Research your (UN)KNOWNS to INNOVATE

Whether it's DERs, AMI, the Internet of Things, or smart home devices, the energy industry is being forced to adapt and find ways to innovate within increasingly outdated frameworks.

For example, successful integration of DERs into the generation mix relies on reducing uncertainty and better understanding consumer choices. Knowing how consumers use and interact with new technologies, such as EVs, solar, and batteries, will be critical to developing solutions such as locational value methodologies and time- and location-dependent resource planning.

Reducing uncertainty requires that you begin with a clear head. Maximizing efficiency requires that you leverage the assets and investments you have already made. At ILLUME, we believe that innovation starts with knowledge generation. However, you have to know what knowledge you have, what you need, and what are your black boxes. But how?

The Rumsfeld Typology to Inquiry

To quote twice former U.S. Secretary of Defense Donald Rumsfeld (yes, you read that right), "There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. There are things we don't know we don't know." When you begin any innovation process, it is critical to know what you're working with. You need to identify your known knowns, your known unknowns, and unknown unknowns.

Here, we explore the best research approaches for moving forward no matter where you are on the spectrum of knowledge generation. These techniques are especially helpful in navigating the market entrance or expansion of nascent technologies like DERs.

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As we become even more digitized, utilities have access to an increasing amount of customer data, but it often exists across silos. Marketing departments have demographic data, program staff have participation data, and billing data is in yet another location. Integrating data across these silos can provide utilities profound insight into customer behavior and choice.

This is no easy feat. Most of our clients do not have in-house Data Scientists who can merge, clean, and mine disparate databases into a single, queryable database. Further, many vendors claiming to do this are startups who don't know or understand utility data. How do you, for example, roll-up interval meter data in meaningful ways for planning? What transactive data represent predictive behavioral patterns and what is noise? How can past research investments, such as saturation studies, be appended to this data to better size the market?

ILLUME's Data Scientists have supported multiple IOUs in doing just this. Gather existing data in a single place to truly assess what you know, so that you know you know it. From this vantage point, you can assess gaps in your knowledge to outline a strategy to learn and gather information to augment your known unknowns.

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As researchers, we find that most of our clients assume they have known unknowns, that is, a set of specific, targetable questions that will help them arrive at strategic solutions to their business objectives. For the average utility business questions, they know what they need to know about 80% of the time.

In these moments, surveys, data modeling, and other quantitative techniques are perfect for augmenting our knowledge. Propensity modeling, for example, uses integrated data to predict how customers will act in order to optimize new business solutions. This type of predictive modeling allows us to create tailored solutions for customers. However, in the 20% of cases where you don't know what you need to know, new research methods are required.

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In the case of customer choice and engagement with DERs, there may be few prior use cases or precedents for customer behavior, making it challenging to predict how customers will respond. As EVs, rooftop PV, or other DERs gain traction in a broader segment of the market, the characteristics of early adopters may not usefully predict characteristics of more mainstream adoption. In these cases, how do you know what to research and what to measure when you don't know what you don't know?

ILLUME's answer: cast a wide net — you don't yet know what's relevant and what's not, so it's crucial to orient your research with a broad scope.

ILLUME includes Anthropologists whose work is identifying the unknown unknowns through open-ended and exploratory research. Ethnography,

the method of cultural Anthropology, relies on a flexible orientation that demands both an openness to what data is relevant (and what constitutes "data" in any given case), along with a willingness to adjust preconceptions and expectations when faced with contradictory or unexpected information. This stance creates an adaptive research process, where the initial findings shape later research questions. In fact, it is a mark of authenticity in fieldwork to return with a new (or enhanced / tweaked / adjusted) set of research questions and objectives.

To return to Rumsfeld's pithy framework, with DERs, you're largely dealing with the unknown unknown. You don't know who among non-participants might be potential participants, or what value they would get from a given product or service. Why would they want to sign up or purchase this? What barriers might be preventing them from engaging with this product or service? And then there are even more unknowns — the questions we aren't even asking, that we don't know to ask. With all these unknown unknowns, you have to begin with exploration.

Rumsfeld, Remixed

So, what does this look like in practice? ILLUME recently completed a product design and discovery effort for a new smart home product and service model, illustrated in the following pages. In a crowded and rapidly changing market, we worked the Rumsfeld typology to arrive a strategic business and delivery strategy for our client. ■