

Considerations for Effective User Research in Design

September 5, 2019

Manufacturers across a range of industries have recognized the value of user research at all stages of the product development life cycle. User research can help designers and engineers optimize product appeal and ensure safe and appropriate use by the intended users before launch. If a manufacturer brings a product to market without validating that it supports a user's workflow, needs, and mental model, it can open the door to misuse, personal injury, and potential market failure. According to a 2018 Nielsen BASES analysis, 80–85% of all fast-moving consumer goods (FMCG) launches fail; however, initiatives with strong performance in pre-market product testing are 15 times more likely to succeed in the market than those with poor pre-market testing performance.¹ Effective user research can help close this gap and eliminate the need for in-market experimentation.

User Research Timing

It is important for manufacturers to conduct user research as early in the product design process as possible. Some manufacturers wait to test a prototype until the product is close to market launch, which can create a temptation to disregard negative research findings to avoid launch delay and additional cost.

Studies indicate that the cost of product design changes increases exponentially the further along a manufacturer is in the product development life cycle.² A manufacturer once asked my team to complete a user study at the end of its product development life cycle. When research participants indicated that the existing product design did not support their needs, the multi-year, multi-million-dollar product development effort was scrapped. If the manufacturer had integrated early user research into its product development and launch timeline, it very likely could have made the necessary corrections to the product design in a timely, cost-effective manner.

The Food and Drug Administration's Center for Devices and Radiological Health (CDRH) supports the iterative nature of medical device design and highlights the importance of incorporating user needs and device experience into next-generation device development.³ According to the CDRH, the pathway to successful device development should be cyclical, as ideas are prototyped, tested, improved, re-tested, optimized, and finalized. Product evaluations and modifications should continue to occur even after a product reaches the market. Manufacturers across different industries can benefit from conducting user research at different junctures in the life cycle to guide product improvements and future product iterations.

External Recruitment of Users

It is important for manufacturers to conduct user research with naïve users from outside the company who represent the target market. Some manufacturers are tempted to conduct "dogfooding" or testing of

¹ <https://www.nielsen.com/us/en/insights/article/2018/three-common-causes-innovation-failure/>

² Proceedings of ICED 2007, 629–630 <https://www.designsociety.org/download-publication/25647/Engineering+Change+Analysis+during+Ongoing+Product+Development>

³ <https://www.fda.gov/about-fda/cdrh-innovation/medical-device-innovation-initiative-white-paper>

Considerations for Effective User Research in Design

products in-house. This solution of convenience can lead to misleading results if research participants do not align with the demographics or mental models of the representative user market, or if participants face internal pressures for the research outcome to conform to the expectation of the researchers. For this reason, many manufacturers find it beneficial to use third-party researchers who can help obtain an unbiased assessment of a product and how it fares with representative users.

Incorporation of Basic Science Principles

Finally, it is important that the individuals conducting user research have extensive training in empirical research methods and rigorous technical expertise associated with human subjects research. Such specialized training allows qualified researchers to collect data that are free from bias and ambiguity, in turn permitting stakeholders to use empirical results to decide confidently between different product designs; to assess the health and safety risk of a product; to provide actionable findings to product designers and engineers; to evaluate the viability of a product in its target market; and to calibrate product performance in a multidimensional tradeoff space—among other things.

Exponent's Expertise

At Exponent, our Ph.D.-level research scientists have degrees in cognitive psychology, neuroscience, and development psychology. We are also published in peer-reviewed journals and funded by national research agencies. Our team uses inferential statistics, computer vision, and data analysis tools from basic science research to design custom studies that operationalize manufacturers' business questions as tractable research questions. When combined with the advanced tools for capturing motion, eye tracking, and physiological measurements available at Exponent's Phoenix User Research Center (PURC), we can answer research questions in a way that most others cannot. PURC is strategically located in the fifth largest city in the United States and provides access to a demographic and geographic diversity of product testers. Because it is located thousands of miles from the tech bubbles of highly developed geographic regions, research participants are more characteristic of the general U.S. population when it comes to their degree of technical savvy.

Clients who would like to learn more about Exponent's user research capabilities or arrange a tour of PURC can contact Robert Rauschenberger at rrauschenberger@exponent.com / (623) 587-4191.



Robert Rauschenberger, Ph.D.

Human Factors

Principal Scientist
Phoenix

(623) 587-4191 | rrauschenberger@exponent.com

Exponent Office Locations

Atlanta, Austin, Boston Area (Maynard, Natick), Chicago Area (Downtown Chicago, Warrenville), Denver, Detroit, Houston, Miami, New York, Philadelphia, Phoenix, Northern California Area (Menlo Park, Oakland, Sacramento), Seattle, Southern California Area (Los Angeles, Orange County, Pasadena), Washington DC Area (District of Columbia, Maryland, Virginia)

International Offices:

Basel, Switzerland; Derby, Harrogate and London, UK; Düsseldorf, Germany; Shanghai and Hong Kong, China

www.exponent.com