

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

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Business model and technology innovations are relentless, as each organization must learn and experiment to develop products, services and new ways of working. EA and technology innovation leaders must use a combination of iterative, experimental methodologies to support digital innovation efforts.



## FOUNDATIONAL DOCUMENT

This research is reviewed periodically for accuracy. Last reviewed on **2 December 2020**.

## Key Findings

- Innovations in technologies appear almost daily. With many of these technologies, there are no tried and tested business models or “best practices.” Only an innovator will gain competitive advantage by learning and experimenting to find what works for it and its customers.
- Iterative and experimental approaches to innovation are needed to explore and evolve a potential innovation. There are many approaches, but design thinking with its focus on the customer, lean startup as an innovation “engine” and agile to develop technology elements work well in combination.
- Enterprise architecture has evolved to support organizations’ digital innovation efforts by incorporating new techniques such as design thinking and service design into the EA practice.

## Recommendations

Enterprise architecture (EA) and technology innovation leaders managing enterprise architecture:

- Start small and grow by finding a business area where you can try a new approach with a supportive business partner. Create a cross-functional team and innovate, expanding the approach over time as you gain experience.
- Transform your approach to innovation by using the flexible approaches described in this research. You will need to experiment with them and find out what works for your organization. Over time, you can give your innovation more structure to support it.
- Leverage the EA team to support the innovation process by allowing them to help drive the innovation process itself and guide team members. They can provide the bridge into the wider organization and its systems and processes to scale an innovation.

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## Analysis

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 techniques.

Business managers are looking for a more responsive approach where “time to value” — when customers actually benefit and can use the innovation — is measured in weeks not months. The ideal is to be able to continuously innovate and deliver. To respond to this challenge, many organizations are changing their approach, shifting from a “product” approach to a digital “product management” approach (see Table 1).

**Table 1. Digital Innovation Requires an Iterative, Experimental Approach**

Tenet	From a “Project” Approach	To a Digital “Product Management” Approach
<b>Strategy</b>	<ul style="list-style-type: none"> <li>■ Walled-garden value chain</li> <li>■ Quality and function</li> <li>■ Full data ownership</li> </ul>	<ul style="list-style-type: none"> <li>■ Rapid testing of market opportunities</li> <li>■ Experience and engagement</li> <li>■ Ecosystem participation</li> </ul>
<b>Processes</b>	<ul style="list-style-type: none"> <li>■ Procedural governance</li> <li>■ Cautious, methodical, linear</li> <li>■ Full control of product development</li> </ul>	<ul style="list-style-type: none"> <li>■ Experimentation</li> <li>■ Disruptive innovation, nonlinear</li> <li>■ Collaboration across partner ecosystems</li> </ul>
<b>People</b>	<ul style="list-style-type: none"> <li>■ Separation of roles by function</li> <li>■ Focus on process</li> <li>■ Risk-averse</li> </ul>	<ul style="list-style-type: none"> <li>■ Community-like collaboration</li> <li>■ Focus on outcomes</li> <li>■ Failure viewed as an opportunity to learn</li> </ul>
<b>Technology</b>	<ul style="list-style-type: none"> <li>■ Focus on core systems and stability</li> <li>■ Vendor-driven architectures</li> <li>■ Vertically integrated solutions</li> </ul>	<ul style="list-style-type: none"> <li>■ Focus on services, data, analytics and content</li> <li>■ Solution-driven programmability</li> <li>■ Platform-based, reusable components</li> </ul>

Source: Gartner (June 2019)

Enterprise architects play an important part in delivering innovation (see “Predicts 2019: Enterprise Architecture Evolves Into an Internal Management Consultancy”). Leading enterprise architecture teams are incorporating these experimental, iterative approaches into their EA practice to support their organizations’ innovation efforts. By understanding these approaches and being able to apply them to innovation efforts, enterprise architects can add significant value to their organizations.

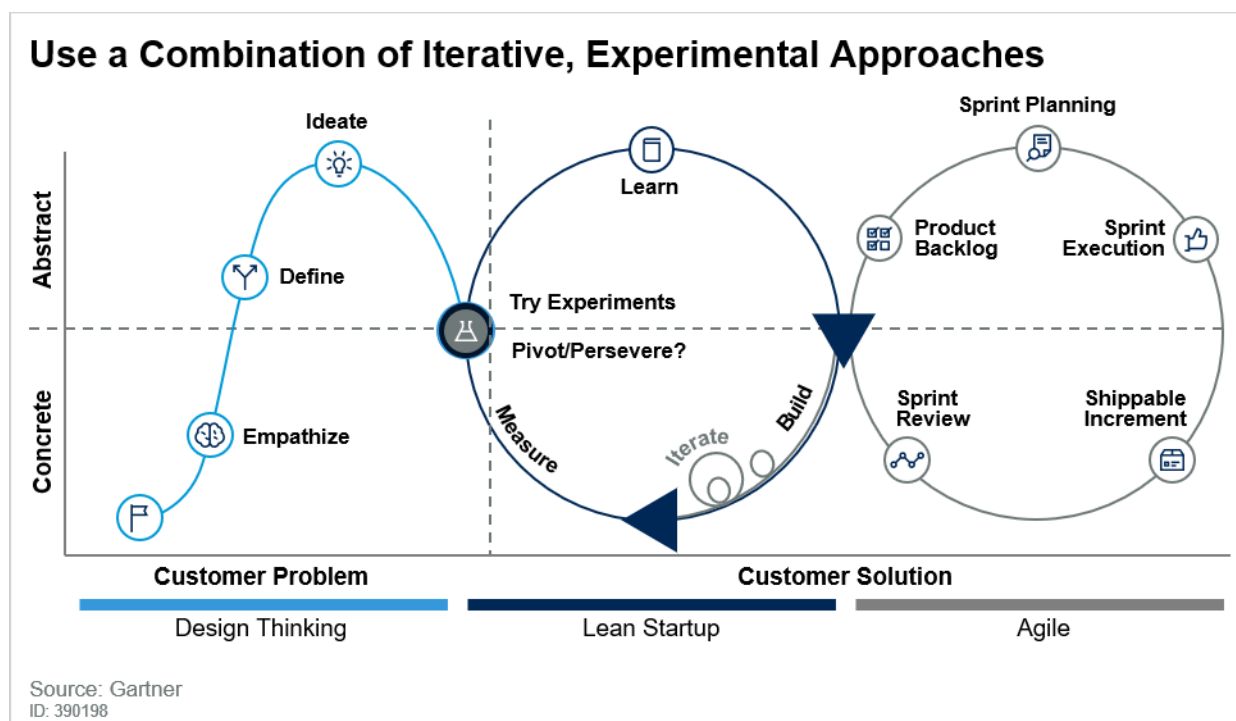
## Innovation Demands a Combination of Iterative, Experimental Approaches

Innovation often begins with an insight, an idea for a new product or service. In most cases, there will be no tried and tested example 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 inexpensively. Clearly, traditional waterfall approaches don't work in this situation. Something different is needed; we recommend an iterative, experimental approach.

There are many such approaches; however, our experience has shown that enterprise architects can draw on three approaches in particular (see Figure 1):

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

Figure 1. Use a Combination of Iterative, Experimental Approaches

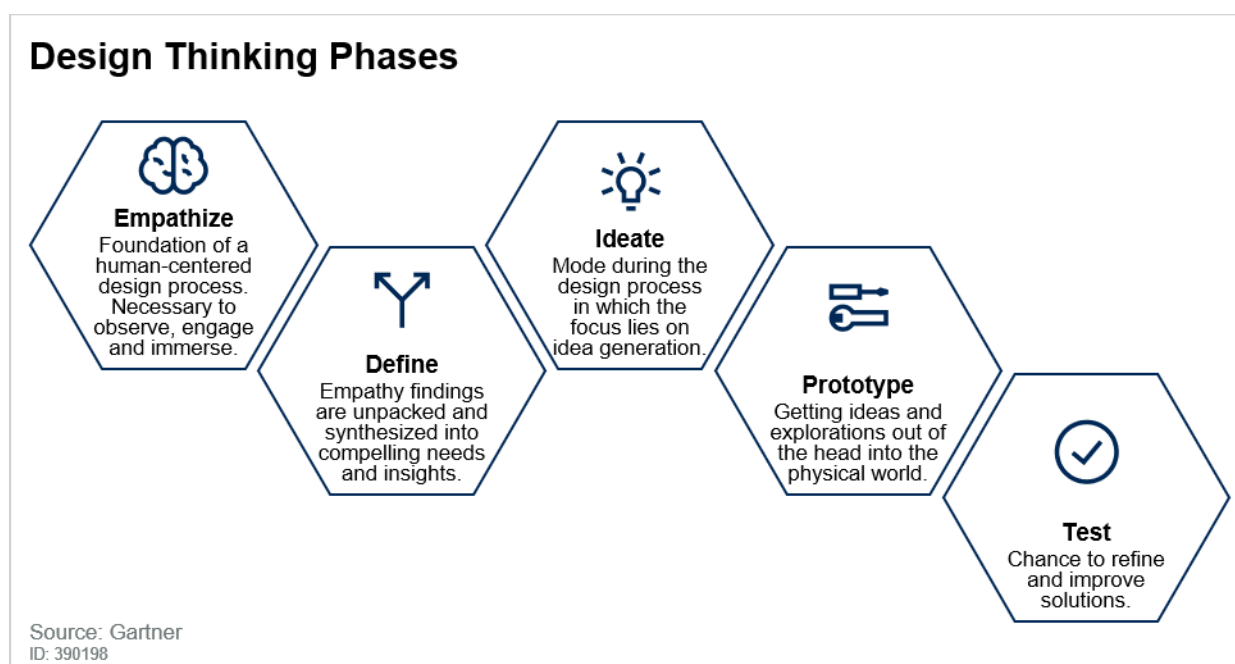


Both design thinking and lean startup can be applied alone. But, in Gartner's experience, design thinking brings a very strong customer-centered focus to the innovation process, while lean startup is an excellent way to build out an insight, or hypothesis, once it's been developed.

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

Innovation begins with the customer, whether they're internal or external. Design thinking<sup>1</sup> emerged from the world of design with a focus on people and their behavior, and it has five major phases (see Figure 2). Its strength comes from the human-centered 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



The **empathize** phase is the foundation of human-centered design, and it focuses on understanding people: the way they do things and why. It takes an ethnographic approach,<sup>2</sup> closely observing people to gain clues to how they think and feel, and why they behave in certain ways. As people often don't know these things explicitly, understanding emerges through observation and 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 people say, 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** — Asking someone to go through their task, watching what they do and asking them to explain it. Asking 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 you feel are important to fulfill and provides a focus for the team working on the design.

Many companies combine the “empathize” phase of design thinking with insights from data analysis in the problem area. For example, Airbnb combined data from surveys with insights from one-on-one interviews to get a better understanding of how hosts decided to accept or reject a guest.<sup>3</sup> 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 in the other to reach a consensus.

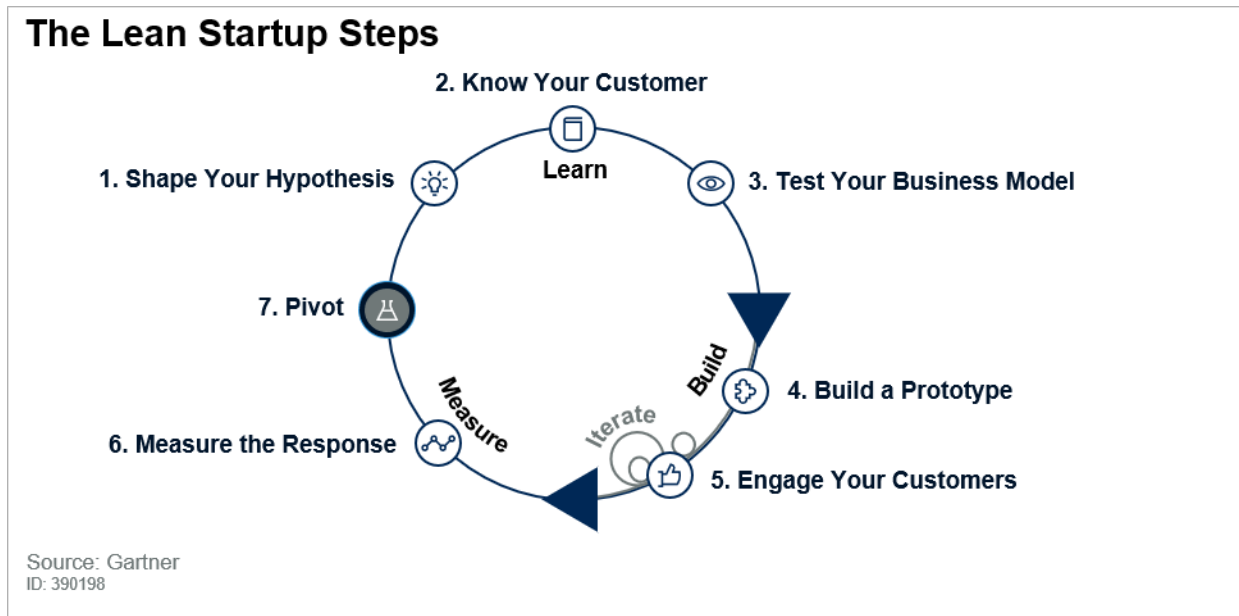
The **ideate** phase focuses on developing ideas, aiming to “go wide” looking for wider, more innovative solutions. This is a highly creative, iterative process playing off the ideas and insights of others. Techniques such as brainstorming, mind mapping, sketching and even creating mock-ups from basic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

From this process, we have now 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

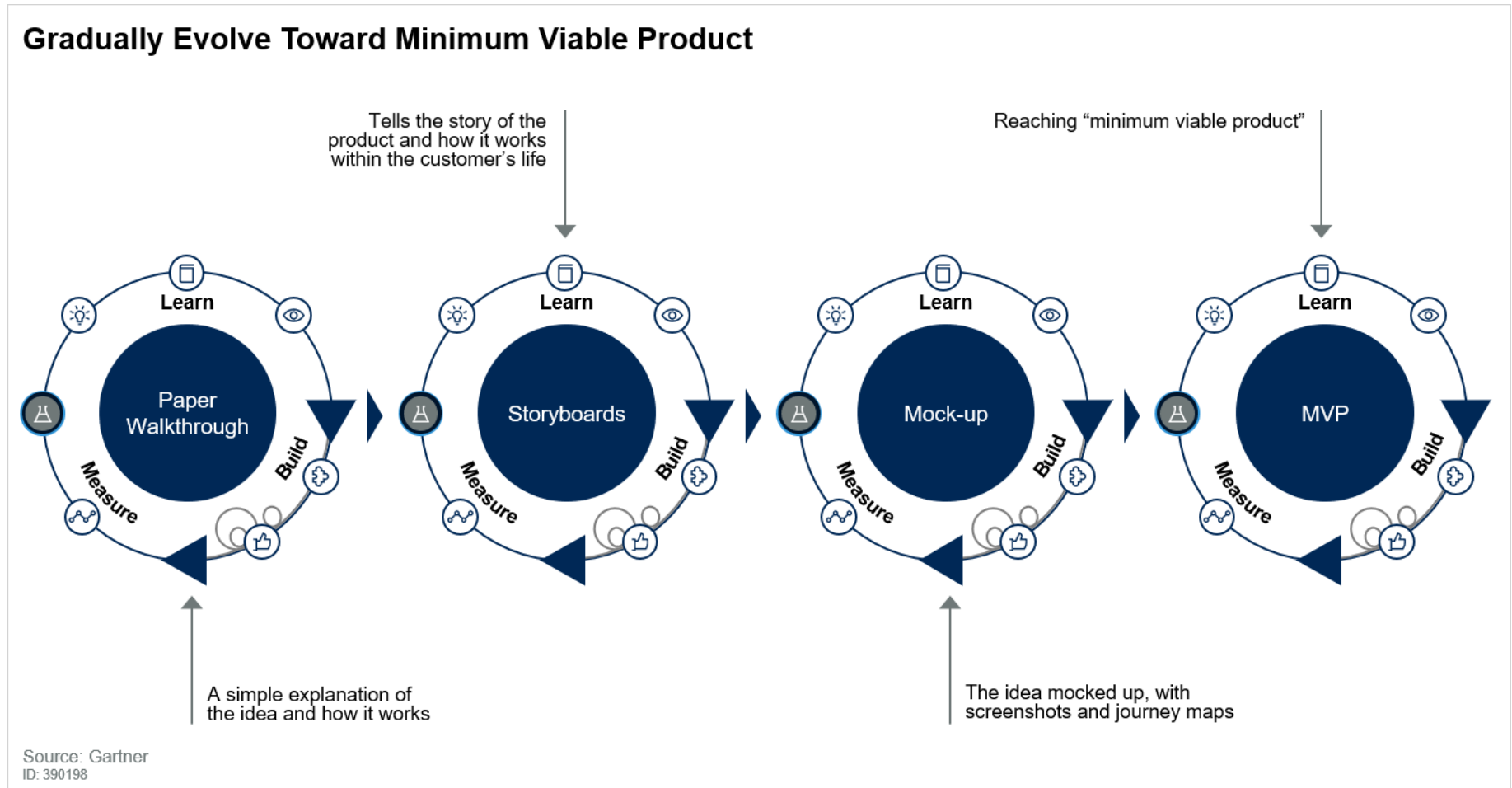
Lean startup was developed by Eric Ries<sup>5</sup> based on his experience as an entrepreneur with several startups. This process aims to quickly and iteratively build an innovation to become a “minimum viable product” that can be released to the customer, and then through feedback it continues to evolve the innovation. Lean startup 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; and **measure**, where we assess the results (see Figure 3).

Figure 3. The Lean Startup Steps



Lean startup is the “engine” of innovation, with each cycle building on the preceding one. (For a more detailed discussion, see “Embrace Bimodal Business Transformation by Adopting Lean Startup Techniques.”) The aim is to build the customer base and develop the innovation with each iteration. 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 we hit “minimum viable product” and continue on from there.

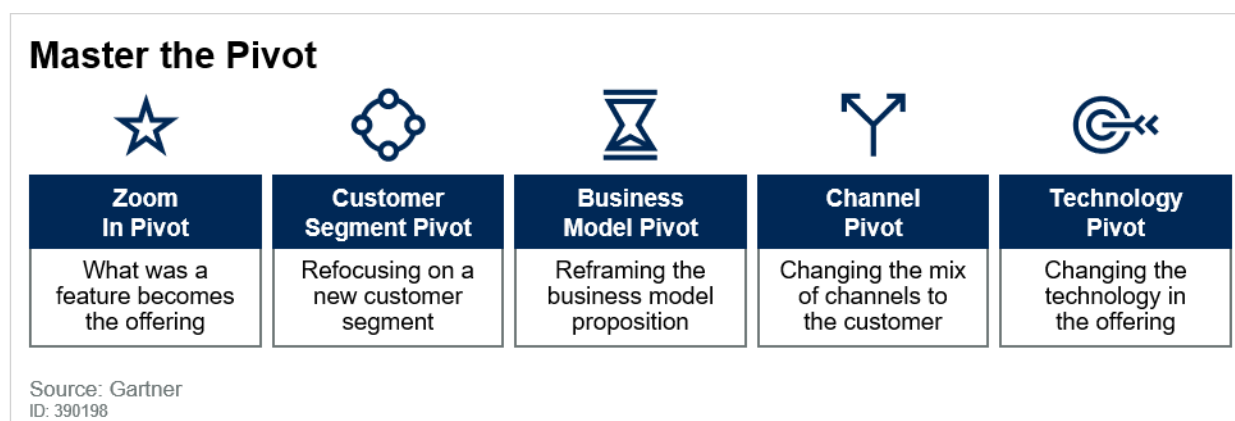
Figure 4. Gradually Evolve Toward Minimum Viable Product





Lean startup introduced two new concepts — “minimum viable product” (MVP) and “pivot” — that 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 Eric Reis, there are 10 different types of pivot; the key ones are shown in Figure 5. The “minimum viable product” is the minimum amount of functionality customers will find useful. The MVP allows us to release the product to the market, grow the customer base and get the all-important feedback needed to drive further iterations.

Figure 5. Master the Pivot



The lean startup approach aims to evolve not only the innovation itself but also the business model that underpins it. The innovation can be a wonderful thing, but if there's no way to make money off it, then it's probably best not pursued. The “business model canvas”<sup>6</sup> 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<sup>7</sup> 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, and this video generated over 5,000 users. This demonstrated there was merit to the idea, and it generated a pool of initial customers to try it and provide feedback. A second video, along with referrals from the initial pool, brought users to over 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 to existing users who made a referral, taking its customer base to over 4 million.

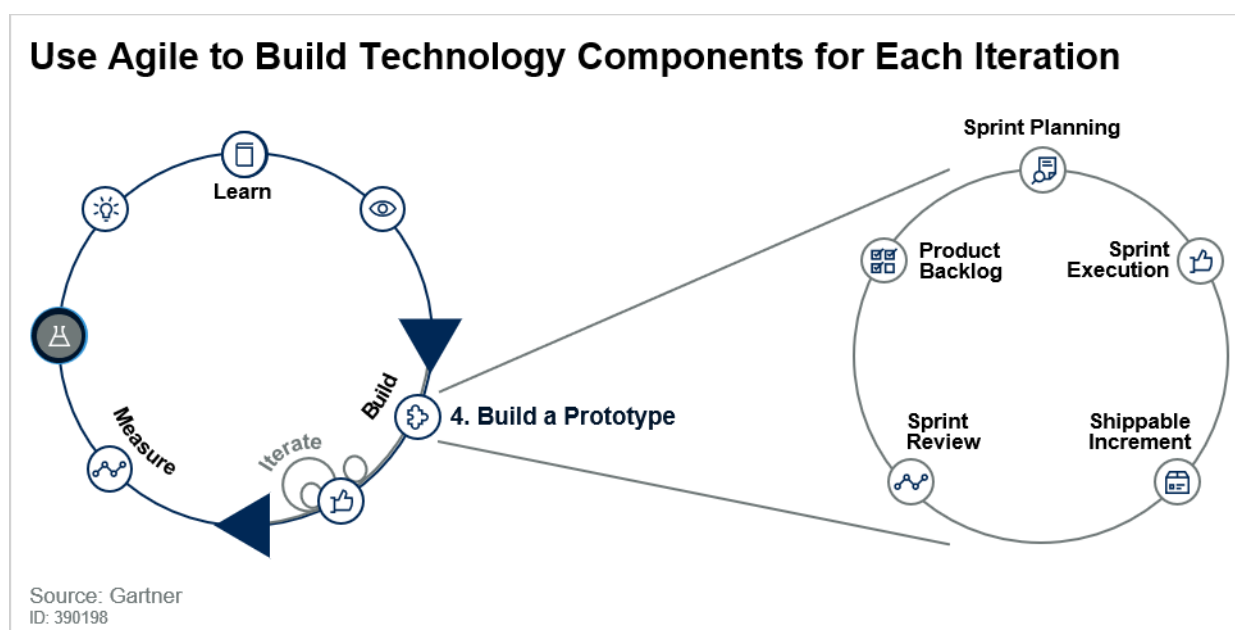
And it's not only startups that have successfully leveraged lean startup. Nordstrom's Innovation Lab<sup>8</sup> combines design thinking and lean startup to innovate and keep ahead of the smaller, nimbler competition. Coca-Cola<sup>9</sup> has embraced lean startup and open innovation, works with outside 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

In our recent CIO survey, 75% of leading organizations said they have adopted a product management approach (see “2019 CIO Agenda: Global Perspectives on Securing a New Foundation for Digital Business”). For many, agile is a key element of product management. Agile is an umbrella term for a set of iterative methodologies such as Scrum, Kanban and extreme programming. This research focuses on Scrum, but other agile methodologies can be used. Scrum’s roots go back to product development,<sup>10</sup> and 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



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

- **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 the team will select who will represent them.)
- **Scrum Master** — Helps everyone understand the scrum process and embrace its values, acting as a coach and process expert.

- **Development team** — The individual developers working on the components of the design such as UI and database. 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 both 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 key ingredients of successful innovation. Ideally, the two teams should be encouraged to be physically colocated or at least to meet as often as possible, both formally and informally, through the various stages and meetings.

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 and so on. The prioritization is driven by what has been learned in the previous lean startup cycle and the 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, **sprint review**, overlaps with the **measure the response** step in lean startup (see Figure 3). We now have feedback from the customers and the results of the metrics and measures we have set for ourselves. The aim now is to critically assess the innovation, see if we need to pivot and determine what should be the focus of the next lean startup iteration. The combined teams call 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, and often continues for the whole life of the innovation.

## Putting It All Together

Design thinking, lean startup and agile are powerful approaches that have considerable flexibility. There's a lot of great research in each area (see the recommended reading), but these approaches must be tailored to suit the needs of the organization. So, in a sense, each organization has to iteratively learn about the innovation approach that suits it. Four principles will help guide your 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 your 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 in situations where this is an entirely new way of working for the organization. Over time, the approach can be more formalized and expanded once you have the experience.

## **2. Don't get hung up on the methodologies.**

The methodologies are "thinking tools" to guide your efforts, but there's no right way of using them. The case studies show that every organization using them has to learn about them through trial and error. Get the team together early on and discuss the methodologies and how you're going to apply them. Take time out to review them at the end of each cycle and refine. Over time, you'll develop a combined methodology that suits your 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 both business and IT; the richer the better. The teams are nonhierarchical and self-directed and they come together around a vision rather than a direction from management. Ideally, the team is colocated, or it 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 show, 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 is essential, as it allows new services to be created and deployed quickly and easily, and then removed and replaced just as quickly and easily. (Just as an illustration, from six eight-studded Lego bricks — a standard, modular architecture — it's possible to create 915,103,765 unique combinations.<sup>11</sup>) 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.*

"Design Thinking Can Revolutionize Your Customer Experience Strategies"

"Use Design Thinking to Architect Customer Experience Into Your Digital Platforms"

"To Scale Digital Design, Add Just Enough Design Thinking Method to Agile Practices"

"To Scale Digital Design, Amplify the Impact of Limited Resources With Design Thinking Coaches"

"Achieving Digital Business Transformation With Digital Design"

“Leveraging Digital Product Management: A Gartner Trend Insight Report”

### Evidence

<sup>1</sup> For example, see [Stanford d.School](#).

<sup>2</sup> T. Brown. “Change by Design, How Design Thinking Transforms Organizations and Inspires Innovation.” Harper Collins. 2009.

<sup>3</sup> [“Design Thinking: How Design Thinking Transformed Airbnb,”](#) TED-Ed.

<sup>4</sup> [LEGO Serious Play](#).

<sup>5</sup> E. Ries. “The Lean Startup.” Crown Business. 2011.

<sup>6</sup> [“The Business Model Canvas,”](#) Strategyzer.

<sup>7</sup> [“The Lean Startup Case Studies, Dropbox,”](#) The Lean Startup.

<sup>8</sup> [“Nordstrom Innovation Lab Sunglass iPad App Case Study,”](#) YouTube.

[“Nordstrom Innovation Lab: Rethinking How You Shop,”](#) Harvard Business School Digital Initiative.

<sup>9</sup> [“From Startup to Scaleup: The Next Wave of Innovation,”](#) Coca-Cola Journey.

<sup>10</sup> [“The New Product Development Game,”](#) Harvard Business Review.

<sup>11</sup> [“A Lego Brickumentary Clip: Math,”](#) YouTube.

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