

Using lean thinking to solve really difficult problems

In the previous issue of News42 Dr Nick Scott presented the first of three articles discussing how lean thinking helps us reimagine uncertainty in new product development.

In two further articles we consider how to use lean to solve really difficult problems, and how to use lean for more effective product development.

Nick's second article is now available for download at <https://goo.gl/Sarh9V>

But what do we mean by a **really difficult problem**?

In lean terms, it is helpful to think about a problem as an

undesired outcome from, or an undesirable *state* for, our system. A solution to the problem changes the state to one that is better.

Why? Because systems are things we can easily relate to and change. This view helps us understand the root causes of the problem, the constraints we should challenge, and those we should accept — *however frustrating that may seem*.

We can then benefit from a whole class of simple, rapid solutions that we may otherwise have overlooked.

Perhaps breakthrough problem solving isn't rocket science after all!

42 Technology secures The Queen's Award for Enterprise as international sales soar



We are delighted to have been awarded The Queen's Award for Enterprise in the international trade category on the back of significant and sustained year on year growth in export sales over a six year period.

Our annual turnover more than doubled over the qualification period and international sales increased almost six-fold. Export is now a fundamental part of our growth strategy, and in 2016 accounted for 65% of total annual turnover.

"The award is a significant endorsement for the whole team and will help underscore our credibility when presenting to new UK and overseas clients," said Jeremy Carey, 42 Technology's managing director.

We have grown considerably over the last few years as a direct result of success in international markets, particularly in the US, Germany, Sweden and Switzerland. We are winning larger and longer-term strategic projects from many of our existing clients and have significantly expanded our client list.

The Queen's Award for Enterprise is the highest official award that can be given to any British business. It recognises a company's contribution to UK exports while also looking at its role within the local community, its environmental impact, and the quality of its relationships with suppliers, partners, employees and customers.



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The latest news from

42 Technology

Developing *smarter* metering technologies

Funded by Innovate UK's Energy Catalyst award, 42 Technology is developing a smart metering technology that will allow energy suppliers to provide their customers with detailed and itemised billing, for the first time showing specific energy consumption by appliance type.

42 Technology's Triple Ohm technology, which is being designed for integration into domestic smart meters, can identify when specific appliances are being used within a building, and can even tell the difference between a vacuum cleaner with an empty bag and a full bag.

The results can then be displayed in real time, for example on a home energy monitor or a smartphone app, or the data stored for incorporation into the householder's next bill.



“This innovative approach could help consumers to significantly reduce their electricity bills by deciding to use specific appliances less frequently, to switch items off rather than leaving on standby, or to replace outdated appliances with more energy-efficient models.”

— **Jeremy Carey,**

42 Technology's MD and energy sector head

The Pre-mortem

Why is intuition in our day-to-day work important?

Intuitive decisions often consider a far richer set of data, and use more complex algorithms, than decisions taken consciously with a small amount of explicit information. They often combine experience built up over years, subtle cues from colleagues and risk calculations that, if performed explicitly, would be overwhelming.

And they are fast, by design. *Decide-before-you-get-eaten-by-a-bear* fast, in fact.

The point is, intuitive decisions are (whether you know it or not) very well thought through. The **gut feeling** of an experienced employee should certainly not be taken lightly.

But intuitive decisions are difficult to document and difficult to explain to another person. In our modern, logical world, people are reluctant to even voice purely intuitive opinions for fear of seeming irrational. Yet we can probably all point to decisions we have made in our lives that seemed at the time to have been based purely on intuition (choice of house, partner or job, for example) that time has shown were some of the best decisions we ever made.

It may not be a surprise that interviewers generally decide about a candidate in the first 10 seconds, whether they believe so or not.

What's interesting is that such decisions are generally regarded as invalid. **Why is that?**

Research has shown that students, shown 10 seconds of silent video of a new lecturer, form qualitative judgements of the lecturer's talent that are barely distinguishable from those formed by students who experience several full lectures in person.

We should not underestimate the power of intuition in complex decision making, just because we can't always see how it happens. And we should certainly never ignore an experienced person's gut feeling that something may be wrong, even if they can't yet say why.

Allowing intuition to be heard

In a creative workshop or brainstorm we typically aim to create a non-critical environment, to enable discovery of novel solutions that may otherwise remain suppressed. Why not create the same open group dynamic expressly for the purpose of allowing people to express negative ideas?

When a large project fails, there are frequently people within the company (or team) whose intuition told them there was a problem long ago, yet there was no forum in which to feel safe expressing such a view.

In one reported case, in a Japanese multi-national, a whole global team publicly expressed a belief that a project was on track for weeks, while each member privately believed it would fail. Later investigations revealed each team member had grave doubts but believed or hoped someone other than them would ultimately break ranks and be blamed. Unsurprisingly, the cost of eventual failure was far greater than if everyone had felt able to speak their mind far earlier.

The Pre-mortem

It is to address this problem that the *pre-mortem* was conceived.

A pre-mortem is a meeting at which a team gets to determine, before starting a project, why it failed. That is, they imagine a future time at which the project has gone spectacularly wrong, and try to imagine what flaws with the project as currently proposed might have caused the failure. Then they figure out what mitigations to put in place to address the flaws before the job even starts.

What's unique about a pre-mortem — as compared to, say, an FMEA meeting or a risk analysis session — is this 'prospective hindsight' approach. Research has shown that this approach increases the ability to correctly identify reasons for future outcomes by 30%*.

As with a creative brainstorm, the meeting tone is uncritical, with no suggestion shot down. If you have a bad feeling about a particular risk, get it out in the open. In one approach, participants privately list their concerns, then take turns reading out one issue at a time, until all issues have been aired. This prevents extroverts dominating. What's important in this first phase of the pre-mortem is to treat everyone's gut feeling with respect, and to try to understand the source of it.

In the second phase, the team determines what the mitigation will be for each concern or (if it's agreed that a particular item may not be a risk after all) makes a commitment to revisit the pre-concern later to see if it has become any less improbable.

Participants know that no concern raised can be 'swept under the carpet' by an over-optimistic project manager.

The benefits of the pre-mortem are threefold:

- 1 Risks not identified during formal project planning are discovered before they become expensive issues.
- 2 Everyone is on board. No one secretly harbours a concern believing it would not be listened to. We're now all in it together.
- 3 People who identify a serious flaw in the project plan are valued for their experience and foresight, rather than denigrated for their negativity.

In the words of the Danish Physicist Niels Bohr, "*Prediction is very difficult, especially about the future*". But the pre-mortem at least makes it a little easier.

* Research conducted in 1989 by Deborah J Mitchell of the Wharton School; Jay Russo of Cornell; and Nancy Pennington of the University of Colorado.