

INNOVATION



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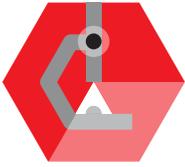
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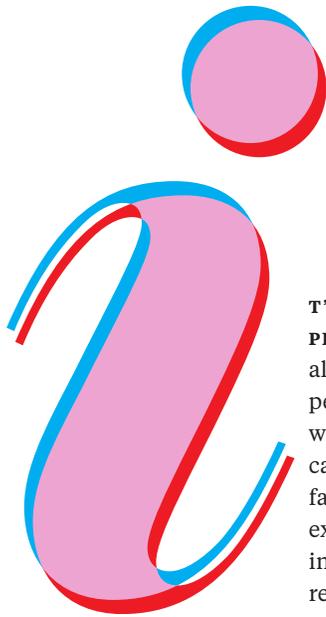
Identifying Unmet Needs in a

Digital Age

A four-part framework
for diversifying how and
where you look



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T'S A BASIC TENET OF ENTREPRENEURSHIP: Innovation is all about identifying and filling people's unmet needs. Customers want products and services that can solve their problems better, faster, or more cheaply than existing offerings can. But even innovators and organizations renowned for their scanning capabilities often have trouble

perceiving and correctly interpreting those needs.

Consider Amazon. In its determination to be “customer obsessed,” it was blind to the needs of another constituency: its merchants. It squeezed them on fees, forced them to compete with other vendors and its own knockoffs, restricted their ability to customize virtual storefronts, and limited their access to payment options.

Shopify stepped in with a suite of easy-to-use, reasonably priced tools that let merchants set up their own online stores, allowing them to retain control of the customer relationship. In 2021 it reached \$4.6 billion in net sales and a market cap of \$171 billion, all by addressing needs Amazon had neglected. That year Amazon implicitly acknowledged its mistake by acquiring Selz, an Australian start-up making tools that similarly help businesses launch online stores.

In our work as researchers, teachers, and consultants, we've studied dozens of innovators, entrepreneurs, and organizations to learn how they went about identifying (and sometimes misjudging) unmet needs. This has shown us that to increase your chances of accurately spotting customers' problems and aspirations, you must diversify how and where

you look. In this article we outline a four-part framework that can help you do so. We describe how successful innovators have used each of its elements and how digital technologies can augment more-traditional methods of looking.

Searching for unmet needs involves two main approaches: improving your vision of mainstream users and challenging your vision by looking at unconventional users. Within each you can adopt a narrow focus or take a wider view. You can zoom in on individual mainstream users and their everyday experiences (what we call the *microscope strategy*) or pull back to discover patterns in their aggregate behavior (the *panorama strategy*). Likewise, you can take a close-up look at users outside your core (the *telescope strategy*) or seek a broader view of the patterns they exhibit as a group (the *kaleidoscope strategy*). (See the sidebar “Four Ways of Looking.”)

THE MICROSCOPE STRATEGY

Zooming in on the lived experiences of mainstream users can help you discern needs not surfaced by focus groups, interviews, or questionnaires. This is a natural starting point for many solo innovators. Often, personal experience alerts them to an overlooked issue they feel compelled to address. For example, as a teenager Javier Larragoiti noticed that his father, who had diabetes, constantly cheated on his diet because he hated the taste of sugar substitutes. Later, as a graduate student in biochemical engineering, he devised a low-cost means of producing xylitol, which tastes almost exactly like sugar but doesn't have the same effect on blood-sugar levels. The substance has long been used in chewing gum and other products, but the original production process—extraction from a type of birch—made it too expensive for everyday use as a standalone sweetener. Larragoiti realized that it could be made far more cheaply using agricultural waste from Mexico's cornfields—with the added benefit of reducing harmful emissions from the burning of that waste.

Some organizations have drawn on concepts such as user experience and human-centered design to gather insights from the field. Others have turned to anthropologists, whether in-house experts or external consultants. An iconic example is Lego, whose firsthand observations of children's

IDEA IN BRIEF

THE PROBLEM

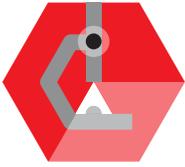
Even renowned innovators are often unable to correctly identify and understand consumers' unmet needs.

THE SOLUTION

A four-part framework can help. You can zoom in on individual mainstream users (the microscope strategy) or look for patterns in their aggregate behavior (the panorama strategy). Likewise, you can take a close-up look at users outside your core (the telescope strategy) or study patterns they exhibit as a group (the kaleidoscope strategy).

WHAT DIGITAL CAN ADD

Digital tools can capture data unobtrusively and in real time. They facilitate observation of large groups, allow you to find and engage with niche users, and make it possible to quickly sift through masses of data and identify trends therein.



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play famously helped lift the company out of near bankruptcy to become the world's biggest toy maker by sales. (For more on the use of social scientists by Lego and other companies, see "An Anthropologist Walks into a Bar..." HBR, March 2014.)

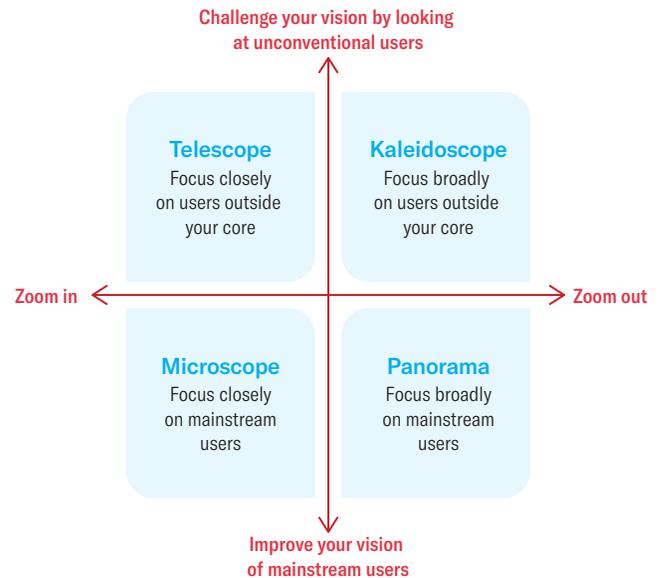
Close observation can be particularly valuable in the tech sector. Intel's in-house anthropologists have spent days on end visiting gamers at home to better understand their passions, frustrations, needs, and wants, all to support the development of chips capable of supporting those needs and wants. "Technology companies as a whole are in danger of being more disconnected from their customers than other companies are," **the Intel anthropologist Ken Anderson told the *Atlantic***, explaining that engineers often fall in love with technology for its own sake and incorrectly assume that users will too. It's no surprise that Microsoft is said to be the world's second-largest recruiter of anthropologists, behind only the U.S. government.

What digital can add. The proliferation of smartphones, IoT sensors, wearable technologies, and smart home devices lets organizations capture data unobtrusively and in real time to a much greater degree than ever before. Unlike surveys and other traditional assessment tools, digital technologies can track actual behavioral changes in real time, thus avoiding self-reporting and retrospective biases. The improved accuracy and richness of the data thus gathered can be especially useful in health-related fields—and not just for humans.

In 2016 Mars Petcare, a division of the confectionary company, acquired Whistle Labs, a start-up that manufactures a smart collar—something like a Fitbit for dogs. The device and its associated app help owners track the health and activity of their pets and locate them if they get lost. But the real value for Mars isn't revenue from sales of the collars; it's the anonymized data the app collects (with users' permission). That gives Mars a direct connection to pet owners and a channel for identifying their unmet needs. Analysis of the data provides new information about dogs' activity requirements by breed, age, and size. It is driving innovations in premium-quality pet food: products optimized for particular breeds and mixes along with customized therapeutic foods. It also yields a view of pet behaviors, such as disrupted sleep and increased scratching or licking, that may be signs of illness. The insights thus gained have paved the way for a more-holistic value proposition.

Four Ways of Looking

To boost your ability to spot unmet needs, you must diversify how and where you look, as in the four strategies below.



THE PANORAMA STRATEGY

In addition to zooming in on individual mainstream users, you can infer their unmet needs from looking at aggregated data, such as errors, complaints, and accidents, that amplify weak signals.

In 1989 Keith Alexander, a professor of mechanical engineering in New Zealand, wanted to buy a trampoline for his daughter. His wife objected, saying that trampolines were unsafe. He set out to convince her otherwise but learned that she was right: Research showed that injuries from trampolines were on the rise.

Digging into the data, Alexander found that most of the incidents classified as random accidents actually arose from product features: the metal springs and frame and the absence of any enclosure to prevent falls. With that in mind he engineered a spring-free, mesh-enclosed backyard trampoline and turned what had been a small niche market into a vibrant global one.

What digital can add. Digital tools make it much easier to observe the behavior of large numbers of individuals. Data can be collected from multiple sources and analyzed for trends.

For example, smartphones can deliver digital health programs to people with chronic conditions such as diabetes and heart disease, and their sensors can feed databases that reveal overall rates of adherence. Shocked by the high drop-out rates among users of digitally delivered lifestyle-change programs, the Icelandic physician Tryggvi Thorgeirsson



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realized that the apps left people with an unmet need: fun. The programs had been designed to appeal exclusively to the rational side of the brain; their developers had assumed that the life-threatening nature of participants' conditions would be motivation enough.

Thorgeirsson decided to leverage elements of game design to boost engagement and retention. He teamed up with the Icelandic company CCP Games to create a new digital platform, Sidekick Health. Remote sensing tells the company which exercises are the most engaging for which populations and under what conditions. Machine learning helps it give users exercises tailored to their personal needs and preferences. The platform has significantly boosted positive clinical outcomes and engagement: Recent clinical trials have shown that its users are three times as likely as those receiving standard coaching sessions to achieve their weight-loss goals and 30% likelier to fully adhere to their programs.

Digital technology was also key to spotting a hidden need among sufferers of depression. In 2015 Jo Aggarwal and her husband, Ramakant Vempati, created StayClose, an app able to detect signs of depression in the elderly through built-in smartphone features that can track changes in mobility, sleep, and communication. It proved highly reliable and showed that the problem was widespread. But it also revealed that very few of those identified as depressed were willing to visit a therapist. So Aggarwal and Vempati devised Wysa, an AI-powered chatbot that can recognize more than 70 emotional subtypes and respond with empathy and compassion. Although StayClose never took off as a product, the insights it facilitated catalyzed the development of Wysa, which now has more than 3.5 million users of all ages around the world.

THE TELESCOPE STRATEGY

If you keep looking at and interacting with the same people, in the same context, with the same tools, you risk missing outside-the-box opportunities. To challenge your habitual perspective, you may need to study fringe users, extreme users, or nonusers. Demands from outliers are often dismissed as noise. But by zooming in on users at the periphery, you might uncover pain points that are relevant to the masses, too.

Chris Sheldrick, an organizer of live music events, noticed that musicians and their crews faced an unusual

problem: Gigs are often held in remote open-field locations with no formal address. Sixteen-digit GPS coordinates proved inadequate, not because they were imprecise but because they were prone to human error: easily mistyped, misread, or misheard. Instead of dismissing the issue as an unavoidable hazard of the business, Sheldrick realized that it constituted an unmet need for a simpler way to talk about location. He built an app that uses three-word combinations to identify any three-meter square on the planet. What-3words has become a valuable alternative to GPS, embraced by organizations including UK emergency and car-break-down services, Domino's Pizza, Lonely Planet, and Airbnb.

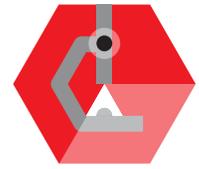
You can also innovate by focusing on people who struggle with conventional offerings because of a personal challenge; the solution you devise for them may find broader reach. Audiobooks were created for people with visual impairment, and the electric toothbrush was invented to serve people with limited motor skills. The housewares entrepreneur Sam Farber came up with OXO Good Grips kitchen utensils after talking with arthritis sufferers. It turned out that thick rubbery handles work better for everyone, and—like audiobooks and electric toothbrushes—the items quickly moved beyond their initial niche to become mainstream products used by millions.

You can even learn from misusers of your offerings. The consumer appliance giant Haier picked up on complaints from rural customers in China that their washing machines' drainage hoses were perpetually clogging up. Repair technicians realized that those customers were using the appliances to wash root vegetables before selling them in the market. So Haier devised a machine that could be used for both purposes and immediately sold the first 10,000 produced. More important, that sort of sensitivity to subtle needs has helped the company become the world's leading provider of laundry equipment.

What digital can add. Outliers, extreme users, challenged users, misusers: Almost by definition, such populations have traditionally been hard to reach. Today, however, niche groups often gather on community sites such as Reddit, Facebook, Quora, and LinkedIn, making observing, engaging with, and learning from them much easier. The platforms can provide a treasure trove of insights, given the existence of some 2.8 million subreddits (Reddit



Kaleidoscopic discovery can be achieved by engaging with parties that have a wider view of the domain, such as regulators and NGOs.



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communities focused on specific topics), 2 million LinkedIn groups, and more than 640 million Facebook groups. Many of them can be easily accessed through Google searches or special-purpose providers such as GummySearch.

Lego again provides a case in point. Historically, “adult fans were often seen as a source of irritation,” Jake McKee, a senior Lego executive, told *National Geographic*. Adult Fans of Lego, or AFOLs, sent the company fan mail and proposals for new products, but the unvarying response was “We don’t accept unsolicited ideas.”

The internet changed all that. Lego managers could suddenly observe the engagement and creativity of AFOLs as a community. The number of adult user groups went from 11 in 1999, located mainly in North America, to 60 worldwide in 2006. Adult enthusiasts have remained fringe users, but ones with a clear appetite for more-demanding sets that appeal to adults and teenagers alike. In 2007 the Chicago architect and Lego enthusiast Adam Reed Tucker reached out to the company with the idea of reproducing iconic buildings. Lego worked with him to create a Sears Tower set as a prototype. Not only did it quickly sell out; it commanded twice the price of a kit of an equivalent size for kids. It launched the popular and profitable Lego Architecture line, which includes the Empire State Building, the Sydney Opera House, and the Leaning Tower of Pisa. Even more important, it signaled a dramatic shift in Lego’s appreciation of what could be learned from its adult user community.

THE KALEIDOSCOPE STRATEGY

To challenge your current perspective, you can also view distant players in the aggregate, looking for commonalities that point to unmet needs. Think of this as akin to seeing patterns in a kaleidoscope. The difficulty, especially for entrepreneurs working within an established company, is to think beyond the usual suspects, such as suppliers, distributors, and competitors.

Your organization’s strategic focus and mindset might temporarily blind you to some constituencies. Consider Volvo. For years it forged its reputation on building safer cars, introducing many features that became industry standards. But a decade ago it took notice of a wholly different set of players: cyclists.

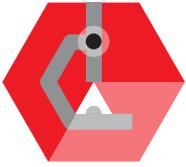
By 2010 Swedish insurance data was showing that cyclists accounted for a higher proportion of casualties than did any other type of road user. That revealed new and unmet safety needs, to which Volvo responded with a wave of auto innovations aimed at protecting everyone on the road, not just the inhabitants of cars: bike-detection sensors and autobraking, external airbags, and sensors that can detect when drivers are tired, distracted, or drunk and intervene. Some of the innovations are even meant to prevent injury to other species. For example, Volvo’s radar-based technology allows drivers to see 300 meters ahead of them, day or night, and automatically detects the contours of deer, elk, moose, and other large animals as they enter the vehicle’s path.

Kaleidoscopic discovery can also be achieved by engaging with parties that have a wider perspective on the domain in question, such as NGOs, organizational regulators, information aggregators, and intermediaries. Shortly after the 2010 earthquake in Haiti, a professor at Columbia’s Graduate School of Architecture assigned students to design a relief product. Most responded as architecture students might be expected to, with plans for easily assembled shelters. But Anna Stork and Andrea Sreshta took a different tack. They were disturbed by media accounts of sexual assaults and other crimes inside the unlit refugee camps at night. Victims tended not to report the incidents for fear of reprisal—but journalists with access to UN observers, relief workers, and volunteer nurses revealed the extent of the problem.

Stork and Sreshta realized that in addition to the basic requirements of shelter, food, water, and medical supplies, occupants had an unmet need for nighttime security. Their solution was LuminAID, a compact, inflatable, solar-powered lantern. It was adopted by the NGO Shelterbox and subsequently found a commercial market among campers.

What digital can add. Social-listening tools, unstructured data-scraping algorithms, and semantic AI make it possible to quickly sift through masses of data and identify patterns therein. Unlike focus groups and surveys, user-generated content, or UGC, often captures insights at the “moment of experience” that shed light on users’ emotional states along with specific malfunctions, difficulties, or missing features in the product or service at hand.

Take the consumer health business (now Haleon) of GSK. In 2020 the pharmaceuticals giant worked with the market



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research and consulting firm Ipsos to investigate emerging trends in the nonprescription flu and colds category. By scraping the web for UGC from the previous three years and applying semantic AI, researchers surfaced unmet needs on platforms for patients, doctors, and pharmacists and in adjacent forums on topics such as natural remedies and parenting.

The researchers mapped the importance and growth of those needs, revealing a spike in demand for natural and immunity-boosting products, including for young children. The data also showed strong dissatisfaction with the effectiveness of products to ease cough and fever symptoms. By further refining the AI filter, the researchers zeroed in on DIY solutions from lead users, among them frustrated parents, that addressed some of those needs. One was a roll-on perfume applicator filled with nasal decongestant for easy application under a sleeping baby’s nose. Another was a cough suppressant that works instantly by targeting the cough reflex arc in the brain stem. Although neither innovation has yet been commercialized, such hacks spotlight user pain points and stimulate new lines of thinking. “This approach has helped us understand how leveraging social data can provide actionable, powerful insights on unmet needs and innovation opportunities,” James Sallows, GSK’s global head of transformation and capability, has said.

PUTTING IT ALL TOGETHER

To optimize your ability to spot unmet needs, you should employ each of the strategies we’ve described. Although there is no set starting point, most organizations find that improving their vision of mainstream users (with the microscope and panorama approaches) is easier and more intuitive than challenging their vision (the telescope and kaleidoscope approaches), because the latter demands a conscious effort to look beyond known customers and markets.

The four strategies are meant to work in combination. Much of their value comes from switching perspectives and integrating the insights that emerge. For example, you often need to deploy both a microscope approach and a panorama one to get a full picture of what is happening with your mainstream users—to see the forest *and* the trees.

While serving time for a white-collar crime, Teresa Hodge observed that many women who left prison excited by the

prospect of a fresh start were back within a year. Listening to their stories (zooming in), she realized that unless they had jobs, it was very hard to get back on their feet—and their prison records made them essentially unemployable. Meanwhile, Hodge’s daughter Laurin, a sociology student, was researching nationwide data on incarceration, reemployment, recidivism, and their effects on families (zooming out). Her work confirmed that low rates of reemployment were a widespread but neglected problem. So after Hodge’s release the pair founded Mission: Launch to help former inmates start their own businesses. They also created R3 Score, a digital tool that does sophisticated risk evaluation of former inmates who want to secure work, housing, or loans.

Digital technologies can facilitate a combined approach, making it easier, for example, to simultaneously see microscopically and panoramically. Mars Petcare’s smart dog collars enable the company to target the health and exercise needs of individual dogs, to identify breed-wide nutritional issues, and to monitor health concerns such as pet obesity across its entire community of dog owners.

And machine-learning semantic filters let you take a simultaneous look at multiple populations. As noted, GSK could search across various groups (patients, doctors, pharmacists, parents) to identify the unmet needs of users generally along with those of specific subgroups (such as new parents). With just a slight tweak to the process, it could also identify lead users who were creating their own solutions.

It would be a mistake, though, to assume that spotting unmet needs will shift exclusively to the digital realm. Although digital technologies can reveal previously invisible patterns and data, they also suppress important cues—feelings, intuition, and context—that are accessible only through in-person sensemaking. Physical and digital approaches are best seen as complements. Used together, they can enable you to look further afield and on a larger scale than ever before. ☺

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