

The Needs and Wants

**What is a company supposed to do in order to have a strong PULL methodology?
Dr Aruna Shekar talks about the deployment of ethnographic research and the
benefits for product development and design.**



The success of firms depends on their ability to identify consumer needs & create products at a low cost to meet those needs.

The “PULL” method is in terms of identifying the need or problem that exists in the market. This initial investigation helps the developer to focus their time, energy and budget on what is most important and of value to the end-user. The success of a product is determined by a receptive market.

Recent research by Cooper and Edgett conducted in 2008, on different methods of ideation for product innovation looked at 18 different voice-of-consumer methods and compared them according to both popularity and effectiveness. Ethnographic research was found to be the most effective method for ideation, and one of the least used methods, with only 12.9% of firms using it. Ethnographic research can be described as the observation of participants in their natural habitat and cultural environment.

Ethnography is “a descriptive, qualitative market research method for studying the customer in relation to his or her environment.”
(Belliveau et.al.2002)

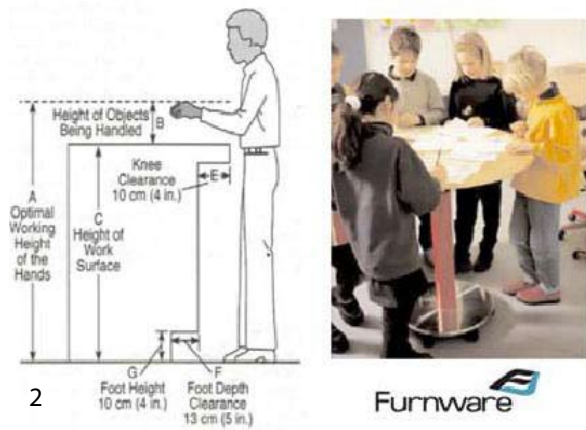
Over the last few decades there has been a decided increase in the number of ethnographic applications in companies where it tends to be used in marketing, design and consumer research. Malefyt (2009) concluded that ethnographic research methods appeal to developers as it reveals an insight into the actual use of a product and not just what the designer thinks it will be used for.

Focus Groups are used to gather valuable insights from real user experiences via group discussions with product users. One typically runs 2 or 3 group discussions for a couple of hours, moderated by a skilled practitioner who is a good listener and works with a list of topics (not a questionnaire) and keeps the discussions focussed on the topic. This method unravels user needs, competitor product attributes that are liked/disliked, important features, buyer motivations, usage problems etc.

Insights from the field

- 1) Rags and tubes hold bikes and prevent scratch marks on cars.
- Design a better bike rack to address these issues.
- 2) Observe the activities of children in a classroom, to design classroom furniture.
- 3) Focus group at an interview.
- 4) Observe farmers' use of toolboxes, to design a new one for farmbikes.

These techniques help break down the barriers between marketing and R & D, as they need to be integrated into the development process. This information is required by both, and they need to work collaboratively in order to combine 'market pull' information with that of 'technology push' capabilities.



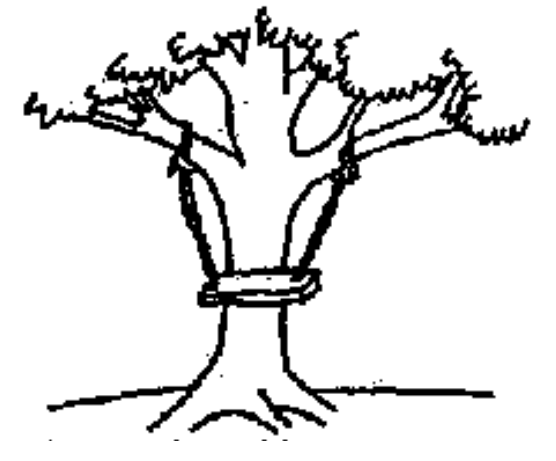
As proposed by the project sponsor



As specified in the project request



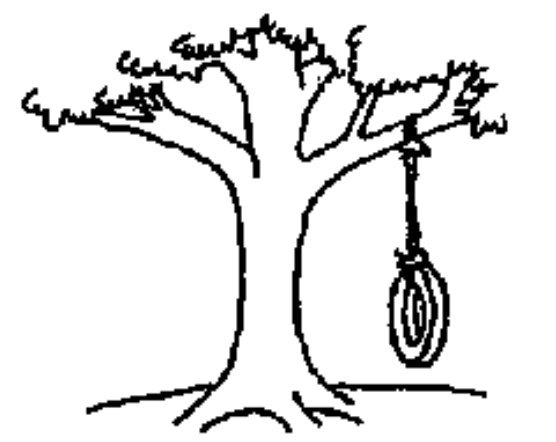
As designed by the senior analyst



As produced by the programmers



As installed at the user's site



What the user wanted

How user research helped improve the design of a medical device

An emerging concern of critical importance is the involvement of end-users in the design of medical devices for use in the home. If the medical device is very complex or counter-intuitive to use, often it can result in errors and lead to safety issues. Research findings indicate that lack of attention to human factors and contextual considerations during product development may lead to dangerous errors that have the potential for patient injury, or even death. The application of user techniques (like ethnography, personas, focus groups etc.), and the participation of healthcare practitioners in the design and testing phases are very important.

An example of this is the sleep apnea device developed by Fisher and Paykel recently, with input from end users. A medical device can be used safely and effectively only if the interaction between the operating environment, user capabilities, and device design is considered and integrated during the development stages. Desirable features include functional grouping of controls and displays, unambiguous labels, and easy-to-operate keys. Clear instructions and effective warnings are important. To simplify the design for the user- interface is actually quite challenging. Sometimes creators can get carried away by the various functions that can be offered. User research can help identify which features are most important and how best to integrate them in the design.

The sleep apnea machines have typically looked like medical appliances, due to the fact that they are made by manufacturers who also make hospital medical equipment. In the hospital this is a good thing as they are made for the hospital environment. However in the home and more especially beside the bed, these devices are unsuitable and users disliked them. Sales were slow.



How to develop the right product for the right context

Up-front user and context studies were undertaken. A lot of time was spent with users at home, in sleep labs and with clinicians and nurses. Usability analysis led to the large dial user-controls that could easily be found and operated even while lying down during the night. Use scenarios were storyboarded and actions like opening the humidification chamber lid and entering user menus were acted through in a bedroom situation at night to ensure that the best possible experience was provided. Role-playing by the designers, and simulations of the environment were a big part of the research. User research in NZ, Australia, and the United States were then used to hone the designs to the final form and usability. These were conducted as in-depth interviews and used visual models to prompt discussion around preferences. Most of these interviews were conducted in the simulated bedroom or sleep labs.

From user-design to delight

Things specifically considered at the beginning of the project in terms of design elements:

New Product Features:

The “vision”—best aesthetic possible, ornamental and decorative

The easiest way to operate this device—usability

Use environment, the bedroom

Form factor, smallest footprint

Colours—colours to suit bedroom

Material choices to reflect aesthetics

Build full size models for real-life testing

Benefits of the new product

Patient compliance is better than before, and user errors have been minimized. Manual operations

have been deliberately kept simple to reduce user errors, including limiting the number of selection buttons, keeping only the main functionality that is visible while lying down. Hence, good product development practices ensure that users are involved early, and become part of the development team during the testing phases, thus resulting in a better product in terms of functionality, aesthetics and fit within their context of use. This example demonstrates the value of considering the user-interface and operation context during design and development, particularly for medical devices as they require accuracy in usage and compliance.

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