Developing comprehensive utility programs for low- and moderate-income customers

E Source

Through a collaboration with the Edison Electric Institute (EEI), E Source brought together three utilities with a shared goal: to better understand their low- and moderate-income (LMI) customers' energy challenges and design solutions to help them manage their utility bills.

E Source developed the initiative with three key phases:

- **Data science.** E Source experts applied data science to customer data from each utility to form customer cohorts within the broad (and often poorly defined) LMI customer segment.

- **Ethnography.** We conducted an ethnographic market research study to get customer feedback and humanize customers and their challenges through direct observation.

- **Design thinking.** We hosted a three-day design-thinking workshop with the utilities to review the data and research findings and brainstorm solutions.

Throughout the project, each utility used E Source's data-driven analysis, human-centered design principles, and collaborative ideation to recognize LMI customers' unique motives, habits, and challenges around energy usage and billing and payment activities.

Using data science to create LMI cohorts

Data science techniques give us powerful insights into how things are related and what makes them different. For this project, we defined LMI households as those making less than 300% of the US federal poverty threshold. We used modeling to create LMI cohorts and a digital replica of each customer by combining utility-specific transactional data with E Source demographic and behavioral data.
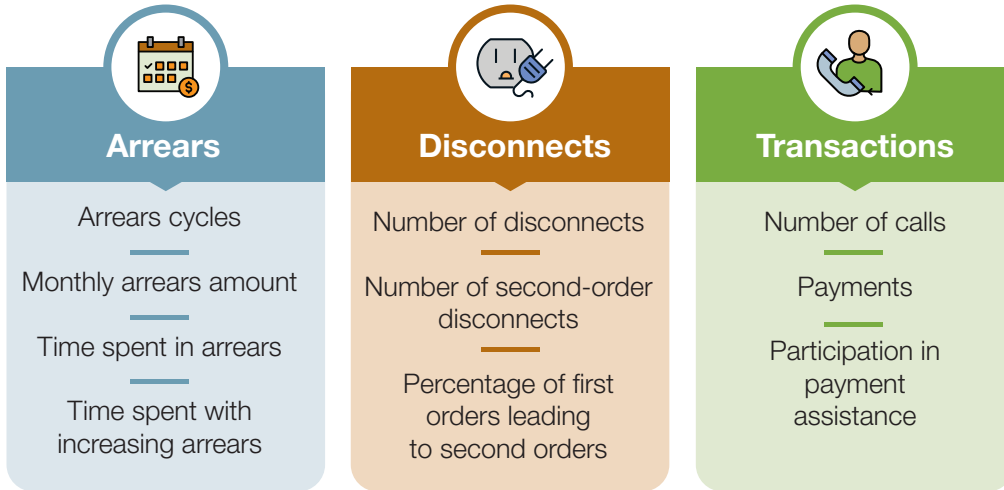
The transactional data allowed the team to group customers based on risk features like arrears and disconnection history, call data, and payment history (**figure 1**). We used the E Source Audience of One approach, applying machine learning to find patterns in the data and subdivide the broad LMI segment into cohorts.

Audience of One

The E Source Audience of One solution uses high-resolution AI models to discover individual customer traits and behaviors, allowing utilities to serve each customer on a personal basis.

Figure 1: Transactional data inputs

E Source used utility-specific data to gather insights. By looking at various risk factors, we isolated key differences and similarities in customers to build cohorts within the LMI segment.
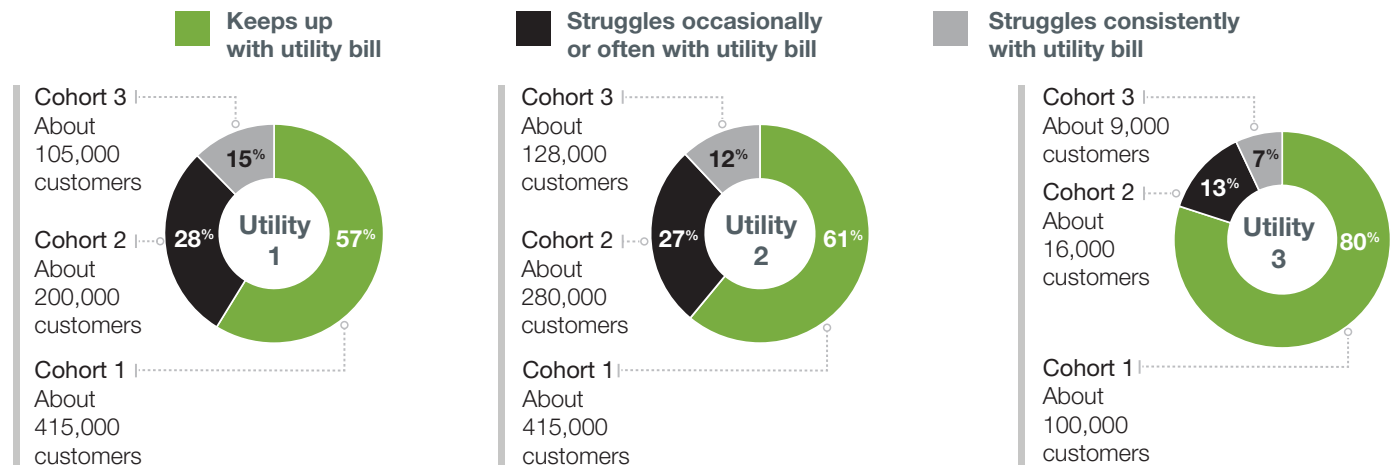
Arrears

Arrears cycles

Monthly arrears amount

Time spent in arrears

Time spent with increasing arrears

Disconnects

Number of disconnects

Number of second-order disconnects

Percentage of first orders leading to second orders

Transactions

Number of calls

Payments

Participation in payment assistance

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Once the team created the initial cohorts, we appended proprietary data to build out each customer's behavioral and lifestyle attributes. We focused on data like income, size of household, age of children, and banking and credit card use.

The E Source models resulted in at least three defined cohorts per utility (**figure 2**).

Figure 2: LMI cohorts

The Audience of One solution identified three LMI cohorts for each utility. Cohorts included customers who keep up with their utility bills, those who sometimes struggle, and those who consistently struggle. Cohort distribution for the utilities produced mixed results. We found slight demographic variations among the cohorts. For example, customers in cohort 1 were slightly older than customers in other cohorts and had a higher percentage of home ownership.

Keeps up with utility bill

Struggles occasionally or often with utility bill

Struggles consistently with utility bill

Cohort 3
About 105,000 customers

Cohort 2
About 200,000 customers

Cohort 1
About 415,000 customers

Utility 1 — 15% — 28% — 57%

Cohort 3
About 128,000 customers

Cohort 2
About 280,000 customers

Cohort 1
About 415,000 customers

Utility 2 — 12% — 27% — 61%

Cohort 3
About 9,000 customers

Cohort 2
About 16,000 customers

Cohort 1
About 100,000 customers

Utility 3 — 7% — 13% — 80%

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Our analyses revealed some interesting findings about each cohort. We learned that compared to customers who keep up with their bills, customers who struggle contact their utility more often (**figure 3**). They also:

- Participate in energy efficiency programs at lower rates

- Are more sensitive to severe weather (particularly those who pay more per unit for electric heating)

- Live in older homes with a lower market value

- Have younger heads of household

Figure 3: Customer calls by cohort

Customers who struggle to keep up with their electric bills tend to call the utility more than customers who keep up with their payments.
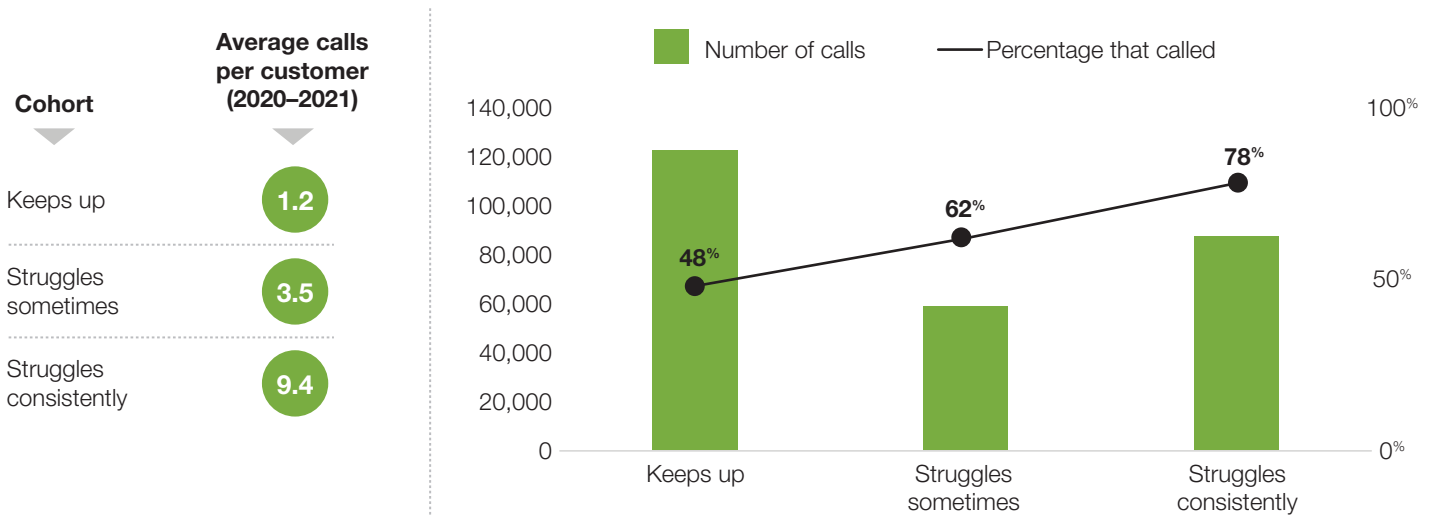
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We also found that the top three characteristics of those in the cohort that consistently struggles were:

- Lower enrollment in autopay

- Higher weather sensitivity in gas and electric use

- Higher bill amounts

Bringing our LMI cohorts to life through ethnographic market research

In the project's next phase, E Source conducted ethnographic market research. We focused on individual customers, examining their lifestyles and behaviors through direct engagement. This approach helps us capture customer sentiment in a way that traditional surveys can't.

How we approach ethnography

Our researchers connected with customers from each cohort using mobile ethnography. Over two weeks, participants responded to prompts in an app on their mobile phone or tablet. They answered questions by making videos, taking pictures, recording audio, and writing responses at their own pace and in a comfortable setting.

We prompted customers to share information about the following:

- Employment status

- Income flow

- What a typical day in their life looks like

- Household and family makeup

- Financial challenges and goals

- Energy usage

- Bill payment habits

The team recognized that it can be uncomfortable for customers to discuss finances and bills. We designed our mobile ethnographic approach to create a more comfortable atmosphere in which to share.

## Ethnography provides a glimpse into customers' worlds

Our ethnographic research provided a deeper look into customers' emotions and needs. This important information allowed our participating utilities to improve existing programs and create new ones that are attractive to customers and beneficial to them (**figure 4**).

Figure 4: Key findings from our ethnographic research

Mobile ethnography allowed us to engage with utility LMI customers on a deeper level and deliver insights not typically available through traditional market research.

All cohorts expressed interest in energy efficiency measures that would increase comfort in their homes during warm and cold months.
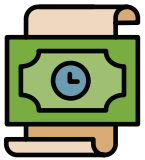
All cohorts considered paying their utility bill a priority and conveyed negative emotions like shame, frustration, and anxiety about past-due bills and disconnection notices.

Money-saving habits varied by cohort. **Cohort 1** puts money away in retirement funds and savings accounts. **Cohort 2** wants to save but struggle to find a way to make it work. **Cohort 3** saves by getting more value out of a dollar through coupons and sales.

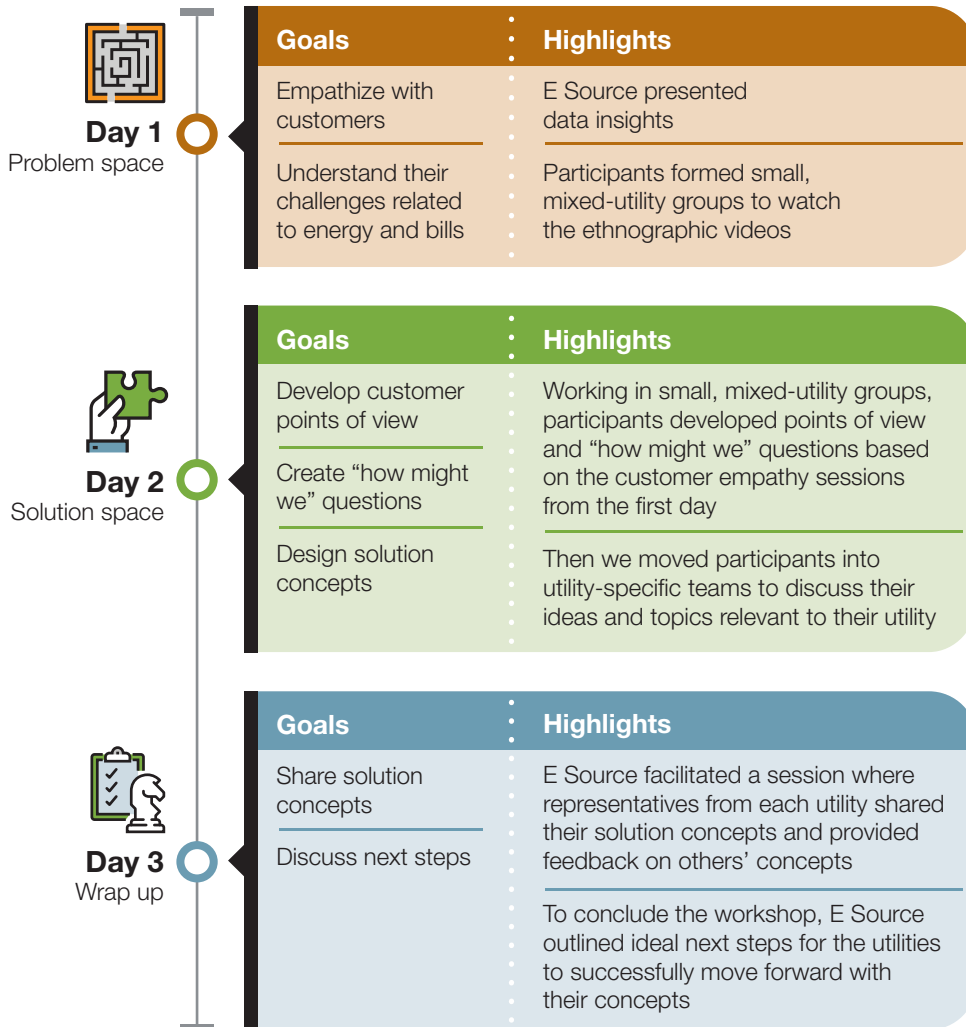© E Source

Developing customer-centric solutions

In the final phase, we brought together a cross-functional group of employees from each of the three participating utilities to collaborate in a three-day design-thinking workshop (**figure 5**).

Figure 5: Design-thinking workshop objectives

Participants focused on empathizing with customers and understanding their challenges during our workshop. We then moved into developing customer-centric solutions and how to implement them.

Day 1
Problem space

Goals	Highlights
Empathize with customers	E Source presented data insights
Understand their challenges related to energy and bills	Participants formed small, mixed-utility groups to watch the ethnographic videos

Day 2
Solution space

Goals	Highlights
Develop customer points of view	Working in small, mixed-utility groups, participants developed points of view and "how might we" questions based on the customer empathy sessions from the first day
Create "how might we" questions	
Design solution concepts	Then we moved participants into utility-specific teams to discuss their ideas and topics relevant to their utility

Day 3
Wrap up

Goals	Highlights
Share solution concepts	E Source facilitated a session where representatives from each utility shared their solution concepts and provided feedback on others' concepts
Discuss next steps	
	To conclude the workshop, E Source outlined ideal next steps for the utilities to successfully move forward with their concepts

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Each utility developed customer-centric, early-stage solution concepts based on the results of our ethnographic market research. Participants focused on ways to break down internal utility silos between billing and payments, general assistance programs, and energy efficiency solutions.

What became clear was that utility processes for past-due balances and arrears don't align with the needs and behaviors of customers struggling to pay. Utilities often fail to connect customers with the most applicable assistance programs. And they don't allow customers to pay what they can when they can.

By examining the insights from the data analysis and listening to direct customer feedback, the participating utilities developed greater empathy for the challenges facing their customers. They created innovative solution concepts that support

timely payments, home efficiency, and better access to assistance. Some of these concepts include:

- Redefining delinquency to account for nonstandard payments and more effectively connecting customers to assistance programs

- Creating a customer savings account program that rounds up payment amounts; the customer can tap into these funds for their utility bill if they have a lean month

- Designing back-end platforms that connect assistance programs and statewide data with utility customer data, program eligibility, and payment history

These are big ideas that require commitment and focus to implement. For example, redefining the delinquency notice process is no small feat. It will require alignment from various utility departments, stakeholder input, and regulatory approval. But as customers experience economic struggles with increasing regularity and severity, solutions like these will be critical for customers and the solvency of the utilities that serve them.

What you can start doing today to better serve LMI customers

You might be wondering how to get started today. In addition to the strategies described above, follow these tips from our experts:

- **Regularly speak with your LMI customers.**
  Spend time with community partners and have personal conversations to understand customers' needs and wants as individuals.

- **Don't assume that existing offerings will solve LMI challenges.**
  Identify areas where you can improve outcomes for at-risk populations. Seek customer feedback on your offerings. Have tough conversations internally about whether a program is effective. If not, why not? Can it be redesigned, or does it need to be scrapped?

- **Develop solutions with your LMI customers.**
  We're too far removed from customers' challenges to know whether our ideas are good. Designing solutions in partnership with LMI individuals or proactively getting their input during the design process will lead to more-successful offerings.

Ready to get started?

Contact us today if you're interested in applying the E Source Audience of One solution to better understand your LMI customers.

E Source is the leading provider of research, consulting, and data science services to energy and water utilities across the US and Canada. We bring these capabilities together to transform their operations and solve their sustainability, safety, reliability, equity, and cost challenges. With hundreds of clients, an exclusive focus on utilities spanning 35 years, and a growing arsenal of data-driven solutions, E Source brings to each engagement an unrivaled understanding of what works and how to implement it, increasing speed to value. Owned by Align Capital Partners, a growth-oriented private equity firm managing $775 million in committed capital, E Source is headquartered in Boulder, Colorado, with offices across the US.