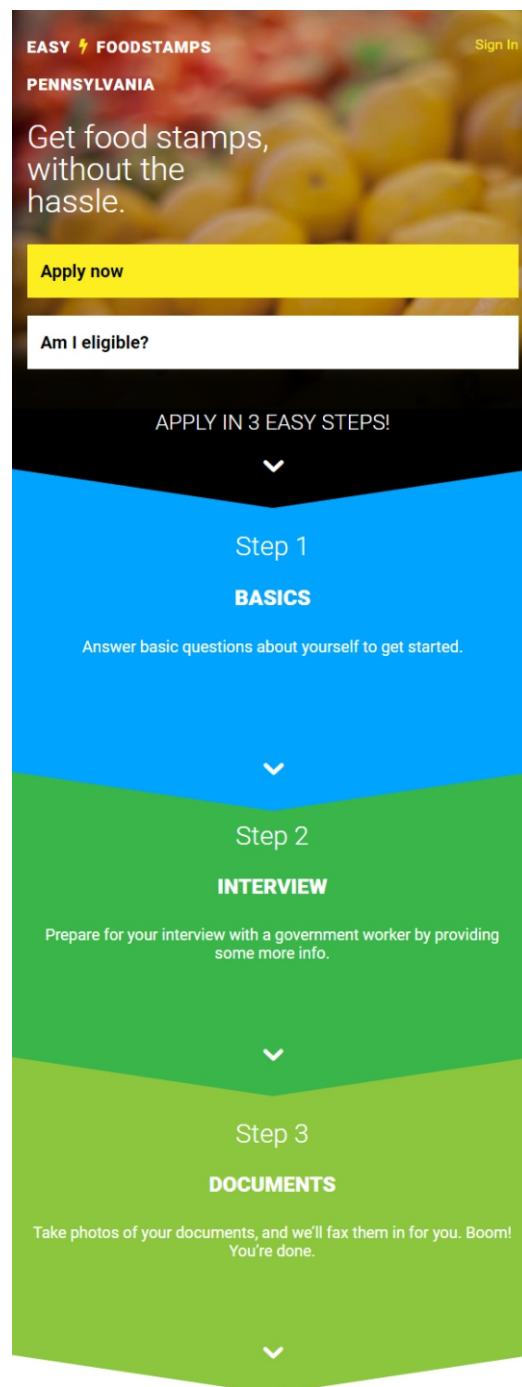
easyfoodstamps.com app

GetCalFresh.org

Get help putting food on the table

Apply for food stamps in 10 minutes

Apply now →

GetCalFresh website

By contrast, New York State's myBenefits online portal suggests that it takes **30 minutes** or more just to screen for eligibility. While an online screening tool like **GetCalFresh.org** or **easyfoodstamps.com** may not cover every outlier or unusual case, by streamlining the process and boiling down screening questionnaires to the **most pertinent criteria**, as well as using branching logic to keep subsequent questions relevant based on previous answers, these types of sites can provide a more **user-friendly** solution that helps the large majority of **potential recipients.**

New York State's myBenefits.com website

What the Research Shows:

How to Create a User-Friendly SNAP Website

In comparing state SNAP websites, the Center on Budget and Policy Priorities (CBPP) highlighted a few key tips to create a more user-friendly site for applicants:

• Keep text and explanations clear and concise.

• Use graphics and simple interfaces.

• Although benefit eligibility can be a complex process involving many variables, focus on only the key criteria to keep the process short and easy to follow. "Screening tools are most effective if questions are limited to the most pertinent eligibility issues and assist users with the answers rather than requiring users to fill in blank spaces." [54]

What the Research Shows:

SNAP Reduces Food Insecurity

Helping people gain access to SNAP and other food assistance benefits, and more readily use those benefits, may help to reduce food insecurity.

It can be difficult to determine the extent to which SNAP benefits reduce food insecurity, because other key factors that also impact food insecurity (e.g., lower savings, less community support [57]) are difficult to observe and quantify.[58] However, data from a nationally representative study, and the largest study of SNAP recipients conducted to date (in 2014), found a significant impact:

- Researchers surveyed households at the time of receiving SNAP benefits and again six months later. They found that the food insecurity rate among children in those households fell by 33% (and by 40% according to a second analysis that adjusted for household characteristics).[59]

SNAP has also been shown to reduce poverty, of which food insecurity is a component.

- In 2014, the SNAP program helped lift 4.7 million people, 2.1 million of them children, out of poverty, and SNAP was responsible for reducing the overall child poverty rate by 2.8%.[60]

Current Stats:
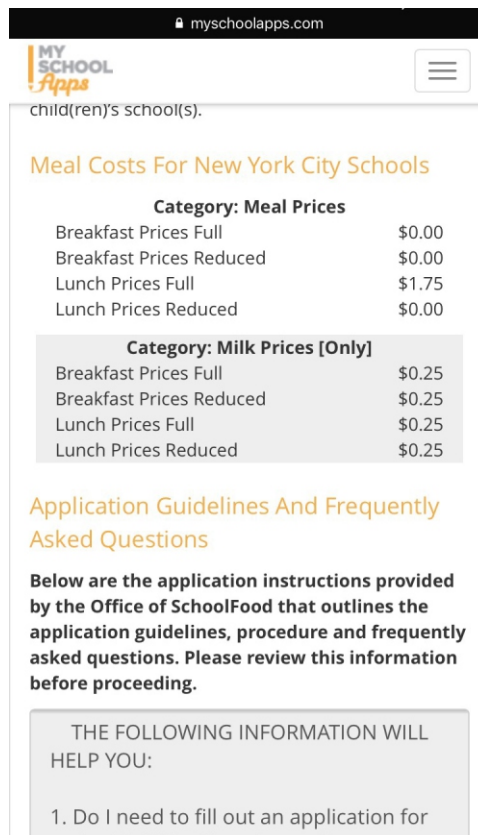
SNAP Participation

Not all individuals who are eligible for SNAP benefits receive them. Could improved websites encourage more people to sign up for SNAP benefits to improve food security?

- In 2014, 17% of the 51 million people who qualify for benefits were not participating in the program.[61]

- SNAP is particularly underutilized among elderly persons, with only four out of every 10 who are eligible receiving benefits.[61]

Apps for Parents: School Meals

The School Lunch app and MySchoolApps allow parents of students who qualify for **free** or **reduced** cost school lunches to **apply online** rather than through paper applications. **Electronic applications** are a convenient way to apply for benefits, reducing the **time** it takes to complete the application, and removing some of the common **challenges** of paper applications (e.g., getting lost in children's backpacks).

MySchoolApps app

A parallel **example** is a web-application like Turbo Tax, which transforms the submission of complex **paper-based** tax return forms into a **step-by-step** process with **easy-to-follow**, **multiple choice–style** questions that **guide** the user through the tasks.

Making It Easier for Food Assistance Recipients to Use Their Benefits

Once individuals have begun receiving food assistance benefits, technology can also be used to help recipients manage and use their benefits.

Basic Websites and Apps Help SNAP Recipients Check Their EBT Balance

Background: Traditional Methods Using Phone Calls and Paper Receipts

For benefits recipients, the ability to easily track and check their EBT balance is necessary for planning and budgeting to help their benefits last the full month. The common way to check the balance is through a call number on the back of the card where participants enter the card number into an automated system. While effective, this process is clunky, time-consuming and antiquated. Other recipients do all of their budgeting by storing paper receipts, which requires careful organization.

Always know your EBT balance

At home or in the checkout line, Fresh EBT makes it easy to check your food stamps and benefits balance on your phone.

Available in both English and Spanish!

Download on the
App Store

Download on the
Play Store

FRESH EBT app

*Websites and Apps Make It
Quicker and Easier*

There are now websites, such as
Connect EBT, that interface with
state government sites (like New
York's mybenefits online portal),
which allow EBT recipients to check
balances and perform other tasks
after creating an account on the
website.

Mobile applications can
streamline the process of
logging in or **calling to**
check one's **EBT balance.**

Fresh EBT is a **free Android and
iOS app** built by the tech start-up
Propel that lets users check their
EBT balance in about five seconds,
as well as view recent activity,
nearby stores that accept SNAP and
a pie chart that tracks their
expenditures across different stores.
Users can also see when their next
deposit is expected to hit their
account and can link multiple cards
into the app. Propel prides
themselves on designing modern
consumer-grade apps that are
clean, simple and easy to use.

Similarly, **Balance 4 SNAP**, a **free
Android** and $0.99 iOS app, allows
registered EBT users to check their
card balances.
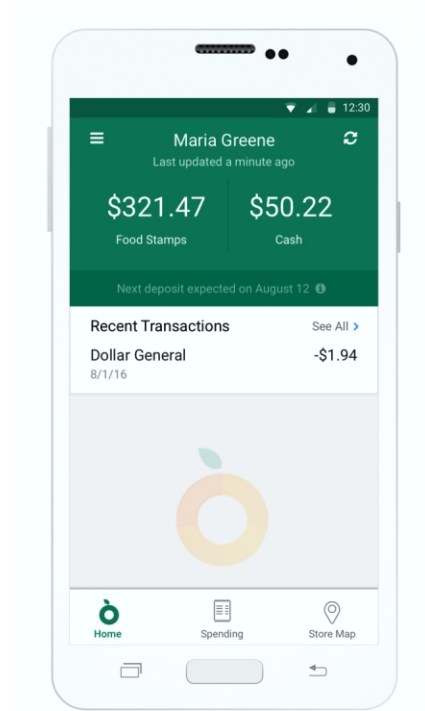
Fresh EBT app
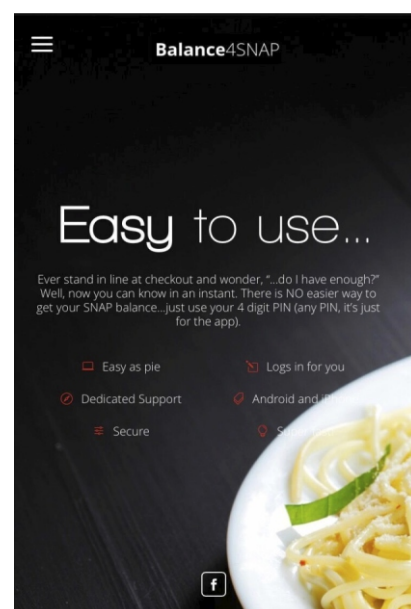
Balance 4 Snap app

Balance4SNAP

Get your SNAP EBT balance with Balance4SNAP

A better way to get balance from your SNAP/Food Stamps EBT account...
Now available on the App Store and Play Store!

⬇ Download App

Balance4SNAP app

What SNAP App Users Are Saying:

Online Reviews

Bugs

When seeking a new app, users often read through the reviews to help them determine whether an application is worth downloading. The large majority of the 3,700+ reviews for Fresh EBT in the Google Play Store are positive, with nearly 3,000 users giving it a 5-star rating (as of January 2017).

However, both Balance 4 SNAP and Fresh EBT have numerous complaints in the Google Play and App Store reviews about bugs and problems with the app.

This highlights one of the challenges of building Android apps that are used across many different devices; sometimes an app works perfectly on one device but consistently crashes on another.

Continuing to Improve

The Google Play Store permits the application developers to respond to reviews, which provides great insight into an app's customer support and responsiveness to their users. The customer service team of Fresh EBT is particularly responsive to the negative review comments (always replying within a day); this willingness to incorporate user feedback helps them to fix bugs and improve the app over time. Indeed, they frequently release updates to the app that address these issues. By contrast, Balance 4 SNAP's last version update was in March 2016.

Concerns with Privacy

One common thread among the 1- or 2-star reviews highlights a lack of trust in providing personal information to an app. In some states, Balance 4 SNAP requires a user to enter their PIN number (which they use to make purchases, like with a debit card), which raises security concerns among users.

Apps That Help WIC Recipients Use Their Benefits

Background: Barriers to Using WIC Benefits

There are a variety of other applications designed to simplify benefits usage for recipients of the WIC program, which is managed differently in each state. Many states provide benefits via EBT cards, while some distribute food through WIC-specific warehouses or home delivery programs. Even for states that use EBT cards (which will be mandated for all states by 2020), recipients still typically bring a food guide, voucher checks and approved shopping list with them to the grocery store (see New York's WIC food guide as an example), requiring that they review each product to determine if it is covered by their benefits and track receipts.

34

WIC recipients often experience embarrassment and frustration from misunderstandings surrounding what can be purchased with WIC benefits and having foods rejected at the cash register.[62,63] WIC currently serves only 60% of eligible mothers and children,[64] and some of this gap is likely due to the frustrations and challenges involved in using the benefits. Indeed, similar to SNAP benefits, WIC is an area ripe for technological advances, which could improve the user experience and encourage more mothers to take advantage of the program.

SNAP and WIC Apps:

Apps that Help SNAP and WIC Recipients Find Participating Retailers

Locating SNAP Retailers

The SnapFresh website and texting service, available throughout the country, has many features that make it easier for SNAP shoppers to use their benefits:
- A website, mobile app and text messaging program in which users text their address to a number and are sent back a list of nearby certified SNAP retailers via SMS
- Information about retailers to help customers find stores that have healthy choices available
- Links to Google Maps to provide clear directions for various modes of transportation
- Availability in English, Spanish and simplified Chinese, in an effort to reach as many SNAP recipients as possible.

SnapFresh is a text-message and mobile app, built during a one-day hackathon in 2011, that exemplifies a straightforward solution using technology. It works by leveraging data from the USDA's SNAP Retailer Locator and uses existing software "plug-ins" like the Google and Yelp APIs, and Tropo for its SMS framework.

Fresh EBT's app also contains a map of SNAP (from the USDA) and is used by thousands of people each day.

Locating WIC Retailers

While most major grocery chains accept WIC, many states do not publish a list of WIC retailers and recipients often have to call individual stores or their local WIC agency to determine if a store will accept their WIC vouchers. There are a number of state websites, like Massachusetts, that list WIC-approved vendors by town. Many state WIC programs have created web applications with maps (Montana) or lists (Pennsylvania, which links to Google Maps Directions API) of the locations of WIC retailers.

WICShopper app

Apps for WIC Shoppers

WICShopper is a free mobile app that helps families determine which products are covered by WIC benefits to facilitate purchasing decisions. The app is available in 10 states (KY, WV, FL, MA, IA, VT, OR, KS, DC and AZ).

The app has a barcode scanner so users can check product eligibility while they shop, thereby eliminating the need to save paper receipts for reporting purposes. Since not all products have barcodes, the app also provides a searchable list of all WIC-eligible items, obviating the need for recipients to manually scan through a paper guide. Additionally, WICShopper helps users plan recipes based on eligible products, and can alert users to use existing benefits as the expiration date approaches.

Another key advantage that the WICShopper app has over paper vouchers is the ability (in some states) to purchase only some of the items within a recipient's WIC package during a shopping trip, rather than having to use the entire paper voucher check and buy all items at one time.

WICShopper App:

Identify WIC-Eligible Foods

What it does: WICShopper allows users to instantly determine whether a specific food item is eligible for WIC benefits.

How it works: The app provides personalized information about WIC benefits based on state and WIC card number. Users can scan products to verify WIC eligibility before heading to the register.

Why it's interesting: The app provides convenience and confidence for a shopper using WIC benefits.

What can be learned from the app: Simplifying this process maximizes benefits and eliminates disputes.

Created by: Juvenile Products Manufacturers of America (JPMA)

Website: http://www.ebtshopper.com/

Cost: Free.

Future of the app: The app is only available in a handful of states (KY, WV, FL, MA, IA, VT, OR, KS, DC and AZ, with NJ, ME and RI coming soon), but could be expanded nationally or internationally.

Food Insecurity/Hunger

Apps for WIC Agencies

QuickWIC* is an app that functions similarly to WICShopper, but is marketed to WIC agencies as a low-cost and easy-to-implement solution for connecting with their recipients. Agencies can opt to include features depending on their needs and budget from the app's three tiers:

1. Live Benefits (e.g., benefits balance tracker, a barcode scanner to check product eligibility and an approved product catalog);

2. Education & Content (e.g., nutrition coaching); and

3. Communication (e.g., a live chat through which recipients can connect with a WIC agency staff member and receive clinic appointment reminders).

As WIC agencies have been tasked with modernization and implementing EBT systems by 2020, the USDA's FNS has initiated a State Agency Model (SAM) project to fund, plan, develop and deploy model information systems in WIC state agencies that incorporate modern web technology, open system architecture, standard WIC data elements and modular components. QuickWIC is compatible with three of the main state agency IT systems that have come out of the SAM project (and can also be customized to sync with other systems):

• SPIRIT (used by AK, AR, ME, MN, MS, MO, MT, OK and several Native American tribes),

• Mountain Plains (used by CO, IA, NE, NV, ND, VT, PA, UT, WY) and

• Crossroads (used by AL, NC, VA, WV).

By consolidating features that can be customized and used across the 90 WIC programs in the United States, apps like WICShopper and QuickWIC offer services that could be out of reach for an individual agency. WICShopper states, "We create mobile-friendly versions of any of your WIC assets. We seamlessly integrate them into WICShopper so that your participants have all of the tools they would have if they visited your website or offices. It's like having your own custom mobile app at a fraction of the cost and none of the overhead."[65]

However, while this model can help keep costs down, WIC agencies often operate on tight budgets. Paying for a Software-as-a-Service style app (e.g., with an annual subscription price) could result in tough trade-offs for agencies that may see greater value in putting that money towards additional staff or other resources. In a conversation with Max Thayer (October 2016), CEO of QuickWIC, he reflected that a WIC agency might look at the cost of mobile services and weigh it against the salary of another part-time breast-feeding counselor. Indeed, it can be hard for an agency to foresee the direct value these sort of technologies, especially when data are lacking to support their impact on outcomes.

*When checked at the time of publication, QuickWIC's website (http://quickwic.com) was no longer active.

Mobile apps like WICShopper and QuickWIC make it quick and easy for users to access that information and can help them find what they need faster; users remain logged into the app, so the information can be tailored to their specific benefits package. This is important because state WIC websites are generally outdated and can be challenging to navigate efficiently.

> While states and local WIC agencies are in the process of bringing all of their systems "online" to use EBT, it is critical to consider ways to use technology to improve the overall experience of WIC recipients.

School Meal Apps for Students and Parents

Apps are targeted to students enrolled in the national school meals program. For example, the New York City SchoolFood Feed Your Mind mobile app allows students who qualify for the school lunch program to view menus and provide feedback to help influence menu choices. The app also helps students locate free summer meals at nearby parks, pools, libraries, SchoolFood trucks and public housing locations. By having a simple, fun and easy to use interface, the Feed Your Mind app can help children be more engaged with their food choices.

Feed Your Mind app

Food Insecurity/Hunger

Providing 'Virtual' Nutrition and Shopping Education to Recipients

Background

Educating individuals about topics such as eating healthy, reading food labels, planning meals, using shopping lists, learning cooking techniques and appropriately storing food is an important component of strategies to promote food security. Food insecurity is often associated with obesity,[66,67] in part due to the low cost of energy-dense and nutritionally poor processed foods.[68]

While education alone is insufficient to improve nutrition and dietary intake quality in the face of systemic barriers to healthier eating, it is often a first step, and can be combined with more robust behavioral interventions to support those changes.[69] Technology-enhanced nutrition education tools, such as computer or mobile-based programs, are recognized as effective education interventions, especially when focused on behavioral change.[70]

Overview of the USDA's SNAP-Ed Websites

The USDA's SNAP education (SNAP-Ed) program attempts to teach SNAP recipients and those eligible for SNAP about healthy eating and how to stretch their food dollars. The program has grown significantly since it began in 1992, with an increase in funding over 500% since then,[71] and focuses on obesity prevention and general nutrition education.

USDA's SNAP-Ed website

The SNAP-Ed Connections website is designed to help state and local SNAP-Ed educators to develop in-person nutrition education and obesity prevention programs and has tip sheets such as "Eat Right When Money's Tight" and seasonal produce guides, as well as a stock of budget-friendly healthy recipes. However, in-person classes can be a significant barrier to individuals who work long hours and face other weekly stressors, and yet, technology has been underutilized as a way to promote nutrition education.

While the government does use basic websites to offer information to SNAP beneficiaries, there is a lack of innovation; the user experience is generally flat and not interactive. While most creative information websites in the commercial world are incorporating modern gamification and interactivity, the SNAP-Ed site is lackluster.

SNAP-Ed–Recommended Apps and Websites

The SNAP-Ed website lists a number of recommended nutrition apps and websites for adults and kids, aimed at helping SNAP participants get the most out of their benefits. While most of their recommendations are geared towards children, some are targeted to healthcare professionals and others to adult SNAP recipients. For example, the Cooking Matters app includes features such as recipes with nutritional information as well as tips to save money at the grocery store. While the research team did not review all of these sites and apps, judging from the sampling that was reviewed, they do not compare to commercial apps that are being developed by the food and beverage companies (e.g., Kellogg's and General Mill's cereal-branded games, like Buzz's Pass and Play, or Coca-Cola's Fanta FunTap app).
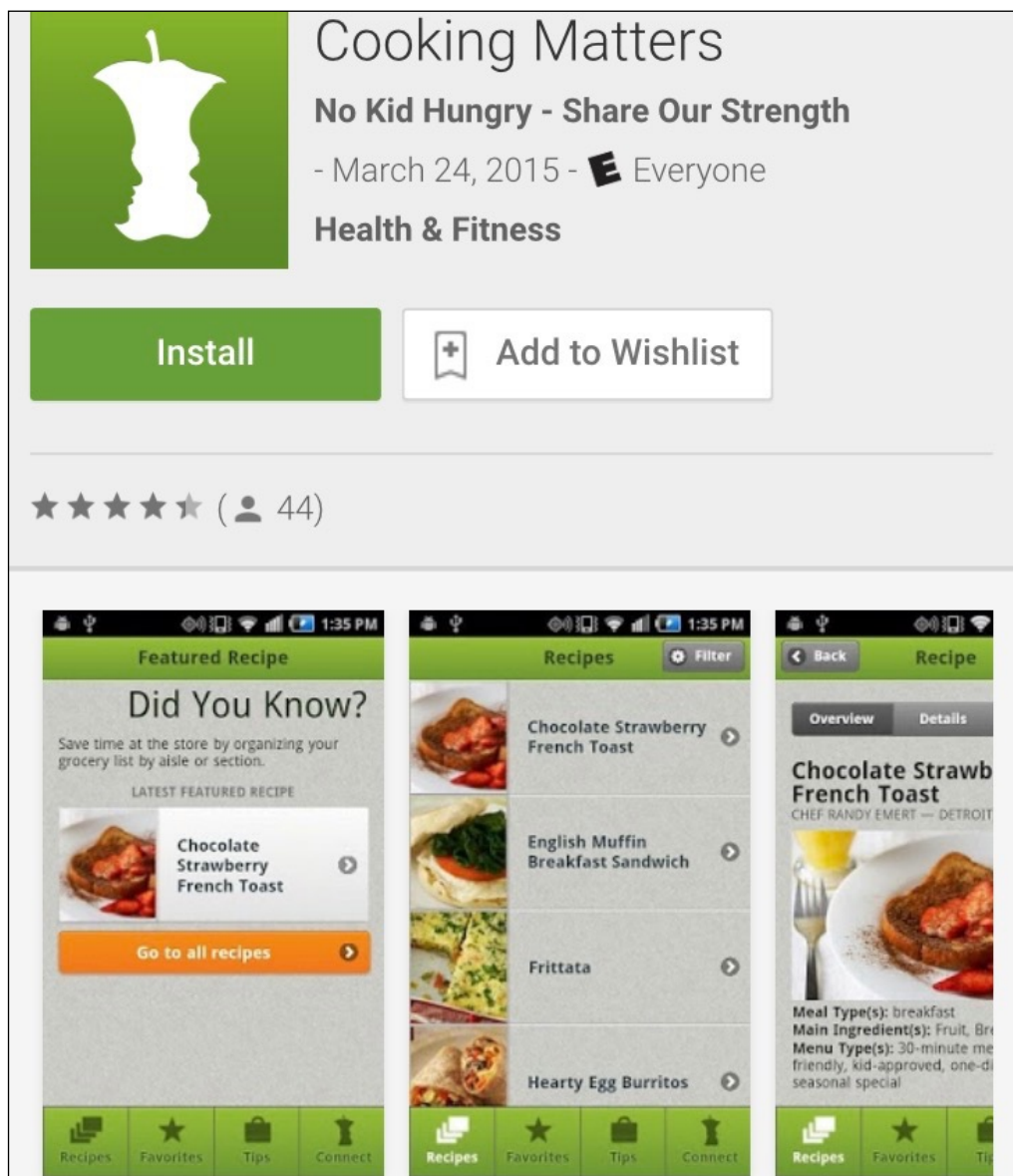
Cooking Matters app

Examples of SNAP-Ed–Recommended Apps and Websites for Kids

The Children's apps found on SNAP-Ed use games and quizzes to educate users (most are targeted for ages 6-8) on eating healthy and exercising:

- In the Catch the Carrot app, users answer multiple choice trivia questions on food and eating practices in order to fill up their shopping cart and earn points (from the University of Illinois).
- In the Snack Planet App for iPad, players learn the benefits of healthy eating and exercise by helping Optimus the robot find healthy food on his way through the maze before time runs out (from the University of Nebraska-Lincoln).
- In Body Quest: Food of the Warrior the Body Quest Warriors, anime-style characters, battle each other to show the importance of preventing childhood obesity (from the Alabama SNAP-Ed initiative).
- The GrowIt-KnowIt app focuses on food sourcing and is designed to be a child's first guide to how farming produces the foods they eat (from the University of Nebraska-Lincoln).

GrowIt-KnowIt app

The SNAP-Ed website also features games for kids that focus on kitchen and food safety and healthy eating.

- [Scrub Club Games](#) uses a variety of games to teach kids about food-borne bacteria and other diseases that can be spread around food and how to prevent them (from NSF International).
- [Nutrition Decision](#) teaches kids how to read nutrition labels (from New Mexico State University).

While the intentions behind using games to engage low-income children in nutrition education are good, these apps and websites all feel outdated in comparison to commercial apps and games that children use, like Candy Crush or Pokémon Go, particularly with regards to graphics, animation and ways to interact with the software. Indeed, most of the apps recommended by the SNAP-Ed website are outdated, and have not been updated recently, in some cases since 2011. Furthermore, the apps are relatively slow to provide new information or tasks, and in many of them, the educational content is of little value (e.g., Q: the jiggley, transparent food is made of many different flavors. A: Jello).

Could the Future of SNAP-Ed Be Digitized?

Technology-based education interventions have a strong advantage in their ability to be completed at the user's convenience. Digitized education models, such as [Khan Academy](#), have provided new ways for people to learn, by breaking the content on nearly any academic topic into short, bite-sized video lessons.

Khan Academy's content is available for free, accessible to anyone (with access to the internet and a compatible device), anywhere at any time of day. An online or app-based model could allow for tailored nutrition education to be delivered quickly and easily to SNAP recipients.

Tips for Website Health Literacy:

e-learning

- Remove unnecessary distractors
- Break up content into "bite-sized" chunks
- Present content through varied modes: text, visuals, audio, etc.
- Promote user engagement through interactive exercises or games
- Ensure information uptake through mini-quizzes or other assessments

WIC Nutrition Education Apps

The WIC program includes nutrition education as a specific program benefit. The QuickWIC app (see p. 38) has nutrition coaching and educational content built into the app. The developers of WICShopper (see p. 37), the Juvenile Products Manufacturers Association (JPMA), also have a separate WIC Smart Nutrition Education app, in which they promote the convenience of having nutrition information available through an app wherever the users might need it — at home while they are planning and cooking, in food stores or in the clinic. The app serves as a content management system, and individual states and local WIC programs can use content from other subscribers, write their own lessons, modify them, assign them to groups of participants and track the results.

Another education-based app, wichealth, provides a simple user interface and interactive lessons for WIC recipients. After completing each short, dynamic lesson through the app, users receive a certificate, by which they can receive credit from their WIC clinic.

Financial Management Apps

Other apps focus more generally on financial management strategies, much of which can be supported through mobile apps and websites. The widespread use of online banking and the use of credit and debit cards allow households to track their spending across various categories (e.g., food, transportation, housing). While this may not be as useful for tracking cash spending, there are a number of free apps that support this sort of careful monitoring, like Mint, Every Dollar and YNAB (You Need A Budget), which can help users make more careful financial decisions.

What the Research Shows:

Nutrition Education Helps SNAP Recipients Shop Smarter

Studies of education programs have demonstrated their role in successfully reducing food insecurity and improving diet quality.[72] Kaiser et al found that recipients who participated in the CalFresh SNAP-Ed program based on the Plan, Shop, Save and Cook curriculum reported improved resource management skills:

- 52% reported checking food labels more often while shopping
- 43% began shopping with a list
- 42% planned meals
- 38% reported fewer instances of running out of food before the end of the month.[73]

Several studies around nutrition education interventions have shown an improvement in food resource management skills[72,74] and improved attitudes towards healthful foods[75] in low-income audiences.

Food Insecurity/Hunger

Accessing Affordable, Healthy Food: Grocery Shopping and Meal Planning

While federal food assistance benefits are an important resource for many food insecure households, there are other ways technology can help individuals plan meals, shop strategically, save money and maximize the resources they do have. Food shopping on a tight budget can be stressful, requiring in-store decisions about quantity and value, and careful math to stick to a budget. To help with these challenges, consumers can choose from a plethora of apps and technology that focus on meal planning, grocery shopping, and promoting affordability by offering coupons and promoting deals at local food stores.

Planning Low-Cost Meals and Shopping on a Budget

Websites for Budget-Friendly Recipes

One of the first key steps in grocery shopping on a strict budget is to plan out the week's meals in advance. There are countless websites and blogs focused on eating on a tight budget, such as Feast on the Cheap.net and BudgetBytes.com, both of which provide "gourmet"-style recipes while breaking down the cost per ingredient and subsequent cost per serving for each one. Other blogs have focused specifically on health-conscious, budget-friendly recipes, with the aim of combatting the perception that healthy foods are not affordable. Recipe blogs are extremely popular and can be a helpful resource by providing detailed instructions with photos, and even videos, to make the recipes easy to follow. The blog Plant Based on a Budget focuses on easy-to-make, affordable, plant-based recipes.

Other websites, such as lifehacker.com, TheSimpleDollar.com and WeGotReal.com, have published articles of recommendations for stretching one's food budget, such as drinking tap water instead of store-bought beverages, and using frugal, but healthy ingredients like rice, beans, eggs, lentils, oats, pasta, potatoes, sweet potatoes, chicken (buying a whole chicken rather than specific cuts) and in-season produce.

Some common suggestions from these types of websites are outdated, like seeking out grocery store coupons and weekly sale flyers, a time-consuming process that could be significantly easier via a couponing app that sends location-sensitive alerts for available coupons that can be scanned at the register.

Food Insecurity/Hunger

Meal-Planning Apps

Blogs and websites offering advice can serve as an inspiration and help households find new and creative ways to stretch their food budgets. However, there is still considerable effort involved in taking those recipes, planning them out as meals throughout the week and creating shopping plans that maximize each ingredient purchased. To this end, meal planning apps, which can organize recipes and use algorithms to combine them into weekly meal plans and shopping lists, can be a helpful resource to save time and stress.

Pepperplate is a cross-platform app and website that allows users to add recipes to the app from anywhere on the web via a "bookmarklet," and then plan menus and generate a shopping list based on those recipes. The app also has cooking timers built into it to help make recipes easy to follow. While the app is highly rated, free and easy to use, particularly since users can add recipes from anywhere on the web, the developers appear to have abandoned it.

MealBoard, a $4 iOS app, works similarly but adds the feature of including prices on the aggregated grocery list (for select grocery stores) so users can work out their shopping list budget before arriving at the store. While a $4 app is not practical for low-income populations, the inclusion of prices on the shopping list is a feature that free apps could incorporate to better serve this population.

Supercook is a website that allows users to input the ingredients they have on hand and finds matching recipes, culling from a variety of popular recipe databases. A Supercook Android and iOS app is still in development as of October 2016.

Saving Money on Groceries

Using digital technology, apps and websites can make it easier to locate and keep track of sales, coupons and rebates.

ibotta is an app that unlocks rebates on products at stores like Walmart, Target, Food Lion, Kroger, Rite Aid, Walgreens and CVS. To unlock these rebates, users browse through a list of available rebates at a given store and perform "simple tasks," like viewing a brief informational page about the product, answering a trivia question or watching a 15-second marketing video to activate a rebate. A barcode scanner helps to check if a product qualifies while users are in the store. After scanning barcodes of each purchased rebate-eligible product and uploading a photo of the receipt, cash is deposited into the user's app account and can be transferred to PayPal, Venmo or a gift card. Users can earn even more money by promoting the app on social media through referral codes and adding "team members" to unlock extra bonuses.

Food Insecurity/Hunger

ibotta

Pick a few of your favorite stores.

This helps us find the best rebates for you.

Walmart	Wegmans	Target
Albertsons	Stop & Shop	GIANT (PA,WV,MD,VA)

ibotta app

Similar apps include MobiSave, Checkout 51 and SavingStar. SavingStar has a special section for 20% savings on healthy "items of the week," which generally include fresh produce. However, all of these apps require customers to pay upfront and get reimbursed later, which is less advantageous for low-income customers than saving money at the time of purchase.
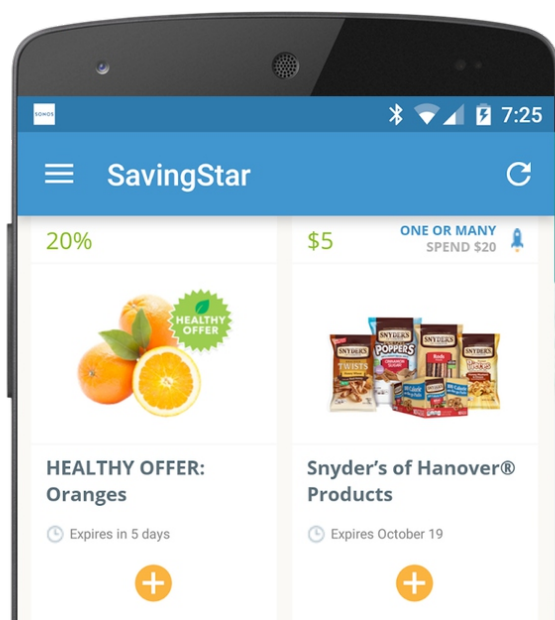
SavingStar app

OurCart provides a platform that allows users to compare prices of items on their shopping list across local stores and recommends where users should shop to save the most money. MySupermarket is a similar app in the United Kingdom.

Grocery Pal and Favado are apps that help users find weekly sales at local grocery stores and redeem coupons.

Websites like Coupons.com and Coupon Mom keep track of sales at chain stores like Kroger and Walmart and print coupons. Users of Coupon Mom can search grocery deals by state, by store or by brand, and the site also has a section of How-To Videos.
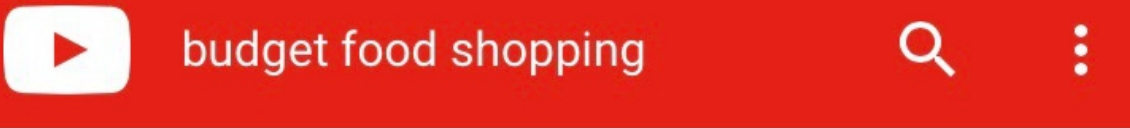
Sites like these could be "appified" with barcode coupons that can be scanned directly from the app to save printing costs and time.

Apps like RetailMeNot and CouponSherpa have done this for traditional retail deals (e.g., clothing, electronics), with features such as location sensors that notify users of coupons available while at a specific store, and barcode-style coupons that can be scanned directly from users' phones, however, they are very limited in the grocery category.

YouTube has dozens of videos on budget food shopping. While these type of websites and applications are used by anyone who appreciates a deal, they can be a time-saving and stress-relieving resource for low-income households with tight food budgets.

YouTube's "budget food shopping" results

What the Research Shows:

Individuals Face Challenges to Planning and Budgeting

Individuals with limited resources have been shown to place more focus on immediate concerns, and often have a perceived inability to plan for the long term.[76,77] In economic terms this is known as "delayed reward discounting," and a preference for small rewards now, rather than larger rewards later.[78] A survey-based study that recruited participants via Amazon's Mechanical Turk service found strong associations between poor financial planning skills and food insecurity. The study also found while individuals with low financial planning skills had higher rates of food insecurity, even those with good financial planning skills had nearly an equal probability of food insecurity if they were also impulsive.[79] Meal planning and couponing apps can help households plan, and see how small savings now can add up to larger rewards later to better allocate their resources over the course of a month.
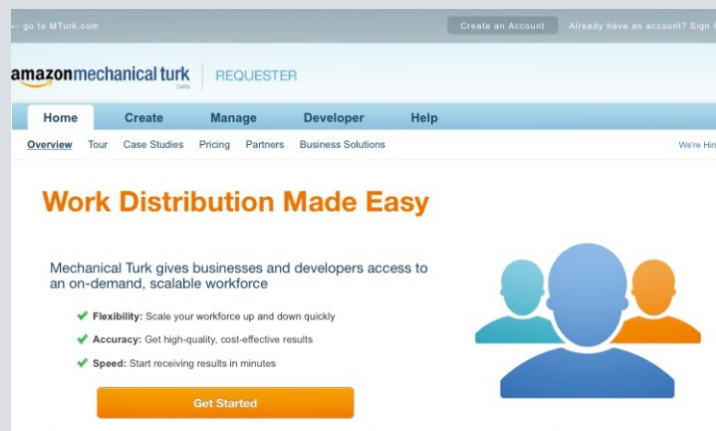
In a study of over 5,000 respondents, individuals who reported running their households on a strict budget were significantly less likely than those who did not follow a strict budget to make a list before shopping (20% vs. 32%), search for bargains (14% vs. 25%), use coupons (10% vs. 14%) or stock up on food items when they are on sale (5% vs. 9%) (all p<0.01).[80] The author speculated that families on a strict budget may not have the time/ resources to "comparison shop," nor the money to stock up when there are good deals.[80]

In different analysis that used data from the 1996 National Food Stamp Program Survey, about half of participants reported using lists and taking advantage of grocery specials, and two-fifths reported using coupons and comparison shopping.[81] Overall, these strategies were underutilized, and meal-planning and couponing apps could help households better apply these types of strategies by eliminating the need to physically compare prices and hunt down nearby deals.

Tech Opportunities to Reduce Hunger Among Low-Income Households

'Hooking' New Users on Technology

Digital technologies can extend the reach of existing food assistance programs by helping households sign up for federal food assistance benefits, and make better use of those benefits by locating participating retailers, identifying eligible products and tracking benefit balances.

Propel describes its Fresh EBT app as "an anti-poverty platform that uses EBT balance checking as its hook...We've partnered with a grocer in Brooklyn to share deals on fresh produce (despite $70 billion in captive purchasing power, the grocery sector has never before had a way to advertise high-quality products directly to food stamp recipients)."[82]

The "hook" that Propel describes is an important concept in technology development because people will continue to use software that helps them complete a task, solve a problem or experience a particular emotion.[83] Technologies that can do this are considerably more engaging than flat, informational websites. When an app or website solves a common nuisance, like the hassle of checking one's EBT balance by phone or by tracking paper receipts, people are more likely to use the technology. Once adopters are regularly using the app, it is easy for developers to promote new features and extend the value users can derive from the app.

By offering coupons for fresh produce, grocery stores in underserved neighborhoods can improve inventory turnover and offer a wider range of healthy options. Engaging food benefit recipients through mobile technologies could not only be used to extend reach and reduce stressors associated with the food stamp system, but could also play an important role in improving participants' dietary intake and health.

NYC Department of Education

FEED YOUR MIND

VIEW MENUS

SUBMIT REVIEW

Feed Your Mind app

Future Features: A Wishlist

**Improved User Experience Using Health Literacy
and Health-Promotion Content**

Apps used by food assistance recipients for tasks like checking balances and product eligibility could strengthen their impact by rolling in tailored educational content, like WIC Smart and wichealth do. Apps like WICShopper could expand upon their recipe features to promote healthier diets, or help families to plan ahead via meal prepping. New York City's SchoolFood Feed Your Mind app could be expanded to include nutrition information for meals and make healthy food suggestions for individuals with allergy-related concerns.

While there a number of nutrition-focused apps for meal planning or helping to read nutrition labels, these apps are not integrated into a comprehensive program that includes a suite of additional health tools, or into a school app or SNAP-based education program. They are generally stand-alone apps, and few, if any, are theory-based. There are a number of SNAP-Ed programs that focus on bolstering household resource management skills, such as the Social Cognitive and Adult Learning Theory-based Plan, Shop, Save and Cook (PSSC) curriculum.[73] There is great opportunity for integrating those features in one location and translating theory-supported, evidence-based curriculums into an app or website intervention.

In general, there is an opportunity to channel engagement with food-related apps towards health-promoting content. Of Western WIC region study participants who owned a smartphone, 31% stated that they used their smartphone for health-related activities, and three-quarters of study respondents reported they thought it would be useful to speak to a nutritionist via a video chat.[51]

As the food world continues to adopt digital technology, there will continue to be numerous opportunities for integrations that collect data on consumer behavior, and then leverage that data for health promotion. For example, Fooducate is an app with a grocery barcode scanner that can make nutrition suggestions based on a customer's current shopping cart, but this model could be expanded to make comprehensive recommendations in real time (e.g., "you have a lot of carbohydrates in your cart, here are some healthy proteins you could add that fall within your budget"). Indeed, there are many emerging apps and programs that make these types of inferences (see Part 5), but true disruption can arise from more seamless integrations amongst these various tools.

A Better User Experience

Of note, 50% of low-income (<$30K) individuals own a smartphone and 13% are dependent on a smartphone as their only way to access the internet,[11] and yet the majority of government-built SNAP websites are not mobile-responsive. When opening a non–mobile-responsive webpage (e.g., connectEBT.com or mybenefits.ny.gov, or the USDA's WIC eligibility site) on a mobile phone browser, the font is small and hard to read without zooming in (which then requires scrolling from side-to-side in order to read the text), and the buttons are small and hard to tap. When entering information into one of the forms via a mobile phone, the interface zooms in to the field when the user starts to type, but then the user can no longer see the instructions for that field or the field below it, requiring the user to scroll around the page to figure out what she is doing, a time-consuming and frustrating process. By contrast, GetCalFresh.org and easyfoodstamps.com are built for smartphone browsers and work smoothly and effectively on a smaller screen.

USDA's WIC Eligibility Requirements website

Tech Highlight

Improving the 'User Experience' for Underserved Populations

What is User Experience?

User experience (UX), the overall experience of using a product — and the quality of that experience — is composed of the expectations, emotions, thoughts and actions someone undergoes while interacting with a website, app or other interactive product.[84] Big name tech players like Google, Apple and Facebook have put significant resources into perfecting and polishing the UX for their products, and in doing so have defined an industry-standard for how an app or website should look and feel.
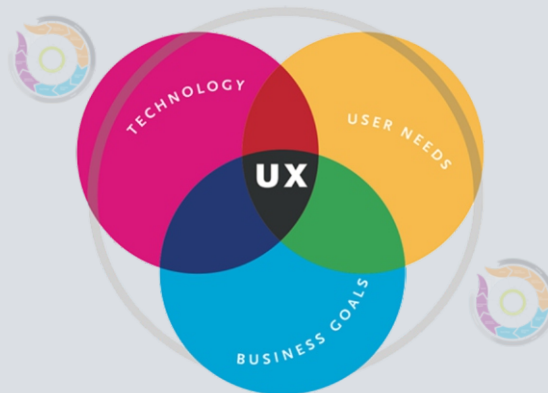
In fact, the best UX design strategies are completely invisible to the user, but comprise important intangibles such as the amount of time it takes for a page to load, the ease of navigating through an app or website and using features (e.g., knowing how to find something without having to be trained to use it), features that "surprise and delight" the user, or the way search results are displayed. Great UX design starts with a thorough understanding of the software's user base, grounded in research with actual future end-users to understand their needs, goals and "pain points."[83]

Despite the fact that people use smartphones across the income spectrum, underserved populations are underserved by innovation. Highly educated and well-paid software engineers and designers have tended to dream up technology solutions to problems that they personally experience and/or that have the opportunity to be very profitable.[85-87] Furthermore, venture capitalists are typically interested in funding ideas that are commercially viable and will have a clear return on investment. This does not bode well for low-income populations who typically have tight budgets and are not viewed as a viable commercial customer base. Technology designers have an enormous opportunity to bridge this "empathy gap," by working directly with underserved populations to understand their needs and build impactful solutions.[88]

Tech Highlight (cont.)

Propel: High-Quality UX for a Low-Income Population

Propel is a start-up, founded by former Facebook and Google employees, that "[builds] technologies for low-income Americans who are often overlooked by traditional tech innovation." Propel's products include easyfoodstamps.com and the Fresh EBT app.

Propel was formed out of a Significance Labs fellowship immersion program in 2014 that put engineers, designers and product managers from some of the leading tech companies in Silicon Valley into the shoes of American families who live on less than $25,000 a year to help them understand the real "pain points" and think about potential solutions for this demographic. Significance Labs has since merged with Blue Ridge Labs at Robin Hood and the program offers grants, fellowships and workshops to promote social innovation for products and services that help the underserved.

PROPEL

To promote user-centered design, Blue Ridge Labs gathers a Design Insight Group composed of NYC residents who are experiencing the very challenges Blue Ridge is trying to solve. They pay $25 an hour to people for sharing their stories and testing products in development.

Furthermore, Propel spends thousands of dollars each month on digital marketing through Facebook and Google ad services to reach their target population of low-income Americans. While engaging the target population during the design phase is crucial, so is adequate dissemination and awareness of the product.

Free or Subsidized Access for Low-Income Populations

The line of websites and apps that help people plan meals and save on groceries represents a growing trend, with a steady stream of new cooking blogs and meal planning services entering the market. Many of the more robust meal planning apps charge a monthly or annual fee (e.g., $5-8/month for subscription meal planning apps like Cook Smarts or Plan to Eat, see part 5) and are not practical for underserved populations. Future research could investigate whether vouchers or subsidies for these kinds of services could reduce hunger/food insecurity. Future innovations might include better integrations between these types of apps, or new apps that offer a one-stop-shop to identify nearby deals and help users plan meals based on those ingredients.

Additionally, delivery services such as Plated and Blue Apron offer consumers the ability to have healthy foods delivered to their door each day of the week. The meals are portioned and ready to cook with all the ingredients. The services offer consumers an easy and simple way to cook healthy foods at home. The catch is that these services are costly, and they do not accept SNAP.

More Integrated Services

Another important strategy for food shopping on a tight budget includes comparing the unit price of commonly purchased items at nearby stores. WeGotReal.com recommends doing this on paper, but this is something that an app could potentially operationalize. Another powerful app might integrate budgeting and EBT benefit tracking with robust meal planning, shopping lists and cooking tips so that users can connect the dots between all of these inputs to maintain a food secure household.

There can also be significant savings gained by purchasing in bulk. However, although the price per unit for purchasing in bulk can be very low, the upfront, out-of-pocket cost for these items may be out of reach for low-income households. The sharing economy, and models such as food cooperatives (see Part 2), could be applied to help food insecure households team up to take advantage of these bulk and wholesale discounts.

Collecting Data to Impact Healthy Eating Interventions and Food Policy

Finally, these apps are not only useful to food-insecure households, but can also help collect and leverage important data. Apps that are designed for SNAP and WIC recipients, and employ barcode scanners and other features to help users budget and plan their purchases, could offer new methods for collecting detailed data on EBT use. These data can provide valuable insights into the dietary composition of low-income Americans, helping public health practitioners craft interventions accordingly.

In 2010, New York State proposed a 2-year demonstration project that would ban the purchase of sugar-sweetened beverages using SNAP benefits in New York City.[89] The USDA rejected the proposal, stating (among other concerns) that they would be unable to monitor the successful implementation of this change at the retail level and its impact on health outcomes.[90] With the widespread adoption of EBT cards and their "digital paper trails," these data could be used to evaluate nutrition interventions like the one proposed for NYC.[91]

USDA

United States
Department of
Agriculture

Food and
Nutrition
Service

3101 Park
Center Drive

Alexandria, VA
22302-1500

AUG 1 9 2011

Ms. Elizabeth R. Berlin
Executive Deputy Commissioner
New York State Office of Temporary and Disability Assistance
40 North Pearl Street, 16th Floor
Albany, New York 12243-0001

Dear Ms. Berlin:

Thank you for your request of October 6, 2010, that the Department of Agriculture (USDA) waive Supplemental Nutrition Assistance Program (SNAP) rules to permit a demonstration project restricting the purchase of sugar-sweetened beverages with SNAP benefits in New York City (NYC).

While we share in the underlying goal of the waiver to reduce obesity, several aspects of the proposal raise concerns about its potential viability and effectiveness:

Big Data and Privacy Concerns

The realm of big data has introduced new considerations about the conflicting interests of transparency and privacy. Data collected by individual grocery stores have historically been proprietary and thus not publicly available. In 2014, the USDA reconsidered its policy of keeping retail-level SNAP data private, and received a deluge of public comments on the docket via regulations.gov. Small businesses and chain retailers harked the importance of keeping these data private to protect competitive advantages; in particular, small businesses expressed concerns about the labor demands of increased reporting requirements and big box-stores using the data to identify regions of potential growth.

On the other hand, public health advocates and believers in government transparency on the use of taxpayer dollars argued for the many benefits that these data could provide. Lisa Levy, a representative from the New York City Coalition Against Hunger commented on regulations.gov:

> *"There have long been links between poverty and obesity, and a lack of access to affordable, nutritious food. If we know what people are purchasing with their EBT cards and where, we can link subsidies to healthy food to make it affordable and more accessible through the use of programs such as New York City's Health Bucks, which is used at farmers' markets. Purchases can also be tracked, tabulated and linked to the USDA's food desert map so that tactics can be developed to bring more nutritious, affordable options to those who lack them."*[92,93]

Big Data for Targeted SNAP Interventions

Big data on federal food assistance programs can provide powerful insights into behavioral patterns, reducing fraud and waste, improving the reach of these programs and generating new ideas to inform policy. Gregory Mills, an Associate at the Urban Institute, has proposed a way to use EBT transaction data to fight food insecurity, specifically among SNAP recipients who run out of benefits before the end of the month.[94] Miller suggests that analytic tools could be used to identify households that redeem at least 90% of their benefits within the first week, who could then be targeted for specific interventions or discretionary support.[94]

> *The Bottom Line: Digital technology can make it easier for food insecure households to sign-up for, track, and utilize food assistance benefits, and can play an important role in supporting resource-management skills, like meal planning and budgeting. By automating data collection, these apps and websites can provide important data for agencies to track outcomes.*

How Technology Works to Help Anti-Hunger Groups

Increasing Donations

Nonprofits working to reduce food insecurity, such as [Feeding America](#) and City Harvest, rely on donations to fund their programs. Indeed, small amounts of money can go a long way towards serving people in need; Feeding America cites that a donation of just $1 can provide meals to 11 people.

Digital Donations and Micro-Giving

Digital Donations

Nonprofit organizations have capitalized on the ease of making online payments to enhance their existing fundraising strategies as well as to promote new strategies. Nearly every nonprofit's website has a "Donate Now!" button to collect one-time or recurring donations, and many solicit donations using email lists.

There are a variety of online donation tools, widgets and plugins:

- [Google Wallet](#) (which charges 2.9% plus $0.30 for each transaction) and [PayPal](#) (2.2% plus $0.30) are broadly used tools for many forms of online transactions.

- [Razoo Donation Widget](#), [Network for Good](#), and [Just Giving](#) are geared specifically to nonprofit organizations, and all three charge a 5% processing fee per transaction.

- Google also has an [Ad Grants](#) program that makes it easy for nonprofits to launch strategic and effective advertising campaigns with an in-kind advertising budget of $10,000 per month for qualifying organizations.

Building on the success of crowdsourcing and crowdfunding models, a new wave of other giving trends has emerged that includes micro-giving and crowd-feeding.

Micro-Giving

Micro-giving involves collecting small donations from a large audience, and is facilitated by making the donation process as "frictionless" (i.e., easy) as possible, eliminating the need to take extra steps or go out of one's way to contribute a small donation. Many organizations provide the option to donate a small amount at the end of an existing purchase transaction, which is often as simple as clicking a checkbox to opt in.

For example, upon checking out for a purchase on the PBS Kids store users see the following message: "Support PBS And Donate $1.00...100% of the net proceeds PBS KIDS® receives from your purchase helps us encourage all children to discover who they are and what they can do." with a checkbox: "Yes, I'll Donate $1."

Apps that Encourage Customer Donations

Spare is an NYC-based app that encourages users to round their restaurant bills up to the nearest dollar (generating micro-donations <$0.99). That money is then donated to the users' choice of Food Bank For New York City, or City Harvest. Participating restaurants can offer rewards (e.g., after 5 round ups at a given restaurant, the user gets a free cocktail, appetizer or dessert), and users are encouraged to share their actions on social media.

As of late 2016, it appears that only 16 restaurants across NYC's five boroughs are participating with Spare, and unless that number grows, this model may not have a broad impact on hunger, however, apps such as Spare NYC help to build a foundation for innovation.

Food Insecurity/Hunger

SP△RE

?

$14.64
**Donated
This Month**

18
**People Fed
This Month**

0 0 0 0 2 4 0 4 4

TOTAL PEOPLE FED

122
YOUR TOTAL
IMPACT

235M
IS THE GOAL

Spare app

NEW YORK CITY
FOOD POLICY CENTER
AT HUNTER COLLEGE

Spare App:

Round Up a Restaurant Bill to Feed Hungry New Yorkers

What it does: Spare allows diners to round up their bills at restaurants to feed hungry New Yorkers.

How it works: Diners use the app to round up their dining bills at a partner restaurant to the nearest dollar, donating the extra change to Food Bank For New York City or City Harvest. Users can share their donations and track their impact. To become a partner restaurant, an establishment must agree to offer a system of rewards, as laid out by Spare.

Why it's interesting: The app provides rewards, such as free dishes or discounts, to incentivize rounding up bills.

What can be learned from the app: Taking a physical concept (donating change after a purchase) and making it digital can widen reach and impact.

Created by: Andra Tomsa, Rameet Chawla

Website: http://sparenyc.org/

Cost: Free app, donations of spare change up to $1.

Future of the app: The app is only available in a small number of restaurants in New York City, but could be expanded nationally or internationally.

Spare app

65
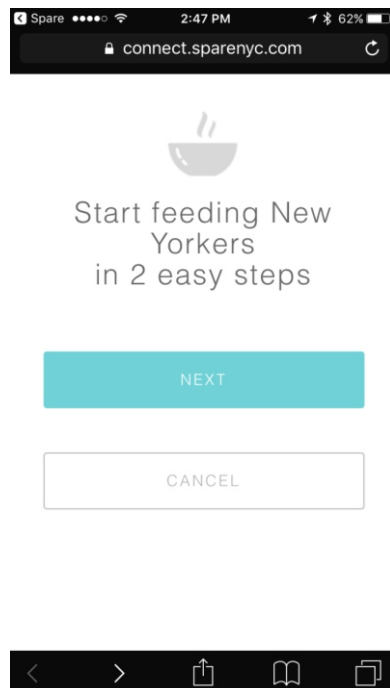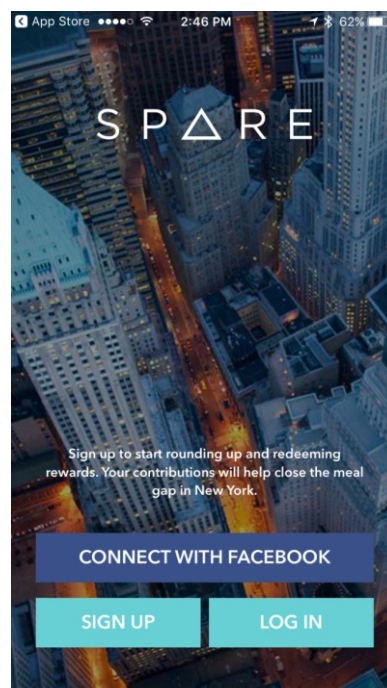
Other initiatives have used mobile technologies to provide new ways to donate. Continuing the micro-giving trend, Share the Meal, an app built by the United Nations' World Food Programme, has a simple donation interface that makes it easy for users to donate $0.50, which feeds a child for one day, with just a tap in the app. Users can set up larger or recurring donations as well, and after a donation is made, the app displays a picture and short description of the recipient. The app also has a map to show where the meals are delivered and a news feed with stories and videos from those regions. As of October 2016, over 8.3 million meals had been shared through the app by approximately 630,000 users ($4.15 million in donations), demonstrating that micro-giving can indeed have a large impact.

Share the Meal app

Food Insecurity/Hunger
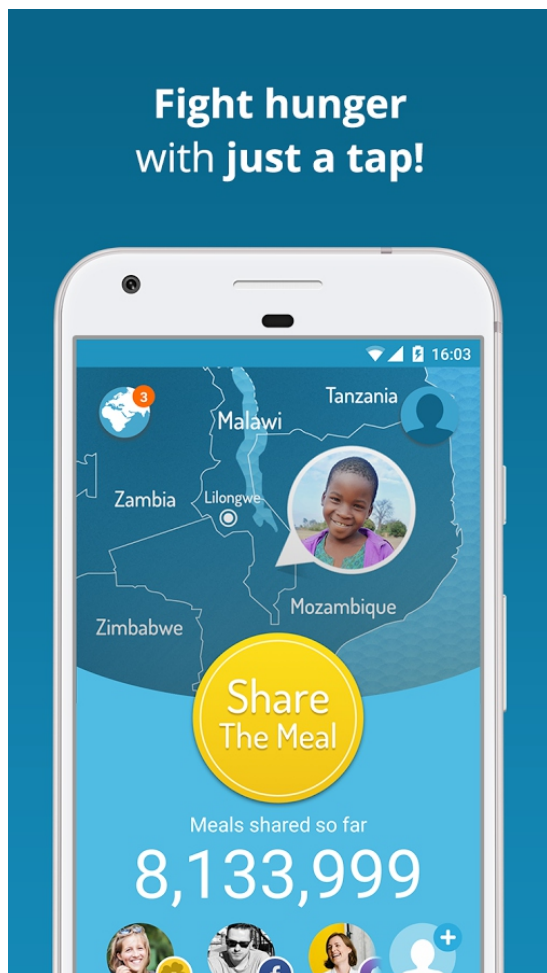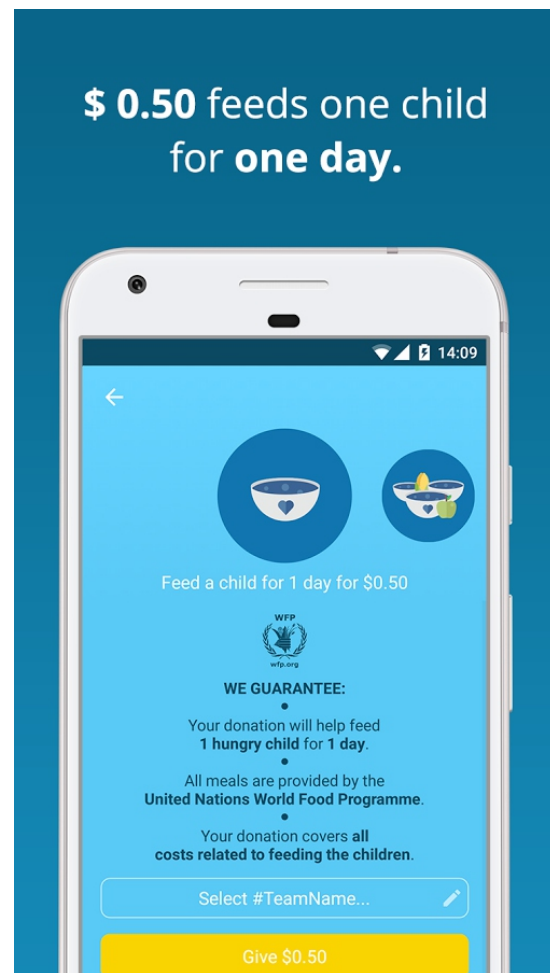
Share the Meal App:

Micro-Giving to Feed Hungry Children

What it does: Share the Meal allows people to make donations to feed children around the world.

How it works: Donors download the app and tap to make a $0.50 donation that will feed a child for the day. The United Nations World Food Programme provides the meals and illustrates where the meals have been distributed.

Why it's interesting: The platform does not have special algorithms or features; it uses a simple donation interface.

What can be learned from the app: Turning something into an app can make it more accessible and desirable for people to use.

Created by: United Nations World Food Programme

Website: https://sharethemeal.org/en/

Cost: Free app, meal donations cost $0.50.

Future of the app: Donations could be expanded to include sponsorships for extended periods of time, or to support food production education or other lasting services.
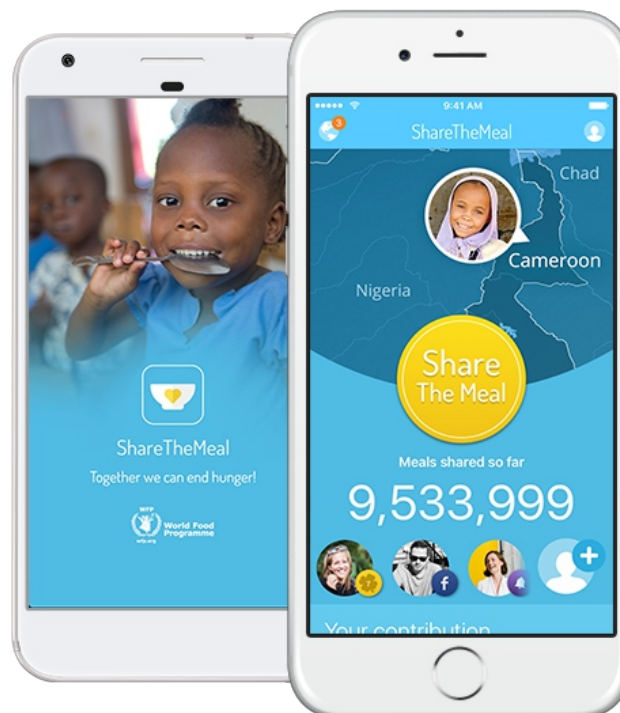
Share the Meal app

Text Messaging Campaigns

Text messaging donation campaigns have also been successful by providing an easy way to give, tacking on small donations (e.g., $5, $10 or $25) to the donor's cell phone bill. Nonprofits can work with the Mobile Giving Foundation, which partners with the major wireless carriers in the United States and Canada to set up mobile giving programs by generating short codes and keywords, e.g., "text GIVEBACK to 20222 to donate $10 to our cause."

Amp Your Good's Crowd-Feeding Platform:

Increase Healthy Food Donations at Food Drives

Modeling online crowdfunding platforms like Kickstarter, Amp your good is a crowd-feeding platform attempting to solve problems related to food drives.

Background: Food Drives

Food drives typically collect non-perishable items in centralized locations such as a workplace or grocery story, but locations and drop-off times may not always be convenient. Fresh fruits and vegetables are in high demand at food pantries, but drives often receive donations of unhealthy products and products that are expired or damaged.

Online Donations Reduce Barriers to Healthy Food Donation

Amp your good's platform allows individuals or organizations to set up online food drives that focus on healthy and fresh foods. Food products are purchased for donation through the online platform, and at the end of the drive the items are delivered directly to a soup kitchen, shelter or other food assistance organization. Eliminating the need for a physical collection box to accumulate items over the given time period can significantly increase the volume of fresh produce and other healthy food items to food pantries.

Stamp Out Hunger, one of the largest food drives in the country that collected over 80 million pounds of food in 2016,[95] partners with the National Association of Letter Carriers and the United States Postal Service to collect non-perishable items left next to household mailboxes. In a 2016 pilot program, Amp your good partnered with this campaign as Stamp your Good,* providing a second donation option through their online platform. Online donors purchased an average of 20 pounds of food, compared with the average 2-pound donation left out by people's mailboxes.[96]

Tech Facilitates Fruit and Vegetable Donations

The ability to make online donations of fresh food is particularly innovative as it eliminates many of the barriers faced by both donors and recipients of food products. A food pantry might receive an oversupply of one type of produce that they then struggle to adequately store and distribute;[97,98] with online donations, needs can be updated in real time to account for the resources on hand at that given recipient site. For example, once a certain amount of produce requiring refrigeration has been donated, those items can be removed from the list (like an online gift registry, that lets other gifters know which items have already been purchased).

*When checked at the time of publication, the Stamp your Good website had been updated to Amp your good's new #GiveHealthy campaign.

Amplify your good and take it to a new level!

Crowdfeeding

A new kind of food drive, featuring Real Food

As seen in:

The Washington Post   nj.com True Jersey   TECH.CO   CIVIL EATS   Forbes

Featured Campaigns

Curbing Hunger Youth Council Fights Hunger!

1 in 5 Kids in NJ Struggle with Hunger, 1 in 6 Adults, too...

The Youth Council is dedicated to supporting the mission of Curbing Hunger - to provide hunger organizations with food donations when they really need them. As members of the council, we're reaching out to our community to ask them ...

Garces Grabler LeBrocq Healthy Food Drive

Let's get people facing hunger the food they really need!

We're supporting Meeting Emergency Needs with Dignity (MEND), which is the largest hunger assistance organization in Essex County, supporting 18 food pantries and feeding over 100,000 people in need.

CIBC Cares for Fort Mac!

Help feed those affected by the Alberta wildfires

CIBC is hosting this emergency food drive to support the many people displaced by the Fort McMurray wildfire. Please join us in getting healthy food to our neighbours.

Amp your good

What the Research Shows:

How to Increase Digital Donations

Show Donors How and Who Their Money Helps

Digital donations make it easy for organizations to track and display data, such as who has donated, the cumulative amount donated and how those donations were used. Giving real-life context to a micro-donation — by quantifying exactly what that money does (e.g., feed a child one meal with your donation of just $0.25), where it will be used or whom it will benefit — can help donors feel more connected to the process of helping others.

DONATE JUST $0.25 → **FEED A HUNGRY CHILD ONE MEAL**

Experiments have shown that people are more likely to give when motivated by perceived efficacy, that is, if they feel they are helping one individual versus contributing just a "drop-in the-bucket" towards a much broader problem.[99,100] Thus, when apps like Share the Meal show a photo and description of one child that the user's donation helped to feed, that user is more likely to donate more money.

Address Donors' Privacy Concerns

One challenge of many of these apps is users' concerns about privacy, particularly about providing their bank account and/or credit card information. Apps that adopt established payment systems like PayPal or Google Payments may alleviate some of these concerns.

Collecting mobile donations via SMS, by contrast, is quite frictionless (by tacking on donations to the user's cell phone bill, no exchange of additional financial information is required). This form of "impulse giving" in response to video footage or specific events has been wildly successful for natural disaster relief, like the "Text for Haiti" campaign.[101]

Show Donors How Much They Have Given

Showing logs with the total amount an individual user has contributed over time, as well as the cumulative total donations from all app users and progress towards a goal, can motivate people to continue using the app as well as to share the app with their social networks. The Spare app uses a "leader board" to show which users have donated towards the most meals. Indeed, seeing that others, and particularly peers, have donated strongly influences individuals' decisions to donate themselves.[102]

What the Research Shows: (cont.)

Encourage Donors to Share with Their Networks

Nearly all of these digital donation apps and platforms donate additional amounts when users share their activities on social media, as it serves as a form of free marketing. Mano conducted a secondary analysis of Pew data on civic engagement and found that increased internet and social media use as well as general "online engagement" (posting comments, articles, photos, etc.) were associated with high levels of online donations to social and political causes.[103]

Based on an analysis of donation data from Facebook's Causes, Saxton and Wang found that there is a strong "social network effect" to donations given the spread of information through online social networks, which increases overall charitable donations.[104] Social networks may facilitate impulse giving, although more users are willing to "like," share or otherwise promote a cause than to actually donate. However, many do donate, often driven by social network pressures, and are more likely to donate to causes related to health and other "socially-acceptable" or "warm and fuzzy" cases.[104]

Another study found that people who donated money online and then shared the donation link on Facebook (peer-to-peer fundraising) could help solicit new donations,[105] and social ties and peer pressure can increase willingness to donate as well as donation size.[106,107] Apps and websites that help people connect with each other while contributing to a common cause can be a powerful way for nonprofit organizations like food banks to increase awareness and raise money.

Apps that Facilitate Organizational Giving to Charities
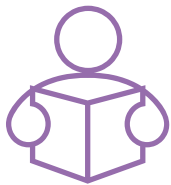
While the examples above encourage customers to donate, other apps encourage businesses to donate a share of their profits. For example, AmazonSmile is a branch of the mammoth online retailer's website that donates 0.5% of the purchase price to a user's selected charity when items are ordered through the smile.amazon.com URL instead of amazon.com.

iGive works similarly and partners with existing online retailers, like Walmart, Verizon Wireless, Ticketmaster and Hilton Hotels, each of which elects to donate an average of 3% of their profits to the customer's selected cause. Shoppers can install a simple web browser app, the iGive Button, which automatically activates the service when on the website of a participating store. iGive also has native iOS and Android apps available for download.

iGive.com®

Tango Tab App:

Donate the Cost of a Restaurant Meal to a Food Charity

What it does: TangoTab donates the cost of a meal to a local food charity each time a user dines out a participating restaurant.

How it works: Users locate participating restaurants and check in through the app. TangoTab donates the cost of a meal (using the fee from the participating restaurant) to a local food charity.

Why it's interesting: The app uses publicity for restaurants as an incentive to join the program.

What can be learned from the app: Patronage at a specific establishment can be encouraged by tapping into individuals' altruistic tendencies.

Created by: Andre Angel

Website: http://tangotab.com

Cost: Free app; price of meals for diners varies by restaurant. Restaurants pay a fee to TangoTab to be listed in the app.

Future of the app: The app is available in a handful of cities (Dallas/Fort Worth, New York City, Austin, San Diego, Oklahoma City, Houston, Bay Area and Atlanta), but could be expanded nationally or internationally.

Similarly, a variety of applications attempt to make charitable acts routine by sharing a portion of restaurant profits with nonprofit organizations that are fighting food insecurity. TangoTab and Sharebites are apps that donate to local charities when users eat out or order in.

When TangoTab app users check in with the app at participating restaurants, the restaurant pays a fee to TangoTab, a portion of which is donated to City Harvest in New York City. This money is used to cover the cost of a meal for a person in need.

Tango Tab app

The [Sharebite](#) app, also available in NYC, uses a similar approach to combat food insecurity. When a customer orders take-out from participating restaurants through Sharebite, 2% of their order total goes to City Harvest, or the charitable organization of the customer's choice.

ShareBite App:

Donate Profits from Take-Out Orders to Charity

What it does: ShareBite donates a portion of the profits from take-out orders at participating restaurants to [City Harvest](#) or another charity.

How it works: A user orders a take-out meal through ShareBite, and the app either donates a meal to City Harvest or 2% of the profit to a cause of the user's choice.

Why it's interesting: Users do not have to do anything extra for the donation — like pay a fee or share a photo — they simply order through the app.

What can be learned from the app: Philanthropic goals should draw from things people are already doing (such as ordering take-out).

Created by: Mohsin Memon, Ahsen Saber

Website: https://sharebite.com

Cost: Free app; food prices vary based on establishment.

Future of the app: The app is available only in New York City, but could be expanded nationally or internationally.

[Munchery](#), a "chef-made" meal delivery service that operates in San Francisco, New York, Los Angeles and Seattle, donates to a local food bank with each purchase.

Some restaurants regularly donate surplus food to local food banks. City Harvest publishes an annual "[Great Food, Good Hearts](#)" restaurant guide highlighting their restaurant donors. The organization also had a short-lived app that connected their guide to [OpenTable](#), a website and app used to make restaurant reservations, prompting users to donate money directly to City Harvest, if they wished, during the process.[108]

FIND ME

DELIVERY

📍 211 East 23rd Street, New York, NY

🔍 Craving a restaurant, dish, or cuisine?

❮   ❯

Trending: Create Your Own Sandwich

Sort	Cuisine

Gila's Nosh

$11.50 min • Delivers in 25-40 mins $$$

4.1 ★★★★✰

Mediterranean, Coffee & Tea
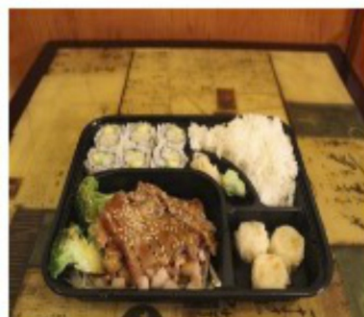
Aki Chinese

$10.00 min • Delivers in 30-45 mins $

3.1 ★★★✰✰

Chinese, Japanese, Sushi

ShareBite app

New Ways of Engaging Users to Raise Money

Other apps have sought creative ways to engage users to raise money, such as by translating healthy behaviors into micro-donations and through gamification.

Using Fitness Trackers to Earn Money for Charity

Applying a unique business model, Charity Miles is a company that connects charities (like Feeding America), individuals and corporate sponsors. Individuals who download and use their fitness tracking Android or iOS app help earn money for charities while walking, running or biking (bikers earn up to $0.10 per mile; walkers and runners earn up to $0.25 per mile), as measured by their mobile devices' native accelerometers. The funds come from corporate sponsors, like Johnson & Johnson, Humana, MasterCard and Kenneth Cole, which donate a portion of their advertising budget to Charity Miles. In return, Charity Miles provides premium quality, graphic-rich advertising through the app (e.g., "*Humana is proud to sponsor you…*").

Cutting Calories to Donate Calories

foodtweeks is a free app that helps people make small changes to cut excess calories from their diet and then donates an equivalent amount of calories to a local food bank. The app takes a unique approach to weight management by focusing on making small changes to a desired meal, rather than suggesting a particular diet to follow. For example, if a foodtweeks user is at McDonald's and wants to order a Big Mac, he can type 'Big Mac' into the app to pull up suggestions that include removing the center bun and ordering without cheese or the special sauce.

The app maintains a crowd-sourced database with pictures of over 44,000 small changes that can be applied to cut back calories in specific menu items at restaurant chains, in grocery items and in home-cooked meals.[109] The app tallies the amount of calories from each of the selected tweaks and makes a donation for every 600 calories accumulated. As of December 2015, foodtweeks is undergoing a revamp of their app and business model and the new app was not yet available at the time of this publication.

Translating Small Behavior Changes into Donations

[Instead](#) is another app that encourages making small changes that can be translated into micro-donations; their motto is "micro donations/macro impact." Through their mobile app, they suggest "consumption-conscious" changes such as brewing coffee at home, instead of buying at a coffee shop at $3 a cup, and using that money instead to provide clean water for 3 people. The app also promotes the use of social media and office environments to inspire group micro-giving challenges (e.g., co-workers pack a lunch every Wednesday for a month and donate those savings).

Hunger Crunch App:

In-App Purchase Proceeds to Feed Hungry Children

What it does: Hunger Crunch donates the proceeds from in-app game purchases to feed children in eight countries around the world.

How it works: Users play the free game and purchase "candy coins" to use in the game. Proceeds from the purchases go to [Rice Bowls](#), the creator of the app, and is used to feed children.

Why it's interesting: Rice Bowls uses a free, entertaining game to draw in users and then introduces philanthropy by asking them to make in-app purchases that benefit a charity.

What can be learned from the app: Entertainment and viral popularity are powerful tools for marketing charitable causes.

Created by: Rice Bowls

Website: http://www.zeropercent.us

Cost: Free app; in-app purchase costs vary.

Future of the app: The charity is active in eight countries, but with more funding, this could expand.
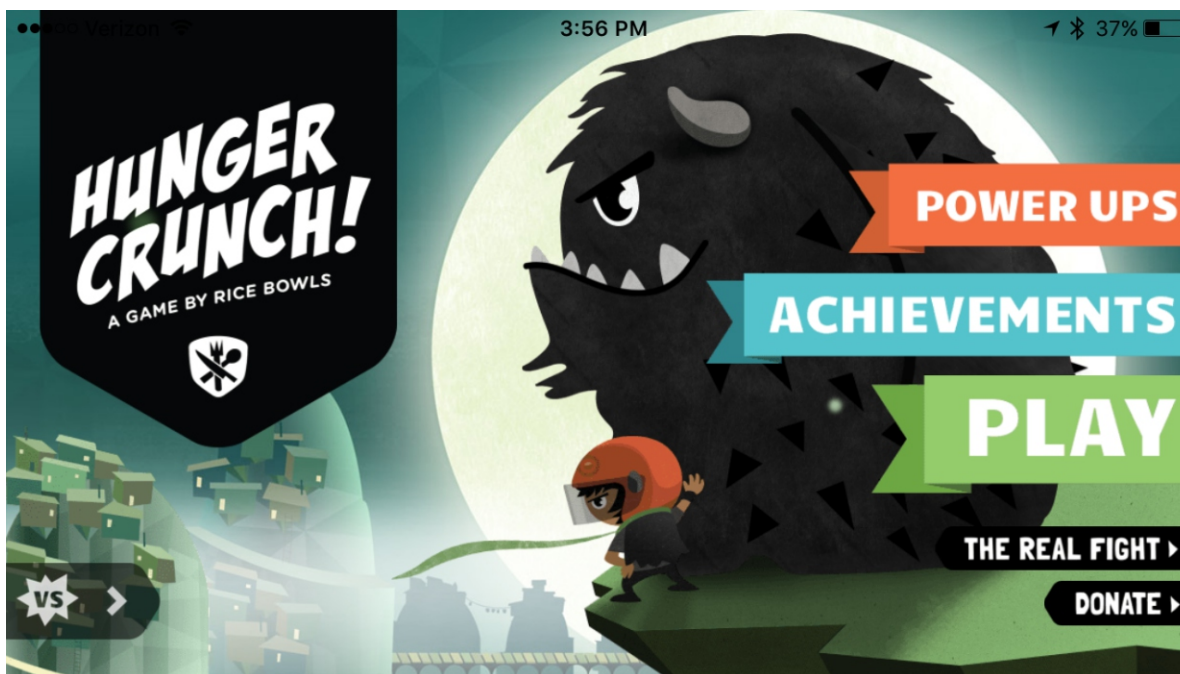
Hunger Crunch app

#FoodPorn and Social Media Campaigns

Background: Food Photos and Viral Campaigns

Food photography has become a cornerstone of social media, representing one of the largest categories of photos posted to Instagram (with an estimated 300 million food photos as of mid-2015), second only to selfies (316 million).[110] In short, people love to look at photos of food, and thus people love sharing them with their networks.

Social media has led to the rise of viral advertising and fundraising campaigns, like the ALS Association's Ice Bucket Challenge. The Ice Bucket Challenge became the world's largest social media campaign in the summer of 2014, with over 17 million people uploading a video and sharing it on Facebook.[111]

The "challenge," designed to raise awareness for amyotrophic lateral sclerosis, was to record a video of oneself dumping a bucket of ice water over one's head, upload the video to Facebook, and then tag and challenge at least 3 friends to do the same using the hashtag #ALSIceBucketChallenge. The campaign led to over 10 billion views by 440 million people, raising over $115 million.[111] Donations were not a prerequisite to participate in the challenge but were encouraged and made easy through a link. This campaign had viral success due to its catchy nature; watching videos of friends momentarily shocked by the freezing cold water was both entertaining and fun to share.

Social media fundraising has been a growing trend; in late 2015, Facebook launched a dedicated fundraising feature for nonprofit organizations that allows their supporters to initiate their own charitable giving campaigns and share those campaigns with their social networks.

Leveraging Social Media Trends to Raise Money

Apps have sought to capitalize on this trend by using social media and food photos to raise money for and awareness about a particular campaign, while generating good publicity for participating restaurants. Feedie (see box p. 80) partners with restaurants, which donate $0.25 to The Lunchbox Fund each time app users (restaurant guests) take and share a photo of their food; each donation provides one meal to an orphaned or vulnerable South African school child.

The app seamlessly shares those photos with users' selected Instagram, Facebook and/or Twitter accounts, which further promotes the cause while promoting the restaurants' philanthropy.

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Feedie App:

Share Food Photos over Social Media to Feed Children Living in Poverty

What it does: Feedie allows people to feed impoverished children in South Africa by sharing photos of their food.

How it works: Diners link the Feedie app to their social networks, visit a participating restaurant and use the app to share a photo of their meal. The restaurant will make a donation of $0.25 (the estimated cost of one meal for a child) to The Lunchbox Fund.

Why it's interesting: The process requires minimal effort from diners, and participating restaurants receive exposure via social media in exchange for their donations. The restaurants can also promote their participation in Feedie as a social benefit.

What can be learned from the app: Publicity is a powerful incentive, and philanthropic goals should draw from things people are already doing (such as taking photos of their food and sharing them).

Created by: The Lunchbox Fund

Website: http://www.wethefeedies.com

Cost: Free for diners, donation of $0.25 per photo for restaurants (made in an annual $500 donation).

Future of the app: Photo sharing could increase in popularity so that restaurants are donating more than $500 each year. Feedie could also incentivize "likes" or "shares" of photos taken and shared in the app.

Feedie posts have generated over 600 million social media impressions to date. Over 12 million meals have been shared through Feedie since its launch in 2013, and the app has been promoted by food celebrities Mario Batali and Jamie Oliver.
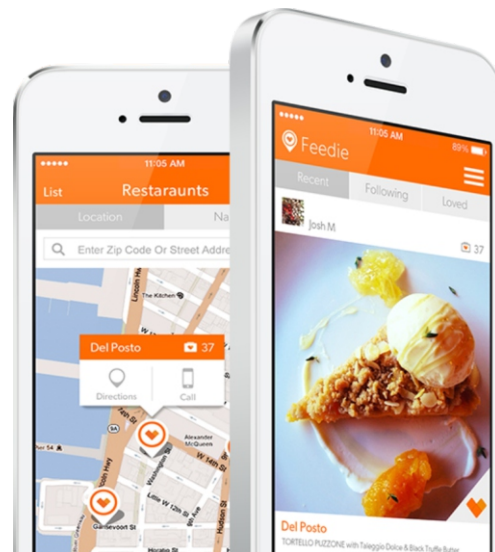
Feedie app

GiftAMeal works similarly to Feedie. Users download the app, dine at one of GiftAMeal's partner restaurants and then share a photo while at the restaurant, either of their meal or of another aspect of their experience. For each photo posted to the app (and verified by location tag), a meal is donated to a local food pantry (e.g., Operation Food Search in St. Louis, where the app is headquartered).

The app makes it easy for users to recommend the restaurant (and broadcast their good deeds) to their friends, and if users share the post to Facebook, a second meal is donated. GiftAMeal covers the cost of storage, transportation and labor related to the food donations. GiftAMeal charges participating restaurants a tiered monthly fee, and the restaurants benefit from good publicity and repeat visits from app users and their networks.

GiftAMeal App:

Share Food Photos with Other App Users to Feed Hungry People

What it does: GiftAMeal allows diners to donate meals to hungry people in their community by dining at a participating restaurant and taking a photo of their food.

How it works: A restaurant pays a monthly fee to participate in the GiftAMeal program. Diners eat at participating restaurants and take a photo and share it within the app (which notifies the diner's friends). GiftAMeal funds the distribution of one meal from a food bank to a food pantry.

Why it's interesting: The app focuses on in-app sharing, with social media sharing as a secondary option.

What can be learned from the app: Publicity is a powerful incentive, and philanthropic goals should draw from things people are already doing (such as taking photos of their food and sharing them).

Created by: Andrew Glantz and Aidan Folbe

Website: http://giftameal.com

Cost: Free for customers; tiered monthly fee for restaurants.

Future of the app: The app is currently available only in St. Louis, but it could expand nationally or internationally.

136   **8**

Meals donated   Friends

Michael Kaushansky | mike K

| Inbox | Tried it | On GiftAMeal |

Search all restaurants on GiftAMeal 🔍

0.6 miles

Cicero's

6691 Delmar Blvd Saint Louis, USA 63130

Imagine if every time you took a photo of your food

GiftAMeal app

a meal was donated to someone in need.

Walmart donated $2 million to food banks in the spring of 2012 in its Fight Hunger campaign, by having people vote up to once a day via Facebook for their local communities. Youngstown, Ohio, a town of 73,000 people, won the contest with over 98,000 votes.[112] In the campaign's current iteration, Walmart and its partners donate 10 meals ($0.90) to Feeding America for each social media post on Facebook, Twitter or Instagram with the hashtag #FightHunger, as well as each share and like, for a total of up to $3 million.

In a different twist, the Delete to Feed movement aims to raise awareness about food insecurity by prompting Instagram users to delete a food photo they have posted. In this campaign, Land O'Lakes, one of the largest agribusiness and food companies in the United States, will donate 11 meals to Feeding America for each deleted Instagram post. Through a simple process, users log-in to their Instagram account via Delete to Feed's website, select the photo they wish to delete, and then have the option to share an image via social media that promotes the campaign, stating "I deleted a meal to donate a meal," featuring Land O'Lakes' logo and the campaign URL. Three weeks into their month-long campaign, 137,764 meals had been donated.

Leveraging Bloggers' Networks to Raise Money

The No Kid Hungry initiative, from the anti-hunger group Share Our Strength, works to connect children in need with nutritious food and teaches families to cook healthy and affordable meals. One of their primary fundraising tactics is the Bake Sale for No Kid Hungry campaign, and in recent years they have had considerable success by engaging food bloggers with large networks of readers for a "Food Bloggers Bake Sale." One blogger team, Maggy Keet (of Three Many Cooks) and Gaby Dalkin (of What's Gaby Cooking) raised over $25,000 in 2012.[113]

Notably, the Bake Sale for No Kid Hungry campaign is sponsored by Domino Sugar, and the website states that the campaign encourages people to host bake sales to raise funds. While this not a stellar example of a healthy food policy programming or innovation, it is a strong example of how to use the power of social media and the internet to mobilize around hunger issues.

Other campaigns, such as the annual Thanksgiving Hungerthon (@whyhunger) are promoted by bloggers and other influences (such as actors and musicians) via Twitter.

Tech Highlight

Peer-to-Peer Food Sharing

On a smaller scale, apps, websites and social media have made it easy for individuals to lend a helping hand to their peers in times of need.

Campus Meal Plan Sharing

The Share Meals app lets college students share their extra meal card "swipes" with fellow students who are food insecure. Founder Jon Chin was inspired to create the app after seeing an anonymous user post on NYU Secrets (a facebook page started by New York University [NYU] students who post anonymous "secrets") that he had only $25 to feed himself over the next two weeks. "Immediately, dozens of NYU students offered to swipe or buy a meal for someone [they'd] never met."

Chin built a prototype of the app in just 24 hours and it was able to match 400 students with meal swipes just in the first week. Share Meals uses an algorithm to log available time slots when and locations where users can trade swipes.

In 2016, Chin was working on a new version of the app to help even out the supply to better match on-going demand; the majority of swipes are donated in the last few weeks of the semester, when students realize they have a surplus. In the new version, Chin plans to include a "free food" locator, to identify campus events that have leftover food. He is also working on expanding the app to other schools.[114]

Share Meals app

Tech Highlight (cont.)

Social Media Altruism and the Reddit Food Bank

Reddit, a message board for entertainment and social news that launched in 2005, operates as a community-curated idea, feedback and commentary marketplace, where users can upvote and downvote posts and has between 15-20 million unique visitors each month.[115] There are "subreddits" for nearly every topic imaginable, one of which is the Reddit Food Pantry. The site is designed for short-term aid requests, and users can post their story and requests for food or other household essentials.

Requestors can post an Amazon, Walmart or other online "wishlist" that allows items to be purchased one by one or in groups and sent to them directly; other people post PayPal accounts. People can also post offers, if they have excess food to share.

In order to post a message, either as a requester or a giver, users must have been active on Reddit for at least 3 months, post their zip code and have at least 300 "comment karma" points, an indication of their genuine use of the site. The site has been very successful; posts are marked as "fulfilled" once items are received and there are countless threads expressing gratitude for the help received. Users also share advice about dumpster diving and other ways to get through times of hunger and stretched household budgets.

As one article wrote, in praise of the genuine altruism happening between strangers, "the Reddit Food Bank might be the best thing on the Internet."[116]

Restaurant Meals for Hungry Families

The 1 Family 1 Restaurant* (1F1R) app has a network of participating restaurant members in the community that "sponsor" a meal for a family, giving them the opportunity to dine at a sit-down restaurant. By partnering with both local restaurants and local food banks, which identify recipient families once a sponsored meal comes in, the app helps to build ties within the community. One recipient, a mother of two, reflected on the experience of dining out, "there's something really special about being able to enjoy that atmosphere. We haven't had that and it really does mean a lot."[117]

*When checked at the time of publication, 1 Family 1 Restaurant's website (http://www.1f1r.com) was no longer active.

r/Food_Pantry

5,508 subscribers • 9 online

🔥 HOT POSTS ▼

u/Rocket-J-Squirrel • 3d   •••

Elder and disabled couple in need of a meal or two.

Husband and I are in a tight spot and could use a meal or two to get us through until Jan 3rd. The local food pantry is empty and we have no way to get to a shelter for a free meal. We will have funds...

↑ 12   💬 15   ⬆ Share

u/JhonnDough • 4d   •••

[Request] possibly a pizza

well I made a post here and was lucky enough to get a pizza(14 days ago). it pains me to come back but im 2 days away from pay day and could really use something **Reddit's online food pantry**

Safety Net Software: Solving Logistical Challenges

Background: Existing Challenges

Food banks, food pantries and food rescue organizations face complex logistical and bureaucratic challenges involved with locating, transporting, storing and distributing food. Food banks generally track food donations closely, keeping logs of which businesses or individuals donate food and on which days. Food pantries, for example, are required by the USDA and The Emergency Food Assistance Program (TEFAP) to report on metrics such as the number of households and specific groups (e.g., children and seniors) that they serve.

Software for Food Banks

Some organizations use software for big data analytics. Tableau is an example of powerful analytics software that can be used to mine data for insights and visualize data in a variety of ways. Feeding America uses Tableau's analytics to answer questions such as: how much it costs to source a pound of food; how much it costs to distribute 1,000 pounds of food; and what the inventory turn-over is in a particular location.[118]

The organization uses Tableau dashboards to track data on sourcing, distributing and cost management in order to make decisions about how their efforts can best address current needs. Ross Fraser, Feeding America's Director of Media Relations, states: "[Tableau] helps us visualize where the food is, where we need to take the food, who's hungry, where they're hungry, and how we can be much more efficient and get more food to hungry people."[118]

Tableau software

Salesforce, the leading global customer relationship management (CRM) platform, is a cloud-based Software as a Service company that helps businesses find, win and keep more customers through a suite of products (Sales, Service, Data, Marketing, Community, Analytics, Apps and IoT), powered by artificial intelligence.

The Salesforce.org branch has a Nonprofit Success Pack that helps nonprofits engage with their communities, fundraise, analyze impact metrics and build apps, among other features. They offer a free 30-day trial, and eligible nonprofits can apply for their "Power of Us" Program, which comes with 10 free subscriptions to their standard software, plus steep discounts on additional subscriptions (starting at $36/month), products and/or services.
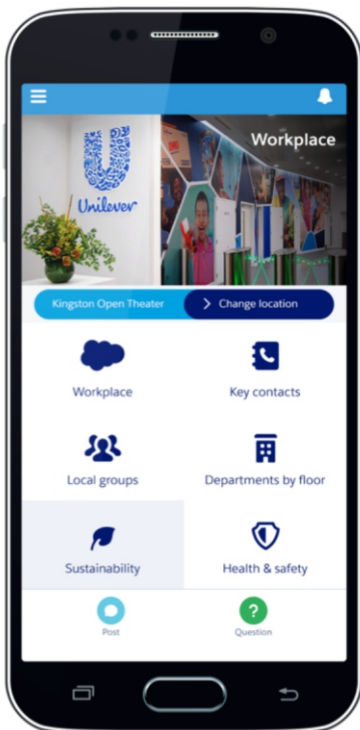
The South Plains Food Bank (SPFB) in Texas uses Salesforce to manage their food inventory and keep track of both donors and volunteers. Because food banks are often staffed by volunteers with various levels of tech savvy, data entry should be as painless as possible, and Salesforce has put considerable resources into optimizing their user interfaces for ease of use.

Salesforce helped SPFB to clean up and input 17 years' worth of data into the software in order to help them glean insights that could help future performance. They also implemented other solutions such as a volunteer kiosk, for volunteers to punch in and out, which provided a much easier reporting and accounting system.

Salesforce app

South Plains Food Bank

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While Salesforce offers an end-to-end solution and can be customized for many different cases, there are a variety of other software services that have been designed specifically for food banks. FoodStar is a Windows-based software application that helps food pantries streamline their recordkeeping and reporting processes. The software also accepts digital signatures from donors and recipients, meaning that food pantries can go entirely paperless if adopting this sort of software.

Software has also been used to make connections between food banks and their donors by enabling real-time updates of the food banks' current needs. An app in the United Kingdom, aptly titled Foodbank, sells its Software as a Service to food banks for approximately $10 per month, but is free for supporters, including both volunteers and donors. Foodbank provides an administrator portal through which local food banks can indicate their current needs based on a shopping list composed of the standard items distributed by food banks. These items are color coded, e.g., red items on the list are urgently needed, yellow are in low supply and green are fully stocked. These needs are updated in real-time on the supporters' apps. Supporters select their local food bank and can set alerts that remind them to check the app during grocery shopping trips.

Club Appetite,* from a Canadian software company, is a fundraising app for food banks that takes a novel approach to symbiotically connecting food banks, donors and local businesses. Food banks use their platform to indicate which items are needed (similarly to Foodbank), track what has been donated and by whom. Individual users can browse Club Appetite's mobile app to "shop" for items to donate based on the current needs of their local food bank. With each purchase, donors earn points that can be redeemed for offers at local businesses. Users can also keep track of track tax receipts for their donations through the app. With each purchased "item," the food bank receives a monetary donation of equal value that can be aggregated with other donations to harness the purchasing power of a larger order.

*When checked at the time of publication, Club Appetite's website (http://clubappetite.com) was no longer active.

What the Research Shows:

Software Use Increased Donations and Volunteering

Foodbank ran a pilot study of its app with the Sheffield S6 Foodbank in December of 2012, resulting in a 100% increase in food donations during a one-month span, and an increase in donated items that were in highest demand.[119] (Granted, these data were collected by the software company, which may have introduced elements of bias into this study.) Foodbank's founder noted that use of an app has been a way to engage the younger generation to volunteer at and donate to food banks.

After implementing Salesforce, the South Plains Food Bank saw a 3-4% increase in online donations and found it much easier to generate reports for their board members. Their CEO noted that "all our information including volunteer hours, financial donations and food donations, and every other touch that we have with our constituents is now organized in one location allowing us to generate concise reports, alleviating wasted staff time spent on entering and compiling information."[120]

Predicting Need and Identifying Fraud

Big Data: Estimating Program Need

As more people seek information about food assistance programs and connect with resources online, these data can be used in a broader sense to track fluctuations in demand for these programs.

Google Trends can be used to track search terms that are entered into Google in a particular region and time period; these data are easy to access and readily available for download as a simple CSV file. These data can produce powerful insights and have been used to track flu outbreaks,[121-124] population mental health,[125-127] and food safety.[128-130]
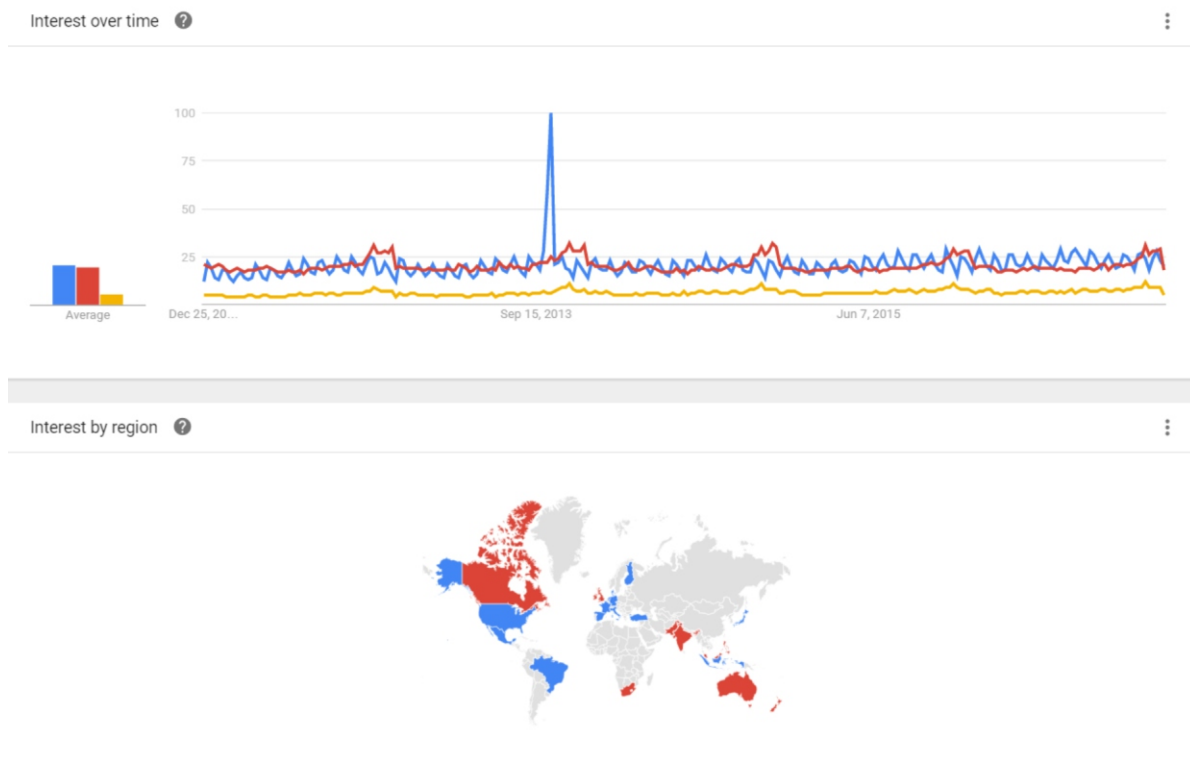
Google Trends

SNAP (food stamp) caseloads have generally been hard to predict and most of the published literature in this area focuses on determinants of caseloads or analyzing the effect of particular policies and economic conditions retrospectively.[131] Dean Fantazzini used Google Trends data in a series of 3000 different predictive models to forecast the number of SNAP recipients at both the state and national level, and found that models including the Google data consistently outperformed the other models.[131] By being able to predict how the demand for SNAP fluctuates in response to changing unemployment rates, for example, these sort of forecasting models can help states better allocate resources to combat food insecurity.

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Digitized data can be collected through any website, app or electronic transaction process in an automated way. With some foresight with regard to data management (e.g., how the data are stored, labeled and accessed) and the help of analytic software, those data can be used to identify patterns or track particular occurrences. For example, EBT cards, like any debit or credit card, transmit data each time the card is swiped, making it easy to track balance and transaction histories.

Open Government Data:

Free Access to Nearly 200,000 Datasets

The United States government has an open data project, data.gov, that provides free access to over 192,000 datasets.

"Open government data is important because the more accessible, discoverable, and usable data is, the more impact it can have. These impacts include, but are not limited to: cost savings, efficiency, fuel for business, improved civic services, informed policy, performance planning, research and scientific discoveries, transparency and accountability, and increased public participation in the democratic dialogue." [132]

The site provides access to a wide range of data from local, national and international governments, consumers, businesses, climate, health, energy, agriculture and education. These raw data can be harvested for research or to power software applications, or can be accessed via APIs. There is also a list of current challenges in which teams can win monetary prizes for using these data to solve specific government challenges.

A number of innovative apps have applied data.gov datasets and/or APIs to power their content and features. Everyday examples include:

- Accuweather uses real-time National Oceanic and Atmospheric Administration (NOAA) data to update its website and mobile applications.

- Realtor.com uses geospacial data from the National Atlas of the United States and the Homebuyer Activities Report published by the Department of Housing and Urban Development.

- Where are the jobs, a web application, uses data from the U.S. Department of Labor to give a graphic representation of employment statistics (e.g., average salary and number of firefighter jobs in a given state, city or region) for different occupations.

- Several of the apps described in subsequent reports in this series utilize data.gov datasets, including Fooducate, Healthy Out, Lose It! and Safe Eats.

Big Data: Identifying Fraud

The USDA's Food and Nutrition Service (FNS) has used SNAP data from EBT records to identify fraud, such as SNAP trafficking, a scam in which beneficiaries illegally sell their SNAP benefits for cash (e.g., selling an EBT card with $100 worth of credit for $50 cash). While SNAP has one of the lowest fraud rates of any federal program, at just 1.3% of total SNAP benefits,[133] it is still important to identify potential abuse of these benefits.

FNS uses the advanced analytics software SAS to sort through data from tens of thousands of transactions each month to look for patterns.[134,135] SAS applies statistical algorithms to these big datasets and uses machine-learning techniques to make predictions about certain outcomes, based on historical data from known fraud cases. An example of such a pattern is repeated claims for lost EBT cards from the same address or within a particular zip code.[135]

What the Research Shows:

Modeling to Detect SNAP Fraud

Once the USDA Food and Nutrition Service began using SAS to predictively model fraud in South Carolina (where they piloted the program), they were able to increase the rate at which they detected EBT trafficking from 60% to 83% and subsequently placed 12-month disqualifications on stores.[134] This resulted in more efficient use of resources to combat such fraud.

The executive director for accountability within the SNAP program reflects in *Baseline Magazine* that "it was important to demonstrate quick wins and show a return on investment before moving forward… Some states have brought in vendors and attempted to build programs, which are often expensive and less effective than desired. But we are seeing real-world results with this program. It's helping put tax dollars to work more effectively."[134]

Lessons Learned: Start Small

The concept of showing an early return on investment is an important strategy for local government agencies and nonprofits with limited resources that are seeking to implement technology solutions. Indeed, it is often better to start small to gain momentum and demonstrate the cumulative value. In the realm of big data and analytics, this might mean starting with just one analysis, even though there might be dozens of potential insights that can be drawn from a particular dataset.

Existing Technologies Can Help Anti-Hunger Groups Reduce Food Insecurity

Technology can help organizations fundraise, manage their operations and make a bigger impact through better data and analytics. By turning profit margins into charitable donations and using technology to connect with donors, social entrepreneurs can provide valuable resources to fight food insecurity. Soliciting digital donations, especially through social media and apps, can go a long way to bring awareness to anti-hunger groups' missions.

The Marketing Power of Social Media

Social media essentially gives nonprofits free "advertising" when users share content about their group; information about campaigns can spread rapidly through networks. Social media campaigns like Delete to Feed by Land O'Lakes capitalize on the notion that corporations want to promote their philanthropy, and they can use social media giving campaigns to bolster their public image and attract and retain customers.

Engaging Donors

Both Charity Miles and foodtweeks draw on two of the most pressing challenges within the food system — food insecurity and obesity — and propone that turning behavior changes, like exercising and cutting excess calories, into small donations can encourage these healthy habits. Associating these concepts through an app could have a cyclical effect that continues to promote healthy habits, while accumulating micro-donations that benefit nonprofits. These types of models increase donors' engagement with the fundraising process.

The *Burlington Free Press* reported the following about the Vermont Foodbank, including a quotation from the director: *"increased demand and fewer donations have led the foodbank to think of new ways to raise awareness and inspire people to take action… 'our partnership with foodtweeks is unique because it generates additional awareness for our work with both new and current supporters, and allows them to lend a helping hand while also doing something good for themselves.'"* [136]

Quantifying the Impact of Micro-Donations

The cumulative impact of small donations can be quite powerful, especially if they can be made routine, by pairing them with existing eating behaviors like dining in restaurants and ordering takeout. Grubhub Inc. (the major online and app-based restaurant takeout platform that merged with Seamless in 2013) processes 234,700 orders per day, and Americans order $9 billion worth of food online annually.[137] Sharebite estimates that "if everyone in Manhattan ordered takeout on Sharebite, we could end childhood hunger in NYC." [138] Similarly, Spare estimates that if just 10% of New Yorkers round up their bill each time they eat out (about $71 over the course of a year), these donations could close the currently estimated meal gap of 235 million meals in just one year.[139]

Optimizing Operations

Apps can be expensive to build, but they can reduce operational costs and overhead in the long term. Club Appetite's co-founder, Jordan Dunlop, emphasizes the ability of good software to help food banks be proactive rather than reactive: "The executive director [of a food bank] has no idea what the donations are going to be the next day. We want to flip the system. If we have 5,000 users donating ten dollars a month on average, that's $600,000 over the course of a year. Then we're going to kick in another 20% as well, so now the food bank has $700,000 just from the donors. [The food banks] know how many people they [serve] over the course of a year, and now they know how much money they'll have. They can start proactively buying and planning proactive meals that are nutritious and will stretch out much further than five days."[140] Software packages can make a big impact in helping food banks and other nonprofits optimize their operations, saving time and valuable resources.

Big Data for Small Budgets

While small organizations may perceive that big data analytics and robust software are cost-prohibitive, some software companies make special concessions to nonprofit organizations. Tableau provides its platform for free for qualifying small nonprofits, and Feeding America received a $1.9 million grant from the Tableau Foundation to provide software licenses to their network of 200 food banks.[141] The Tableau Foundation also set up a year-long Data Fellowship program to help train Feeding America staff in how they can optimize the software's use. Feeding America's "Performance Benchmarking Dashboard" helps them to monitor and identify the top-performing food banks according to key performance indicators and then learn from those that excel in order to "facilitate the exchange of best practices and innovative thinking."[141]

Technology can be used in a variety of ways to fundraise for organizations fighting food insecurity, by collecting small payments, promoting profit-sharing, tracking data and leveraging social networks. Furthermore, powerful software packages can help anti-hunger groups streamline operations while collecting and analyzing data to help maximize their impact.

Food Insecurity/Hunger

Appendix 1. Food-Tech Glossary

The tech world has common lingo; the following are some key terms, phrases and concepts that are important in the context of technology's impact on the food system:

Tech Terms[142,143]

Algorithm: a set of rules or processes that perform a calculation or solve a recurrent problem[144] and can be used to automate decision-making

Application (app): type of software that is often developed for and used on mobile devices, like smartphones and tablets

Application Program Interface (API): a set of routines, protocols and tools for building software applications that allows different components of software to communicate with each other and operate as one unified program or app (e.g., Google Maps API allows any application to "plug" in Google's mapping features)

Architecture: the way data and components of a given software application are collected, stored and accessed

Back end: the "behind the scenes" components of a web page, including servers, databases or applications that support the functions of that web page and make it work

Cloud computing: storing and accessing data and programs through the internet instead of the computer's hard drive

Content curation: choosing what content is shared online, whether through an app, via social media or on a website

Content management systems (CMS): a range of systems that provide the actual content for a website or application

Customer relationship management (CRM) software: software that helps a business or organization collect, track and manage data about its clients

Data mining: gathering new or useful information from large datasets

Database: a collection of electronic information (data)

Engagement: how much people interact with social media, such as posting tweets about a particular topic on Twitter or liking posts on Facebook

Front end: the part of a website that users see and interact with

Hardware: the physical components of technology, such as computers, hard drives and microchips

Impressions: the number of times a piece of content is viewed on social media

Machine learning: a form of artificial intelligence that allows algorithms to "learn" from the data collected as people use the product (e.g., Siri)

Minimum viable product (MVP): the smallest piece of software that a company releases to its users, generally to gain feedback to help continued development

Open source: programming code that is publically available for anyone to use. Open source code can be used as is to replicate an existing application, and developers agree to share improvements and updates they make to the code; it can also be "borrowed" to use as a starting place for developers to modify for a new purpose

Pain Point: a real or perceived problem that technologies attempt to solve

Reach: the number of people who see social media content (related to the number of followers someone has on Facebook, Instagram, Twitter, etc.)

Search engine optimization (SEO): a strategy that increases a website's ranking in online search results by incorporating keywords and other elements

Software: a program or set of instructions that help users do work or some other task that they want to complete; software tells a computer, phone or tablet what to do (e.g., Microsoft Word)

Software as a Service (SaaS): software that is delivered over the internet, and paid for monthly, helping make it more affordable

Traffic: the number of people who visit a website

User: the person who interacts with and uses a technology product

User-generated content: this generally applies to social media, but is any content (e.g., text, photos, videos) shared online that is created by an individual user, rather than an organization

User experience (UX): the overall experience people have when using a website, app or product

User interface (UI): the way a website is laid out and how users interact with it, including elements such as buttons, forms, etc.

Web app: Short for web application, a web app can have many of the same features as a regular application, but it is a web page that can be accessed from any browser on any device (often without requiring any special downloads or configuration)

Appendix 1. Food-Tech Glossary

Tech Phrases and Concepts

The following phrases and concepts represent broad categories of technologies that are being used to innovate throughout the food system:

Sharing Economy

- **What it is:** The sharing economy increases peer utilization of existing resources, facilitating access to others' resources and providing new customers to those with existing resources

- **Best known examples:**

  - Uber

  - AirBnB

- **Examples from the food system:**

  - Connecting people who have goods to ship or store with excess space on trucks or in storage warehouses

  - Matching food donors to nonprofit recipients

  - Enlisting volunteers to collect food waste from restaurants and distribute it to the hungry

Internet of Things (IoT)

- **What it is:** Everyday objects that have network connectivity and communication amongst those objects based on cloud computing. IoT devices and objects generally have sensors that measure and evaluate data within a network that can leverage those data in some meaningful way.

- **Best known examples:**

  - Wireless key locators

  - Interactive dolls and toys

  - Smart lighting systems, such as in parking lots, that provide targeted light

- **Examples from the food system:**

  - Smart sensors for precision agriculture

  - Sensors to predict and prevent food waste in storage facilities

  - Smart kitchen appliances

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Small Data

- **What it is:** Small data is generally collected and used by individuals or IoT devices, and contains very specific attributes on what that person or object is doing

- **Best known examples:**

  - Tracking activity level via wearable devices

  - Smart labels on medicine bottles that monitor shelf life and improper storage conditions

- **Examples from the food system:**
  - Smart labels on food packaging

  - Tracking caloric intake and physical activity

Big Data and Analytics

- **What it is:** Using computers to collect and analyze very large datasets to reveal patterns, trends and associations

- **Best known examples:**

  - The National Security Agency uses big data to track potential terrorist plots; the financial industry uses High Frequency Trading

  - In 2012 Obama's team used big data analytics to drive their campaign strategy; IBM's Watson uses natural language processing to answer questions based on large volumes of text and other data

- **Examples from the food system:**

  - Retailers target coupons to customers based on purchase history

  - Anti-hunger groups track operational data to maximize their impact

  - Government agencies use transaction data to reduce SNAP and WIC fraud

  - Precision agriculture collects and aggregates environmental data to inform decisions about food production, processing and distribution, improving the speed and accuracy of those forecasts[145]

  - Individuals analyze online recipes and ratings to determine which ingredients are associated with the highest ratings or make recommendations for healthier substitutions (e.g., this food "social network" analysis conducted by University of Michigan computer scientist Lada Adamic)

  - The food industry invents recipes based on food chemistry and flavor preference data

Social Media

- **What it is:** Sharing ideas, posting content and maintaining connections with social networks

- **Best known examples:**

  - Facebook

  - Twitter

  - Instagram

  - LinkedIn

- **Examples from the food system:**

  - Using keywords like "food poisoning" on Twitter or Yelp (the restaurant review website) for food safety surveillance

  - Conducting social media scraping to collect information based on what people are saying about a product or organization online

  - Disseminating healthy nutrition and cooking tips — there are countless Instagram, Twitter, Facebook, YouTube and Tumblr accounts plus blogs and message boards dedicated to recipes, cooking, cuisines, brands or even individual products

  - Using hashtags to promote campaigns (e.g., #FightHunger), gain views for a particular post or generate discussion around a particular idea

Crowdsourcing

- **What it is:** Obtaining ideas, services, funding or data from large groups of people using the internet or mobile technologies to collect and aggregate those data

- **Best known examples:**

  - Waze, a traffic crowdsourcing app that provides real-time navigation

  - Crowdfunding platforms like Kickstarter, Crowdrise and GoFundMe

  - Wikipedia for ideas

  - Amazon's Mechanical Turk workers who receive small payments to perform "human intelligence" tasks online

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- **Examples from the food system:**

  - The Reddit Food Pantry connects people in need of short-term relief with a social network of strangers willing to help

  - Crowdsourcing nutrition feedback based on photos posted to apps like PlateMate, which uses the Mechanical Turk pool

  - Micro-giving for anti-hunger groups

Appendix 2.
Social Media: Metrics and Means

Org/Blog/App	Mission or Niche	Social Media Use	Facebook	Instagram	Twitter	YouTube	Most Popular Video
Budget Bytes	Wallet-friendly, simple, quick and satisfying recipes	*Reach*	77,658 likes	42K followers	8,127 followers	2,749 subscribers	16,931 views
		How they use social media - most common types of posts	Links to new blog posts/ recipes	Appetizing photos, with links to recipes and a string to hashtags to improve SEO	Appetizing photos, with links to recipes	Recipe how-to videos	30-Minute Thin and Crispy Pizza Crust
Plant Based on a Budget	Health-conscious, plant-based meals on a budget; Vegan recipes	*Reach*	79,538 likes	24.4K followers	6,246 followers	286 subscribers	4,294 views
		How they use social media - most common types of posts	Links to new blog posts/ recipes, fundraising (link to give $3 micro-donation)	Quick recipe photos/ snack ideas, memes	Recipes, articles, success stories, challenges, memes	Recipe how-to videos	Orange Ginger Tofu
Feeding America	Large and wide-reaching network of food banks in the U.S.	*Reach*	577,547 likes	22.4K followers	216K followers	2,440 subscribers	84,217 views
		How they use social media - most common types of posts	Grass-roots Facebook fundraising, promoting partners, links to news articles	Photos, videos and captions for food insecurity awareness/ advocacy, promoting campaigns, hashtags to increase reach	Sharing success stories, fundraising, advocacy, promoting partners, links to articles	Public service annoucements (PSAs), recipient stories	Feeding America Farm to Pantry PSA

Org/Blog/App	Mission or Niche	Social Media Use	Facebook	Instagram	Twitter	YouTube	Most Popular Video
City Harvest	Food rescue organization in NYC	*Reach*	41,866 likes	7,591 followers	22.8K followers	220 subscribers	41,900 views
		How they use social media - most common types of posts	Links to related articles, sharing stories, promoting fundraising partners	Posts that highlight work done, staff stories, promoting campaigns	Posts that highlight work done, staff stories, promoting campaigns	PSAs, promoting campaigns, recruiting voluneers, sharing stories	City Harvest PSA
ibotta	Cash back rebates for shoppers at large retailers	*Reach*	438,694 likes	23.9K followers	50.7K followers	916 subscribers	1,443,081 views
		How they use social media - most common types of posts	Highlighting specific promotions, customer Q&A, social network referrals	Highlighting specific promotions, "life hacks," team photos	Highlighting specific promotions or brands, sharing recipes	Commercial, tips for using the app	ibotta 30sec app store (commercial)

Appendix 2. Social Media: Metrics and Means

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