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Rapid Cycles of Learning

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Build — Measure — Learn

Continuous Improvement is all about learning. Learning what the customers think and value (something that continuously evolves), learning where the opportunities are, learning where the waste is and what the root causes are, learning what the people closest to the work see and think, learning how the management system fosters or impedes high quality performance, learning how well our solutions accomplish their objectives, learning how to further improve. The Deming Cycle, Plan-Do-Study-Act, is a cycle of learning.

Time Value of Learning

Every company learns and improves in some ways. But what matters is the speed of improvements: the speed of learning, plowing that learning into fruitful action, and studying the results in order to learn and improve again. Fast. Waste — whether it is waste of opportunity in the market place, waste of time, materials, capital — is always a rate: scrap per day, overtime expense per week, rework per application and applications per week, forgone return on capital per month on days-sales-outstanding or excess inventory or excess space. So every day that passes without an improvement implemented costs money. We may not feel it because it is built into our baseline, but it is every bit as real as if we cut a check for it every day.

In other words: "speed is of the essence."

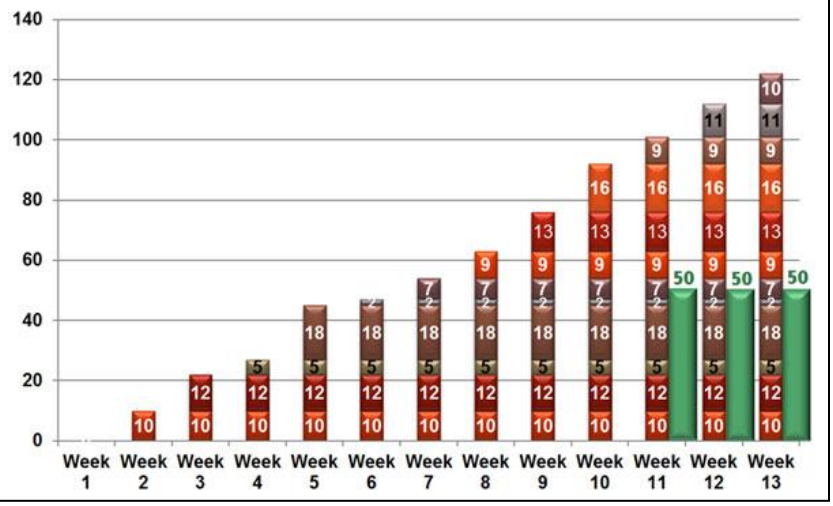
Intuit has adopted a rapid improvement methodology based on small rapid experiments. In the book, *Lean Startup*, Eric Ries describes the Intuit method of making a change to their website on Thursday, gathering data over the weekend. On Monday and Tuesday, they study and learn from the results and develop the next action and new test for Thursday. Not only does this produce rapid and continuous improvements based on actual customer responses, but cultural changes as well. Intuit's founder, Scott Cook, describes the impact of rapid cycles of learning on the culture: *"The amount of learning they get in is just immense now; and what that does is develop entrepreneurs. Because when you have only one test, you don't have entrepreneurs, you have politicians because you've got to sell. Out of a hundred good ideas, you have to sell your idea. So you build a society of salesmen and politicians. When you have five hundred tests you are running, everybody's ideas can be run. And then you create entrepreneurs who run. And learn and can retest and relearn as opposed to a society of politicians. So we're trying to drive that throughout our organization."*

A Plan-Do-Study-Act cycle that runs every week produces a stream of improvements that produce faster returns and therefore higher cumulative returns.

Some improvements have greater benefit than others but rapid cycles nearly always outperform slower cycles — even if the slower eventually has a bigger bang.

To illustrate, this example shows weekly improvements that average 10 units of benefit a week to produce a Cumulative Benefit at Quarter End = 771 units and almost 1,600 each future quarter.

Alternatively a bigger but slower improvement might yield 50 units per week for a cumulative benefit of 150 units for this quarter and 650 for future quarters.



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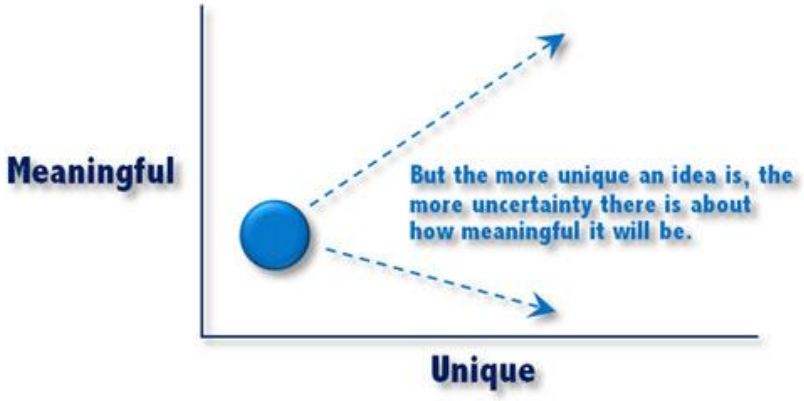
The time value of information increases relative to the uncertainty involved. Therefore 'time value of information' is exceptionally high in development of new products, new services, and new marketing messages. In these situations, the impact on the customer and ultimately the business is very uncertain at the outset because there are no measurements, no historical data. To wait until development is complete to test the value in the concept is to risk wasting a long development investment.

These innovations must provide something meaningfully unique, but the more unique the product or service, the more uncertain the level of meaningfulness in the market. No one has done it before: it could be a break-out success story or a flop.

In situations of high uncertainty, we need to be able to test and validate our core assumptions as quickly as possible. When it comes to innovation, the biggest waste comes from working on the wrong things.



Fail Fast, Fail Cheap

If an innovation is going to fail, the faster we know it, the cheaper it is. Doug Hall, of Innovation Engineering, advises that we test first those elements that could make or break the concept: i.e., the 'death threats.' A death threat could be market viability — whether it addresses an important market need. It could be whether or not the most technologically challenging aspect can be solved. It could be whether a key collaboration can be arranged or whether intellectual property rights can be protected. Identify the most important and most difficult challenge, and address that one first with the goal of learning meaningfully and rapidly.

Taking on the most uncertain aspects of development goes against the instinct of almost every development team. The natural order is to execute on the clearest and simplest deliverables first because many of us value work by the number of deliverables produced. But to continuously improve our innovation, we need rapid cycles of learning about the most critical and uncertain assumptions and challenges first.

Reduce the "Batch Size" of Learning

Analogous to small batch production, which reduces waste by accelerating visibility to quality issues and by increasing agility to produce to real market demand instead of forecasts, "small batch development" like Intuit's example, accelerates the cycles of learning in product development. *Traditional* product development involves months of planning, forecasting, designing, and development before the product is released to the market. Whether it succeeds or fails will be the combined result of thousands of decisions and investments, some good and some bad. If the concept falls short, all of the development time and expense is waste. Rapid development and testing, such as the 'agile' methodology achieves small batch rapid learning and improvement.

Eric Ries recommends that a startup launch a minimally viable product: the least investment possible to begin testing the value proposition and the growth assumptions with real customers. Ries, an engineer himself, acknowledges how difficult it is to let a product go to a customer when it lacks the quality and features he has envisioned. Yet he has learned that this approach accelerates critical learning because real customers respond in surprising ways, revealing value that had been overlooked and behaving indifferently to features that had been assumed to be critical in the strategic plan. He learned that instead of investing long months developing irrelevant features, he could instead discover and address the previously latent actual needs and wants of actual customers. Delivering the minimally viable product surfaces those latent needs and vets the leadership's vision of what is really important to the customers.

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Lean Startup describes several successful startups that followed this model. For example, when Zappos founder, Nick Swinmurn, had an idea to create an online shoe store, he didn't begin by making big development investments. Instead, he designed a simple experiment to test the main idea: is there sufficient demand for a superior online shopping experience for shoes? He asked local shoe stores if he could take pictures of their inventory and post them online. In exchange, he promised to come back and buy the shoes at full price if his customers ordered them. By doing so, he not only tested the concept, but he learned from every interaction with customers on the sales cycle. The experiment taught him what was really important to his market, what was unimportant, and where and how to invest his resources.

Michael Bloomberg founded Bloomberg, LLP on this concept of rapid development of the minimally viable product (*Bloomberg by Bloomberg*). His team set an astoundingly aggressive development cycle for their first Bloomberg terminal for their first customer, Merrill Lynch. On the appointed day, they carried their machine across Manhattan by taxi for the demo, still debugging the software along the way. It was not perfect, but they learned a tremendous amount by sharing it with the customer much earlier in the design stage when development was more flexible. The company still pursues the strategy of getting early adopter feedback when the product is just 80% completed.

The Obama campaign employed rapid cycles of Continuous Improvement in the 2012 election. The traditional campaign approach involves testing messages with focus groups, followed by poll-testing to see which categories of voters responded well to different messages. Mitch Stewart, of the Obama campaign, comments on the traditional approach of making significant resource investments based on the opinions of a couple hundred people, "Isn't that nuts? And people have been doing it for decades!" In 2012, the Obama campaign conducted a series of rapid experiments to empirically test communication effectiveness, randomly assigning voters to receive varied sequences of direct mail and using survey calls to isolate the attributes of people' whose opinions changed. They gathered and learned from the data to improve the effectiveness of their communication.

Design Experiments

Ries gives an example of how the start-up online tutoring firm Grockit was faced with the management decision of investing in the infrastructure to allow "lazy registration" — that is enable potential customers to begin working with the online experience directly before registering. Lazy registration is considered best practice because it presents no barrier between the user's first interest in the product or service and the user's opportunity to experience the benefits before investing effort. As an experiment, Grockit conducted a split-test — giving one randomly identified group (i.e., a 'cohort'), the option of lazy registration and requiring another group of visitors to register immediately. They then monitored the behaviors of the two cohorts' rates of follow-through. The test revealed no difference in customer behavior between those who had the lazy registration option and those who did not. The expenditure of resources to develop that feature would have been a waste.

Agile development, with its rapid prototyping and constant and early interaction with all stakeholders, can yield rapid cycles of learning and Continuous Improvement. The start-up team at IMVU improved their product on $5 a day using cohort analysis. They bought $5 a day worth of data about customer clicks from Google, with the assumption that customers clicking today are independent of those who clicked yesterday. If the improvements they built yesterday are real, they should produce the desired behavior in the new set of visitors today. Cohort analysis, measuring responses from a random group, indicated to the team which changes were successful and which were not.

Reduce Setup Costs

In order to conduct 'small batch learning' we have to reduce setup costs. Our internal systems are usually optimized around large batch execution. For example, when launching a marketing campaign, an organization will have an internal debate about what marketing message would be most effective. Based on opinions of management and focus groups, they decide and order a large quantity of the necessary material from suppliers who are also optimized around large batch sizes. To conduct rapid frequent experiments and maximize learning, an organization

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must adjust their supply chain to be able to acquire materials in the small batch sizes they require in order to experiment, learn, and adapt.

No Data; No Learning

It is really that simple: no data; no learning. All good experiments must have careful measurements — whether it is how much faster we can process a loan application if we eliminate the paper, how much faster we can set up a line if we put in another jig, or how much space we can free up if we redesign the flow.

Identify the questions, design the experiments, and analyze the data: all in small batch sizes and rapid cycles. Dr. Deming says Plan-Do-Study-Act. Eric Ries uses different words to apply the same concept to innovation:

BUILD — MEASURE — LEARN
[repeat]