

Rethinking Customer Research in the Utility Industry



Insights from Competitive Industries

BY AHMAD FARUQI AND HENNA TREWN



Customer research has a long tradition in the utility industry. Today, the utility toolkit includes surveys to solicit items such as demographic and appliance ownership information.

The toolkit also attempts to assess customer satisfaction through focus groups in order to discuss new product or service introductions and by scheduling one-on-one interviews with large customers on selected issues such as power quality and economic development rates. Yet each of these methods relies on asking customers to articulate their needs.

Gary Hammel, co-author of “Competing for the Future,” noted in the 2015 *Harvard Business Review* article, “The 5 Requirements of a Truly Innovative Company,” that asking customers what they want does not yield new insights.

“Instead, you have to observe them, up close and over time, and then reflect on what you’ve learned. Where are we creating needless frustrations?”

Where are we wasting our customers’ time?

Where are we making things overly complex? Where are we treating customers like numbers instead of people? To be an innovator, you have to be a relentlessly curious anthropologist and a keen-eyed ethnographer,” he writes.

Imagine if people were asked decades ago whether they would want to withdraw cash through a machine in the wall, what answer they would have given. The ATM may not have seen the light of day.

Or if someone had asked people what new features they would want in their Walkman or mobile phone, would that have led to the iPhone? Or if someone had asked folks if they would like books or groceries to be delivered to their door step, would Amazon have come into being?

Such examples are legion. They illustrate the importance of identifying customers’ unarticulated needs by observing them in the course of their natural buying behavior rather than asking them what they would like.

In the staid utility business, customer needs have begun to change at an unprecedented pace. Some Wall Street analysts have begun to wonder if these changes may spell doom and gloom for the industry. It is imperative for utilities to find ways to better understand these changes before someone else does.

Customer Needs are Changing

Big changes are already underway in customers’ homes, businesses, and factories. These changes involve more than just buying fancier hardware such as digital appliances, Wi-Fi thermostats, and home energy monitors.

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They also involve more than the increasing installation of solar panels on rooftops, or the cleaner cars that are parked in driveways. These changes are equally present in customer

attitudes toward the consumption of energy.

Younger generations are typically greener, as documented by studies such as those by the Pew Research Center. Their company research shows that homeowners under fifty are more likely to have installed or given serious thought to installing home solar panels than those fifty and older. The majority of adults under fifty believe that organic produce is healthier than conventionally grown options.

Customers as Competitors

Residential and small commercial and industrial customers in the mass market have begun generating and storing their own electricity, giving expression to a newfound yearning for grid independence. This was not anticipated by traditional customer research.

Yet the self-generation phenomenon could have been anticipated. It has been around for a long time in other industries. Why should utilities have been immune to it?

We should not have been surprised by the growth of energy prosumers. That term was coined by futurist Alvin Toffler back in 1980 in his book, “The Third Wave,” to describe those individuals who blur the distinction between producer and customer.

Even in our own industry, co-generation or combined heat and power has been around for almost a century among large customers. What is new is the extension of this phenomenon to the mass market.

Change the Pricing Structure

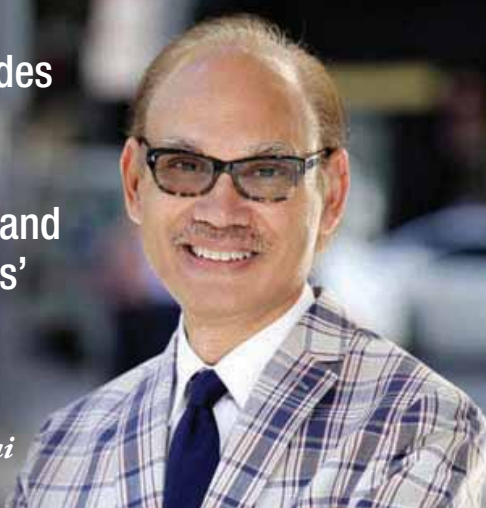
For decades, the only thing that changed was the price level. The pricing structure stood unchanged. Faced with disruptive changes, the industry has begun to propose new methods of rate design to better capture the costs of supplying and delivering

electricity. However, we don't know whether customers – and thus, regulators – will accept these new approaches.

Furthermore, we don't know how to speak in a language that customers will understand. This is ironic given the fact that most of us are utility customers in our private lives and some of us are even prosumers. We inevitably converse about energy with our friends and neighbors. Those conversations are rich in information that we need to harness.

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– Ahmad Faruqui



With good intentions, we have thrust our latest products and services – such as energy efficiency, smart meters, demand response, and time-varying rates – on customers without asking them whether they want them or not. To get ahead of change, we have to find better ways of framing and structuring these programs so that they connect more effectively with customers.

Identify the Competition

Despite decades of customer research, we don't understand our customers' unmet needs, and even less our competitors' offerings. It is fair to say that we don't even know who the competition is. Is it Amazon or Google or Microsoft or Tesla?

Is it the appliance and thermostat manufacturers? Engineering firms? Home builders? Rooftop solar financiers? Home security firms?

Many utilities believe they are insulated from competition by virtue of being a regulated monopoly – a feeling even more strongly held among utilities that are purely in the wires business.

Yet no utility will survive the coming decade without knowing its competition. Our industry should take heed of the fate that befell regulated telephone companies when wireless began stealing their business.

They were lulled into complacency; then suddenly the landlines that were their primary asset were turned into a liability. While wireless electricity is nowhere close to becoming a reality, distributed generation – think rooftop solar coupled with battery storage – provides a proxy for wireless telephony.

Study Competitors

Consider, for example, the retailer in Texas who calls its one time-of-use pricing plan “free nights and weekends.” Framing these structures with easy-to-understand terminology that guides a customer's decision to use the product is an approach often used in other industries.

A widely used ride-sharing service calls its time-variant system “surge pricing.” Movie theaters and opera houses use the term “matinee” pricing. Airlines often offer vacation fares that involve a Saturday night-stay over.

Even upscale retailers such as Nordstrom have their “half-yearly sale” and Williams-Sonoma has its “friends and family” event.

When retail competition was being introduced to households in Great Britain, a retailer ran an ad showing a man looking at a piece of toast popping out of the toaster with a chunk missing. Next to him was a sign that said, “Take a bite out of your electricity bill by switching to us.”

In the U.S., a solar company has a sign on its window that reads provocatively, “Why are you still paying for electricity?” A well-known solar company makes the following pitch. “Ahmad,

what do you have to lose? You put no money down and lock in an electric bill that will forever be lower than your utility bill.”

Rethink Focus Groups

Steve Jobs famously eschewed focus groups, a staple of utility customer research, to design his products. In an interview with *Business Week* back in May 1998, he said, “It's really hard to design products by focus groups. A lot of times, people don't know what they want until we show it to them.”

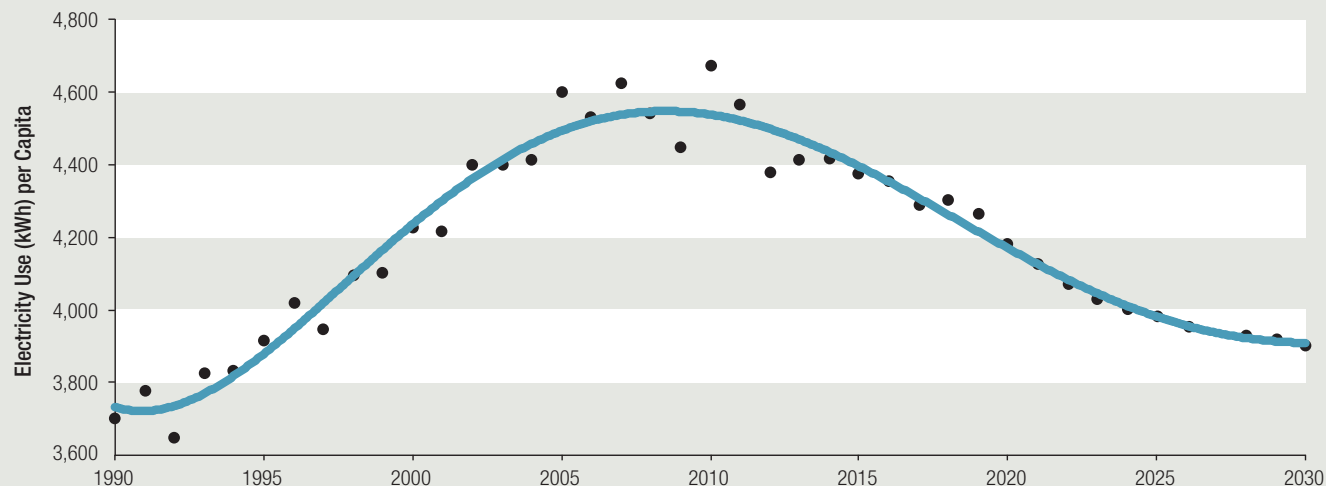
Back in 1985, he said his team at Apple designed the Mac personal computer, truly a breakthrough product, for its own use. “We were the group of people who were going to judge whether it was great or not. We weren't going to go out and do market research.”

Of course, Jobs was a true genius, but even his creative process was backed by world-class designers. The lesson for utilities is not to go looking for a genius like Jobs. Instead, it is to rethink the ways in which they have carried out customer research and to imagine new ways of doing it.

Deploy Discrete Choice Modeling

The discrete choice modeling technique is used to explain and predict choices between two or more discrete alternatives. It was popularized by the future Nobel laureate Dan McFadden at the University of California, Berkeley, and applied to forecast appliance choices by the California Energy Commission in 1976.

It was also used in the early 1980s by the Electric Power

Fig. 1**U.S. ELECTRICITY USE PER CAPITA, 1990–2030**

Sources: Historical residential electricity sales from the U.S. Energy Information Administration's (EIA's) Form 861M and population estimates as of July 1 from the U.S. Census Bureau (estimates calculated in 2000, 2010, and 2016 for previous years). Projected sales (2017 onward) from EIA's reference case in its Annual Energy Outlook 2017. Forecast population (2017 onward) taken from U.S. Census Bureau's 2014 national population projection.
 Note: The fitted curve is based on a fifth-order polynomial trend line.

Research Institute to forecast demand for electric vehicles. It yielded the insight that is now common wisdom: that car owners would suffer from range anxiety and electric vehicles would be bought mostly as third cars unless dramatic changes were made to lengthen the range of these cars.

Discrete choice models can provide insight into a number of relevant questions, such as which rate design will garner the largest market share? How many households will install rooftop solar? Which high-rise buildings in New York City will install boilers and produce their own steam?

Embrace Behavioral Economics

In nearly all recessions since the Second World War, load growth has resumed its normal trajectory within a year or two, as diligently documented by Edison Electric Institute's John Caldwell. However, in the years since the Great Recession of 2008-09, energy sales growth has slowed down as more and more customers have tightened their consumption and opted for efficient appliances and distributed generation.

See Figure One.

This point has been well documented in a recent paper by Lucas Davis of the Haas School of Business at University of California, Berkeley, who has plotted the decline in per capita electric consumption.

Figure One reproduces Davis's chart of historical consumption per capita and adds a forecast which we have derived from the U.S. Energy Information Administration's projection of electricity consumption and the U.S. Census Bureau's projection of population.

The EIA is predicting sub-one percent growth in total electric sales for the next quarter century.

Econometric models are consistently over-forecasting electricity demand, since price and income elasticity estimates assume that tastes are constant. End-use models combined with econometric models do a better job of forecasting demand, but they too cannot totally fathom changing customer tastes, needs, preferences, and behavior.



New demand models based on the behavioral economics paradigm need to be developed, tested, and put in the field. We have too often assumed that if prices fall, consumption will rise. In other words, the demand curve for electricity is downward sloping.

But that is predicated on a key assumption: that nothing else changes. If "organic conservation" becomes widespread, the

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demand curve will shift inwards and consumption would fall without a rise in price.

In a recent piece written for *Public Utilities Fortnightly*, “What if Elasticity is Changing?” Leonard Hyman and William Tilles described the paradoxical behavior of electricity sales. Consumption had stopped growing in the U.S. even though electricity prices were not rising and incomes were rising.

This is a manifestation of the need to dive into behavioral economics. We need to acquire a deeper knowledge of how customers’ attitudes toward electricity are changing. It is no longer sufficient to simply count the number of light bulbs and their efficiency levels.

Deal with the Uniqueness of Electricity

Electricity is an invisible service and most customers don’t understand, or care, how it is produced and delivered to them through the “electronic highway.” Indeed, it is fair to say that most electric customers think they are buying electrons just as they buy a gallon of gasoline, rather than knowing that what they are buying is the movement of electrons.

All they know is that when they flip the switch, the lights come on. And when the power goes out, it goes dark and all their appliances, air conditioners, computers, and TVs stop running.

Utilities must find a way of connecting with their customers

in a language they understand, taking the time to research customer psychology and perspective when forecasting demand, designing pricing, and creating other services.

According to the EIA, about half of the nation’s households receive their electric service through smart meters. Every year, a few million households are added to that number. By 2025, it

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is quite possible that all U.S. households would have smart meters.

Smart meters yield hourly load data for every household. When supplemented with new digital algorithms, this whole house load data

can be decomposed into its major end use constituents.

This rich reservoir of information lies largely untapped today. Using Big Data analytics, utilities can decipher this information and educate and inform customers on how to manage their energy bills. They can also use the information to study the way in which customer use of energy is changing.

Finally, by talking to a few thousand customers routinely over a period of time, they can connect these changing loads with changing preferences. That will improve their ability to forecast load and develop new products and services. All of this will strengthen customers’ positive experience with electric utilities and ensure a prosperous and rewarding future for the utilities and their customers. **PUF**

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