**Vertical 9. Lean Startup and Innovation Methodologies**

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| **Deliverables:**   1. **An “elevator pitch,” which provides highlights of the content, such as why the approach is important, how it works, and examples of where it has worked** 2. **A short, digestible summary of underlying premises and rationales, supported by research (i.e., not a report)** 3. **Profiles of major categories of candidate users, including specific examples of when, and under what circumstances, the approach may be employed, supported by research into the target audience and their needs** 4. **One or more “success stories” or other learning narratives that highlight the impact of and justification for using this approach.** 5. **Documentation of challenges to deployment, and potential limitations of the approach, including barriers or obstacles encountered within agencies employing the approach** 6. **A “How-To” document, detailing key steps for deploying the approach, including promising practices in adaptation and deployment** 7. **An online inventory of resources** 8. **Examples of policy (e.g. legislation, Executive Order, etc.) that have enabled or encouraged the approach** 9. **Future directions (next practices as opposed to best practices)** |

**Pull quotes [[options to consider for website]]:**

“There are no facts inside the building, so get outside.” Steve Blank, creator of the Lean Startup methodology and adjunct Professor Stanford University [Blank, S., personal communication with Policy Design Lab, January 5th, 2017.]

“A startup is a temporary organization designed to search for a repeatable and scalable mission/business model” Steve Blank, creator of the Lean Startup methodology and adjunct Professor Stanford University’ [Blank, S., personal communication with Policy Design Lab, January 5th, 2017.]

“For long-term change, experiment immediately.” Eric Ries, serial entrepreneur and author of the [Lean Startup](http://theleanstartup.com/book), [Ries, E., *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, p. 59, Crown Business Publishing, 2011] [for D6, how-to]

A startup can be understood as any“human institution designed to deliver a new product or service under conditions of extreme uncertainty**.**” Eric Ries [Ries, E., *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, p. 27, Crown Business Publishing, 2011]

**Deliverable 1: Elevator pitch summary**

**[[link/insert “Breaking down the buzzwords” (Deliverable 2 – benefits) here]]**

**Intro**

Lean Startup represents a framework for developing solutions through small scale tests, regular end-user engagement, and continuous iterations. This approach can be adapted and applied to bring tangible impact on a broad array of missions and agency-specific contexts. Pioneered by educator and serial entrepreneur Steve Blank, Lean Startup is both a structured process and a conceptual framework for improving the effectiveness and efficiency of problem-solving.

The idea of a “blueprint for innovation” might sound paradoxical at first. But those most familiar with Lean Startup have called it the “**scientific method for evidence-based innovation**” because of its structured, testable principles. [Andrea Kates, “[Evidence Based Innovation](http://videos.ypoinnovationweek.com/entrepreneurship-and-innovation-summit-evidence-based-innovation),” Innovation Summit, online video.] Philosophically, the concepts are deeply aligned with and central to the various approaches to evidence-based decision-making, including the tiered approach of testing, piloting, and scaling up promising solutions. [crosslink tiered evidence grantmaking / evidence based policy content]]

With an emphasis on extensive customer feedback and iterative prototyping, the Lean Startup principles promote a deeper understanding of the problem at hand and the challenges of deploying a solution. The value of this approach is broadly and deeply useful for Federal work, regardless of mission focus. “Despite the methodology’s name, in the long term some of its biggest payoffs may be gained by the *large* [entities] that embrace it,” observed Steve Blank. [Blank, S., “[Why the Lean Startup Changes Everything](https://hbr.org/2013/05/why-the-lean-start-up-changes-everything/ar/1)”[,](https://hbr.org/2013/05/why-the-lean-start-up-changes-everything/ar/1) Harvard Business Review, May 2013.] By prototyping approaches that are responsive to stakeholder needs and incorporate feedback from user experiences, agencies can “fail small, and fail fast” when experimenting with new programs and scale-up only the strongest and most effective idea [Chopra, A., “[Open Innovator’s Toolkit](https://www.whitehouse.gov/sites/default/files/microsites/ostp/openinnovatortoolkit_nstcmemo.pdf),” NSTC, February 8 2012].

**Why**

Built from Toyota’s Lean approach to manufacturing, some of Lean Startup’s language reflects its origins in the private sector – but the core principles translate to public sector work. This is not about merely adopting Silicon Valley buzzwords; the term “startup” is used as a shorthand descriptor for a way of working that uses hypothesis-driven, incremental steps with “build, measure, learn” feedback loops to continually create improvements. [[crosslink OODA content below]] By emphasizing flexibility, pragmatism, and experimentation, “the method allows organizations to learn as quickly as they can about what works, so that they can build and scale successful programs while avoiding huge up-front investments that might lead in the wrong direction.” [Blank, S. et al, “[Lean Experimentation for the Social Sector](https://ssir.org/podcasts/entry/lean_experimentation_for_the_social_sector_build_smart_to_learn_fast),” Stanford Social Innovation Review, August 22, 2016.] Lean Startup offers a genuine framework for understanding the problems and needs of beneficiaries and stakeholders. By understanding their stakeholders, deployment issues, costs, resources, and ultimate mission value, agencies can rapidly iterate on solutions that best align to stakeholder needs.

Adopting effective Lean Startup techniques can:

* Break the status quo and overcome obstacles with effective change management processes
* Build an entrepreneurial mindset and agency culture that’s responsive to stakeholders by design
* Generate new ideas for improvement and build capacity for translating ideas into action.

**How**At their core, Lean Startup methods are about applying a collaborative, team-based approach team-based approach to accelerated problem solving. The mindset stresses the importance of challenging assumptions and reacting quickly to new information, using hypothesis development and testing as part of “customer discovery.” With its emphasis on the end-user, it has considerable overlap with human centered-design principles, which stress empathy, iteration, collaboration, nonlinearity, making, and a bias toward action. [crosslink HCD content]] Lean Startup seeks a deep understanding of a problem, then builds and iterates a solution. Lean Startup can be brought to bear on a range from activities, including program creation and management, procurement, and grant making. [crosslink further elaboration in D3: Use cases]

**Lean Startup’s Four Steps: [**[**2 min video overview**](https://videos.files.wordpress.com/6f5VMvrR/what-is-customer-discovery_dvd.mp4)**]**

* Step 1: Break down your grand vision into component parts, and sketch out your hypothesis
* Step 2: Test the problem
* Step 3: Test the solution
* Step 4: Verify or pivot
* (Step 5: Iterate the loop as necessary)

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| **Distinction between Lean Startup, Lean LaunchPad, Hacking for Defense/Diplomacy and I-Corps.** [[left for website *if* useful bridge between Lean & I-Corps content – crosslink as appropriate]]  The most structured and visible application of Lean Startup thinking into the public sector has been through Innovation Corps (I-Corps). I-Corps provides experiential entrepreneurship training to Federally-funded researchers to promote commercialization, and other agencies have tailored Lean LaunchPad to their own goals. While Lean Startup is a broader innovation methodology, the I-Corps program is one structured approach to teach the methodology and to accelerate commercialization/solution-finding. While the same foundational principles hold, one key difference is that the I-Corps formulation starts with a technology that’s seeking a market, rather than starting with a customer problem/need and iterating on a solution.  Hacking for Defense is another iteration of Lean Startup-related programming. In the [Hacking for Defense](https://steveblank.com/category/hacking-for-defense/)/[Diplomacy](https://steveblank.com/2016/08/04/hacking-for-diplomacy-solving-foreign-policy-challenges-with-the-lean-launchpad/) classes, Federal agencies provide universities with problems and teams of students use the same Lean LaunchPad/I-Corps method to provide solutions.  [Blank, S., personal communication with Policy Design Lab, January 4th, 2017] |

**Deliverable 2: Summary of underlying rationales / empirical research**

**Benefits of Lean**

Any agency is capable of reaping the benefits of Lean Startup methods in it work. Lean Startup emphasizes rapid experimentation driven by customer insight. Its counterintuitive practices – like failing fast and front-loading feedback in the discovery process – can actually shorten planning cycles. Agencies can reduce risk while increasing their efficiency and cost savings by piloting, testing, and adapting before investing in large amounts of initial project funding or even full-scale deployment.

A startup culture is a valuable asset for Federal agencies to cultivate, as it helps all levels of the civil service to be better problem-solvers and to be more nimble and effective in pursuing their mission. In recent years some notable [‘startup’ agencies](http://www.govtech.com/pcio/Governments-Take-a-Lean-Startup-Approach.html) spun up, including [18F](https://18f.gsa.gov/), [United States Digital Service](https://www.usds.gov/), and the [Consumer Financial Protection Bureau](http://www.consumerfinance.gov/). Their early results demonstrate the value of incorporating some of the best private sector thinking on innovation into their public sector missions -- and their takeaways are applicable to a much broader range of agencies.

Investors (e.g., venture capital and angel firms) are beginning to adopt this framework to evaluate the [Investment Readiness Level](https://steveblank.com/2014/07/01/how-investors-make-better-decisions-the-investment-readiness-level/) of a business, akin to the way the [Technology Readiness Level](https://www.nasa.gov/directorates/heo/scan/engineering/technology/txt_accordion1.html) framework is used to evaluate the maturity of a developing technology. [Interview with Marc Wynne, OSTP, phone, 9/1/2016] [Read more.](http://www.forbes.com/sites/steveblank/2014/02/24/is-this-startup-ready-for-investment/#7a263f096c4d)

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| **Breaking down the buzzwords & insight on Lean lingo**  Lean. Agile. Design thinking. Human centered design. The plethora of new approaches to problem-solving comes with its own blizzard of jargon. It can be tempting to dismiss these terms as the trendy buzzwords du jour -- especially when you’re a career public servant with ample experience in management theory. But underneath the specific terminology, there are real breakthrough concepts that can facilitate more effective problem-solving. Each of these approaches has some common, evergreen principles, including:   * **Gather evidence** to support your decision-making process * **Identify your customer needs**(stakeholders), and *talk to them* as part of your planning process * **Identify other critical hypotheses early and test them:** deployment, funding sources, budget support, partners, success criteria * **Iterate early and often**; start small with pilots before investing significant resources in expensive and time-consuming development phases, and incorporate early feedback into your work   [Read more](https://www.startupgrind.com/blog/cult-of-the-feedback-loop-lean-startup-vs-six-sigma-vs-everything-else/) on how to cut through overlapping management methodologies to focus on the key takeaways.  These entrepreneurial and design methodologies have some recurring vocabulary worth clarifying. While some terms might seem business-focused, the concepts have deep relevance for Federal work and have been successfully applied in the Federal context:   * Customer: While some agencies have customers in the classic sense of the term, this term also encompasses broadly one’s target audience and intended end-users, including stakeholders and beneficiaries. These may be particular segments of the American taxpayers, but could also be your colleagues in legal, procurement, human capital, etc. * Customer discovery: This refers to the process of developing a hypothesis and then testing it by engaging directly with the intended audience. It’s *not* just about finding a customer willing to pay; instead, it’s an approach to gaining a deeper understanding as to human needs through honest, useful conversations and other meaningful engagements. * Validated learning: “It’s not after-the-fact rationalization or a good story designed to hide failure,” notes Eric Ries [Ries, E., *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, pp. 38, Crown Business Publishing, 2011]. It’s a rigorous way of quantifying progress – concrete, accurate, and more rapid than classical planning strategies. He goes on, “It is the principal antidote to the lethal problem of achieving failure: successfully executing a plan that leads nowhere.” [Ries, E., *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, pp. 38, Crown Business Publishing, 2011] * MVP (minimum viable product): An MVP is the smallest, simplest possible product that solves a defined problem. An MPV is very small (it’s minimal) but it stands alone and solves customer problems (it’s viable). However, the primary goal is to begin the feedback and learning process of Build-Measure-Learn to enable further iteration. * Pivot: Don’t get stuck in an ineffective course of action. A pivot is not just a synonym for change; it’s “a structured course correction designed to test a new fundamental hypothesis” about the project or venture. There’s no rigid formula for these “Go or No-Go” decision points, but the idea is that over time and across many user-centered tests, patterns present themselves. When enough evidence says one of your hypotheses needs change, the plan at hand should be re-evaluated and adjusted. [Ries, E., *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, pp. 149, Crown Business Publishing, 2011]   Sources:  [Ries, E., *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, pp. 149, Crown Business Publishing, 2011; Holman, R., phone interview with Policy Design Lab, August 12th, 2016; Holman, R., personal communication with Policy Design Lab, December 29th, 2016; Blank, S., personal communication with Policy Design Lab, January 4th, 2016] |

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| **OODA Loop (Observe-Orient-Decide-Act): *[pop-up site content; place close to Build-Measure-Learn intro]***  The concept of ‘Build, Measure, Learn” borrows heavily USAF Colonel John Boyd’s OODA Loop, which refers to a decision cycle of observe, orient, act, and decide. Now frequently used for commercial applications and to understanding learning processes, the method emphasizes agility and responsiveness to environmental conditions.    Source: [“[The Observe, Orient, Decide, Act (OODA) loop](https://www.effectivecommand.org/OODALoop.aspx)”, Effective Command]  Image credit: Ries E., “[Product Development at Lean Startup](http://www.slideshare.net/startuplessonslearned/2009-09-08-the-lean-startup-gov-20-summit-edition/14-Product_Development_at_Lean_Startupbr)”, Startup Lessons Learned, September 2009.] |

**Deliverable 3: Profiles of major cats of candidate users - examples of when to deploy**

**When, how to use:**

Because Lean Startup represents a framework for innovative problem-solving, the principles are applicable to a very broad range of situations. It is a useful tool for the development of new programs and its insights also have relevance for other areas, for example:

* **Procurement:** Lean Startup principles complement agile development methods, which are increasingly encouraged in the use of technology contracts and information technology services. Agencies and officers who approach their work with a Lean Startup mindset may find a natural fit with the best practices recommended in the [TechFAR Handbook](https://playbook.cio.gov/techfar/) and Digital Services Playbook, both of which encourage agencies to build agile development methods into their contracting and digital services. [[Crosslink Innovative Contracting content on agile]]
* **Grantmaking:** The Lean Startup mindset also complements the recent push towards diffusing evidence-based grant making approaches. [LINK to EBP content] Traditionally, many grant programs lack fully developed feedback loops. Several grant making agencies have begun evaluating how to encourage grantees to adopt Lean Startup principles and practices through their grant process. In one example, the HHS Office of Adolescent Health’s [Teen Pregnancy Prevention program](http://www.hhs.gov/ash/oah/oah-initiatives/teen_pregnancy/about/) required grantees to run their own accelerator models that incorporate Lean Startup principles. [crosslink to accelerator language in V6 or V8 – text is copied below, for clarity] *[[See D6 – How to – Funding Lean Approaches – for guidance on how to incorporate into grantmaking.]]*

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| **Text section on accelerators to crosslink (from V8):** Internal Innovation Accelerators provide a space for the exploration and testing of new ideas, wrapped in a structure of training, coaching, and support. Similar to startup accelerators in the private sector, they contain the following elements:   \*  They are for small teams (typically of 3 to 5 people)  \*  They are competitive to get into.  \*  Some resources are given to the teams that get in, be it seed-funding, tools, or something else.  \*  They have a fixed time frame (typically 3 months)  \*  There is a training sprint where the practices of customer-discovery, prototyping, and product testing are introduced and acted on (typically in a 3 to 5 day “boot camp” at the beginning of the program)  \*  There is ongoing coaching along the way to reinforce the methodologies (typically through weekly check-ins)  \*  There is a single culminating day the end where each team presents to senior leadership what they built, what they learned, and pitches for support to take their idea to the next level (typically this is a “Demo Day” or a “Shark Tank”)  [Holman, R., personal communication with Policy Design Lab, December 18, 2016] |

**When not to use:**

Lean Startup is a methodology for creation, ensuring that a new thing being built is solving the right problem for the right people. To that end, it isn’t always the right approach. For example: When re-designing an existing process, Lean Six Sigma maybe more useful. When going beyond building a minimum viable product to enhance an existing product – where the concern is not just to meet the needs of users but to delight them, human centered design [crosslink] may be a more appropriate tool. It’s also worth noting that not all agencies are always able to quickly ‘pivot,’ as they may be directionally bound by their mission statement. [Holman, R., personal communication with the Policy Design Lab, December 29, 2016.]

Lean Startup approaches are also generally not conducive for audacious goals. Marc Andreessen, noted entrepreneur and investor, offers two private sector examples where Lean Startup thinking and the use of minimum viable products would not be appropriate: The development of the Macintosh computer and Space-X. He posits that for the Macintosh, the goals for the product were so large that the product had to exist in its entirety for the public to wrap their minds around it. A minimal product, prototyping, or incremental steps could not achieve the goals alone. Similarly, he argues, a venture like Elon Musk’s SpaceX cannot be done on a small scale; the rocket has to get into space on the first try. [Quoted in Kern., E., "[Not Every Startup Should be a Lean Startup](https://gigaom.com/2012/12/03/marc-andreessen-not-every-startup-should-be-a-lean-startup-or-embrace-the-pivot/)," GigaOm, December 3, 2012.]

For agencies considering how to best to realize incredibly ambitious goals, consider using the framework offered by Grand Challenges instead. [crosslink Grand Challenges]

**History of Lean Startup:**

Steve Blank had been a practitioner for over 20 years as a successful, serial entrepreneur when he came to reflect that everything he’d ever been told about startups was wrong. “We didn’t have a language, let alone a methodology, that really focused on the start-search-and-execute process,” he notes. In his time teaching, Blank also saw that business school students were missing a crucial element between the classroom theory and real-world practice. Specifically, he observed an unmet need for a framework and a language that prioritized customer interaction. It has since become an often-repeated truism that “No business plan survives first contact with customers.” (In other words, business strategies only succeed if they address what customers’ needs and wants) [Blank, S., phone interview with Policy Design Lab, July 27, 2016].

“Lean” was invented to fill the gap between old theory and current practice. Lean Startup “was evangelizing very simple concepts in a conceptual framework that did not exist,” Blank notes [Blank, S., phone interview with Policy Design Lab, July 27, 2016]. The three components of Lean Startup represents the fusion of contributions from several thought leaders:

1) Business Model Design, from [Alexander Osterwalder](http://alexosterwalder.com/): *What are all the hypotheses we have?*

2: Customer Development, from [Steve Blank](https://steveblank.com/): *A formal methodology to validate the hypotheses*

3) Agile Engineering in the form of Build-Measure-Learn, from [Eric Ries](http://www.startuplessonslearned.com/2009/04/validated-learning-about-customers.html): *Incremental and iterative engineering processes to develop solutions*

While Lean Startup originated in the business world, key insights are equally applicable to the public sector: No amount of careful and thoughtful advance planning can substitute for actual engagement with and feedback from a program’s stakeholders.

**Deliverable 4: One or more “success stories” or learning narratives to underscore impact**

Case study profiles:

**1. Hacking For Defense**

**2. HHS’ Indian Health Services (IHS)**

**Case 1:** [**Hacking 4 Defense**](http://www.h4di.org/)

[Case sourced from Blank, S., personal communication with Policy Design Lab, January 5th, 2017.]

**Summary:** Hacking for Defense (H4D) aims to increase the speed at which national security organizations solve mission-critical problems by enabling the DOD and intelligence community to tackle hundreds of critical national security problems each year. H4D is a university-sponsored class that allows students to develop a deep understanding of the problems and needs of government sponsors in the Department of Defense and the Intelligence Community. In a short time, students rapidly iterate prototypes and produce solutions to sponsors' needs.

**How it works:**

The class uses the identical Lean Startup principles and I-Corps methodology as the NSF program. The difference is that the Federal “Problem Sponsors” are partnered with students who are eager to harness their skills to address national security issues. Sponsors work closely with and guide their students while they utilize lean business practices to rapidly create and deploy solutions. This give sponsors a low risk connection to a pool of highly-qualified and engaged talent. By watching the students operate at speed agency sponsors gain a startup’s sense of urgency and efficient use of resources to address the nation’s emerging threats. They see how to rapidly iterate prototypes to produce solutions to operational needs in an extremely short time. Sponsors also become connected to other innovators in the Department of Defense and Intelligence Community.

Deployment of Hacking for Defense (H4D) begins with a robust problem definition and evaluation process to select challenge candidates for the subsequent H4D sprint process. A non-profit, [H4Di](http://www.h4di.org) has been set up as a single point of contact to curate and distribute problems to all the participating universities.

H4Di works with “problem sponsors,” representatives of national security organizations identify a problem to be solved. Agencies work directly with senior leaders in their organizations to ensure there are sufficient resources allocated to support the testing, deployment, and scaling of the most promising results from the H4D process. Each problem is then vetted, scoped, and translated by H4Di to ensure that problem can be accessible to non-governmental technologists in an unclassified environment while at the same time remaining relevant for addressing the root issue.

All H4D problems are scrubbed down to an unclassified level as students and most faculty will not possess a security clearance. Oftentimes, an analogous problem environment that is commonly understood by commercial users is used to substitute for a classified problem.

Examples of problems vetted by H4Di and given to the universities can be seen here:

* <http://hacking4defense.stanford.edu/dodic-problems.html>
* <http://www.hacking4defensegu.com/dodic-challenges/#dodic-challenges-1>
* <http://jacobsschool.ucsd.edu/hackingfordefense/fall2016problems.shtml>

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**Key accomplishments (Impact):**

For Federal agencies, H4D allows problem sponsors to increase the speed at which their organization solves specific, mission-critical problems. For universities, it keeps their programs attached to real-world problems and provides students with an experiential opportunity to become more effective in their chosen field, with a body of work to back it up.

The first Hacking for Defense class was offered March-May 2016 at Stanford University.

The first 2½ day class for new educators and sponsors was held September 7-9 2016.

To date 17 universities have committed to offer the class.

Currently H4D is being taught at:

* UC San Diego: <http://jacobsschool.ucsd.edu/hackingfordefense/>
* Georgetown University: <http://www.hacking4defensegu.com/#welcome>
* Stanford University: <http://hacking4defense.stanford.edu>
* University of Pittsburg: <http://www.engineering.pitt.edu/hacking4defense/>
* James Madison University: <http://jmuxlabs.org/hacking-for-defense/>
* Boise State University: <https://cid.boisestate.edu/venturecollege/hacking-for-defense/>

The national scaling of the class is being funded by the National Defense University.

other NGO’s.

For agencies interested in using the "Hacking for X" framework, questions to consider when selecting internal challenges most likely to benefit:

* Can the problem be clearly articulated
* Is the problem critical?
* Can success criteria be clearly defined?
* Can the sponsor devote adequate time to weekly interaction with student teams who are engaged in the problem-discovery and solving process?
* If a student team came up with a prototype solution could it be deployed in the agency/to beneficiaries within 1-3 years?
* Is there authority to both address the problem and implement any resulting solutions?

Wanting to learn more? [Read here](http://www.h4di.org/government.html).

**Read more:**

* Steve Blank’s [blog entries related to Hacking for Defense](https://steveblank.com/category/hacking-for-defense/).
* Steve Blank’s [blog entries related to Hacking for Diplomacy](https://steveblank.com/category/hacking-for-diplomacy/).
* “Hacking for Defense: A Handbook for Innovation Insurgents,” by Steve Blank, Joe Felter, and Peter Newell, Wiley & Sons, Inc is scheduled for publication in fall 2017.

## Case Study 2: [HHS’ Indian Health Services (IHS)](https://www.ihs.gov/)

[Sources:

Anfune L., Presidential Management Fellow and Program Specialist, Division of Program Innovation, HHS, 2016; Rivera, M., "Indian Health Service (IHS) Hospital Check-in Redesign," HHS IDEALab, online video, July 25, 2016; *Other details are provided based on discussions with IHS staff and internal IHS documents.* ]

**Background**

In 2014, staff from the [Indian Health Services (IHS)](https://www.ihs.gov/) came together to address the issue of long wait times and overcrowding in an emergency department in Arizona’s Whiteriver Indian Hospital. After engaging in a process of redefining their problem and rapid prototyping, the team endeavored to develop a new system for processing patients, using Lean Startup and human-centered design frameworks [crosslink] to redesign the emergency department.

The Whiteriver Indian Hospital, located in the White Mountain Indian Apache Reservation in Arizona, has over 40,000 emergency department visits per year – four times the national average. Records indicate that in recent years 65% of these visits were not for emergencies. The large inflow of patients with non-emergent conditions led to extended wait times and over 20% of patients left the hospital without being served. [Rivera, M., "Indian Health Service (IHS) Hospital Check-in Redesign," HHS IDEALab, online video, July 25, 2016.] This overcrowding issue represented almost $5.5 million dollars in lost revenue annually for the hospital, in part due to the fact that many of the patients who left without treatment returned in the future with more severe conditions. After assessing the impact on the hospital and its patients, IHS identified two key concerns: improving patient flow and reducing emergency room crowding.

**How it works**

A team of IHS staff entered the Department of Health and Human Services’ Idea Lab Ignite Accelerator, hoping to gain the funds and skills to develop a solution to this pervasive issue. From the beginning, the project team thought they had identified the best solution to their problem: the installation of high-tech service kiosks that several advanced emergency departments around the country had already adopted. Participation in training in the [Ignite Accelerator](https://www.hhs.gov/idealab/ignite-accelerator/) helped them adopt an entrepreneurial mindset, in which it was necessary to challenge their own assumptions about the problem and solutions and put the feedback from patients first.

First, the team engaged in a customer discovery process. They interviewed patients and staff at the hospital to learn more about their firsthand experiences. By profiling the patients and how they interacted with the hospital, they discovered that patient flow and overcrowding was in fact a primary concern, but high-tech kiosks were not appropriate for the elderly, who made up the majority of the population that the hospital served. The team used information gathered from the interviews to iterate a new, lower-tech solution. They created a paper form that would allow patients who enter the emergency department to identify the severity of their medical issue, which would allow an intake clerk to direct them to the appropriate department for service.

Next, the team began prototyping and iterating on the design. In their initial prototype, they encountered two major problems. First, in such a small, deeply-connected community, many patients were not comfortable sharing their conditions with clerks in the waiting room. The form proved effective for those willing to use it, but the solution was only appealing to a portion of the target population. The team also learned during conversations with the Center for Medicare and Medicaid Services (CMS) that this solution violated the [Emergency Medical Treatment and Labor Act (EMTALA).](https://www.cms.gov/Regulations-and-Guidance/Legislation/EMTALA/) [Rivera, M., "Indian Health Service (IHS) Hospital Check-in Redesign," HHS IDEALab, online video, July 25, 2016.]The Act requires anyone who enters an emergency department requesting service to receive a medical examination, regardless of the severity of their condition. The team returned to the drawing board, designing, testing, and redesigning several solutions through further rounds of rapid prototyping and iteration.

The final solution was a combination of paper forms, a fast track triage process, and hospital renovations. The new fast track system for triage allows a dedicated physician, not a clerk, to manage intake on the busiest days in the hospital. This physician provides the medical examination, determines severity and sends cases directly to the appropriate departments to cut down on long lines. The physician also uses the paper forms while working patients to help determine their needs more quickly.

The team was able to leverage the information and data compiled from each pilot to also advocate for funding for emergency department renovations that will provide a fully equipped physician fast track station and facilitate unhindered patient-staff contact to make assessments of severity of conditions easier and quicker.

**Key Accomplishments**

Integrating human-centered design and Lean Startup thinking into the final solution will reduce waste, increase revenue for the hospital, and most importantly, drastically improve access to care. The renovations, in progress, are expected to cost $150,000 – but the full implementation is projected to provide the hospital with over $6 million in revenue and cost savings. [Rivera, M., "Indian Health Service (IHS) Hospital Check-in Redesign," HHS IDEALab, online video, July 25, 2016.] This revenue is derived primarily from an increase in patients served, plus the cost savings from serving patients before their conditions worsen. Additionally, the Hospital is no longer at risk of penalties imposed by CMS for sites that have high numbers of patients who leave without being seen.

Already, emergency department staff are conducting simplified version of the proposed fast track triage, and have already experienced a documented decline in patients who have left without being seen from 20% to 12%.

**To Learn More**

* Watch a [video](https://www.youtube.com/watch?v=qFPiNuUJKWc) from the project lead, Marliza Rivera
* Read more on how HCD and Lean Startup are being [infused into HHS](http://www.govtech.com/health/IDEA-Lab-Injects-Entrepreneurial-Tactics-in-Federal-Health-Services.html)

**Deliverable 5: Challenges to deployment / approach limitations (inc. lessons learned from agencies where implemented)**

* **Key ingredients for deploying Lean Startup methodologies**
* **Four misconceptions about Lean Startup**
* **Mythbusting: perceived obstacles to innovation**

**Key ingredients for deploying Lean Startup methodologies include:**

* Reducing the organizational friction costs in experimentation
* Capacity building for effective implementation
* A cultural shift that embraces early learning

**Reducing friction costs and embracing failure**

Perhaps the most essential ingredient for achieving Silicon Valley results with Lean Startup is also the toughest: Inculcating a willingness to accept and learn from failure. This is a natural tension to navigate, since for many programs, failure is not an acceptable outcome. Failure, in the right situations, can be viewed as a valuable tool and step in achieving long-term success. The challenge for program managers and leadership alike is committing to processes of validated learning. This includes deliberately creating smaller-scale experiments before full deployment, when failure means a learning opportunity to course-correct and not a severe consequence.

**Capacity building for effective implementation**

Incorporating Lean requires building up capacity – or providing the tools, training, and also an authorizing space for experimentation. It’s not enough to have high-level buy-in for Lean Startup practices, for example, without providing contracting officers with extensive support and training on how to actualize agile or Lean Startup methods in acquisition requirements. Accelerators are one vehicle for empowering staff through experiential training. [crosslink Accelerator content in v8] [Holman, R., phone interview with Policy Design Lab, August 12th, 2016].

**A cultural shift that embraces early learning**

Across the Federal bureaucracy, senior leaders are at times resistant (or fearful) of failure. Failure, in the right situations, can be viewed as a valuable tool and step in achieving long-term success. By prototyping approaches that are responsive to stakeholder needs and incorporate feedback from user experiences, agencies can “fail small, and fail fast” when experimenting with new programs and scale-up only the strongest and most effective ideas [Chopra, A., “[Open Innovator’s Toolkit](https://www.whitehouse.gov/sites/default/files/microsites/ostp/openinnovatortoolkit_nstcmemo.pdf)”, Office of Science and Technology Policy, February 8, 2012.]

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| **4 Misconceptions about Lean Startup**  **'Lean' is a new, untested concept**  While the current theoretical iteration is relatively young, Lean Startup is an evolution of Toyota's Lean manufacturing philosophy. It shares a few key points in common, such as minimizing resource waste. Concepts similar to the ones in the Lean Startup framework have produced amazing results in the past (for example, Apple’s use of minimal viable products).  **'Startup' means it’s just for new Internet companies**  Don’t be put off by the name. A “startup” could also apply to a new agency program or new piece of technology. “A startup is a temporary organization designed to search for a repeatable and scalable mission/business model,” adds Steve Blank.  **'Customer development' is just a new buzzword for feedback**  Feedback is passive. Customer development, instead, is an active way to engage with intended users. Feedback systems can sometimes mean that only the loudest voices are heard, but customer development framework is designed to solicit a wide range of views, ensuring the “silent majority” is also captured.  **'Minimal Viable Products' (MVP) are half-baked beta version iterations**  MVP, while just a label and buzzword, is a useful concept. An MPV is a product with the minimal set of features that accurately solves customers' problem and provides enough added value to make it competitive. It is not just an early version; it’s typically a few iterations in and it actually works. The term MVP could be used to describe a new digital application, physical product, or back-end process.    [Kromer, T., “[Misconceptions about Lean Startup](http://leanstartup.pbworks.com/w/page/36786240/Misconceptions%20about%20Lean%20Startup)”, the Lean Startup Circle Wiki, and Holman, R., personal communication with Policy Design Lab, December 29th, 2016] |

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| Mythbusting: Perceived Obstacles to Using Lean Several Federal rules and regulations are commonly misunderstood to represent barriers to Lean ways of working. Federal entrepreneurs may often hear, “No, you can’t do that” – when in reality, new ways of working are fully compliant. Common misconceptions surround the following areas:  [**Paperwork Reduction Act (PRA)**](http://www.gpo.gov/fdsys/pkg/PLAW-104publ13/html/PLAW-104publ13.htm)  PRA is often incorrectly perceived as preventing Federal employees reaching out and talking to stakeholders. However, **the PRA does not necessarily apply.**  The PRA applies to “structured” information collections to more than 9 non-government individuals. This means that the PRA does not apply in the following situations:   * The PRA does not apply if you are collecting information only from other Federal employees [“[Paperwork Reduction Act for Surveys and User Research](https://energy.gov/eere/communicationstandards/paperwork-reduction-act-surveys-and-user-research)”, Office of Energy Efficiency & Renewable Energy]. * The PRA does not apply if you are collecting information on 9 or fewer individuals [“[Frequently Asked Questions About PRA / Information Collection](https://www.hhs.gov/ocio/policy/collection/infocollectfaq.html)”, U.S. Department of Health & Human Services]. * The PRA does not apply if your information collection is not considered “structured.” [“[Frequently Asked Questions About PRA / Information Collection](https://www.hhs.gov/ocio/policy/collection/infocollectfaq.html)”, U.S. Department of Health & Human Services].   This last point is the most relevant, as all customer feedback, according to the Lean Startup principles, should be through casual conversations. While they are often referred to as “interviews” they are informal and un-structured [Holman, R., personal communication with Policy Design Lab, December 29th, 2016]. Customer discovery can also be considered a form of market research, to which PRA does not apply and procurement is not always necessary to conduct. [Wynne, M., personal communication with Policy Design Lab, December 28th, 2016].  Federal employees can find further OMB clarification on this front – for example, on establishing the [boundaries for digital outreach and engagement](https://www.whitehouse.gov/sites/default/files/omb/assets/inforeg/SocialMediaGuidance_04072010.pdf). Consult HHS’ [FAQ on PRA](https://www.hhs.gov/ocio/policy/collection/infocollectfaq.html#5) for additional guidance.  [**508 Compliance**](https://www.section508.gov/content/learn/laws-and-policies)  Section 508 by law requires information presented to the American people to be accessible to all. In particular, Section 508 has a number of implications for digital and web development. However, Section 508 applies to official government products and services. **It does not apply to prototypes and experimental products and services that are not yet official.**  [GSA offers a 508 Best Practice Library](https://www.section508.gov/best-practices) to help agencies understand how this important accessibility framework does **not** prevent prototyping or early stage testing. It includes the [IT Accessibility Playbook](https://www.section508.gov/content/it-accessibility-playbook), intended to provide offices of Chief Information and Chief Administration Officers, and Federal Section 508 Program Managers, guidance on what is needed to build and manage effective Section 508 Programs.  [**Privacy Act**](https://www.gpo.gov/fdsys/pkg/USCODE-2012-title5/pdf/USCODE-2012-title5-partI-chap5-subchapII-sec552a.pdf)  The applicability of the Privacy Act depends on the stage of product development; this caveat also applies to 508 and PRA compliance. Generally, these concerns are not applicable in when a solution is in the prototyping stage. However, full compliance is important when transitioning from an experimental product/service to a live and official government product/service. When considering moving from a prototype to an official government service, contact your Privacy Office for guidance.  [Holman, R., phone interview with Policy Design Lab, August 12th, 2016 and Holman, R., personal communication with Policy Design Lab, December 29th, 2016] |

**Deliverable 6: How-To: Steps for deploying, practices for adapting**

* **Four Steps for Lean Startup**
* **Funding Lean Approaches**

**Lean Startup’s Four Steps:**

* Step 1: Break down your grand vision into component parts, and sketch out your hypothesis.
* Step 2: Test the problem
* Step 3: Test the solution
* Step 4: Verify or pivot
* (Step 5: Iterate the loop as necessary)

Watch Steve Blank’s [2 minute video overview](https://videos.files.wordpress.com/6f5VMvrR/what-is-customer-discovery_dvd.mp4) of these four steps.

**Step 1: Break down your grand vision into component parts, and sketch out your hypothesis**.

Different problem definition approaches may be used. [crosslink to problem definition V3 content] In some instances, it may be useful to use a [mission model canvas](https://steveblank.com/2016/02/23/the-mission-model-canvas-an-adapted-business-model-canvas-for-mission-driven-organizations/) (a variant of the [business model canvas](http://www.businessmodelgeneration.com/canvas/bmc), which provides a structured process for developing a deeper understanding of the problem and the challenges of deploying a solution. ([Read more](http://steveblank.com/2016/02/23/the-mission-model-canvas-an-adapted-business-model-canvas-for-mission-driven-organizations/) on the history of how the mission model canvas evolved from the well-known business model canvas, or [listen](https://soundcloud.com/clearshore/the-mission-model-canvas-an-adapted-business-model-canvas-for-mission-driven-organizations) to a 10 minute podcast on how to understand each box.)

**Step 2: Test the problem (Customer discovery)**

Customer relationships can be understood as beneficiaries. How does your team get buy-in from all the beneficiaries? This includes not just recipients, but also colleagues in legal, policy, procurement, etc, whose support you may need in terms of funding, mandates, user requests, and so on. Long-term support and maintenance also has to be bought into by the sponsoring organizations. Using the customer discovery process helps to identify the most critical stakeholders to get buy-in from.

**Step 3: Test the solution with a pilot (Agile development)**

First, establish what constitutes a successful deployment for your program or operating context. Next, run an experiment, likely a small scale pilot (think “minimum viable product “).

**Step 4: Verify or pivot**

Step back and evaluate feedback received on the pilot. Do you people agree that you’re solving a high value problem? Do you understand the mission model adequately to move into execution and implementation? Decide whether support exists for further iteration on the piloted approach or if course correction is necessary.

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| **Funding Lean Approaches**  Program officers for grant making agencies can encourage the use of Lean Startup thinking in their portfolio by making tailored adjustments to the grant making process. Peter Murray and Steve Ma of Accelerate Change offer the following concrete suggestions:   * “Ask your grantees which programs or services they would be eager to test if they had enough time and resources to do so. * Create specific experimentation grants. Support of this kind can range from six-month “prototype” grants ($30,000 to $50,000) to multi-year funding for a lean experimentation team ($200,000 to $500,000 per year). * Allow for unexpected pivots. Don’t require grantees to spell out—in advance and in detail—the specific tactics and strategies that they will employ. * Actively support efforts by grantees to make rapid, data-driven shifts in their program design. * Empower grantees to follow a nonlinear process—one that that doesn’t adhere to a traditional timeline. They might run a new experiment every two to four months, for example. Or they might drop an idea after two weeks of constituent discovery. Or they might test an idea that they hadn’t considered during the grant application phase. * Measure success not by intermediate program outputs (the number of people served, for example) but by the amount of learning that grantees achieve through the rapid validation or invalidation of critical hypotheses. * Encourage grantees, as part of their experimentation, to test approaches that promote financial sustainability.”   [Murray, P. and Ma, S., “[Going Lean](https://ssir.org/articles/entry/going_lean#lean3)”, Stanford Social Innovation Review, Summer 2015 |

**Deliverable 9: Future directions (“next practices as opposed to best practices”)**

**3 ways to promote adoption**

[Holman, R., personal communication with Policy Design Lab, December 29th, 2016]

While anyone can use Lean Startup principles in their work, three main avenues may promote further adoption in an agency:

1) Provide training, such as through an accelerator program [crosslink V8 accelerator text]

2) Promote access and proper use of online prototyping tools;

3) Encourage experimentation as a cultural norm.

Provide training

Most Federal employees are not trained in entrepreneurial approaches. In fact, much of their work is often framed around a nearly opposite lens of handling very large things and working at the level of the entire system or enterprise. Accelerator programs can provide hands-on experiential training that serves as an effective on-ramp to applying iterative experimentation tactics in your daily work.

Promote online prototyping tools

A number of digital tools used for product prototyping are either blocked by Federal networks or for various reasons - like Terms of Service concerns - are not allowed. These issues are not insurmountable. HHS offers [guidance](https://www.hhs.gov/idealab/ignite-syllabus/methods-and-tools/) on useful tools that are fully compliant with Federal regulations.

Encourage experimentation as a cultural norm

Many agencies have cultures that are not conducive to the principles of starting small, growing slowly, and interacting frequently with users. Overcoming these barriers starts at the top. A culture of trying new things in a small way -- and recognizing this work as opportunities to learn -- is an important step to address this entrenched issue.

**Deliverable 8: Examples of policy that have enabled or encouraged approach (legislation, exec order)**

[[note: Policy Guidance added here to correspond to D5 – Challenges – perceived obstacles.]]

Legislation

[S.3084 - American Innovation and Competitiveness Act](https://www.congress.gov/bill/114th-congress/senate-bill/3084), December 2016

This legislation addresses programs related to public-private partnerships and manufacturing, such as I-Corps, which is a specific application of Lean methodology.

[**The Stevenson*-*Wydler Technology Innovation Act of 1980**](https://www.gpo.gov/fdsys/pkg/STATUTE-94/pdf/STATUTE-94-Pg2311.pdf) (Pub.L. 96–480), as amended (codified at Title 15 of the United States Code (U.S.C.), Section 3701 *et seq*.) ([94 Stat. 2311](https://www.gpo.gov/fdsys/pkg/STATUTE-94/pdf/STATUTE-94-Pg2311.pdf))

This legislation, as the first major U.S. technology transfer law, sets forth a national policy to promote cooperation among academia, Federal laboratories, labor and industry in order to facilitate the transfer of innovative Federal technologies to United States and world markets.

* A [rule for personnel exchange](https://www.gpo.gov/fdsys/pkg/FR-2016-10-24/pdf/2016-25355.pdf) was published in October 2016, making it possible for Federal researchers to participate in startups and return without leaving Federal service. [Read more](https://www.whitehouse.gov/blog/2016/11/22/lab-market-commercializing-new-technologies-exchanging-talent) about it.

Policy Guidance

Federal agencies must follow various laws and regulations, including the [Paperwork Reduction Act (PRA)](http://www.gpo.gov/fdsys/pkg/PLAW-104publ13/html/PLAW-104publ13.htm) and the [Privacy Act](http://www.justice.gov/opcl/1974privacyact-overview.htm), when collecting information from the public. All agency collections of customer feedback must adhere to the Privacy Act and all other legal and regulatory requirements. In particular, personally identifiable information (PII) should only be collected to the extent necessary, and agencies must meet Privacy Act requirements to the extent they collect, retain and retrieve PII. [[“Paperwork Reduction Act Fast Track Process](https://www.digitalgov.gov/resources/paperwork-reduction-act-fast-track-process/)”, DigitalGov]

HHS offers [guidance for compliance on the Paperwork Reduction Act.](https://www.hhs.gov/ocio/policy/collection/infocollectfaq.html)

[Section 508 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794 (d))](https://www.gpo.gov/fdsys/pkg/USCODE-2011-title29/html/USCODE-2011-title29-chap16-subchapV-sec794d.htm)

# GSA offers a robust overview of [Section 508 Law and Related Laws and Policies](https://www.section508.gov/content/learn/laws-and-policies).

“[Strategic Plan for Improving Management of Section 508 of the Rehabilitation Act](https://www.whitehouse.gov/sites/default/files/omb/procurement/memo/strategic-plan-508-compliance.pdf)” OMB, Jan 24, 2013.

The OMB Strategic Plan outlines additional agency responsibility to increase transparency, strengthen accountability, and improve collaboration for Section 508 implementation.

[Applicability of PRA to Direct Observations of Users Interacting with Digital Services Tools and Products](https://www.whitehouse.gov/sites/default/files/omb/inforeg/pra_flexibilities_memo_7_22_16_finalI.pdf), OMB, 2016.

“[Flexibilities under the Paperwork Reduction Act for Compliance with Information Collection Requirements](https://www.whitehouse.gov/sites/default/files/omb/inforeg/pra_flexibilities_memo_7_22_16_finalI.pdf)”, OMB. July 22, 2016.

“In some cases when agencies obtain information on user interactions with digital services tools or products, including prototypes of those tools or products, they may not be subject to the PRA. In particular, under its regulations OMB does not generally consider facts or opinions obtained through direct observation by an employee or agent of the sponsoring agency or through nonstandardized oral communications in connection with such direct observations to be information under the PRA. See 5 C.F.R. 1320.3(h)(3). Thus, when the sponsoring agency merely observes a user interacting with a digital services tool or product and at most engages in nonstandardized oral communications with the user, the facts or opinions the sponsoring agency obtains are not subject to the PRA. Any direct observation should respect the observed parties' privacy and require their voluntary consent. In practice, many agencies, such as statistical agencies developing large scale surveys, couple direct observation with recruitment, screening, debriefing, and other data collection activities; for example, those necessary to remunerate participants. Many of these types of activities are covered by the PRA, but can still be facilitated through the generic clearance process. “

“[Social Media, Web-Based Interactive Technologies, and the Paperwork Reduction Act”](https://www.whitehouse.gov/sites/default/files/omb/assets/inforeg/SocialMediaGuidance_04072010.pdf), OMB, April 7, 2010.

Relevant guidance for how to achieve compliance during collaborative stakeholder/customer engagement and discovery.

“[A Strategy for American Innovation](https://www.whitehouse.gov/sites/default/files/strategy_for_american_innovation_october_2015.pdf),” National Economic Council and Office of Science and Technology Policy, October 2015.

Outline of strategic moves for furthering innovation in the United States.

“[Open Innovators’ Toolkit](https://www.whitehouse.gov/sites/default/files/microsites/ostp/openinnovatortoolkit_nstcmemo.pdf)”, NTSC, 2012.

Details rationale for Lean Startup methods in government.

**Deliverable 7: Online inventory of resources**

**Contact**

For more information on applying Lean Startup approaches, contact Marc Wynne, [marc.wynne@cms.hhs.gov](mailto:marc.wynne@cms.hhs.gov).

**Federal Resources for Lean Startup:**

* [Lean Product Design Playbook](https://pages.18f.gov/lean-product-design/lean-product-principles/) details the principles and process for “working in an iterative way while staying grounded in user outcomes.”
* [Agile Principles & Practices](https://pages.18f.gov/agile/) describes the core commonalities to different agile methodologies, which also emphasize experimentation, validation, and iteration.
* [Digital Services Playbook](http://playbook.cio.gov/) offers private sector best practices to help agencies successfully deliver digital services.
* [TechFAR Playbook](https://playbook.cio.gov/techfar/) highlights flexibilities in the Federal Acquisition Regulation (FAR) that can offers guidance on working with contractors in an iterative, customer-driven software development process
* How to conduct stakeholder interviews, [Part 1](https://18f.gsa.gov/2016/06/20/build-empathy-with-stakeholder-interviews-part-1-preparation/) and [Part 2](https://18f.gsa.gov/2016/07/22/building-empathy-with-stakeholder-interviews-part-2-conversation/). (And [slide deck,](https://speakerdeck.com/andrewmaier/foster-the-people-building-empathy-with-stakeholder-interviews) by Andrew Maier, 18F).
* [Government at the Speed of Silicon Valley](https://www.volpe.dot.gov/event/us-dot-chief-innovation-officer-chris-gerdes) asks how the government can gain the speed and flexibility of the private sector
* “[Government at the Speed of Silicon Valley](https://www.volpe.dot.gov/event/us-dot-chief-innovation-officer-chris-gerdes)”, video by Chris Gerdes, Department of Transportation, October 2016

**Further Reading / References**

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* Ries, E., *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, Crown Business Publishing, 2011
* “[Funding Radical Experimentation](http://acceleratechange.org/wp-content/uploads/2015/04/2afcae_0f193ec4692841248d6d1d6acab405ea.pdf),” Accelerate Change. While geared towards funders in non-profit sphere, offers detailed advice relevant for grant making program officers.
* [10 Tips for Customer Discovery in the Social Impact Sector](http://plusacumen.org/blog/10-tips-for-customer-discovery-in-the-social-impact-sector/),A[c](http://plusacumen.org/blog/10-tips-for-customer-discovery-in-the-social-impact-sector/)u[m](http://plusacumen.org/blog/10-tips-for-customer-discovery-in-the-social-impact-sector/)e[n](http://plusacumen.org/blog/10-tips-for-customer-discovery-in-the-social-impact-sector/),J[u](http://plusacumen.org/blog/10-tips-for-customer-discovery-in-the-social-impact-sector/)l[y](http://plusacumen.org/blog/10-tips-for-customer-discovery-in-the-social-impact-sector/) [2](http://plusacumen.org/blog/10-tips-for-customer-discovery-in-the-social-impact-sector/)0[1](http://plusacumen.org/blog/10-tips-for-customer-discovery-in-the-social-impact-sector/)5[.](http://plusacumen.org/blog/10-tips-for-customer-discovery-in-the-social-impact-sector/) Offers concrete tips applicable to Federal customer discovery work
* Murray, P. and Ma, S., "[The Promise of Lean Experimentation](https://ssir.org/articles/entry/the_promise_of_lean_experimentation)," Stanford Social Innovation Review, Summer 2015. How nonprofits can adopt an innovation model used in the business world.
* Chopra, A. “[Project Innovation](http://www.govexec.com/magazine/features/2014/05/project-innovation/84115/)”, GovExec,May 2015.Describes several Federal efforts to apply Lean Startup methodology, including HHS’ Entrepreneurs-in-Residence program and CFPB.
* Ries, E. “[The Lean Startup: Doing More With Less](http://www.slideshare.net/startuplessonslearned/2009-09-08-the-lean-startup-gov-20-summit-edition)”, Startup Lessons Learned, September 2009 Slide Deck from Eric Ries on Lean Gov 2.0
* [“](http://www.slideshare.net/startuplessonslearned/2009-09-08-the-lean-startup-gov-20-summit-edition)[How To Build a Startup](https://www.udacity.com/course/how-to-build-a-startup--ep245)[”,](http://www.slideshare.net/startuplessonslearned/2009-09-08-the-lean-startup-gov-20-summit-edition) [T](http://www.slideshare.net/startuplessonslearned/2009-09-08-the-lean-startup-gov-20-summit-edition)h[e](http://www.slideshare.net/startuplessonslearned/2009-09-08-the-lean-startup-gov-20-summit-edition) [L](http://www.slideshare.net/startuplessonslearned/2009-09-08-the-lean-startup-gov-20-summit-edition)e[a](http://www.slideshare.net/startuplessonslearned/2009-09-08-the-lean-startup-gov-20-summit-edition)nL[a](http://www.slideshare.net/startuplessonslearned/2009-09-08-the-lean-startup-gov-20-summit-edition)u[n](http://www.slideshare.net/startuplessonslearned/2009-09-08-the-lean-startup-gov-20-summit-edition)c[h](http://www.slideshare.net/startuplessonslearned/2009-09-08-the-lean-startup-gov-20-summit-edition)p[a](http://www.slideshare.net/startuplessonslearned/2009-09-08-the-lean-startup-gov-20-summit-edition)d[.](http://www.slideshare.net/startuplessonslearned/2009-09-08-the-lean-startup-gov-20-summit-edition) The original open-source lectures for the Lean LaunchPad initiative found through Udacity
* Vermeulen, R., “[Design thinking and Lean Startup](http://www.slideshare.net/IxDABarcelona/design-thinking-lean-startup-35205536)”, May 2014.Useful comparison of the similarities and differences between design thinking and Lean Startup principles.
* “[Design Thinking vs Lean Startup - which to use, and when](http://www.slideshare.net/bradplogsted/design-thinking-vs-lean-startup/24-D_E_S_I_G)”, OXC Design + Strategy, April 2014. Another comparison of design thinking and Lean Startup.
* Blank, S., [Tools and Blogs for Entrepreneurs](http://steveblank.com/tools-and-blogs-for-entrepreneurs/).

**Watch and Listen**:

* “[Stanford University’s Entrepreneurship Corner](http://ecorner.stanford.edu/index.html)”[.](http://ecorner.stanford.edu/index.html) Offers 2000 free videos and podcasts, featuring entrepreneurship and innovation thought leaders
* “[Lean Experimentation for the Social Sector: Build Smart to Learn Fast](https://ssir.org/podcasts/entry/lean_experimentation_for_the_social_sector_build_smart_to_learn_fast)”, Stanford Social Innovation Review, August 2016. 55 minute podcast featuring Steven Blank, Giff Constable, Chase Adam, & Alethea Hannemann.
* Blank, S., **“**[Business Model Design For Mission Driven Organizations](https://www.youtube.com/watch?v=_jvwCY1OjlQ),” June 2016. An hour long webinar from Steve Blank

**Other Lean Startup Resources,** [**as recommended by NSF I-Corps**](https://www.nsf.gov/news/special_reports/i-corps/resources.jsp)**:**

[Blank, Steven](http://steveblank.com/). *The Four Steps to the Epiphany*. 2005.  
Provides step-by-step strategy for any new company or product.

[Blank, S. and Dorf, B.](https://steveblank.com/), *The Startup Owner's Manual:* *The Step-By-Step Guide for Building a Great Company. 2012.*  
Describes each stage of the customer development process.

Constable, G.,”[*12 Tips for Customer Development Interviews*](http://giffconstable.com/2011/07/12-tips-for-customer-development-interviews-revised/)*” (revised)*, July 2011.  
Covers how to conduct meaningful interviews and understand the feedback given.

Kim, W. C. and Mauborgne, R., [.](https://www.nsf.gov/cgi-bin/good-bye?http://www.blueoceanstrategy.com/) [*The Blue Ocean Strategy*](http://www.blueoceanstrategy.com/). 2005.  
Reviews how to create and capture untapped markets.

Livingston, J., ”[*Founders at Work: Stories of Startups' Early Days*](http://www.foundersatwork.com/)*”*,2007.  
Through interviews with founders of famous technology companies, this book demonstrates what makes a startup successful.

 ”[*Assessing the Impacts of Changes in the Information Technology R&D Ecosystem: Retaining Leadership in an Increasingly Global Environment*](http://www.nap.edu/catalog/12174/assessing-the-impacts-of-changes-in-the-information-technology-rd-ecosystem)*”*, National Research Council*,* 2009.  
Chapter 1 describes the innovation ecosystem for the information technology sector.

Osterwalder, A. and Pigneur Y., [*Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers. 2010.*](http://www.businessmodelgeneration.com/canvas/bmc)Discusses how to create, examine, refine, and implement successful business models.

Pincus, M.,. ”[*Quick and Frequent Product Testing and Assessment*](http://ecorner.stanford.edu/videos/2313/Quick-and-Frequent-Product-Testing-and-Assessment)*”*, October 2009.  
Overview of how to conduct rapid product testing and assessment to gauge consumer interest and to test and improve multiple products simultaneously.

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Duxbury, Tom. “Improvising Entrepreneurship,” [Technology Innovation Management Review](http://search.proquest.com.mutex.gmu.edu/pubidlinkhandler/sng/pubtitle/Technology+Innovation+Management+Review/$N/2034500/PagePdf/1614470611/fulltextPDF/579B2BAB73F24819PQ/1?accountid=14541)**,**pp. 22-26. July 2014.

Harms, R., “[Self-regulated learning, team learning and project performance in entrepreneurship education: Learning in a lean startup environment,” Technological Forecasting and Social Change](http://www.sciencedirect.com/science/article/pii/S0040162515000281), Volume 100, p. 21-28, November 2015.

York, J. “Customer development, innovation, and decision-making biases in the lean startup.” Journal of Small Business Strategy, pp. 21 - 39 October 2014.

**Annex of Interviews:**

Steve Blank

Dean Chang

Read Holman

Andrea Kates  
Marc Wynne