

Hypothesis-Driven Experimentation

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Introduction

Experimenting with hypotheses is something we learned in school early on. In chemistry class, for example, we conducted experiments to learn about scientific phenomena and these helped us make sense of more general correlations. Then we refined or adjusted the experimental setup to test the boundaries of the phenomenon. Now, why is it important for both established companies and start-ups to experiment with hypotheses? Companies today act in a world where uncertainty about their environment is growing and customer expectations are rising and diversifying. This means companies need to pivot more and develop new knowledge as they bring new products to market at speed. It has become critical for companies to fail fast, learn fast and improve fast in order to keep waste to the minimum as they develop and launch new products.

The core idea of hypothesis-driven experimentation is to systematically and iteratively reduce uncertainty about the relevant customer problems and the most effective solutions to these problems. This is achieved through constant iteration between abstract assumptions, which are then translated into concrete hypotheses. These hypotheses are tested through experimentation with prototypes that allow customer and stakeholder feedback to be collected.

The goal of this technical note is to explain the role of experimentation and constant learning in the development and management of products and services in the digital age. Each step is explained thoroughly, from gathering assumptions, translating them into hypotheses, testing them with various quantitative methods and finally synthesizing what has been learned. Moreover, principles are introduced for putting hypothesis-driven experimentation into practice.

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Last edited: 2/14/19



Background: Customer Development

Through qualitative customer research (see the technical note “Qualitative Customer Research”)¹, you have already observed and listened to your potential customers in order to build empathy and understand their circumstances. These insights into and lessons learned about your target group and its needs provide the foundation for the ideation of your potential offering. When ideas for product offerings have been developed, the process of customer development begins.

Steve Blank’s framework “customer development”² is a guide for entrepreneurs to create innovative offerings that are iteratively validated with the market. Its ultimate goal is a product-market fit. The framework consists of four sequential steps. The first phase is called “customer discovery” and focuses on developing hypotheses about the potential offering and the corresponding business model and on testing them. There are different types of hypotheses, targeted at different aspects of developing an offering.

Here are examples of hypothesis types and potential questions:

- Customer-segment hypotheses: Does the customer segment exist?
- Need hypotheses: Does the job to be done exist for our potential customers?
- Offering hypotheses: Are we making interactions accessible to customers?
- Value-capture hypotheses: Will potential customers be willing to pay for our offering?
- Technological-feasibility hypotheses: Does our choice of technology and form factor support our customer experience?

Blank’s core assumption is that any product or service idea can be translated into hypotheses and should be tested with a series of experiments with customers, partners and stakeholders. The emphasis is on the fact that founders or decision makers themselves need to “get out of the building” to lead the tests and potentially pivot the idea or the prototype on the spot. After all, they are the ones who need to make decisions based on the measured outcomes. The test results allow them to synthesize lessons about the phenomenon they are trying to understand and pivot without much investment.

The subsequent phases of customer development are customer validation, customer creation, and company building, where the focus is on the scalability of the business, the pricing model, and developing a large customer base. These phases are important for building a successful business from your initial hypotheses but they are not the focus of this technical note.

Build, Measure, Learn

The underlying concept of Steve Blank’s customer-discovery model had a great impact on the development of the lean start-up concept of Eric Ries. The lean start-up model is a theory and mindset that guides the founding of a successful start-up and offering.³ The foundational ideas are to reduce uncertainty and increase confidence about the success of a future offering. To

¹ Claudia Röthke and Robert Wayne Gregory, “Qualitative Customer Research”, SIN-56-E, IESE, January 18, 2019.

² “Why the Lean Start-Up Changes Everything” S. Blank, Harvard Business Review, May 2013: Reprint R1305C

³ Eric Ries, *The Lean Startup: How Today’s Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses* (New York: Crown Business, 2011).

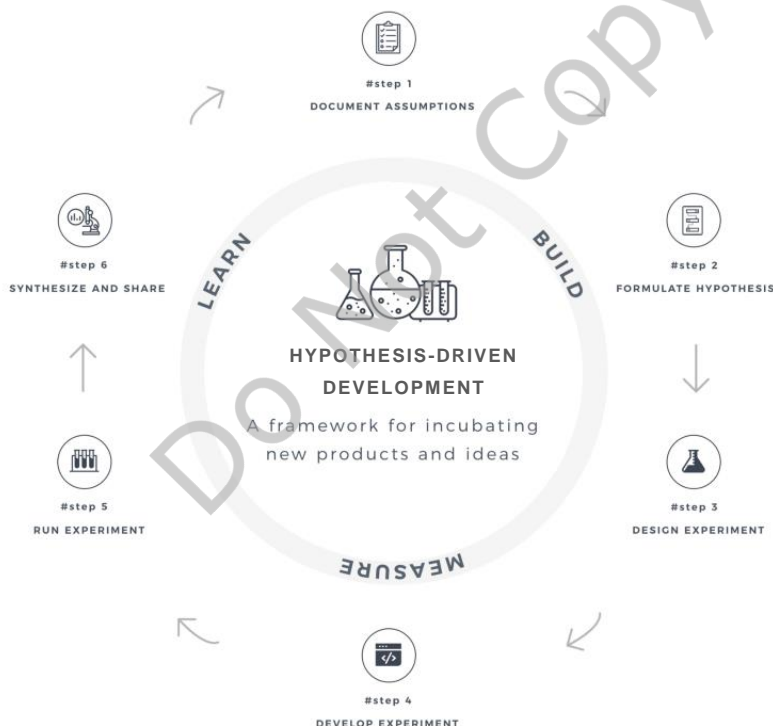


achieve this, the lean start-up approach promotes short product-development lifecycles and the constant integration of customer feedback. This is achieved by following an iterative process of the phases “build,” “measure” and “learn.”

Before the build phase, assumptions are derived from observations of and lessons from previous data collection. These assumptions are reformulated as hypotheses that can be validated or falsified. In the build phase, the hypotheses are transformed into tangible prototypes or product artifacts. The measure phase is the experimentation phase in which the physical artifacts are tested among members of the group the hypothesis is targeting. The learn phase is the step in which the qualitative and quantitative data gathered in the experiments are analyzed and synthesized with prior knowledge. The results of the learn phase provide the foundation for developing new assumptions and hypotheses.

As the “build, measure, learn” cycle is an iterative process, it is used throughout the development of an offering, with the goal of constantly learning and improving. According to the lean start-up approach, the ultimate goal of hypothesis-driven experimentation is to improve the success rate of new and improved offerings through pivoting or persevering. **Figure 1** visualizes each step in the process and can be put into practice by utilizing Mark Butt’s “Experiment Planning Framework” template.⁴

Figure 1
Hypothesis-Driven Development



Source: Mark Butt, “Setting Up an Experiment Framework & Hypothesis Driven Development Programme,” Medium, March 29, 2017, https://medium.com/@made_by_mark/setting-up-an-experiment-framework-hypothesis-driven-development-programme-fa58b3986c05.

⁴ Mark Butt, “Experiment Planning Framework,” Made by Mark, <http://madebymark.co/experiment-planning-worksheet.pdf>.