INFORMING OUR INTUITION

DESIGN RESEARCH FOR RADICAL INNOVATION

Radical innovation requires both evidence and intuition: evidence to become informed, and intuition to inspire us in imagining and creating new and better possibilities.

By **Jane Fulton Suri**

THE TERM 'RESEARCH' shows up in the context of design and innovation in multiple guises, not all of them positive. For some people it connotes 'data collection' – looking to the past and present but not to the future; for others it's simply a required step before coming up with ideas; for yet others it's a filter that rejects promising ideas before they've had a chance to evolve.

The truth is that research can be an immensely positive force in the innovation journey. But to derive value from it, we must be willing to complement, challenge, and evolve many of the approaches and practices that traditionally prevail.

Starting out as a human-sciences graduate, I believed passionately that research could help us reach a better understanding of people – their needs, desires, habits and perceptions – and that this would lead to better decisions about what and how things get designed and put into the world. I still believe this today, but I now have a much more nuanced perspective of what it takes and have come to understand that different challenges require different approaches.

New Kinds of Innovation Challenges

At the beginning of my career I worked on projects that involved

influencing the design of things that already existed: urban housing in Scotland, motorcycles, power tools, washing machines, and elements of public transit systems. Effective research in such cases relies upon carefully gathering and analyzing existing evidence. By looking at current behaviour in existing situations, at records of sales, at complaints and incidents, and by asking people about their desires, problems, and preferences, it wasn't hard to find good ways to innovate by incrementally improving the existing designs.

Later, in the early 1990s at **IDEO**, I was given the chance to work on things that were completely new to the world, such as some of the first digital cameras, and medical processes and devices that neither doctors nor patients had experienced before. I also began to conceive and develop new offerings aimed at specific groups of people – educational games for children, a new kind of drink for athletes, and tools and services for people travelling on vacation.

These days, many of the innovation challenges we face in the workplace are framed in an even more open-ended way:

- How can we leverage the value of this brand to increase its reach?
- Here's an amazing new technology – what applications would be good business opportunities?
- There hasn't been real innovation in our industry for a decade or more – what can we do to change that?
- We already own this market category – what's going to be our 'next big thing'?

Responding to such challenges involves a more radical kind of innovation than that required to improve something that is already familiar. In this more radical context, it is much less clear what kinds of innovations might catch on and how new offerings might influence people's future habits, which presents a different challenge to research: how can you find out what is going to matter to people if it doesn't yet exist? And this new thing that you might develop (but that doesn't yet exist) – how do you discover what kind of people it might appeal to?

In cases such as these, effective research is not just about analysis of objective evidence – there isn't any directly applicable data anyway; it's also about the synthesis of evidence, recognition of emergent patterns, empathic connection to people's motivations and behaviours, exploration of analogies and extreme cases, and intuitive interpretation of information and impressions from multiple sources. This type of approach is now often referred to as 'design research' to differentiate it from purely analytic methods. At its core, design research is about informing our intuition.

The Role of Intuition

In innovation projects – particularly those that are more radical in scope – discovery and decision making cannot rely exclusively on analytic processes. By definition, as soon as we start to think ahead to future experiences and how people might respond, we begin to

Forces at Work in Design Research Figure 1
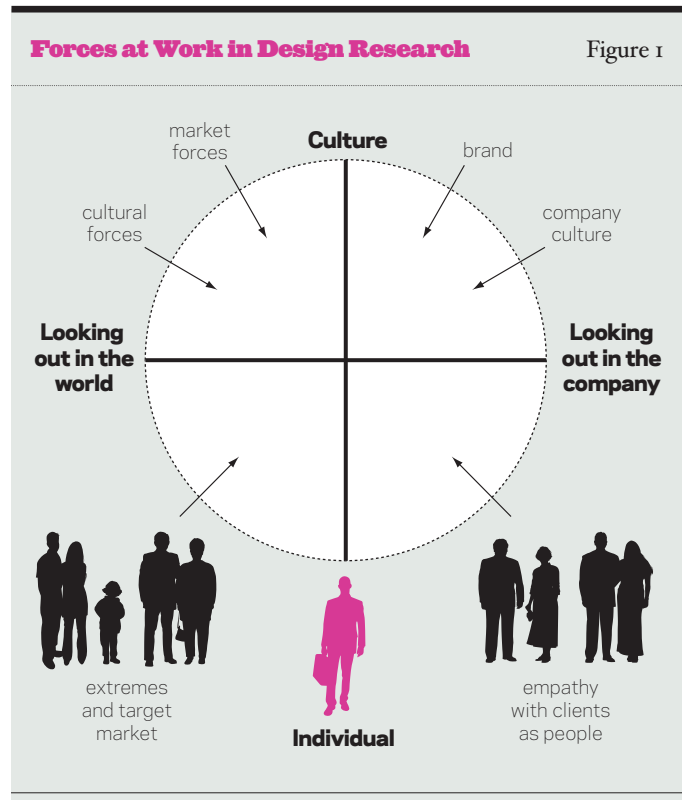
draw upon our intuitive and interpretive abilities. We begin to imagine and empathize.

Of course, imagination and empathy can also run into realms of fantasy. As **Malcolm Gladwell** reminds us in *Blink: The Power of Thinking Without Thinking*, intuitions can be spot-on, but they also can be misleading and, sometimes, simply wrong. Imagination, empathy and intuitive leaps – so important in innovation – also need to be informed by experience and tempered by continual doses of reality.

Design research both *inspires imagination* and *informs intuition* through a variety of methods with related intents: to expose patterns underlying the rich reality of people's behaviours and experiences, to explore reactions to probes and prototypes, and to shed light on the unknown through iterative hypothesis and experiment. Innovation projects have different scopes and different starting points, ranging from the incremental – enhancements to known offerings in a known market with well-understood consumers and usage patterns – to the more radical, in which the intent is to create new offerings for which there is not yet a market or established behaviours.

Innovation is an activity that socially and emotionally affects everyone involved. Teams, investors, and sponsors all have a lot at stake. During the innovation journey, we must be willing to apply

creativity, energy, and enthusiasm to an uncertain venture that has the potential for significant impact on our personal future and the success of our business. In addition, we need to stay motivated, curious to explore, yet responsible about investing time and materials. Positive outcomes can't be guaranteed, but everyone needs confidence and reassurance along the way. It's not realistic to expect blind faith and optimism to carry this process forward.

Sources of Confidence

As a reaction to inevitable risk and uncertainty, many organizations establish consumer research processes as a way of deciding what programs to support, and many employ methods that have been optimized to assist in decision making about incremental innovations. For incremental innovation, by definition, there is a history of actual market performance against which to calibrate new concepts, so it makes sense that we assess ideas using processes and objective pass/fail criteria that have proven to be good predictors in the past.

Unfortunately, these same processes often work against our ability to innovate effectively in more radical ways – to create 'disruptive' innovations. As **Clayton Christensen** writes in *The Innovator's Solution: Creating and Sustaining Successful Growth:*

> Not surprisingly, disruptive ideas stand a small chance of ever seeing the light of day when they are evaluated with the screens and lenses a company uses to identify and shape sustaining innovations. Companies frustrated by an inability to create new growth shouldn't conclude that they aren't generating enough good ideas. The problem doesn't lie in their creativity; it lies in their processes.

Processes that are good at instilling confidence when it comes to directions for incremental innovation can be inappropriately limiting and personally discouraging to more radical innovation efforts, in which many variables are unknown or unknowable. It is heartening to see organizations like **Hallmark**, **Herman Miller**, **Intel**, **Motorola**, **Procter & Gamble** and **Whirlpool** actively developing and applying design research methods as they strive for more radical innovation and for more empathic and intimate understanding of consumers.

Integration and Engagement

Design research is most valuable when it is treated as integral to the innovation process rather than as an external activity. To inform intuition, it is important to have team members actively interpret the richness of evidence and discoveries as they emerge. Research that brings rich information will provide not just facts, but insights and possible reasons behind the facts. Even seemingly bad news – that we have been considering something that seems to be a fruitless opportunity or a concept with serious flaws – can serve as inspiration for new and better ideas, instead of signaling a depressing

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failure. With richly understood bad news, we can adjust our assumptions and perhaps see a new opportunity to move in a more fruitful direction. A huge opportunity for learning is missed when research phases are simply tacked on to a program as 'safeguarding' or when research activities are outsourced to a separate team.

To be effective, decisions informed by design research demand a much higher level of personal commitment and engagement at all levels within an organization than do judgments based purely upon hard facts and objective data. Design research often means changing the way work gets done. It means getting out of the office, being where customers are, becoming aware of and sensitive to social trends and the broad ecology of stakeholders, rolling up our sleeves to try out unfamiliar things first hand.

The largely qualitative and interpretive nature of design research is its strength, but this also makes it potentially vulnerable to invalid or ill-founded conclusions. In order to be done well, design research demands that everyone involved be prepared to grapple diligently with ambiguity and nuance. It asks us to bring creative energy to the synthesis of confusing and conflicting information, to be willing to challenge and adapt our own and our colleagues' interpretations, and to stress-test these interpretations both with other points of view and in the harsh light of relevant evidence, even if such evidence is not statistically-proven fact.

This degree of direct involvement often brings another advantage to the design and innovation process – that of creating common ground and shared perspectives among people representing multiple functions within an organization, in ways that have seemed previously unachievable. Enabling teams to share raw evidence and create meaningful frameworks, principles, goals, criteria, and priorities together energizes movement forward with much more enthusiastically supported ideas and greater confidence. In this way, successful design research first requires, then perpetuates, forms of cultural transformation in organizations that enable radical innovation to thrive. What, then, does it feel like to make this kind of commitment to informing our intuition?

Design Research in Practice

Let's get more specific about what it actually means to conduct design research. Typically, research processes used in new product development combine multiple objectives into a single exploration. A survey tool, for example, may be constructed both to seek out consumer insight about opportunities and to field a sample-size that enables statistical estimations of scale. Or a series of focus groups may be used to explore both the appeal of an early idea and the size of the potential market.

For known markets and offerings, this approach seems to work reasonably well. But in research for radical innovation, compromising the potency of a single research objective leaves important questions unanswered: we know what people say they want, but do their behaviours really support this? How can we use the best of our half-baked ideas to create a better, more integrated experience for consumers? How can we assess the likely size of an opportunity if we have nothing to directly compare it with?

In research for radical innovation, there's great value in separating these objectives – distinguishing the types of questions we want to answer and creating appropriately-tailored tools to apply at different points throughout the innovation process.

Design research addresses three different kinds of questions with respect to innovation:

- **Generative:** gaining insights and opportunities – research that provides human-centered insight, revealing new ways of framing opportunities and inspiring new ideas.
- **Evaluative or Formative:** learning and refining – research that provides continual learning throughout the process to determine the what, how, and to whom of the offering.
- **Predictive:** estimating potential – research that helps to estimate the scale and potential of an opportunity even when most variables are unknown.

Here's how design research contributes in these three areas – and where there are important gaps to be filled.

1. Generative design research

Generative research involves looking for emergent patterns, challenges, and opportunities that can be addressed by innovation. The intent is that ideas about possible new offerings are informed and inspired by in-depth understanding of people's aspirations, attitudes, behaviours, emotions, perceptions, processes, and motivations within their prevailing and evolving social, cultural, and technology context. Crucially, it is about interpreting this understanding to inspire new perspectives that disrupt current conventions and ways of seeing things.

Here's an example from a project for an airline: innovation team members, in addition to shadowing specific passengers and observing their behaviours throughout an airplane journey and asking crew

members and passengers to keep a trip diary of their mood and significant events, also reported on their own trips of various kinds. Later, the team worked together as a group, integrating insights from these direct sources with more traditional forms of market research, technology, and other trend-related information relevant to travel and analogous services, to create a framework for thinking about the air-travel experience. This laid the foundation for innovation opportunities around specific service and physical design, in this case related to seating and baggage in particular.

2. Evaluative or formative design research

Evaluative or formative design research is essentially an iterative series of 'learning loops.' In design research, ideas don't stay intangible or ambiguous for long: they are given form, whether as sketches, models, stories, videos or other kinds of prototypes. In this context, a prototype is simply a visible or tangible representation of an idea, to be thought of as a probe or thought-experiment; it is not a full-fledged pilot or a preproduction version of the real thing. And although evaluation involves an element of testing of ideas, it is less about validating and filtering the ideas than it is about providing ongoing guidance in the uncertain innovation endeavour.

Evaluative design research is about building confidence by addressing questions and uncertainties *as they arise*. Frameworks, ideas, and concepts are shared in various ways as prototypes from very early (even in insight-gathering phases) to late in the process in order to learn from other people's reactions, and to check, revise, and refine assumptions.

Rather than treat evaluative research as a formal and objective test, it is often more fruitful to engage with participants in a spirit of co-discovery, even co-design, in which input is valued for whatever insight it brings, whether or not it reflects well on the concept. Treated more openly as an interactive design session, evaluative research can result in valuable dialogue that engages the best of participants' critical thinking and creativity. For example, in designing a new class of surgical instrument for use in the operating theater, some very significant breakthrough ideas were evolved via hands-on prototyping and evaluation sessions in which surgeons interacted with engineers and other team members around a simulated surgical setup.

3. Predictive design research

How confidently can we really predict whether a radical innovation will be a success? Predictive research refers to those research activities that are concerned with looking ahead to estimate the potential of future opportunities and ideas, primarily from the perspective of their business viability. This type of research is much less well-charted territory for design research. Designers need to be more creative in finding good ways to work through these business questions, both in helping to define potential markets and in determining the viability of ideas. There is tremendous pressure to

Generative design research

Figure 2

Though it shares some characteristics with more traditional forms of consumer insight and market research, generative design research differs in the following ways:

- It is empathic, speculative, and interpretive, not only descriptive and factual.
- It is interactive, behavioural, and contextual, not based in self-report or opinions.
- It often intentionally selects extremes and boundary conditions, not only random or representative samples.
- It integrates perspectives and interpretations offered by team members and consumer-participants, not by professional researchers only.
- It references analogous behaviours and situations, not just the target topic.
- It looks at the world through participants' lenses rather than only through our own.
- It is responsive to context and discovery rather than following a scripted inquiry.
- It is conversational rather than being a formal interview.
- It includes subjective experiences and participatory activities, not just objective observation.
- It integrates material from social, cultural, market, and technology trend sources rather than only from consumers.
- It makes sense through storytelling, collaborative synthesis, and pattern recognition rather than through formal analytical tools.

Evaluative or formative design research

Figure 3

Distinguished by several key characteristics, evaluative design research:

- is more about being in a learning loop and less about validating or filtering ideas.
- uses tangible prototypes to probe broad ideas rather than actual design proposals.
- when possible, represents new ideas visibly rather than only verbally.
- makes as much headway from knowing what doesn't work as from knowing what does work.
- emphasizes richness of response in early rounds rather than sample size.
- selects participants for the value their insights might provide rather than necessarily for their representation of the target market.
- stays human and interactive rather than formal or test-like.
- works to create relevant context, avoiding neutral or lab-like situations.
- focuses on behaviour and non-verbal reactions rather than on verbal responses and opinions.
- adjusts as an inquiry proceeds rather than strictly adhering to an established plan.
- invites participants into discussion, storytelling, musing, questioning, and interpretation rather than looking for only pre-coded responses.
- offers results that feed new thinking, not literal interpretations.
- guides decisions and actions, rather than driving them.

provide estimates of business potential to guide decision making about innovation, including its most radical forms.

In-market experimenting seems to offer great potential to radical innovation in enabling accessible, rapid, and considerably lower-risk and lower-cost learning than would a full-fledged launch. For example, **Bank of America** has been able to make great strides in both learning and innovation by reconfiguring several of its fully-operating branches in Atlanta to run live experiments on multiple service innovations, with real employees serving real customers in real time. A similar approach is exploited on an even larger scale by **Google**, through Google Labs, which has multiple experimental projects running at once and takes full advantage of the nature of hosted software to allow early launches – frequently updated in response to what is learned from users – of what effectively become eternal beta versions of their offering.

In closing

Both a personal and an organizational mind-shift are required to get comfortable with the emphasis that design research places on informing our intuition. Like many people in our culture, my formal education placed higher value upon received knowledge than upon personal discovery. But the longer I practice design and innovation, the more I am convinced that true learning comes not only from ready-processed data, but also from concrete sensory evidence and direct subjective experiences that have the power to capture our imaginations and achieve new understanding.

Design research demands commitment from innovators to reach new levels of understanding about what matters to the people we want to connect with. For radical innovation, we need both evidence and intuition: evidence to become informed, and intuition to inspire us in imagining and creating new and better possibilities. **R**

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