

How large companies can adopt lean thinking in research and development



The principle of lean innovation — *fail early, fail cheap and learn fast* — is gaining momentum in large companies. Gartner estimates that by 2021, more than 50 per cent of established corporations will be leveraging lean startup techniques at the business level to increase the pace and success of business transformation. This is even more pressing in research-intensive industries like chemicals and robotics, where billions of dollars are allocated to R&D projects that typically require several years to complete and where stopping or pivoting a project due to a key assumption proved incorrect may save large amounts of lab investment.

But, for such companies applying lean start-up principles is more difficult compared to other sectors. Take, for example, the concept of *Minimum Viable Product (MVP)*, the idea of developing a product with just enough features to get early feedback from potential customers, which is at the heart of the theory of lean innovation. It may be a relatively easy principle for a company producing software, but when it comes to chemical processes or material systems it gets less intuitive and more complex.

So, it is not surprising if such industries are [lagging behind](#) in the adoption of lean innovation — even though they would benefit the most from it. Our experience working with large research-intensive companies suggests they typically face four pitfalls when they try to implement lean principles:

1. **The minimum viable product is not really “minimum”:** too much time and money is spent on the technical side to build a full-fledged prototype that may be completely disproved as you go out and ask for early feedbacks
2. **The assigned team is distracted by daily tasks:** unlike start-up entrepreneurs in a garage working day and night on their project, the team is often assembled with part-time members who work and sit in different offices and buildings and meet once a week. What should be lean and fast gets lengthy and cumbersome.
3. **The team composition is tech-biased:** the team is often unbalanced in favor of researchers and engineers who will be always be tempted to overelaborate the minimum viable product and put too much focus on technological performances.
4. **The team spends more time in the lab than in the field:** too much time and effort is allocated on testing technical assumptions while the reality check in the market is done very superficially or too late.

But there are ways around these problems. In one recent case, we worked with a large firm providing chemical ingredients for the detergent industry. Besides the traditional R&D process, the company decided to apply lean innovation principles as a new complementary approach. Internal teams were trained in lean innovation tools and set up lean experiments.

One project, for instance, was about a new system that enables savings in energy and water in commercial laundry. Researchers and chemists came up with an innovative concept based on sophisticated chemical recombination. In normal conditions, they would have started the lab work, but instead they were asked to sketch the process into a simple simulation (Minimum Viable Product) to explain how the technology would work and the expected results.

Rather than sitting in the lab, chemists formed a joint team with marketers and innovation experts and went out of the building to meet with end-customers, in this case hotel owners, showing them the sketch and getting feedback. For some chemists, this was the first time they had ever spoken with a real customer. They soon realized that no matter how brilliant and elegant their solution was from a chemistry standpoint it overlooked key market assumptions that would eventually undermine the acceptance of the solution. For this reason the team decided to stop the investment. In the past such an outcome might have sounded like a failure but in reality, thanks to the insights gained from a few field interviews, they managed to save millions of dollars in expensive lab development phases, freeing up resources and time for other R&D projects.

At a meeting with the research department, the CEO himself highlighted the fact that without a lean approach the failure would have become evident only at a later stage, after wasting a significant amount of money — resources that could have been (better) allocated to other projects.

From this and other cases, we have identified four principles that can help lean innovation projects succeed:

1. **Force the team to keep it truly “minimum”:** before assigning a significant amount of money and time, ask the team to prepare a simple simulation or even a visual picture of the product/system explaining the performances and the benefits that the solution would bring
2. **Move the team into a separate building:** assemble the team and assign dedicated resources for a limited period of time working together in the same room without distractions from daily business (a few weeks full-time are much more effective than several months part-time).
3. **Balance the team with marketers:** counterbalance the tendency of scientists to concentrate too much on technical features, by adding strategic thinkers and marketers to the team; they will help move the focus on market assumptions and user benefits.
4. **Bring the team into the field as soon as possible:** make sure that they go on field visits and interview customers to test the initial assumptions. A key element is also the early qualification of potential partners along the value chain that may help bring the solution to the end market.

Such principles can be successfully applied to projects only if the company's systems and processes allow for some form of agility and flexibility: for this reason, management should establish clear priority lanes and shortcuts to let project teams fail soon and learn fast — without being slowed down or killed by the internal procedures and bureaucracy of the traditional R&D chain. The message about “failure and learning” has to be reiterated at every important R&D meeting by showcasing concrete examples and sharing experiences between teams.



Notes:

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