Design and Evidence

Does involving users slow down or speed up innovation?

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Introduction

As part of its aim to “bring about more effective and efficient solutions to the health and care needs of international populations,” the IET has identified four major healthcare topics that have become the themes for a series of events held in regional centres of excellence across the UK in 2018.

The series begins with a meet-up in Glasgow on the subject of ‘Design and Evidence’, which encompasses clinical validation, usability, accessibility and what good design looks like.

Published as a piece of supporting material for the event, this article – written by Dr. Leo Poll, a member of the IET Healthcare panel – explores the relationship between users’ needs and engineering innovation in the healthcare space using examples taken from other technological areas.

Evidence of needs and design success not only speeds up development, but more importantly, ensures that the right ‘thing’ is in development. Designing without evidence is like travelling without a map - you don’t know where you are going and you’ll never know whether you have arrived. The IET’s Think BIG Future Health & Life Science event on Design and Evidence brings together professionals who are aware of healthcare needs (the goals) and those who can develop the solutions to jointly define the shortest route to success. This position paper discusses how a needs-driven approach as opposed to a solutions-driven one ensures the best possible outcomes.
Involving users in design - what did the pioneers think?

“A lot of times, people don’t know what they want until you show it to them”

This is what Steve Jobs was quoted as saying in *Business Weekly* 20 years ago. Many designers use this as evidence that good design is the work of a creative genius with the Midas Touch - if people do not know what they want, there is no point in asking them.

Nothing could be further from the truth, as the quote was taken out of context. What he actually said was:

“But in the end, for something this complicated, it’s really hard to design products by focus groups. A lot of times, people don’t know what they want until you show it to them.”

He wasn’t suggesting that you ignore users, just that you need to engage them in the correct manner.

“If I had asked what people wanted, they would have said faster horses”

Another misquote, this time from Henry Ford, but it is again used as an excuse for not involving people in design. However, this one contains a hint to the root of the problem of why people do not know what they want. What they said they wanted was a faster horse, which is their way of expressing what they really needed - faster travel. It demonstrates a lack of understanding of what is possible, not a lack of understanding of what it is they need. It is the role of the innovator to translate that need into a sustainable product.

“You’ve got to start with the customer experience and work backwards to the technology”

Steve Jobs again. There is a lot of truth in this statement; it indicates that technology innovation doesn’t just happen, nor that Apple introduced a new technology and created a new customer experience as if by magic or accident. It underpins Apple’s approach to innovation which is not really technology-driven but best characterised as technology-enabled.

The Apple iPod was not a technological marvel - Philips and others had far smaller mp3 players that played music just as well as the iPod. The difference was the way it was presented to the end-user.

MP3 players facilitated a user interface that reflected how things worked technically. To get music on the player you moved mp3 files from your computer to your portable player organised in folders, just like a PC - a concept very familiar to engineers but not to the average music consumer. Apple set out to develop a solution that supported the whole experience of purchasing and enjoying music. Once it understood the customer needs it designed a player that offered a seamless experience supporting the journey from start to finish. This was designed to meet real needs, so people recognised that this is what they wanted; it met a need they already had. The solution was new, supported by a combination of technologies that, individually, were not.
Finding the right solutions for healthcare needs – a personal viewpoint

The mismatch between ‘want’ and ‘need’ is commonplace, and one I have personally experienced many times during conversations with healthcare professionals. Throughout my career I have had the privilege of being exposed to a wide range of technical innovations and this broad knowledge allows me to identify possible solutions quite quickly when I hear of a need. As a result, my conversations with healthcare professionals always follow the same script where I say ‘I didn’t know you needed it’, and the healthcare professional replies with ‘I didn’t know that it was possible’.

Healthcare professionals do know what they need as the annual Health Enterprise East (HEE) Innovation competition demonstrates. As one of the judges for the competition and as well as during my time as a member of the board I have been presented with many brilliant solutions to pressing healthcare problems that all have one thing in common: all solutions were very low tech. This doesn’t mean they are not valuable but does indicate the limited knowledge a healthcare professional understandably has of the vast domain of technical possibilities.

It also indicates something even more important: the solutions put forward during initiatives such as the HEE Innovation competition represent the tip of the ‘healthcare needs iceberg’. There are literally thousands of healthcare professionals out there who are aware of needs that could be solved by technologies they are simply not aware of, and so they remain unaddressed.
Tackling the problem

For a user to recognise an innovation immediately as something that she/he wants it must provide a solution to a need that is already there. Achieving this requires the following steps to be taken:

1. Identifying and developing a validated understanding of user needs/behaviour
2. A matching activity to identify the best possible technical candidates for a solution
3. An interactive design approach involving feedback from representative users as often as possible

What is a ‘validated understanding’?

The key is to focus on developing a solution-independent definition of user needs. There are many different possible solutions to one problem, now and in the future. By focusing on a solution-independent definition of needs, we force ourselves to really understand what is required first before we get excited about a possible solution and all of its potential features. In other words, by focusing on the solution too early we lose sight of other solutions that might be better.

We live in a time of rapid and vast technological change. New capabilities, data and connections are enabling rapid transformation of businesses and governments. User needs evolve at a far slower rate than technology; we remain human - flawed, emotional and irrational. An investment into understanding human behaviour and our real needs is therefore more valuable than ever before. Smart companies like Apple and Philips recognised this years ago, and continuously look for technical innovations outside their own organisation to match needs of their consumers that they know actually exist.
Matching solutions to needs

Many people are unaware of their needs until they see a solution, but that doesn’t mean the need does not exist. One would recognise a teleportation machine as a great solution to a need for faster travel, but because this is considered not possible it would not be wise to spend much time thinking about this as a solution that would address the ‘pain point’ of a long commute. However, knowledge of solutions will help identify ‘pain points.’ This requires an assessment of the user needs by engineers asking ‘what if we solved it this way?’, even if users are completely happy with the current solution.

Weighing up the pros and cons of different solutions will then help identify which technology has the best potential. This approach implies that there is an expanding role for more ‘open’ innovation, allowing universities and start-ups to pursue solution-agnostic technical innovations supported by organisations such as the IET to mediate between those with needs and those with solutions.

Iterative design

Once a solution has been identified, the next step is to shape this into a tailored fit, with the defined need as well as the bigger context within which this need has to be met. Most designs can be tested with prototypes of fidelities that start with paper-based designs, and range up to fully-functional computer simulations. The techniques for involving users vary from online A/B testing to fully fledged co-design sessions with end-users. Testing early and often with prototypes of different fidelity supports the identification of the best designs before implementation. This ensures that the end result will be a good match with the need addressed.

This approach also ensures that effective designs are realised within the shortest time and budget possible. Critically, this will only work by involving users who are representative of the actual intended user base. This approach should not surprise the average engineer. Iterative design, including prototyping, is all part of good engineering practice. Designing an effective UX (user experience) is no different and certainly not just creative art. An effective UX must be engineered.
An opportunity for the IET

The IET has a large base of members who are pushing the boundaries with a number of technologies. At the same time there are huge needs in healthcare, the identification of which requires an engineer to talk to a healthcare professional and vice versa.

The IET can play a significant role by facilitating these mutual introductions and ‘let the sparks fly’, starting with the inaugural ‘Think BIG Future Health & Life Science’ event in Glasgow. The next ‘Think BIG’ event, on Healthcare Commissioning, will take place in Manchester on 28th June 2018. For more information on the series, visit www.theiet.org/healthcare.

About this article

‘Design and Evidence – Does involving users slow down or speed up innovation?’ was authored by Dr. Leo Poll, President of Akendi UK and a former Business Development Officer at Philips Research and Health Enterprise East board member. He also founded software consultancy v.o.f. Galileo, and is a member of the IET Healthcare executive panel. Published by the Institution of Engineering and Technology, this opinion piece was produced with input from other panels of the IET Healthcare panel, but does not represent overall IET policy.

About IET Healthcare

IET Healthcare has been established to promote innovation and creativity amongst future leaders in healthcare, social care and wellbeing. Its mission statement is:

“Because we believe that technology can drive better health, we exist to harness all sector vices to build a healthier future for all”

By bringing together stakeholders from groups including clinicians, patients, technologists and entrepreneurs it ultimately aims to bring about more effective and efficient solutions to the health and care needs of international populations.