

BIGGER INNOVATIONS NEED BIGGER DATA

By Sandro Kaulartz | September 2020

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WHO REALLY DRIVES BIG INNOVATION?

Innovation research has long shown that it is the “lead users”, not the companies or manufacturers, who are the real pioneers. These individuals, who are actively invested in the activity, create many radically new products and service models that are then popularised and commercialised.

Many sports that are mainstream today, such as skateboarding, mountain biking and windsurfing were developed and pioneered by these who first participated in them: the lead users, who worked together to build their own equipment, techniques, rules, and competitions for years before bigger producers got involved.

Studies show that the same is true for every consumer product category - both for entirely novel innovations and product modifications (von Hippel, 2017). The first personal computers were developed by lead users. So were the first personal 3D printers. Even trends in hair styles, from mohawks to bright colours (or most recently grey) because someone dared to try something new. Think also of the new medical apps being built into smartphone and smartwatches today – done first by hackers (von Hippel, 2017).

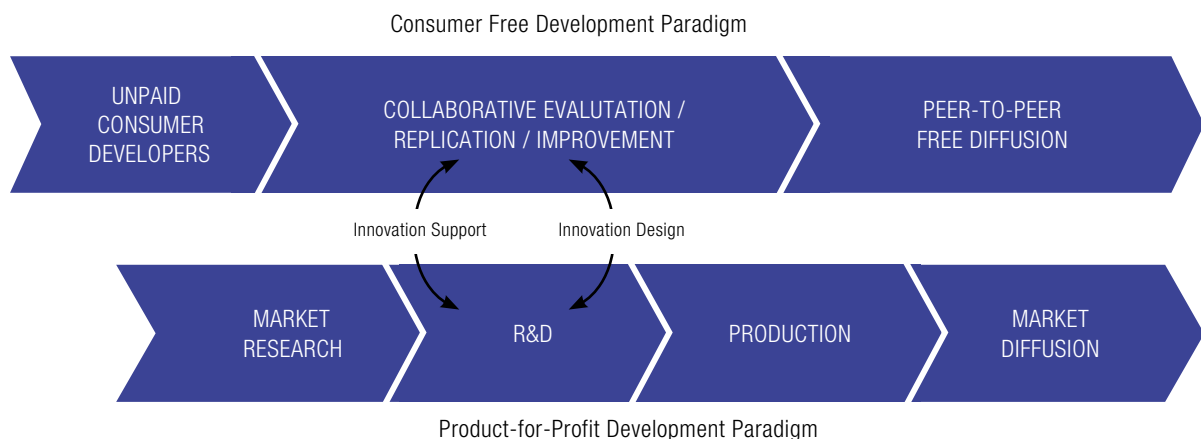
With COVID-19, we saw a huge number of new user innovations gain wide public interest, with people creating ventilators from scuba diving equipment or espresso machines out of frugality and necessity.

Organisations (and consultancies) who work in product development must quickly adapt their innovation processes to this new reality. As represented in the interaction between user/producer paradigms (see figure 1), they must develop find new ways to systematically find, screen and commercialise lead user-developed innovations as well as creating new product concepts in-house.

Searching for Lead User Innovations is not a new concept. Pioneered by Professor von Hippel over 30 years ago, it has since been studied and developed by hundreds of academics and practitioners. However, its practical value has long suffered because of the cost associated with sourcing such innovations.

But we have found that applying semantic AI algorithms to the universe of user-generated social data can significantly improve the efficiency and expense of identifying commercially promising Lead User Innovation whitespaces in consumer goods. In a recent R&D study conducted with Eric von Hippel from the Massachusetts Institute of Technology (MIT), we show that promising user innovations can be found in any consumer product or service fields within a week or two of using a dedicated semantic AI model. This forms the basis of our recently launched **Innovation Spaces** methodology.

Figure 1 The user and producer innovation and diffusion paradigms



Source: Raasch and von Hippel, 2012

ON UNICORNS AND FASTER HORSES

The ability to innovate in an agile and sustainable manner has never been more essential to survive. We are living in a volatile business era constantly disrupted by technological shifts, new “out of the box” business models, and a rapidly changing consumer culture. Furthermore, 90% of corporate innovations fail according to Mark Payne in “How to Kill a Unicorn”. Understanding the root cause of failure has always been challenging. But, one critical aspect is certainly the systematic issue of large corporations tending to base their innovation efforts on past successes. Instead of solving emerging real-world consumer problems, many innovation strategies are designed to focus on delivering efficiency, scalability, and profitability. And while the overarching goal is to develop true breakthrough innovations, “the next big thing”, most innovations actually result in minor improvements to existing products.

Traditionally the ability to scale up quickly has been the engine for growth in mature organisations. But now, in the new “economy of unscale”, empowered by technology, AI algorithms and the consumer data explosion, small and agile challenger brands can effectively transform entire industries before the incumbent can even see it coming. We all know the poster children of category disruptors in the entertainment (Spotify), transportation (Uber) and hospitality (AirBnB) industries that eventually became early members of the ‘**unicorn company**’ club. We also see challenger brands entering categories that were long considered unassailable, such as cosmetics, ready-made food or banking with their new and compelling business models.

The high innovation failure rate can also be put down to a lack of customer centricity in terms of finding and meeting true user needs due to the mass market focus. With the economic shockwaves emanating from COVID-19, pressure to increase this innovation success rate will intensify for the foreseeable future.

In his 2017 book “Free Innovation”, Eric von Hippel advocates that users take centre stage as the solution to the corporate innovation dilemma. This requires a change in culture and processes towards a bidirectional instream of ideas and possible solutions to real-world unmet needs from both internal stakeholders (R&D departments and user experience designers) and the users themselves. There will never be a better time than now to make this paradigm shift.

Critics of open or user-centric innovation strategies seem to like citing the infamous Henry Ford quote “If I had asked people what they wanted, they would have said **faster horses**”. (It is worth noting that no evidence exists that Henry Ford ever said this sentence.) In fact, Ford Motors was the first manufacturer to introduce a vehicle for a new market segment after they discovered that inventive farmers were removing the back of the Ford Model T to install loading spaces they had themselves designed to haul equipment and harvests onto. Ford’s sales took off after introducing the Model T Runabout in 1925 and it marks the birth of the pick-up truck. And while we are not certain if Henry Ford ever asked user’s what they wanted, we for sure know that he very well understood and leveraged the power of innovative users for developing Ford’s products - long before we had coined the term “lead user”.

“Pressure to increase the innovation success rate will intensify for the foreseeable future.”

OUR METHOD

IDENTIFYING INNOVATION SPACES THROUGH CONSUMER SIGNALS

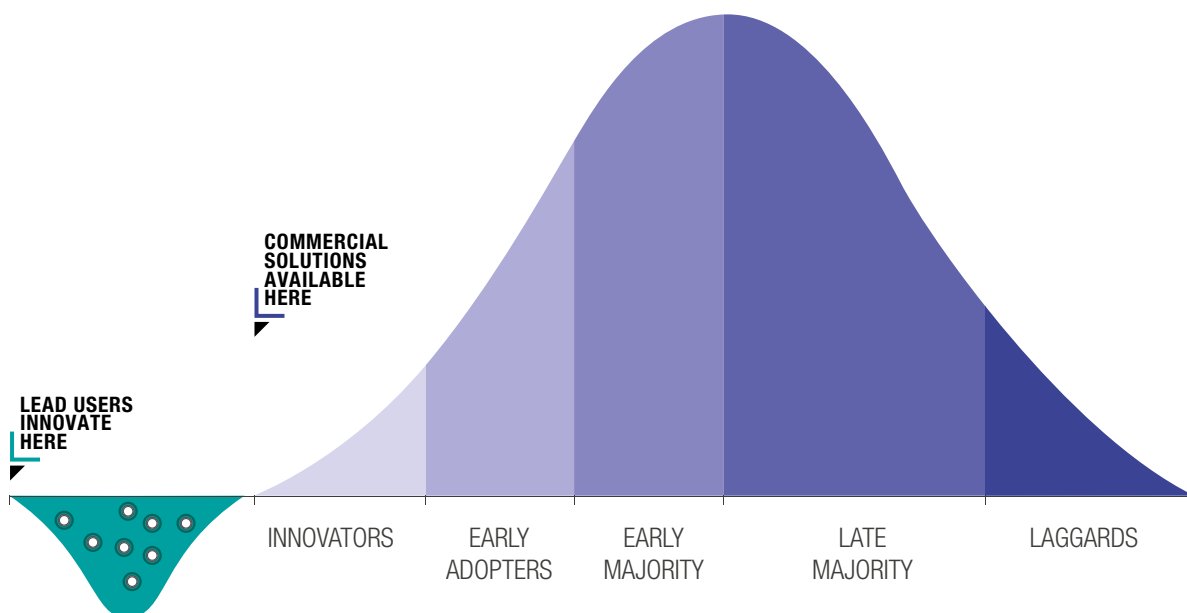
Lead users are known to pioneer new types of products and services that later prove valuable to more widespread audiences (See Urban and von Hippel, 1988; Franke et al, 2006). These innovating users are ahead in terms of trend adoption and are the first to experience unmet needs. They set the bar and direct the future of the category, sending us the first signals as to where the market is heading.

Research has already established that lead users innovate ahead of general market demand. And for this reason, producers have always had an interest in commercialising Lead User Innovations. For example, Poetz and Schreier show that in a comparison of new baby feeding products, ideas developed by lead users scored significantly higher than ideas proposed by in-house producer experts in that field – even according to the producer experts themselves (Poetz and Schreier, 2012).

However, the difficulty of identifying lead users and the associated time and costs have deterred many producers from making this regular practice. The process used to identify lead users would involve a chain of interviews with experts called “pyramiding” and take a very skilled team of four people approximately four months to complete. Despite the time costs involved in identifying lead users, about one-quarter of current producers claim to include lead user methods in their market research portfolios, and consider them effective (Cooper and Edgett (2007, p.4). We believe that, with an improved identification method, this proportion will increase significantly and assist producers to innovate faster, more efficiently and more effectively.

At Ipsos, we saw an opportunity to improve this process by analysing millions of consumer “signals” from social data. With the last advancements in machine learning techniques for semantic analysis, we could design an efficient AI agent to automate the exploration of possibilities for user innovation discovery. We approached Professor Eric von Hippel from the MIT Sloan School of Management, the leading authority on Lead User Innovation, with the following hypothesis:

Figure 2 Innovation activity vs. market demand



Source: Raasch and von Hippel, 2012

Could we utilise the web as an innovation mine to identify emerging unmet needs and detect the corresponding user innovations in a category?

We thought this method could prove successful because consumers with an inherent motivation to develop novel solutions in their field (without receiving compensation from companies) are generally willing to reveal details of their innovations with peers via the internet, without patents or other forms of intellectual property protection. And given the amount of social data available on the web for almost any subject, it was clear that this resource should be part of a new, truly consumer-centric method to identify new innovation opportunities.

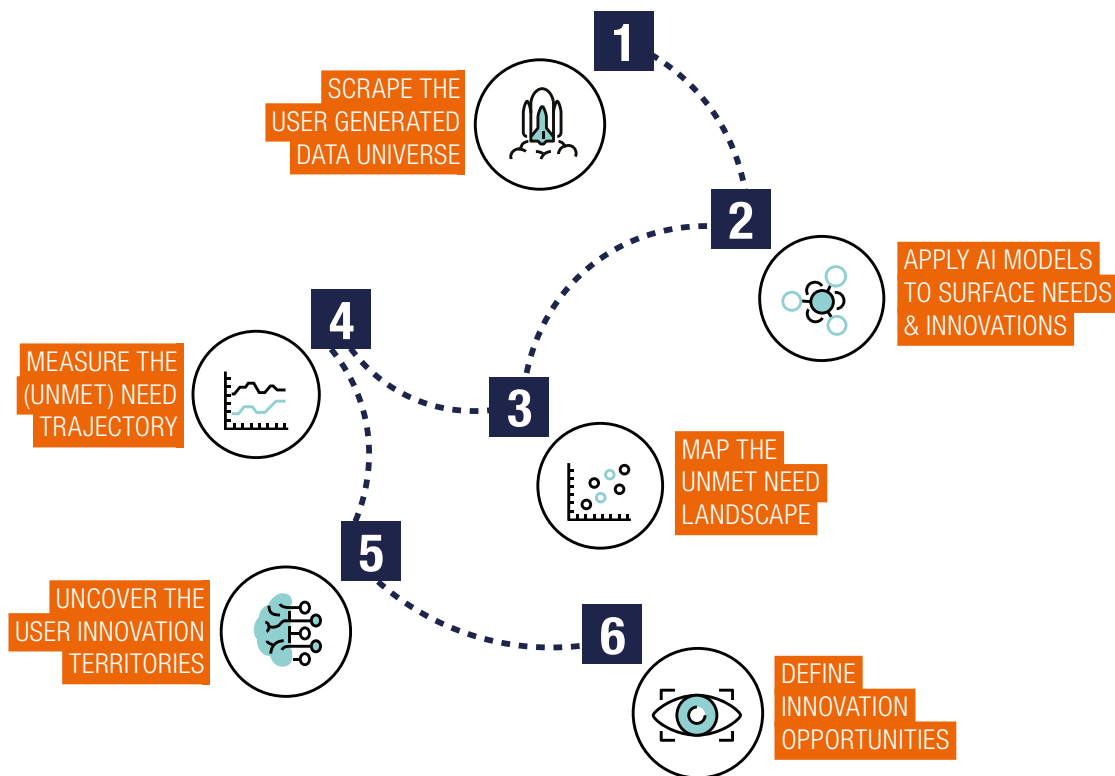
The ineffective pyramiding method mentioned earlier dates back to the mid-1990s when internet search method development was in its infancy, and it remains slow and costly today. However, the new method we have successfully developed in the past two years in partnership with the MIT Innovation Lab is able to identify user innovations in less than two weeks.

Beyond this, our **Innovation Spaces** method is a holistically designed process that explores unmet needs and emerging category trends from the bottom-up in parallel with associated user developed innovations (see figure 3). With this, we are effectively detecting novel “Need-Solution Pairs” that are early representations of innovation whitespaces. And importantly, we are discovering the technique can be used to identify lead users across categories.

While traditional methods would search for the lead users themselves before finding any innovations they may have developed, our method based on user-generated content directly scans the entire ecosystem of unmet needs and user innovations, then assesses their commercial promise as a second step.

Additional analysis can also show the correlation between lead user-developed innovations and commercial promise.

Figure 3 Our Innovation Spaces Method



Source: Ipsos Social Intelligence Analytics

KITESURFING: OUR ACADEMIC TESTING GROUND

To test our hypothesis as to whether applying semantic analysis algorithms to user-generated content would help us identify commercially promising user innovations, we conducted a pilot around kiteboarding equipment. In partnership with the MIT we chose this as our proof of concept because research shows it to be a particularly active user innovation domain (Tietz et al. 2004, Franke et al. 2006). Therefore, if our method did not yield evidence, it would suggest that it was failing to capture Lead User Innovations that do in fact exist.

We began our test by collecting a large universe of user-generated content composed of more than 200,000 posts from 1999 to 2018, scraped from over 9000 websites across the globe. Interestingly, our kiteboarding example showed that more than 90% of the relevant consumer-generated content came from specialized forums and niche sources such as kiteforum.com, seabreeze.com.au or powerkiteforum.com. By contrast, content from large, high-traffic social media or digital platforms such as YouTube, Reddit, Twitter or Facebook played an insignificant role as exchange sources between experts.

Applying the Innovation Spaces method to the kitesurfing domain effectively identified more than 200 unmet needs over time with more than 20 functionally novel innovations. We found that at least 50% of the identified innovations were already commercialised by producers, proving that the method can surface new opportunities for corporate innovation.

The innovations identified were primarily improvement innovations, or user-generated improvements to kiteboarding equipment such as the within existing kiteboarding practice. But the Lead User Innovation method also allowed us to identify more innovations that are more radical in relation to current practices. Each of these significantly altered the nature of the sport and could potentially incubate an entirely new sporting direction.

Another advantage of our method (beyond the identification of Lead User Innovations) is that we can use social and search data to determine which ideas and innovations are gaining traction and thus worth commercialising, taking the guesswork out of the innovation process. We do this through the combination of user-generated mentions and user search behaviour to explore adoption trends of the identified innovations over time.

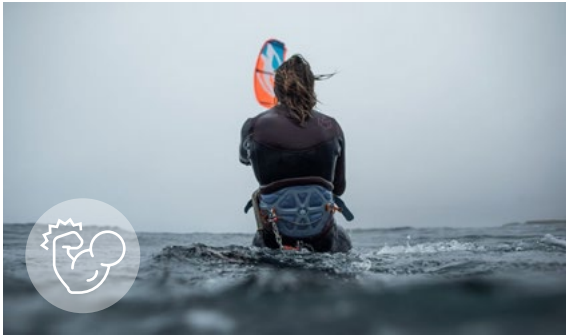
A topical Google search can be considered a signal of intention, through which a kitesurfer hopes to find information or purchase a product. By contrast, user-generated mentions of the specific innovation are signals of deeper interest and desire for more detailed information, including discussing the innovation with expert peers, or seeking advice and instruction. This trend analysis unveils additional insights on the velocity and diffusion of the identified innovations in the specific domain to enable analysts to better judge the commercial attractiveness of each innovation for producers.

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“Social and search data can help determine which ideas are gaining traction - taking the guesswork out of the innovation process.”

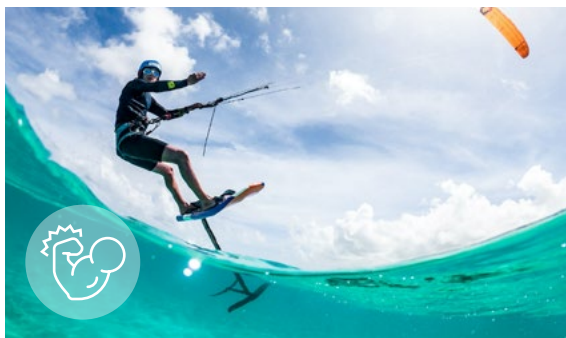
Figure 4 Lead user generated kitesurfing innovations

IMPROVEMENT INNOVATIONS



HARDSHELL HARNESS

A new harness that better distributes the pulling force of the kite across the kiteboarder's body.



KITE FOILING

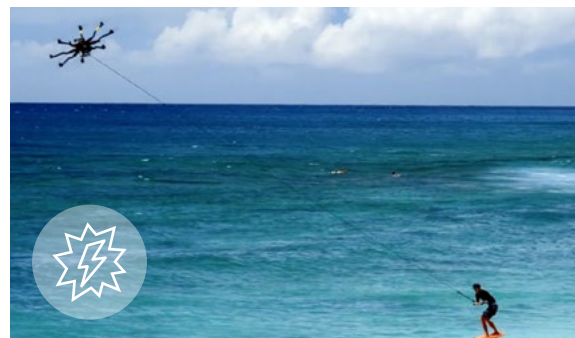
Kitesurfing concept with the addition of a hydrofoil under the board. The foil lifts the surfer up to kite along above the surface of the water, substantially increasing speed.

RADICAL INNOVATIONS



ELECTRIC FOILING

This eliminates the kite as the source of motive power, replacing it instead with an electric motor mounted on a hydrofoil under the board.



DRONE SURFING

Also replacing the conventional kiteboarding kite, a powerful drone flies overhead to provides the motive power. This offers new degrees of freedom are because users are no longer at the mercy of wind conditions and would still be able to kiteboard even in under dead-calm conditions.

Ipsos' user-generated content scraping of content posted on 9000+ websites between 1999-2018.

IDENTIFYING FUTURE INNOVATION SPACES FOR GSK

COLD & FLU CASE STUDY

The cold and flu management category is a crowded market with a large variety of treatment options and formats that are yet not very well understood by consumers. We helped GSK to map the emerging needs landscape and identify future innovation opportunities that are deeply grounded in changing preferences, behaviours and lifestyles.

As a first analytic layer, we explored the evolution of unmet needs in the cold and flu social data landscape over the past 3 years from over 340,000 consumer signals in the United Kingdom. The need mapping lens revealed that preventive regimen and ingredient safety in the context of child treatments are the fastest emerging consumer needs.

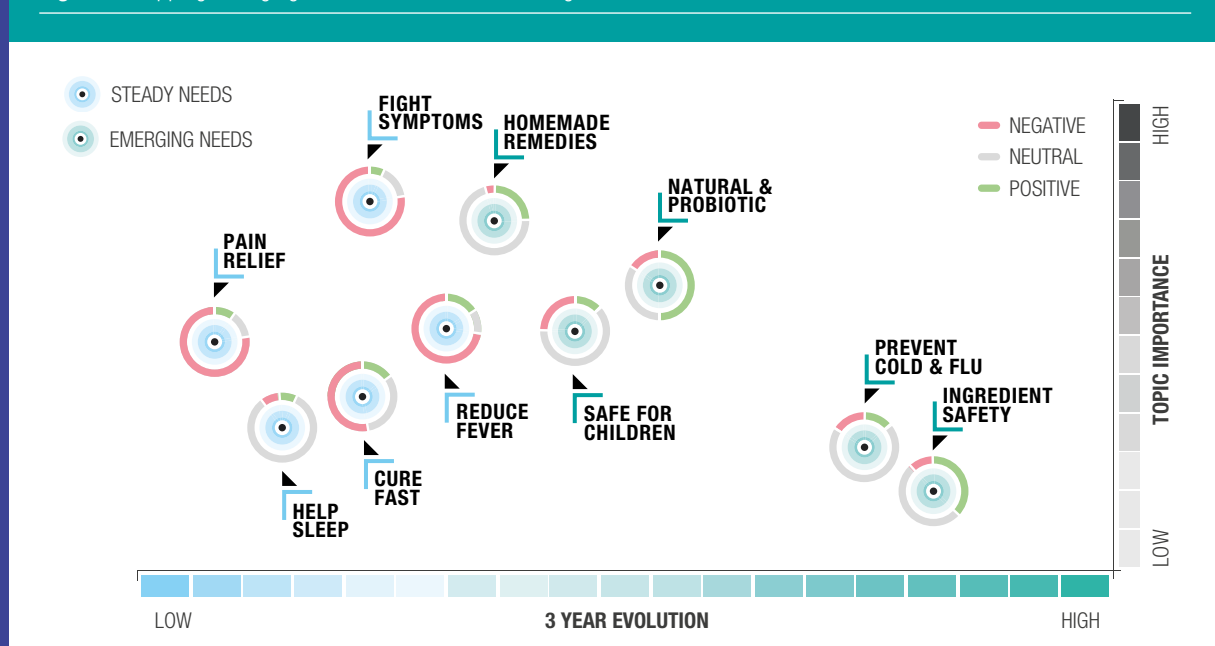
We also discovered that the need for more natural, probiotic and DIY treatments to strengthen the immune system are already well-established but still on the rise. At the same time, the obvious functional effects to fight symptoms, reduce fever, improve sleep and cure fast remain stable and critical needs. Interestingly, these steady needs are voiced by consumers with more negative emotions, mainly due to the

ineffectiveness of available ‘over the counter’ (OTC) products. On the other hand, the rising needs of ingredient safety, naturalness and probiotic treatments see more positive consumer engagement.

After mapping the need landscape, we applied the AI agent to decode user innovations that correspond to these emerging needs. Even though we narrowed the data universe with a focus domain of natural, probiotic, microbiome remedies and solutions, we discovered a whole cornucopia of DIY remedies, solution prototypes and product hacks.

The user innovation ecosystem in the cold and flu category revealed a wide range of simple but practical solutions such as a “blocked nose roller” created from perfume rollerballs to be applied under the baby’s nose to fight nasal decongestant and enable a good night sleep for parents and the infants alike. But we were also able to identify truly disruptive solution off the beaten innovation tracks such as “antitussive cough stoppers”, suppressant remedies using a combination of ingredients to disrupt the cough reflex arc in the brain stem that makes the user stop coughing instantly.

Figure 5 Mapping emerging needs for cold and flu management



Source: Ipsos study for GSK

THE IMPACT FOR GSK

Understanding how consumers are creating innovative solutions to satisfy their needs is a critical step in increasing our consumer understanding and becoming ever more “consumer obsessed”. The resourcefulness and innovation of consumers is a key fuel to drive our own innovation processes and this approach has helped us understand how leveraging social data can provide actionable, powerful insights on unmet needs and innovation opportunities.

James Sallows

Global Head of Transformation & Capability – CBIA

GSK Consumer Health

Figure 6 User developed solutions addressing rising needs



THE RISE OF USER-LED EARLY INNOVATION RESEARCH

Our Innovation Spaces method makes it practical to identify user-developed need-solution pairs on massive scale at a very early stage in the innovation development process. Compared to other early stage innovation research techniques, a critical advantage of this method is its “bottom-up” nature, which enables us to detect user innovations within the entire category landscape (as well as the corresponding emerging needs) within days, thanks to an AI-powered execution process.

This means our clients can now continuously decode innovation opportunities as they arise and effectively establish a truly consumer-centric corporate innovation strategy.

The rise of user innovations during the turmoil of COVID-19 has shown this in action as people around the world have been working collaboratively to find solutions to new and challenging realities.

To make these techniques as valuable as possible, it is also important to learn how to incorporate the user-designed innovations into a corporate innovation culture that is largely concentrated on internal idea-sourcing.

Companies, innovation consultants and market researchers need to learn a new division of innovation labour: they should no longer assume that it is their solely their task to design the “next big thing” for consumers. Research professionals now have easy access to the analytical toolkit and consumer data to turn the internet into an ongoing innovation mine. The latest advancements in machine learning and deep neural networks for Natural Language Understanding has made it possible to detect weak signals of changing need patterns with their corresponding solutions from innovating users on massive scale. Beyond this, by synthesising social and search data, we can now take the guesswork out of innovation strategies and correct the course by continuously analysing trends and the diffusion of novel concepts.

“Our clients can continuously decode innovation opportunities as they arise and effectively establish a truly consumer-centric corporate innovation strategy.”

Ipsos is a member of the MIT Innovation Lab where Professor von Hippel leads a select group of academics and innovation practitioners, reviewing, discussing and sparking research ideas for societal and business innovation. The Ipsos Science Organization supports this initiative, drawing in content and technical expertise from across the company to engage and benefit MIT and Ipsos.

Read the full research paper published in Research Policy:
<https://www.sciencedirect.com/science/article/pii/S0048733320301347>

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