Enterprise Architects Combine Design Thinking, Lean Startup and Agile to Drive Digital Innovation

Published: 4 February 2016

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Business model and technology innovations are relentless. Every organization must learn and experiment to develop products, services and new ways of working. A combination of iterative, experimental methodologies is needed to support digital innovation efforts.

Key Findings

- Innovations in business models and technologies appear almost daily. There are many, tried and tested business models or best practices to guide organizations to mediocre results. Only innovative enterprises will gain competitive advantage by learning and experimenting to find what works for it and its customers.
- Iterative, experimental approaches to innovation are needed to guide an organization. While there are many approaches — design thinking, with its focus on the customer; lean startup as an innovation engine; and agile to develop technology elements work well in combination.
- EA has evolved to support organizations' digital innovation efforts, and vanguard EA plays a role in guiding and supporting digital innovation.

Recommendations

- Start small and grow. Because digital innovation is often new to most organizations, find an area where you can try a new approach with a supportive business partner. Create a cross-functional team and innovate. Expand the approach over time as you gain experience.
- Innovate your approach to innovation. The approaches described in this research are very flexible, so you will need to experiment with them and find out what works for your organization. Over time, you can give your innovation more structure for support.
- Use the EA team to support the innovation process. It can own the innovation process itself, and help guide team members. Team members can provide the bridge into the wider organization, its systems and processes to scale an innovation.

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Introduction

Innovation doesn't just happen, it's the result of combining good people with an innovation process, being focused and willing to learn, and having a culture that supports experimentation. Innovation is about experimentation — shaping a hypothesis, testing it quickly, learning and trying again. Most startups and innovative ideas don't start out with a detailed business plan. They begin with an idea. An iterative, experimental approach is needed to test that idea and to shape it into something

customers will value. To do that, organizations and their enterprise architects must combine design thinking, lean startup and agile.

Business managers are looking for a more responsive approach in which "time to value" — when customers actually benefit and can use the innovation — is measured in weeks, not months. To respond to this challenge, IT organizations are adopting a "bimodal" approach to digital innovation (see "How to Achieve Enterprise Agility With a Bimodal Capability"). A bimodal capability is the marriage of two distinct, but coherent, approaches to creating and delivering business innovation (see Table 1).

Table 1. Digital Innovation Requires an Iterative, Experimental Approach

Tenet	From a Mode 1 Approach	To a Digital Mode 2 Approach
Strategy	▪ Walled garden value chain ▪ Quality and function ▪ Full data ownership	▪ Rapid testing of market opportunities ▪ Experience and engagement ▪ Ecosystem participation
Processes	▪ Procedural governance ▪ Cautious, methodical, linear ▪ Full control of product development	▪ Experimentation ▪ Disruptive innovation, nonlinear ▪ Collaboration across partner ecosystems
People	▪ Separation of roles by function ▪ Focus on process ▪ Risk-averse	▪ Community-like collaboration ▪ Focus on outcomes ▪ Failure is an opportunity to learn
Technology	▪ Focus core systems and stability ▪ Vendor-driven architectures ▪ Vertically integrated solutions	▪ Focus on services, data, analytics and content ▪ Solution-driven programmability ▪ Platform-based, reusable components

Source: Gartner (February 2016)

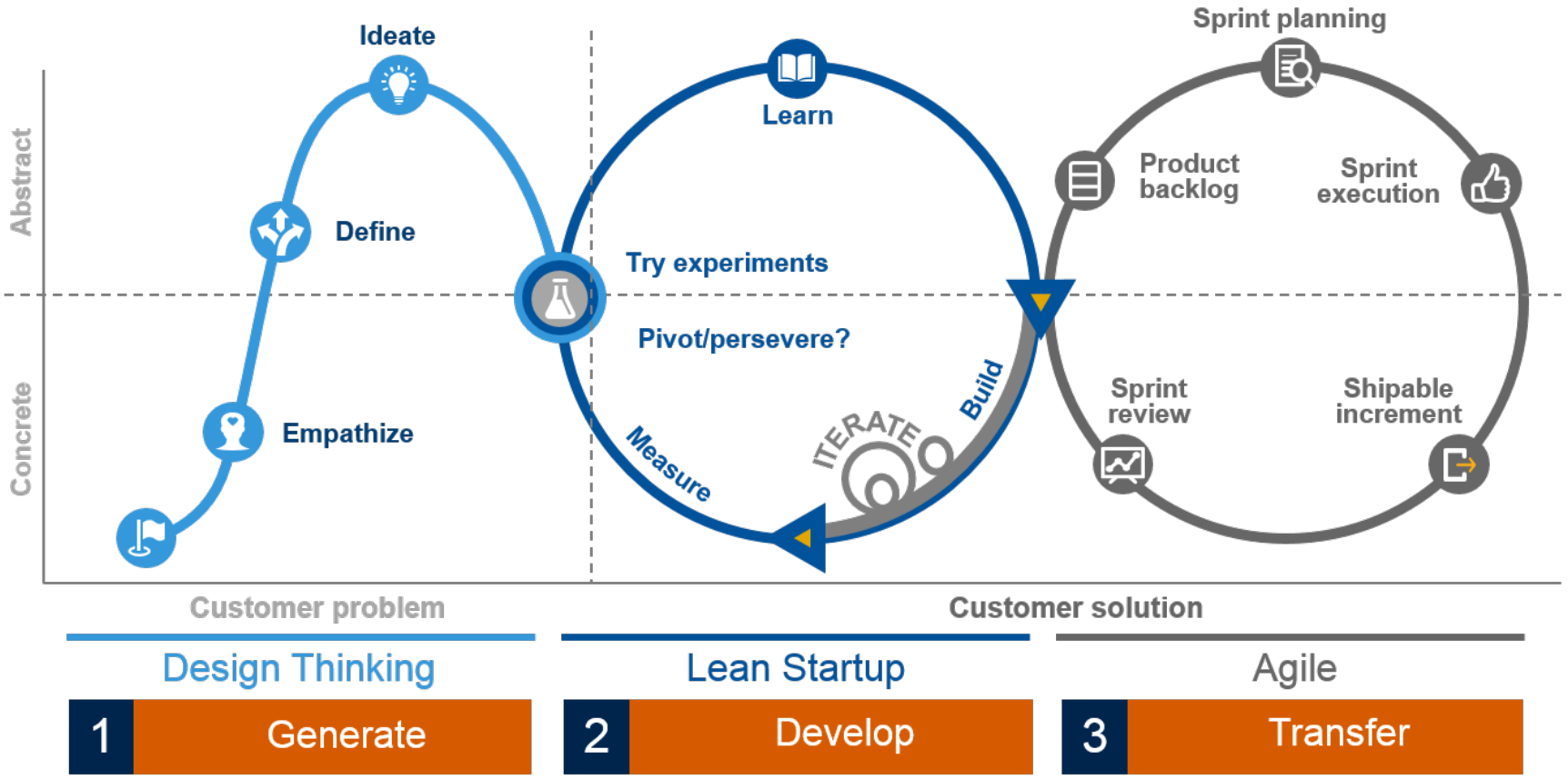
Enterprise architects play an important part in delivering bimodal IT (see "The CIO's New Digital Business Advisor: A Resurgent EA Team"). Leading enterprise architecture (EA) teams are incorporating these experimental, iterative approaches into their Vanguard EA practice to support their organizations' bimodal efforts (see "Vanguard Enterprise Architects Will Lead Bimodal Mode 2 Innovations"). By understanding these approaches, and being able to apply them to innovation efforts, enterprise architects can add significant value to their organizations.

Innovation Demands a Combination of Iterative, Experimental Approaches

Innovation often begins with an insight, and idea, for a new product or service. In most cases, there will be no tried-and-tested examples to review or validate, and no existing customer base. The challenge will be to test the idea — to see if it truly makes sense and has promise, and to do that quickly and cheaply. Clearly, traditional waterfall approaches don't work in this situation. Something different is needed — an iterative, experimental approach.

While there are many such approaches, our experience has shown that enterprise architects can draw on those in Figure 1.

Figure 1. Use a Combination of Iterative, Experimental Approaches



Source: Gartner (February 2016)

The three approaches are:

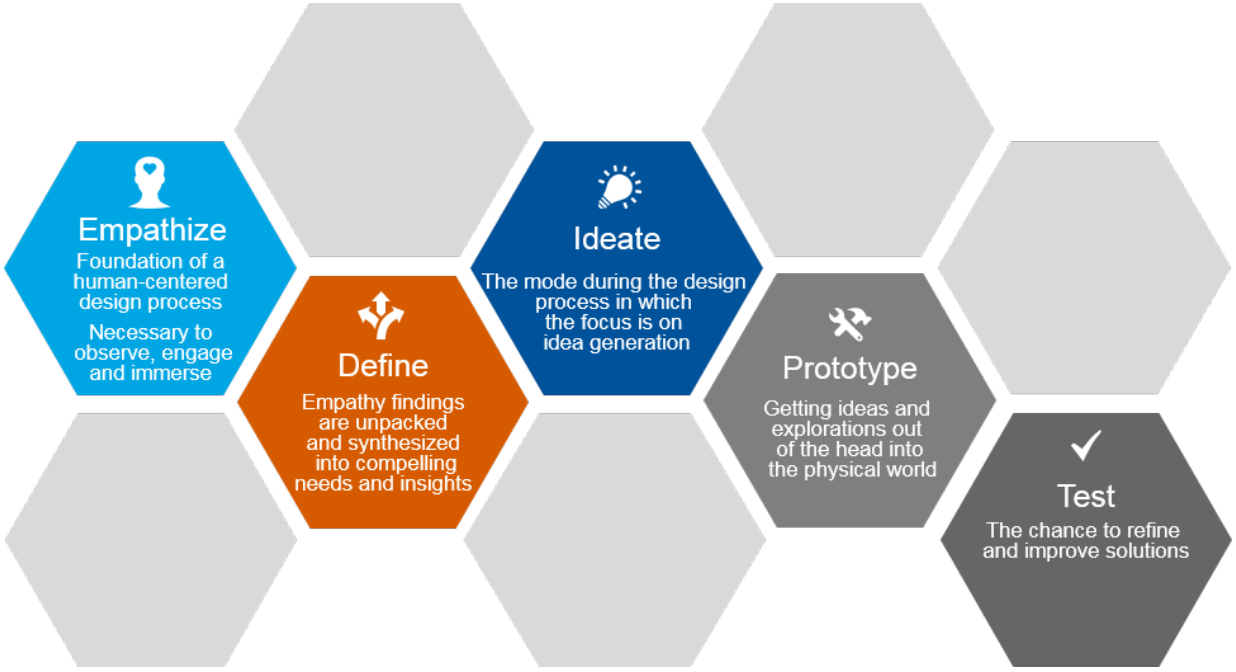
- **Design Thinking —** This brings ideas and tools from the world of architecture and product design with a strong focus on human-centered design. It brings the customer perspective into the heart of the innovation process.
- **Lean Startup —** This provides the iteration engine, building out a hypothesis for an innovation through multiple cycles.
- **Agile —** This keys into the Lean Startup cycle and builds out the supporting technology solution. In later cycles, and as an innovation scales, it works with other approaches, such as DevOps, to take the solution into core systems.

While design thinking and lean startup can be applied alone, in Gartner's experience, design thinking brings a very strong customer-centered focus to the innovation process while lean startup is an excellent way to build out an insight, or hypothesis, once it has been developed.

Use Design Thinking to Understand the Customer and Discover the Real Need

Innovation begins with customers, whether they're internal or external. Design thinking[1] emerged from the world of design with a focus on people and their behavior. It has five major phases (see Figure 2). Its strength comes from the human-centric design of the first three phases, and, in our model, the last two phases are taken up by lean startup.

Figure 2. Design Thinking Phases



Source: Gartner (February 2016)

The **empathize** phase is the foundation of human-centered design. It focuses on understanding people, the way they do things and why. It takes an ethnographic approach,[2] closely observing people to gain clues to how they think and feel, and why they behave in certain ways. Because people often don't know these things explicitly, understanding emerges through observation, conversation to reveal their stories and values, and their view of the world. This phase has three principles:

- **Observe —** Viewing people and their behaviors in context. Watching what people actually do. Recognizing patterns of behavior, and what they mean, which are often different things.
- **Engage —** Often referred to as interviewing, but in an open, unstructured way. Looking for how people understand and explain what they do, and the stories they tell.
- **Watch and Listen —** Ask someone to go through their tasks, watch what they do, and ask them for explanations. Ask about the task, its context and how they understand it.

The **define** phase aims to bring clarity to the design process. It brings together an understanding of the organization and its goals, the business capability being developed, and the perspective of the potential customer. The aim is to create an actionable problem statement, or point of view, to define the right challenge to address. The problem statement also brings together the set of needs that are important to fulfill, and provides a focus for the team working on the design.

Many companies combine the empathize stage of design thinking with insights from data analysis in the problem area. For example, Airbnb combined data from surveys with insights from one-to-one interviews to get a better understanding of how lodging hosts decided to accept or reject a guest.[3] This combination can lead to insights that may not have been available using one of these approaches alone. Naturally, this is often an iterative process, with insights from each side being observed and validated with the other to reach a consensus.

The **ideate** phase focuses on developing ideas, aiming to "go wide" looking for wider, more-innovative solutions. This is a highly creative, iterative process playing off the ideas and insights of others. Techniques such as brainstorming, mind mapping, sketching, even creating mock ups from basic materials, are all useful, even Lego bricks[4] — anything that encourages, and forces, team members to go wide and come up with a richer, wider range of solutions.

From this process we now have developed the innovation to a point where we can decide if it has enough merit to feed it into the Lean Startup process.

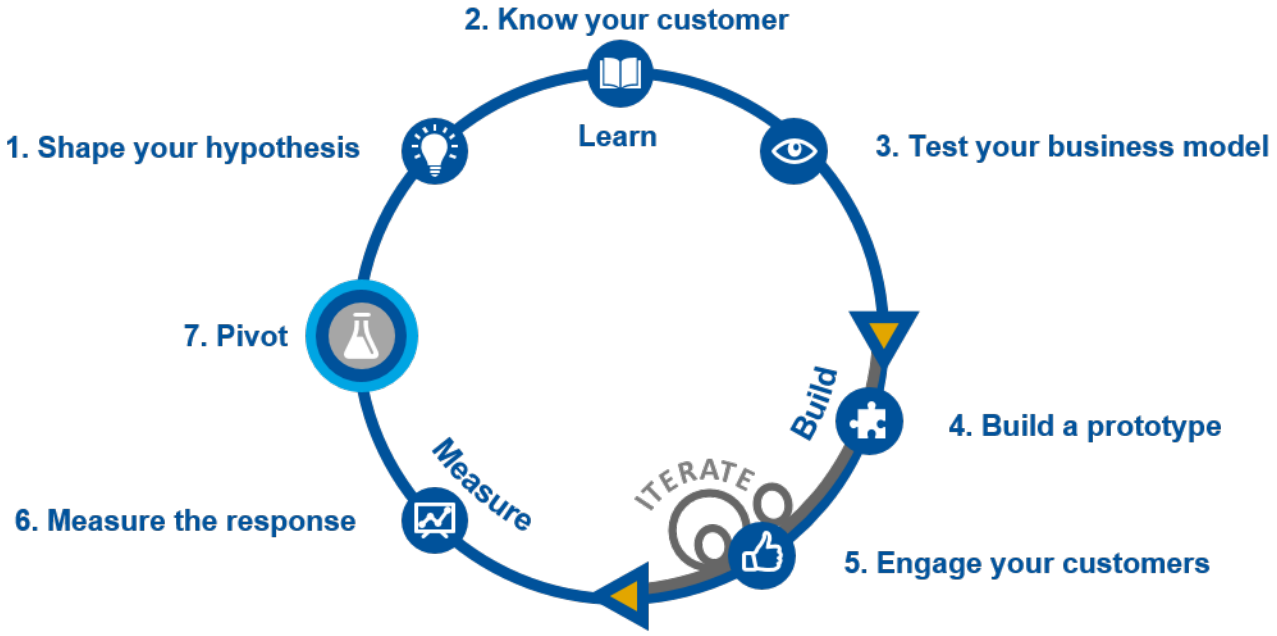
Evolve the Innovation Using Lean Startup

Lean Startup was developed by Eric Ries,[5] based on his experience as an entrepreneur with several startups. The process aims to quickly and iteratively build an innovation to become a "minimum viable product (MVP)" that can be released to e customers. Then, through feedback, continue to evolve. Lean Startup (see Figure 3) has three key phases:

- **Learn,** where we build an understanding of the customer and the potential business model

- **Build,** where we build out a prototype through successive iterations
- **Measure,** where we assess the results

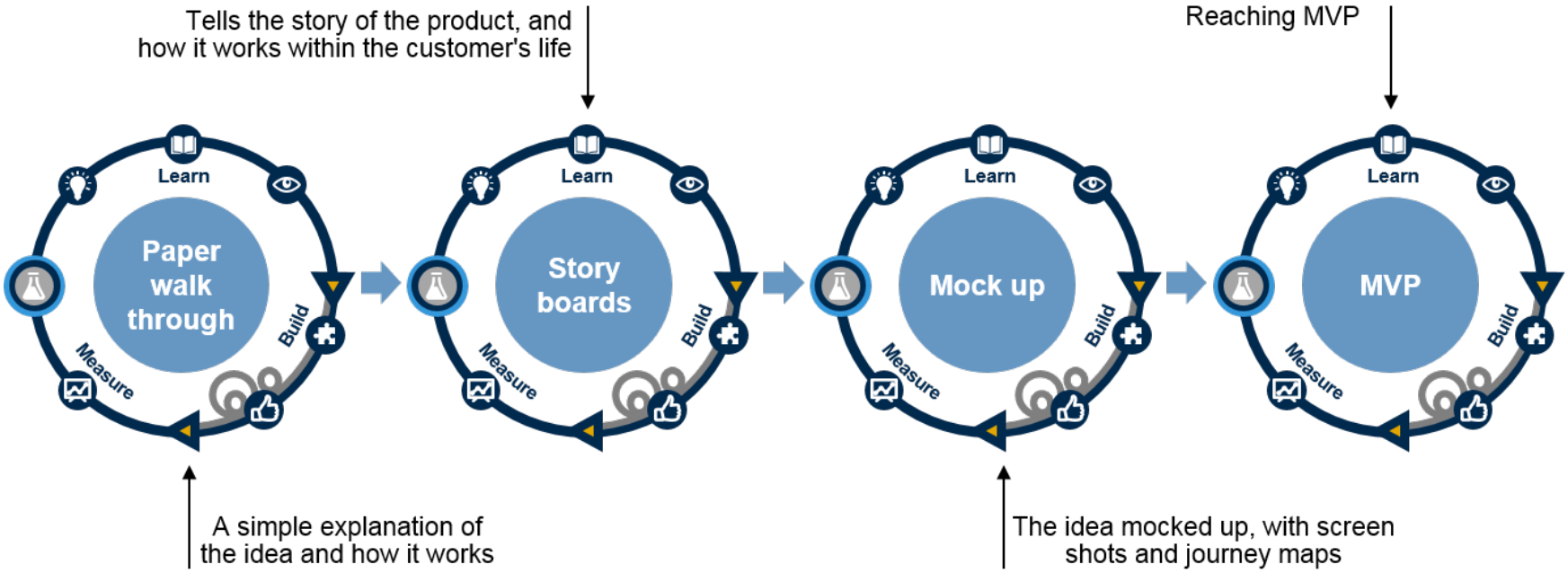
Figure 3. The Steps Leading to Lean Startup



Source: Gartner (February 2016)

Lean startup is the engine of innovation, with each cycle building on the preceding one (for a more detailed discussion see "An Enterprise Architect's Guide to Using Lean Startup to Design Innovative New Offerings"). The aim is to build the customer base and develop the innovation with each iterations. To do this quickly, early iterations are quite simple and designed to get quick feedback from a small group of customers (see Figure 4). The cycles continue until a "minimum viable product" is achieved. The process continues on from there.

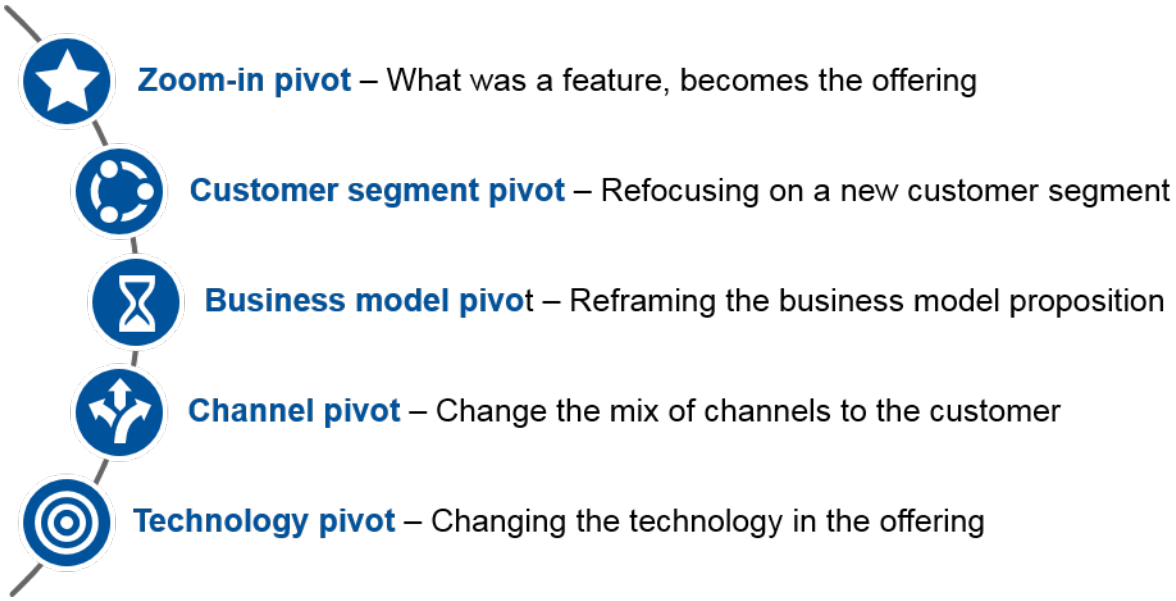
Figure 4. Gradually Evolve Toward a Minimum Viable Product



Source: Gartner (February 2016)

Lean startup introduced two new concepts — MVP and pivot — which have become mainstream. As each iteration unfolds, we are learning about our customers and what they need, and — based on that feedback — evolving the iteration and its features. At the end of each cycle there is an opportunity to pivot — changing the focus of the innovation. According to Reis, there are 10 different types of pivot. The key pivot types are shown in Figure 5. The MVP is the minimum amount of functionality customers will find useful — so the product can be released to the market, grow the customer base and get all-important feedback to drive further iterations.

Figure 5. Master the Pivot



Source: Gartner (February 2016)

The lean startup approach aims to evolve not only the innovation itself, but the underpinning business model as well. The innovation can be a wonderful thing; however, if there's no way to make money off it, then it's probably best not pursued. The "business model canvass"[6] is a simple format for defining the business model and testing it along with the innovation itself.

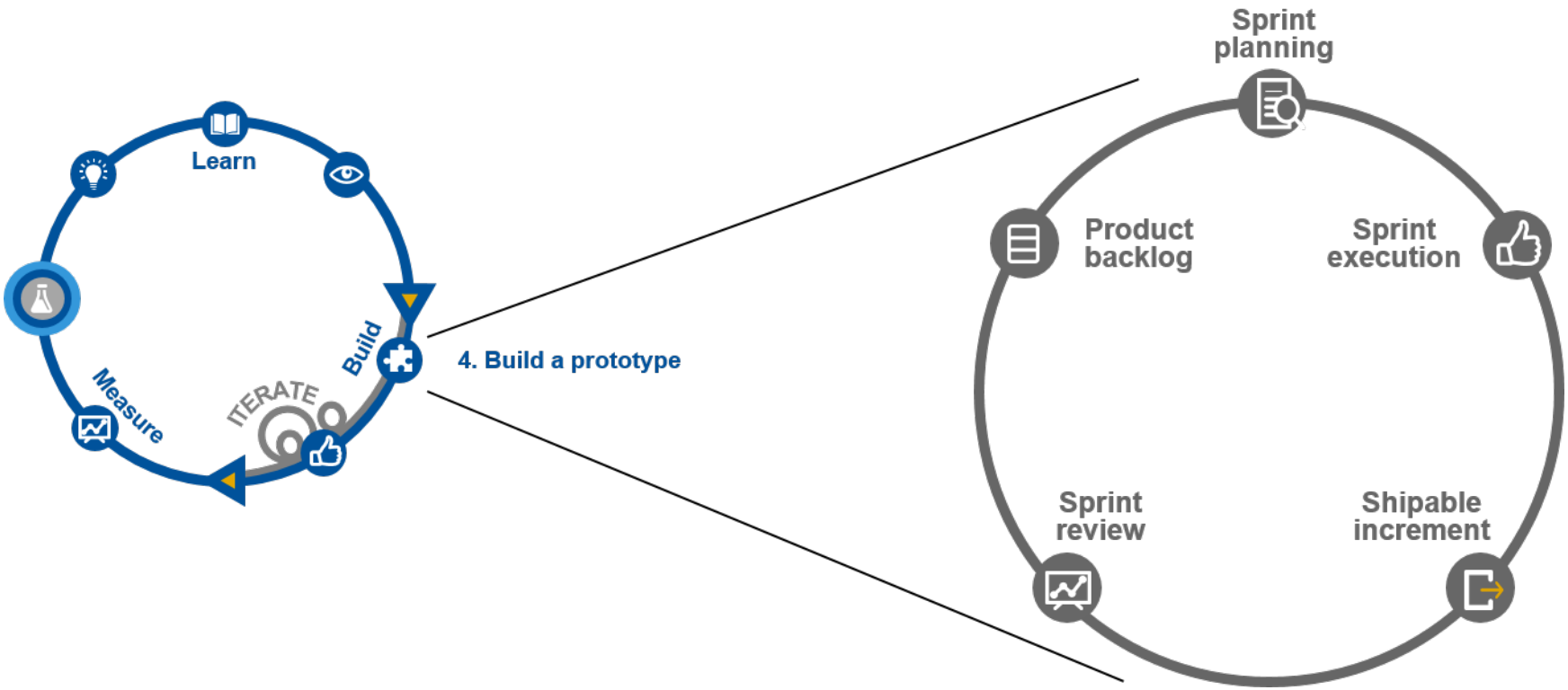
Many organizations have used lean startup as a successful approach to drive innovation. Dropbox[7] began as a traditional technology startup, and uses design thinking as its innovation engine. The founders began with a hypothesis for inexpensive, ubiquitous storage that would "just work." They created a 90-second video explaining the idea and how much users would pay. More than 5,000 people used it. This demonstrated the idea had merit, and a pool of initial customers to try it out and provide feedback. A second video, along with referrals from the initial pool, brought users to more than 75,000, and provided a flood of feedback. This led to multiple pivots — simplifying the interface, dropping functionality, and focusing and expanding it in other areas. With a solid product, DropBox now offered free storage to new users and existing users who made a referral, taking its customer base to greater than 4 million.

It's not only startups that have successfully leveraged lean startup. Nordstrom Innovation Lab[8] combines design thinking and lean startup to innovate, and keep ahead of the smaller, more nimble competition. Coca-Cola[9] has embraced lean startup and open innovation. It works with outside entrepreneurs, and encourages its managers to become innovators. The company hosts idea parties to create an environment of innovation, with the most promising ideas evolving using lean startup.

Use Agile to Build Out and Evolve the Technology Elements of the Innovation

Many innovations have a technology component that will need to be built out using an agile approach. Agile is an umbrella term to a set of iterative methodologies such as Scrum, Kanban and Extreme Programming. (In Gartner's 2016 CIO Survey, 76% of respondents reported that they are adopting agile methodologies[10]). This research focuses on Scrum, but other agile methodologies can be used. Scrum's roots go back to product development.[11] It is a customer-focused, iterative and highly collaborative development approach that complements lean startup (see Figure 6).

Figure 6. Use Agile to Build Technology Components for Each Iteration



Source: Gartner (February 2016)

Scrum has a set of clearly defined roles that overlap with the lean startup team:

- **Product Owner —** Provides leadership for the product (innovation), and decides which features and functionality to build, and in what order. This will usually be a business person on the innovation team (it's worth noting that innovation teams tend to be nonhierarchical, cross-functional, self-organizing and highly collaborative, so team members will select who will represent them).
- **Scrum Master —** Helps everyone understand the Scrum process, and embrace its values. The Scrum master acts as a coach and process expert.
- **Development Team —** The individual developers working on the components of the design, such as UI, database, etc. Senior members of the development team are also part of the lean startup team, and, ideally, have been there since the beginning.

One of the hallmarks of the lean startup and agile processes is a highly collaborative culture. Scrum, in particular, calls for regular meetings and discussions as part of its process. This collaborative culture and team spirit are two of the key ingredients of successful innovation. Ideally, the two teams should be encouraged to be physically colocated, or at least meet as often as possible formally and informally through the various stages.

The Scrum process begins with the **product backlog**. The product owner, working with the innovation and developer teams, will decide the most valuable work to be done, and the sequence of this work. Early on, the product backlog will contain the features needed to meet that cycle's MVP. As the cycles evolve, it will contain new features, changes to existing features, fixes, etc. The prioritization is driven by what has been learned in the previous lean startup cycle and input from both teams.

Work is done in short iterations or **sprints**. The work completed in each sprint should be of tangible value to the customer and tightly time-boxed. As the innovation grows, the number of sprints needed will often increase, so these will need to be planned to balance delivery with workload. The sprints conclude with the delivery of the shippable increment, which becomes part of the innovation.

The last step — the **sprint review** — overlaps with the **measure the response** step in lean startup. There is now feedback from customers, and the results of the metrics and measures the development team has set. The aim now is to critically assess the innovation and see if a pivot is needed, and what should be the focus of the next lean startup iteration. The combined teams can also look at the work completed by the development team and provide feedback for the next round.

From here, the next cycle of lean startup begins again, often for the whole life of the innovation.

Putting It All Together

Design thinking, lean startup and agile are powerful approaches, with considerable flexibility. While there's a lot of great research in each area (see the Recommended Reading section) they must be

tailored to suit the needs of the organization. So, in a sense, each organization has to iteratively learn about the most suitable innovation approach. Four principles will help guide those efforts:

1. Just Do Something

For most organizations the best approach to innovation is to find a suitable area, find a supportive business partner, create a cross-functional team and get going. Try these different approaches, find what works, evolve an iteration approach and move on. As one CIO put it, "You don't run a marathon on day one, rather you start with some small runs, over time build up to a half-marathon, and when you're ready, run a full marathon. It's all about practice and persistence." This is particularly true if this is an entirely new way of working for the organization. Over time, the approach can be more formalized and expanded once experience has been gained.

2. Don't Get Hung Up on the Methodologies

The methodologies are "thinking tools" to guide the team's efforts, but there's no right way of doing it. Case studies show that every organization that uses them must learn about them through trial and error. Get the team together early on and discuss the methodologies and how it's going to apply them. Take time out to review them at the end of each cycle and refine. Over time, a combined methodology will develop that suits the organization. Enterprise architects can be the equivalent of the Scrum master for the whole combined process.

3. Give People the Freedom and Support to Innovate

Using these methodologies in combination requires cross-functional teams working in a highly collaborative way. A wide range of skills and perspectives is needed across the business as well as IT. The richer the better. The teams are nonhierarchical and self-directed, coming together around a vision, rather than a direction from management. Ideally, the team is colocated or comes together regularly to build the working relationships and interactions that are so fundamental to innovation. As leading innovators such as Apple, Netflix, Spotify and many others have shown, at the core of successful, continuous innovation is a culture that underpins, values and supports innovation.

4. Move to Service-Oriented Technical Architectures

Continuous innovation and delivery must be done in a way that minimizes the complexity and change management required. A modular, service-oriented architecture (SOA) is essential. It enables new services to be created and deployed quickly and easily, and then removed and replaced just as quickly and easily. (As an illustration, from six eight-studded Lego bricks — a standard, modular architecture — it's possible to create 915,103,765 unique combinations.[12]) Innovations such as microservices and containers are showing great promise and make continuous innovation a reality.

Gartner Recommended Reading

Some documents may not be available as part of your current Gartner subscription.

"How to Achieve Enterprise Agility With a Bimodal Capability"

"Take Digital to the Core — Harness Three Forces to Win in Digital Business"

"Follow the Leaders: Digital Business Is a Big Opportunity to Evolve Your EA Practice"

"Building the Digital Platform: The 2016 CIO Agenda"

"Innovation Insight for Microservices"

"Ten Things the CIO Needs to Know About Agile Development"

Evidence

[1] The Institute of Design at Stanford.

[2] Brown, Tim; "Change by Design, How Design Thinking Transforms Organizations and Inspires Innovation"; Harper Collins; New York, 2009.

[3] "Design Thinking: How Design Thinking Transformed Airbnb."

[4] Lego Serious Play methodology.

[5] Ries, Eric; "The Lean Startup"; Crown Business; New York, 2011.

[6] Strategyser, "The Business Model Canvass."

[7] The Lean Startup Case Studies.

[8] Nordstrom Technology People Lab.

[9] "From Startup to Scaleup: The Next Wave of Innovation."

[10] "Building the Digital Platform: The 2016 CIO Agenda."

[11] Harvard Business Review, "The New New Product Development Game," January 1986.

[12] You Tube, "A Lego Brickumentary Clip: Math," 28 July 2015.

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