Lean is not just for manufacturing

— **Dr Nick Scott**

In the first of a series of three articles, Dr Nick Scott of 42 Technology explains how the lean approach usually associated with manufacturing can be applied equally effectively to product development.

For the last thirty years we have been getting to grips with the competitive advantage that manufacturers gain from lean manufacturing. Yet design and development is an important area where lean thinking has yet to make the enormous impact it warrants.

Essentially, lean shifts our view from focusing on the details of each piece of work, to managing the process by which we do the work and then ultimately onto how we grow our knowledge of the process.

The first change required to adopt lean thinking into our development process is to recognise that what we are doing really is a process. Few people would dispute that at face value. The development process turns marketing specifications into projects into products into revenue streams.

Lean offers another perspective. The development process is about reducing the amount of uncertainty, as early as possible, and learning from it as we go. If we stressed this in our thinking about our development work, how would we behave differently?

Uncertainty abounds in product development

- Is there uncertainty about what the customer wants? Go and test what we think we know (or believe) with some cardboard models before a marketing spec gets written. Or write a story from the customer's perspective, send it to some customers and ask them to edit it.

- Is there uncertainty about the best new mechanism to use in a product? Come up with seven ways to achieve the motion you need, make your top three from that stuff we accumulate in drawers, lab shelves and using the 3-D printer. Then go and test it next to a train track, at a bus stop or wherever your customers live or would expect to use the product.

- Is there uncertainty about getting a complex product made? Define exactly what the customer needs the product to do, how its manufacture will assure it, and how to make sure each process is under enough control to deliver… before the detailed design is finished!

Managing this uncertainty goes a step further than simply managing project risk, which is invariably about ensuring that the project delivers on-time, on-budget and on-specification. It means treating the whole project as a set of risks that we do not yet fully understand, and making decisions with just enough of the right information *as early as possible*.

Eric Reis, author of *The Lean Start-up*, goes as far as to say that the purpose of new venture is to maximise what we can learn about a customer's real needs and how our new value proposition will meet those needs before the funding runs out! The acid test he employs is as simple as it is strict: a customer must be *willing to pay* for (value contained in) the early stage product you *just showed* them. No sale, no product!

So, the development process is really about coming up with increasingly smart and fast ways to learn about customer needs and how to deliver products to meet those needs.

You know what you measure

A further implication of this is that we should be measuring ourselves in different ways, both in terms of the success factors we acknowledge and the sort of numbers that we use to tell us if we are winning or losing.

Measurement 101

if we want to measure something, we can either measure when it's happened (lagging) or measure when the things that cause the outcome are happening (leading). If we want to manage the process as well as the outcome of the separate pieces of work, we prefer measures that lead, as well as those that lag.

As we take the next step and shift our focus to growing our process knowledge, we become more interested in leading measurements only. We can do this because we have more confidence in our process, namely that our chosen inputs produce desired outputs.

Summing up, we can treat product development as a process for discovery and learning. In doing so we drive out uncertainty and build confidence in our project decisions. As our ability to manage the process, not just the work, increases, we measure factors that cause the outcomes we want, further increasing our understanding.

In two further articles in this series, we will explore how lean thinking helps us build the muscle to give us that confidence in our decisions, and supports us in creating the frameworks in which we work.

We will discuss how to use the principles of lean thinking to help us get to grips with solving difficult challenges and problems, and explore how to accelerate our product development process and create more effective organisations through the application of these principles.

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Nick is an industry experienced manufacturing engineer specialising in the application of lean thinking to the improvement and creation of operational processes and products.

His experience includes inkjet printing, speciality chemicals, functional packaging, medical devices, precision gauging and inspection equipment and capital machinery. He has also applied these ideas to healthcare delivery, utilities replacement and retail banking.

Nick has an honours degree in Manufacturing Engineering from the University of Cambridge and holds a PhD in complex systems within operations management. He is a chartered engineer and has also been an operations and value stream leader.