

User Needs to Drive Product Requirements

An interview with two experts from the Insight Innovation Centers of Nemera, Carolyn Rose, design research leader at Chicago, USA, and Gregoire Gauthier, strategic initiative leader at La Verpilliere, France.

The importance of understanding user needs has been widely acknowledged by consultants, regulators and patients themselves alike to be an extremely critical input to the development process. But sometimes it's not all that easy to identify and prioritise user needs and ensure that they drive relevant decisions throughout the development of a drug delivery device.

We are here with Carolyn and Gregoire to try and understand some of the nuances that help ensure success when considering the impact of user needs on product design.

Let's assume you just completed some ethnographic-based design research and you have just unearthed some pretty important needs...

Can you share how to prioritise user needs? Once you've done that, how do you organise user needs?

C. "Ok, sure. It starts with a qualitative assessment of importance based on what you hear in the field. This type of assessment is very different from quantifying something. In order to understand what the biggest goals and pain points are from the user perspective, it's generally an assessment of two things: frequency and volume.

I think frequency is kind of obvious. For example, if my sample is with 15 people, was it something that 12 of the 15 are citing unprompted? Or is this more of an anomaly, where I'm only hearing it from one person?

In thinking about volume, is somebody getting really excited? Is

there a lot of passion and energy behind whatever it is they're expressing? Or is it something that feels relatively minor based on the way it's being expressed? So we have one sense of prioritised needs from what we learn in the field and from engaging with potential or current end-users. We also have another – the design perspective – which pulls each of these needs through a filter that asks: what's the potential impact or implication? We're thinking through, okay, 'Is that need core to function?' As in, is it going to actually impact the intended use? Is it related to the efficacy? If we don't deliver against this need, are we going to compromise the extent to which it's going to be effective?

Safety is another big one, so we usually pull it through those first: what's effective versus what is safe. These two are key issues that we address with core human factors activities.

Beyond efficacy and safety, there are other things that come into play that aren't as easy to categorise. For example, the frequency of the interaction, considering any unique capabilities or limitations of the user group, the range of users and the environment of use.

It's important to note that prioritisation acts as a development compass, providing a base reference and a direction on where to focus your efforts. However, all user needs must be addressed. For this reason, we're not individually ranking each need (that level of detail would be fairly arbitrary and is unnecessary). We typically create 3–4 buckets or tiers that act as an early framework for comparison."

G. Carolyn provided a great overview, and she gets all of it, I think. Let me add a few comments onto this. I'd like to stress how important it is to handle these user needs as truly user needs – I mean needs that belong to the users. We should avoid deciding 'on behalf of the patient' and

refrain from guessing what these user intentions or behaviours were – that's a common pitfall as it is so easy to draw a conclusion for ourselves. Reframing and summarising user needs is a critical task which requires education as well as practical experience.

Having said that, we usually end up with a list of substantial needs, which requires some further analysis. That's where we will zoom out and consider a broader context, beyond the fact: why is it that a user is needing this or that? Again, sketching out the user environment is conducted with care, as it might introduce some misinterpretations.

An important step resides in mapping these user needs against the expected functions of the studied device or application. That is where we should capture the 'user journey' as well as the functional sequence flow of the device or the application, to build a holistic view.

Organising the needs in a logical way, matching the functional analysis and the intended use sequence helps the development team to address ad hoc features while mitigating the misuse risks accordingly. Carolyn mentioned earlier the ordering and ranking of these needs; that's indeed all about this.

Let me bring one example here: I recall facing a customer request to improve a liquid dispenser system. This was introduced as an outcome of a design research, and our design department was asked to design a locking actuator as well as a child-resistant closure. This turned out to become a sophisticated and expensive addition. Working out the actual user needs, we were able to revisit the study along with our client; it became clear that the locking feature was requested because of an insufficient tightness of the protective cap, when people

were travelling with their product, leading to spillage or leak. The addition of a child-resistant cap was effective enough to fix the concern.

That is also where I'll make a fair point: listening to patient expectations does not necessarily mean ploughing back all into the design stream. It is fair to filter, reframe, sort out, and sometimes reject an end user demand. The rationale from the design specifications always prevails. You've heard Carolyn talking about safety and efficacy, as an example.

Last but not least, over the last couple of years, the rise of connected systems and their digital applications increased the need to accurately capture user expectations; the user experience is key when designing a dialogue with the personal data. The promise leads to a drastic improvement, from patient adherence down the line to remote monitoring from the healthcare professional. The success (or failure) of these eco-systems is tied up to the proper integration of user needs along the workflow.

Is it possible to have conflicting user needs?

C. "It can sometimes happen that user needs, typically derived from different user groups (like a nurse versus a patient) may seem conflicting. However, an understanding of the 'whys' behind desires and preferences can often unveil the 'common ground' or user need and the 'context', which often becomes the design challenge (or opportunity!).

Let's use diabetes management as an example, specifically end-of-dose feedback when administering insulin. Both the nurse and the self-administering patient want confidence that the full dose has been administered.

From a nurse's perspective, they're articulating a desire to have a loud, clear sign that it's been done right. Because they're in a clinical space with lots of activity, there's no reason to be discreet.

However, the patient might be on a train or having dinner with a friend.

They might not necessarily want to call attention to the fact that they're administering their dose but they still want confirmation that it was administered. Perhaps this person could receive confirmation via mobile app.

The point here is that user needs, in the way we frame them, are never conflicting. All must be met. But desired ways to address them may conflict, often based on contexts of use. A successful design solution will strike an effective balance across varying contexts of use and/or provide solutions specific to a unique context."

G. Oh yes, of course, and not only it may happen, but it is likely that we omitted something across the study if no conflict pops up.

Let's refer to the example I mentioned above: when looking at the opening sequence of the device featuring its child-resistant cap, one might face some user needs going against the intended use – considering this feature as a hurdle and occulting the benefit it brings in preventing exposure to their children.

As previously stated, listening to patient expectations does not mean implementing blindly a design specification. That's echoing Carolyn's example with insulin: we need a compromise which satisfies all parties. Another area of concern when crafting a new product, is to avoid the wow effect – in other words, when the novelty takes over any other attributes. While it has some value to collect a user feedback at the time he is discovering what is given, that might not capture the real journey he will be experiencing. If you think about that, the real assessment (benefits or hurdles) of a system is usually more accurate after using it multiple times, and that's most likely the situation the user will face in the real-life environment.

That's why we have been creative in our assessment methods, in developing a new approach, whenever needed. Our profiles are questioned at the time they are presented with a new concept; but they are given the device with a simulated posology – they are tasked

to play the role for a given period of time. Ultimately, users are bringing the system back, where they provide a mature post-discovery feedback; through a concluding interview, we go through the whole learning experience, which is important to factor into the educational journey; thus, we gain confidence in mapping the way a patient behaves across his whole treatment, including the rationale for providing initial or online training.

How can you ensure that the design continues to satisfy these important user needs downstream in the development process?

C. "First, the user need must be properly framed. We're probably all familiar with user needs that are not properly framed. Some can be super-vague –like "easy to use" or have lots of detail – "have a dial torque between four and eight inch-ounce." We've spent a good amount of time thinking through what makes an effective user need. First, we defined what a user need is.

A user need is a capability and/or affordance that must be provided within the context of the intended use of a product. It seeks to answer the following questions from a drug delivery or medical device perspective:

What does this device need to do to achieve the desired end result? In thinking through the use case and context, what's the who, what, when, where, why and the role that these play on the device capabilities?

Then we came up with four user need mandates. These are intended to help us as we're writing user needs because they act as a gut check to determine if it meets the intent of our definition. It seems silly, but sometimes you write something and you wonder, 'Is this truly a user need?' Referencing these mandates is a good way to ensure consistency.

These user needs are the first design input that ultimately lead to product requirements and should be continually referenced throughout development. Properly framed user needs are the first step in ensuring this type of traceability.



As you can imagine, it becomes harder and harder as development progresses to try to relate a requirement back to something like “easy to use”. If it’s properly framed, I think it’s fairly easy to be able to connect the dots from that user need to what you’re exploring. From that exploration, which concepts/ approaches are best enabling those user needs? And then ultimately, how or in what way? Essentially, these

answers are the foundation for our product requirements.”

G. Thanks, Carolyn! Ensure user needs across the whole development? I’m quoting our company motto: “We put patients first!”

You get it; we have to pin these user needs on the development wall and that requires not only some investments but also some continuous

attention at every stage of a project. Carolyn described that huge amount of work; there is no point to let it go and move on to an “engineering-only product” when developing it.

We used to say and educate our teams with the patient in mind: “the user is a member of the project team”. I have to admit that this is working quite efficiently. We’ve been able to connect the dots in between two substantially different backgrounds: engineering and cognitive sciences. There is a kind of magic sauce here, where our teams are working hand in hand from a very early stage, down to the lifecycle of a product line. That’s where the value pops up.

This being said, the unique one-size-fits-all patient does not exist; we acknowledge that the context of use is fuelled by many factors. Among others, the cultural / sociological differences in practice and the relation to the medication. Patient adherence is a worldwide goal; but each culture has its own fundamentals and practices.



**Gregoire
Gauthier**

Nemera, Insight Innovation, Strategic Initiatives Leader Support the innovation community by incorporating new skills or disciplines and by developing strategic partnerships, always with the patient in mind!



**Carolyn
Rose**

Carolyn leads the design research discipline at Insight Innovation Center, where research is leveraged to help define new offerings as well as short- and long-term development strategies. She earned BAs in both Industrial Design and Spanish Linguistics and Literature from Syracuse University, and holds a Master’s of Design Methods from IIT’s Institute of Design.