IHI Innovation System

● **AUTHORS:**

Lindsay A. Martin, MSPH: *IHI Faculty and Instructor, Department of Health Policy and Management, Harvard T.H. Chan School of Public Health; Former Executive Director for Innovation, IHI*

Kedar Mate, MD: *Chief Innovation and Education Officer, IHI*

The Institute for Healthcare Improvement (IHI) is a leading innovator in health and health care improvement worldwide. For more than 25 years, we have partnered with visionaries, leaders, and frontline practitioners around the globe to spark bold, inventive ways to improve the health of individuals and populations. Recognized as an innovator, convener, trustworthy partner, and driver of results, we are the first place to turn for expertise, help, and encouragement for anyone, anywhere who wants to change health and health care profoundly for the better. The ideas and findings in these white papers represent innovative work by IHI and organizations with whom we collaborate. Our white papers are designed to share the problems IHI is working to address, the ideas we are developing and testing to help organizations make breakthrough improvements, and early results where they exist.

Contents

Executive Summary

There are many approaches to, and systems for, innovation in health care (e.g., design and development of novel clinical therapeutics and diagnostics, information technologies, and technology-enabled services). These are essential, and we recognize that others are well positioned to pursue these endeavors and advance the field.

The Institute for Healthcare Improvement (IHI) has focused its innovation efforts on *health care delivery*: identifying evidence-based better practices for care delivery and developing methods to systematically implement these practices at scale everywhere they are needed. Such delivery system innovations improve outcomes and reduce system-level cost and per capita health care expenditure. Some examples of IHI innovations include developing the concept of "bundles" to reduce ventilator-associated pneumonia and bloodstream infections; creating and testing new concepts for population management through the development of the IHI Triple Aim; and designing new approaches to effective learning and dissemination of better practices (e.g., IHI Breakthrough Series Collaboratives, IHI Learning and Action Networks).[1]

There are two primary customers for IHI's innovation system: health care delivery systems, payers, and policy makers (the end users); and IHI's internal teams, who are trying to serve those end users with useful and effective products and services. For innovation teams within health care delivery organizations, there may also be multiple customers: the patients and families that the systems serve; payers, who seek value for their customers; and internal teams, including leadership, shareholders, and operations teams seeking more efficient and effective ways to meet their end users' needs.

By creating its own innovation system, IHI has not only developed dozens of ideas that are in practice around the world, but also learned how to create and manage an innovation function within an improvement organization. We have had the privilege of working with health care organizations to both test ideas that come out of IHI's innovation system and work with them to design and implement their own internal innovation systems.

The infrastructure to support an innovation system within each health care system is different — including budgets and policies, available personnel, distribution channels, and community and social assets. For some organizations, the best option is to identify innovative ideas developed by others and then serve as an alpha or beta tester. For others, prevailing patient need, economic conditions, and resource availability may lead to the creation of their own internal innovation systems.

In this paper, our goal is to describe how to create an internal innovation system, based on the needs of your organization, that focuses on improving health care delivery. We share our nearly 30 years of experience with innovation at IHI, using examples to highlight how to move through this process, determine what is right for your organization, and balance innovation activities with ongoing operations.

IHI's Roots in Innovation

Innovation is a founding principle at IHI: the organization was formed based on the theory that health care could learn from ideas that had originated in other industries and apply them to achieve improved performance. IHI developed, in part, out of a grant from The John A. Hartford Foundation to Dr. Donald Berwick and a group of visionary leaders in 1986 to create the National Demonstration Project on Quality Improvement in Health Care. At the time, Berwick, a pediatrician, also served as Harvard Community Health Plan's Vice President for Quality-of-Care Measurement. In this position, he investigated quality management systems in other industries such as aeronautics and manufacturing to consider their applicability to health care settings.

It was not clear, at that time, if or how the methods of industrial quality management could help improve health care. Early testing in the National Demonstration Project with 21 health care systems led to promising results in improving flow, safety, clinical effectiveness, and financial performance.[2] Thirty years later, IHI's experience and that of others have demonstrated that innovations from inside and outside of health care can help drive better performance in health care systems around the world.

IHI spent its initial decade and a half (1990 through 2005) innovating in a "project-based" mode. Ideas for improvement were derived by working closely with leading-edge health care organizations that possessed the will and infrastructure to test new and better ways of delivering care. One example of this was the Pursuing Perfection initiative, an eight-year demonstration program (2001 through 2008) with 13 participating health care systems, funded by the Robert Wood Johnson Foundation. The overall aim of Pursuing Perfection was to "show that system-wide quality improvement efforts are feasible and, through such efforts, set new benchmarks for health care quality and safety."

In order to achieve performance improvement breakthroughs, innovations or "idealized designs" were continually derived and tested. The limitations of this process were that new ideas were uncovered and developed serendipitously, without a predictable rhythm, pacing, or support system. While IHI was developing new ideas and growing as an organization, we didn't have a disciplined and standard process for learning and innovating.

IHI Innovation System

Six Key Design Components

In 2006, IHI began focusing on developing a more standardized approach to learning and innovation. We studied innovation systems outside of health care, in industry and manufacturing sectors, particularly in high-reliability fields like aviation and nuclear energy. One highly influential example was Proctor and Gamble's focus on looking outside the organization to harvest new ideas and then methodically bringing those ideas in house to make them accessible — a process they called "open innovation."[3] IHI also studied innovation systems within leading health care systems like Kaiser Permanente, Ascension Health, and Stanford Health Care.

Based on this research, IHI identified six key components that were common to effective innovation systems (see Figure 1).

Figure 1. Six Components of an Effective Innovation System

1. Pace	Some predictable rhythm of producing new knowledge
2. Staff with dedicated time	A team of people who have allocated time to work specifically on innovation, initially part-time but eventually full-time
3. A forum for collective thinking to address problems that need innovation	Workshop time for collective reflection and to gather the insights of others external to the research process
4. Organization-wide understanding of the innovation function	This includes defined roles and responsibilities within the innovation system, as well as connection points between innovation and ongoing operations
5. A laboratory for testing	Multiple laboratories and contexts around the world that could test hypotheses and theories, in a robust and rapid fashion, about what might lead to more effective and reliable delivery of products and services
6. Predictable deadlines with a decision point	A timeline for the innovation process and a decision at the end of the research and experimentation period about whether to proceed with or abandon the innovation

These components became the design specifications for the development of a new innovation system at IHI. To establish *pace*, we created a new timeline: innovation projects would be chartered in 90-Day Learning Cycles — IHI's model for reliably and efficiently researching innovative ideas, assessing their potential for advancing quality and safety in health care, and bringing them to action. (More details follow in the section on Create a Disciplined Innovation Process.)

To address the need for *staff with dedicated time*, we initially allocated 30 percent time for five individuals with interest in innovation to conduct innovation projects. As the system matured, five full-time staff were allocated to innovation work. Innovation projects were staffed by three-person teams: a "lead" who had primary responsibility for the 90-day project; a research assistant; and a "helper," the lead on another innovation project whose primary role was to serve as a thought partner. External advisors or IHI faculty members might contribute to an innovation project, but most projects were resourced with the three-person team.

To create a *forum for collective thinking*, IHI organized weekly team meetings to discuss the sticking points of each project and challenge each other to reach further. In addition, larger innovation meetings within IHI occurred every six to eight weeks to discuss the progress of each project with IHI senior leaders and content area leads. During these meetings, the innovation project leads were given feedback on their progress, contacts for further exploration or testing, ideas for redirection if necessary, and links within the organization. To create *organization-wide understanding of the innovation function* within IHI, each innovation project had a standard charter, including the aim, rationale, background, and all intended deliverables for the innovation project (see Appendix). These charters were posted electronically and accessible to all IHI staff.

IHI built strong relationships with multiple health care delivery systems to create a ***laboratory for testing*** the new ideas developed in 90-Day Learning Cycles at the point of care. Through the mutual exchange of information between the IHI innovation team and the health care field, both entities gain insights and advance their learning. Finally, to address the need for ***predictability*** in IHI's innovation system, each innovation project had a decision point at the end of 90 days, when the innovation team and senior leaders chose one of four possible actions:

- **Fail:** Stop additional development.

- **Direct to Market:** Launch a new IHI program or service based on the innovation.

- **Hold:** The innovation has strong merit, but there are currently no willing testers; no market is available for the innovation.

- **Develop Further:** Run another 90-Day Learning Cycle to further develop and test a promising idea that was determined to be not yet mature enough for deployment.

A New Mental Model of Innovation

In addition to identifying six key components of IHI's innovation system, we developed a new mental model of what it means to innovate with and within health care delivery systems. Five characteristics define the difference between the old and new mental models of innovation (see Table 1) — and the new mental model continues to guide IHI's current innovation system.

Table 1. Old vs. New Mental Models of Innovation

Old Mental Model	New Mental Model
Inventers invent.	Innovation is a disciplined process grounded in an understanding of need, based on close observation.
Innovation is everyone's job.	Innovation requires dedicated resources.
Leadership commissions innovation and then awaits its products.	Leadership conscientiously links innovation and operations together to ensure implementation and adoption of proven new ideas.
There is a specific way to innovate and create value.	Organizations use multiple innovation methods, matched to customer needs.
Innovations are found and developed within an organization.	The organization is open to new ideas from anywhere.

Innovation is a disciplined process grounded in an understanding of need, based on close observation.

Innovation has well-developed mythology. Archimedes had his "Eureka!" moment when he stepped into a bathtub and noticed that the water level rose. Sir Isaac Newton discovered gravity

while observing an apple falling from a tree. During a thunderstorm, armed with a metal key attached to a kite, Benjamin Franklin demonstrated the connection between lightning and electricity. But these well-known anecdotes don't tell the entire story of discovery. Successful innovation is typically not achieved in a single moment, as these examples may suggest, but most often occurs via a process characterized by discipline, dedicated resources, deep observation, and iterative testing cycles that refine ideas as they succeed or fail. As Thomas Edison is rumored to have said, "I have not failed 1,000 times. I have successfully discovered 1,000 ways *not* to make a light bulb."

Innovative ideas and approaches can be identified by observing the current state, understanding anomalies, learning from those who have used a different approach, and tracking outcomes of those approaches. Critically, all innovation efforts start with some process to develop a deep and multidimensional understanding of what is needed. It is important to restate this: Innovation requires a fundamental understanding of what people and systems really need, not what they say they want. And understanding "customer" need is best done through close observation. As Henry Ford said, "If I had asked people what they wanted, they would have said faster horses." Ford's invention of the automobile was driven by people's need for a faster way to get from one place to another. (More details follow in the section on Create a Disciplined Innovation Process.)

> *Example:* In a 2016 innovation project, IHI partnered with a health system in the midwestern US to understand how to improve access to contraceptive care for individuals of diverse backgrounds. Through direct observation and field study with community health workers, IHI learned that many of the prevailing models for helping consumers make contraceptive decisions were not culturally sensitive and did not appeal to women of diverse backgrounds. This compelled a redesign of the contraceptive choice conversations and service offerings at this health system.

Innovation requires dedicated resources.

While innovative ideas can come from anywhere and anyone, the notion that "innovation is everyone's job" often dilutes the results. When innovation is everyone's job, it is likely no one's job. The ability to fundamentally change the current system cannot be accomplished by slivers of people's time. As Dartmouth Professor Chris Trimble has written, organizations that try to innovate in this way tend to focus on smaller, more incremental changes to the system.[4] More fundamental transformation of the way the system currently operates requires dedicated resources that can safely disrupt people's normal routines, to reconsider how to more efficiently and effectively deliver value to the patient and family. (More details follow in the section on Determine the Innovation System Architecture.)

> *Example:* At Kaiser Permanente, a dedicated team of designers and innovators, called the Design Consultancy, helps the organization address its innovation and design challenges. The Design Consultancy has redesigned aspects of diabetes care, patient flow, and patient safety. Video ethnography is one interesting technique Kaiser has used to better understand the lived experiences of individuals with complex care needs and then re-imagine the care delivered to them.

Leadership conscientiously links innovation and operations together to ensure implementation and adoption of proven new ideas.

An organization's innovation system and its routine operations (e.g., patient care, administration, support services, information systems) need to work together. Operations teams can leverage

innovative ideas to achieve improvement within the current system, while innovators seek the next set of breakthrough changes. It is the job of leadership to value both the innovation and operations teams, and create the optimal conditions to ensure that they are co-dependent and not just co-existing. (More details follow in the section on Integrating Operations and Innovation.)

> *Example:* At the University of Pennsylvania Health System, the innovation team will not work on a project without a clinical champion leading or co-leading the project alongside of the innovation team. The champion is deeply engaged in routine clinical care operations within the test environment and understands the daily realities faced by those who work in the system. Because of this, an innovative effort to deprescribe unnecessary medications never launched because an internal clinical champion was not identified; an innovation project to transform the discharge process using rapid in-home assessments post-discharge did move forward because this project had both a clinical and an administrative champion.

Organizations use multiple innovation methods, matched to customer needs.

Many organizations start with one method for innovating that suits their particular need and then become transfixed by that method. While this is a good starting point (and this is how IHI started), it is also limiting. The various types of customer needs, problems, timelines, and requirements warrant distinct methods for innovation. Failing to utilize multiple methods often results in limited outcomes or narrowed innovations.

A few example innovation methods are briefly described below:

- **Innovation tournament:** A large number of individuals are asked to submit ideas to solve a particular problem, and the ideas are then narrowed down through successive rounds of vetting (over a few days to weeks) until one winning idea emerges. This approach might serve the important purpose of engaging the creativity of all employees and building interdisciplinary camaraderie, but such tournaments may not complete the task of testing and validating new system designs.

- **Innovation design laboratory:** This approach gives a team the dedicated time to focus on identifying, testing, refining, and validating new designs for rebuilding a care model or service process in a laboratory (in vitro) context.

- **Limited pilot test:** Testing a new idea on a small scale (e.g., on a single clinical care unit) allows for pressure testing the new concept in real time under real-life circumstances.

Each of these methods optimizes a particular aspect of the innovation process — tournaments tend to be effective for crowdsourcing many new ideas, laboratories for developing detailed designs, and pilot tests for trying out ideas on a small scale before more widespread implementation. Organizations should use these methods in parallel or sequentially to build toward a final, implementable innovation. Regardless of which methods an organization selects, the process must be disciplined and standardized. (More details follow in the section on Create a Disciplined Innovation Process.)

The organization is open to new ideas from anywhere.

Successful organizations often get trapped by the thinking (and the products and services) that led to their success originally. Very few organizations will have continued success over time by simply relying on the same, unchanged approach. For instance, Kodak chose not to join the digital

photography revolution initially, and Blockbuster did not embrace on-demand video services — to remain viable, it was innovate or die.

As health care delivery around the world continues to evolve rapidly, new thinking is needed — and organizations with the confidence to embrace new ideas, from both inside and outside their organizations, will be in the best position for success. New ideas might come from unexpected sources within your organization, for example, from individuals who do not typically participate in innovation efforts.

The concept of "open innovation" and sourcing ideas from extended networks allows for efficient scanning of a wide array of potential solutions that could solve local problems. Duke Global Health Innovation Center, for example, has searched seven databases and more than 1,400 innovations to identify those that show the greatest promise for solving current health care challenges. Innovations identified through these efforts come from a range of countries (high- to low-income), focus on a range of health care challenges, and include solutions that aim to change care delivery design as well as payment models and health care policy.

An important note: An organization's innovation team is not the only (or always the best) source of new ideas; it is essential to build a process that sources innovative ideas from others, both inside and outside the organization. (More details follow in the section on Establish Ongoing Management of the Innovation System.)

Developing an Innovation System in Your Organization

Developing an innovation system — based on the six design components and the new mental model of innovation described above — requires leadership to do three things, as shown in Table 2 and described in more detail below.

Table 2. Developing an Innovation System

Determine the Innovation System Architecture	• Establish the Aims/Goals of the Innovation System • Determine Innovation Priorities • Dedicate Resources for Innovation • Prepare the Environment for Change
Create a Disciplined Innovation Process	• IHI's Innovation Process: 90-Day Learning Cycles, 90-Day Testing Cycles • Link Learning and Testing Cycles
Establish Ongoing Management of the Innovation System	• Innovation Drivers • Mainstay Processes • Support Processes

1. Determine the Innovation System Architecture

Establish the Aims/Goals of the Innovation System

When developing an innovation system in your organization, it may be helpful to identify how it is different from your quality improvement function. The **goal of improvement is to *preserve the existing system and make it better*** — to streamline processes; improve performance and efficiency; and eliminate error, harm, and waste produced by those processes.

The **goal of an innovation system is to *create a new or different system*** — to generate new ideas that fundamentally change the existing system, which may lead to a new way of meeting user-defined needs. The effectiveness of the innovation system within an organization depends on how innovation fits into the organization's operations and overall strategy.

Does your organization need an innovation system to:

- Meet new customer needs and expectations?

- Improve the reach or scale of the organization's services?

- Enhance the organization's reputation?

- Generate revenue?

Once you answer these questions, you can begin to establish the types of innovation projects that will help drive toward your organization's desired change.

The next step is for leadership to determine the organization's "growth gap" — the gap between the current state performance and the defined future state performance. The authors of a 2014 *Harvard Business Review* article suggest that, "The larger your company's growth gap, the further from your core [business] those innovation efforts will likely need to be, and the longer it will take to realize substantial revenue from them."[5] Understanding your growth gap helps to set expectations for outcomes and leads to the next step: setting measures to track progress.

By articulating the goals of the innovation system, your organization can then identify a small set of outcome measures for the system. For example, IHI has two core outcome measures for its own innovation system:

- Revenue: 10 percent of IHI's current revenue is related to recent innovation efforts.

- Reputation: IHI is seen as a leading innovator in health and health care (measured via customer surveys).

IHI has defined two process measures related to these outcome measures:

- Revenue: 30 percent of innovation projects from the prior fiscal year are used in revenue-producing work in the current fiscal year.

- Reputation: 30 percent of innovation projects from the prior fiscal year are contributing to IHI's thought leadership, as demonstrated by dissemination of this work in top-tier peer-reviewed journal articles and other publications, media sources, and speaking engagements.

At the end of the 90-Day Learning Cycle, IHI assesses each innovation project, assigning it to one of four categories. The predicted percentages for each category reflect IHI's criteria for a

"healthy" innovation system that is both being responsive to market needs and pushing beyond the current state.

- **Fail:** 15 percent of IHI innovation projects will fail; a rate lower than that typically means we are not challenging ourselves enough in this work or conducting what might be regarded by others as true innovation. IHI defines failure as a project where no new testable ideas emerge, no willing organizations come forward for testing, and there are no plans to integrate findings into IHI's revenue-producing work in the subsequent fiscal year.

  Example: One IHI innovation project aimed to reimagine the role of a district or community hospital in a resource-limited country in providing safer, more efficient care. After reviewing the published literature, conducting expert interviews, and directly observing successes and challenges at a few community hospitals, the IHI innovation team developed an initial redesign that included a distinct administrative structure, evidence integration, and efforts to improve daily clinical operations. These ideas weren't entirely novel, no leadership champions emerged, and there was no appetite from prospective customers to test and validate the elements in the design. The project did not move forward.

- **Direct to Market:** 10 percent of IHI innovation projects will be ready for "production" (i.e., ready for dissemination through one or more of IHI's existing dissemination channels) by the end of the 90-Day Learning Cycle. (In the context of a health care organization's innovation system, "production" means ready for integration with clinical and administrative operations. See the section on Integrating Operations and Innovation below.)

  Example: Two IHI innovation projects, one focused on behavioral health integration and the other on improving joy in the health care workforce, are examples of innovations that went Direct to Market. Both projects resulted in the development of new IHI educational programs, based on findings that identified both customer interest and a market need for the new ideas developed in these projects.

- **Hold:** 25 percent of IHI innovation projects will produce new ideas, but are without willing testers or lack plans to integrate the ideas into IHI project work or educational programs. These ideas are often ill timed and are not useful to the current market. Additional work is needed to create the right environment to engage a small group of testers, or it may be necessary to wait until the market undergoes specific changes that support testing the ideas. In some cases, these projects lead IHI to begin working with our partners to create conditions that might ultimately favor testing and adoption of these innovations.

  Example: Almost a decade ago, IHI began work with employers, health plans, and providers in specific geographic communities, seeking to bring together all three parties in a negotiated local health care market that would lead to fundamentally better care at lower cost for all. The idea failed at that time, but since then market advances and policy changes (e.g., the Affordable Care Act, among others) have led to much greater interest in this innovative idea. In another example, an IHI innovation project focused on bringing technical improvement skills directly to patients (i.e., not going through health system intermediaries). While the innovation project developed useful new ideas and some good patient-facing tools, IHI has yet to identify the best mechanism for successfully implementing this idea.

- **Develop Further:** Approximately 50 percent of IHI innovation projects will require more than one 90-Day Learning Cycle to develop the new idea. If the decision is made to conduct

an additional 90-day cycle on a topic, the project team revises the project charter to update the aims and expected deliverables. Subsequent learning cycles are often needed to complete the pilot testing of the innovation with partners, or to complete the expected communication and dissemination activities associated with the initial cycle.

> *Example:* An IHI innovation project focused on improving health equity required three sequential 90-Day Learning Cycles to develop a new framework on how to improve health equity, develop a testing community for the framework, and disseminate the concepts via an IHI White Paper and other publications. The framework is being further tested and refined by eight US health systems participating in the IHI-led Pursuing Equity initiative.

Determine Innovation Priorities

Core to a strong innovation system is knowing which organizational challenges require innovation. By aligning most (but not all) innovation projects with organizational priorities, the innovation system serves as a support function to help advance strategy. Integration with organizational priorities also guards against the innovation team working on isolated projects that may not target organizational needs.

Use a set of selection criteria to prioritize the innovation projects aligned to organizational priorities. Table 3 outlines the criteria IHI developed for its own innovation projects, which includes major criteria (i.e., an innovation project must meet all of these) and minor criteria (i.e., a project must meet at least one of these). These criteria begin, intentionally, with strategic alignment to ensure that the resources of the innovation system are devoted to efforts that support the mission, vision, and strategy of the organization.

Table 3. IHI Innovation Project Selection Criteria

Major Criteria (Always Required)	Minor Criteria (One or More Required)
- Strategic - Specific - High priority - Value added - Unique contribution - Feasible	- Market intelligence indicates interest in this project - Committed testers have been identified - Project is funded by a partner - Idea is "on the edge"

Depending on the organization's priorities and resources, it is often advisable to leave some capacity in the innovation system for projects on topics that are still emerging but may not yet be a priority. This allows for future-facing ideas to be tested and incubated before determining if they might become organizational priorities.

The challenge with pursuing these types of ideas (IHI refers to them as ideas that are "on the edge") is that it is often unclear if there will be future market interest, a business case, or willing partners inside or outside the organization to test the new ideas. In IHI's experience, these ideas often end up in the "Fail" category, but most frequently they are put on "Hold" until the market can be created or the environment changes sufficiently to drive interest. Understanding an organization's tolerance level for projects that fail helps to determine how much of the innovation

team's efforts can be allocated to innovation projects for ideas that are not aligned with organizational priorities.

> ***Example:*** The original concept of the IHI Triple Aim was developed in 2006 in an IHI innovation project, based on an idea from Tom Nolan (IHI Senior Fellow and leader of IHI's innovation projects at the time) that he discussed with John Whittington (IHI Senior Faculty and innovation lead) and Don Berwick (then IHI President and CEO). In 2006, many health care experts saw the concepts of quality, access, and cost as being in competition, and very few US health care organizations were working on population health — which seemed to indicate no market interest in or readiness for the concept. In fact, at that time, IHI considered the Triple Aim to be an idea that was "on the edge" and perhaps not strategic for IHI. But, on further reflection, IHI believed that the future of US health care depended on the Triple Aim: the simultaneous pursuit of better health, better experience of care, and lower per capita cost of care could benefit populations and communities. Thus, IHI decided to dedicate additional innovation project time and resources to further develop this idea that led to a national movement around the Triple Aim. More than 30 IHI innovation projects conducted over seven years have since contributed to improving care for populations.

Dedicate Resources for Innovation

Determining the structure of an organization's innovation system is a complex issue that is based on the organization's mission and vision, its internal and external demands, and its available innovation capacity. As noted earlier in the paper, organizations must have dedicated staff with time allocated for innovation; small amounts of many people's time are generally insufficient. On the other hand, dedicating full-time resources seems infeasible for most health care organizations.

For example, for a health care organization with 3,000 employees, say 1 to 2 percent of everyone's time is allocated to innovation. Across the organization (assuming 8-hour days), that would equal 240 hours per day dedicated to innovation, or 30 full-time equivalents (FTEs) — a significant allocation of resources. But what does this look like at the individual level? In a typical 8-hour day, a 1 to 2 percent commitment translates to 5 to 10 minutes per person per day. What can you possibly design, develop, and deliver in 5 to 10 minutes per person per day? For such a substantial investment, the organization will get predictably little innovation.

The strategy of having many individuals devote small amounts of time fundamentally limits the size and scope of innovation projects — this approach results in smaller, incremental adjustments to the existing system. To get more substantial changes at the whole system level requires larger amounts of dedicated time from a few individuals. Using the same example, rather than 30 FTEs, the organization would gain more from an innovation system that has 10 to 15 FTEs allocated, providing the time for a designated group of individuals to focus on creating and testing fundamental changes to current care delivery system designs.

> ***Example:*** During an IHI National Forum, Dr. Richard Gibney, a nephrologist in Texas, learned about a new idea: patients in Sweden conducting their own dialysis.[6] Gibney took the idea back to his dialysis center, but rather than engaging small amounts of time from every nephrologist and medical staff member, he created and tested his model of "empowered dialysis" with a small team, dedicating one administrator, one nurse, and himself to set up and test the new service.[7] He started small with a handful of patients, tested the feasibility of the new approach for a limited time, and quickly scaled from there.

Now, about 56 percent of patients at Gibney's dialysis center are engaged in self-dialysis, with much lower hospitalization rates and overall mortality rates.

In addition to having the time to develop the innovation, the individuals working on an innovation project ideally do not have responsibility for current operations in the area of innovation. There is too much bias toward the current system design when individuals are both trying to work within the status quo and develop a new idea, process, or method that seeks to fundamentally redesign the current system. Trimble refers to this as "clean slate design," in which the individuals working on the innovative idea can test a new approach without worrying about breaking the existing system.[8]

IHI's innovation system — which supports approximately 25 innovation projects per year — is currently staffed by five innovation leads, who dedicate at least 30 to 50 percent of their time to working on innovation, and a team of between six and eight full-time researchers, who work with the leads to support projects.

For health care delivery systems, taking people out of routine clinical operations for days, weeks, or months of time to work on innovation means considerable loss of clinical productivity and associated costs. To take a doctor and two nurses off line for a week to design, develop, and test a new idea would cost the system (using rough estimates) up to $60,000. Every health system will be different and every innovation project will be different, both in terms of staff required and other associated costs. But this figure may serve as a useful starting point for understanding how to estimate the "investment" side of the return-on-investment calculation. At IHI, we seek at least a 10:1 return on our investment in innovation. (For example, we would seek at least a $600,000 return on a $60,000 investment in an innovation project.)

Prepare the Environment for Change

By definition, innovation requires change. As *Made to Stick* authors Chip and Dan Heath note, change is hard, and yet every day hundreds of thousands of people willingly make big changes to their lives (e.g., get married, have a child, start a new job). Although change is hard, it is possible — and resistance to change is common and normal.

It is leadership's role to help prepare the organization and staff to accept new ways of doing business and to create an environment that can marry strategy and operations to drive stronger outcomes. To build the will for change, leaders need to demonstrate that a new way of doing business, or implementation of a new tool or method, does not mean that staff in the current system will be permanently displaced or out of a job. It is impossible to create an environment that is receptive to change when employees fear losing their jobs. Roles may change with the development of successful innovations, and it is the responsibility of leaders to prepare staff for how their work may change (which might be for the better) as a result of the new innovation.

Leaders also play a critical role as connectors, internally and externally. Because they have the high-level view of their organizations, leaders can see linkages across projects, programs, and departments that may not be obvious to others.

2. Create a Disciplined Innovation Process

As discussed above, most effective innovation systems have six components: pace; staff with dedicated time; a forum for collective thinking to address problems that need innovation;

organization-wide understanding of the innovation function; a laboratory for testing; and predictable deadlines with a decision point.

In addition, IHI has developed a disciplined process for each specific innovation project within the overall innovation system, including two core elements that are linked fundamentally: the 90-Day Learning Cycle and the 90-Day Testing Cycle.

90-Day Learning Cycle

The 90-Day Learning Cycle (see Figure 2) has five steps, as described in more detail below.

Figure 2. IHI 90-Day Learning Cycle

Charter Development → Scanning → Theory Building → Theory Validation → Summarization and Reporting

- **Charter Development:** All innovation project charters are written within the first 10 days of the project. The charter template includes the project's aim, background, team composition, potential contacts, anticipated deliverables, and timeline. In this step, the specific intent and aim of the project and the primary question and/or customer need are specified in as much detail as possible.

- **Scanning:** The first 30 to 40 days of an innovation project are devoted to scanning. During the scanning process, the innovation project lead and research associate explore different aspects of the innovation topic using a variety of resources: published health care literature, grey literature, popular press, stories from the field, and interviews with topic experts and "out-of-the-box" thinkers. Ideas from other industries are often sought to offer insights into the innovation topic by way of analogy. IHI uses a classic snowball method, searching bibliographies for additional written resources, constructing a "verbal bibliography" by asking interviewees who inspired their thinking, and then contacting those individuals to trace the formation of novel ideas.

  Depending on the setting and the nature of the innovation project, the scanning process may also include direct observation of behavior to better understand not just the stated needs of the end users, but also their unexpressed needs and desires. Unlike a systematic literature review, the goal of the scan is not to conduct an exhaustive review of the field, but rather to gather sufficient information to be apprised of the field, familiar with the challenges, aware of successes, and confident in the angle that will be pursued in the innovation project. As the scan proceeds, new ideas are included in the charter and the scope of the project becomes more explicit.

  Note that senior leaders can be key in scanning. Given that their roles are often externally facing, they have the opportunity to notice new ideas, interesting processes, systems that worked better than expected, and methods that are exciting and different. In observing and then bringing back these ideas, senior leaders can expand the reach of the innovation leads and help collect useful observations. Not all ideas will be acted on, and sometimes it takes multiple observations to spark an idea for a new approach, but continuously observing and then sharing new ideas with the organization's innovation project team helps cross-pollinate those ideas more efficiently.

- **Theory Building:** Scientific observation of the impact of any improvement or innovation requires an explicit theory for achieving the stated goal. Without a theory there is no hypothesis, and without a hypothesis there is no way to determine if the outcome is expected or an anomaly. For example, by observing the work of successful quality improvement organizations, IHI developed a theoretical context for high-performance management, grounded in the Juran Trilogy (quality planning, quality control, and quality improvement). This theory led to the formation of a hypothesis: quality control principles deployed via a frontline management system will lead to sustained quality improvement changes.[9] This theory and hypothesis are now being tested by IHI in multiple quality improvement efforts around the world. While theories of change may take many forms (e.g., a conceptual model, a logic model, or a driver diagram), they all need a clear statement of the predicted outcome and a measurement framework to guide testing of the theory.

- **Theory Validation:** As the theory takes shape, the innovation project lead continues to conduct research, search the field, talk to experts, and validate the theory, continuously looking for anomalies that either prove or disprove the theory. By conducting very early small-scale alpha testing internally and with experts, the lead can gain confidence in the theory prior to testing externally. These small tests can be as simple as asking one or two experts that were interviewed early in the process to test the new theory, or asking an end user to test the theory and gain their insight as to what is missing.

- **Summarization and Reporting:** At the end of the 90-Day Learning Cycle, the innovation project team has a theory with some early-stage validation. The theory still needs to be matured into a testable prototype that can undergo further testing should the organization decide to move forward with the work. All 90-Day Learning Cycles conclude with a written internal document that summarizes the scanning, the theory, the findings, conclusions, and open questions for further exploration. This explicit synthesis and documentation catalogues the learning from the project and enables the organization to return to this innovation topic at a future date, should the organization decide not to proceed with the innovation immediately. In addition, once the work is synthesized and documented, the innovation project lead and organizational senior leaders review and assess each project, assigning it one of four categories (as described above): Fail, Direct to Market, Hold, or Develop Further. Regardless of the assessment, the same standard synthesis and documentation occur.

90-Day Testing Cycle

For projects assessed as "Develop Further," the next phase is to conduct a 90-Day Testing Cycle. This cycle enables the innovation lead to test the theory more thoroughly and gain deeper knowledge of what does and does not work. The 90-Day Testing Cycle (see Figure 3) has five steps, as described in more detail below.

Figure 3. IHI 90-Day Testing Cycle
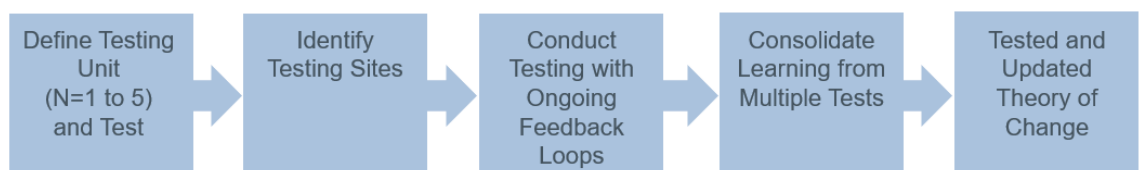
- **Define Testing Unit:** The innovation project team writes a new charter within the first 10 days, defining the specific theory and prototype to be tested, and where testing might be conducted (e.g., a hospital unit, outpatient clinic, community setting, or other microsystem). In addition, the charter clearly articulates a hypothesis, a prediction, and expected

deliverables. The team determines the number of testing sites, typically between one and five sites, depending on the project.

- **Identify Testing Sites:** Potential testing sites are often identified during the 90-Day Learning Cycle. At this stage, the innovation project lead contacts organizations in the innovation network and their personal network to determine sites that are willing to test the idea. Senior leaders may also help identify potential testing organizations.

- **Conduct Testing with Ongoing Feedback Loops:** The innovation project lead, who is either directly engaged in conducting tests or observing the tests conducted by other organizations, focuses on observation and learning during this stage. Iterative small-scale tests are conducted to allow for the idea to be refined and improved, and then retested, and to build confidence in the theory over time.

- **Consolidate Learning from Multiple Tests:** Once testing is complete, the innovation lead consolidates the learning from across all test sites. This learning helps refine the initial theory of change.

- **Tested and Updated Theory of Change:** The output of the 90-Day Testing Cycle is a tested and updated theory. As with the 90-Day Learning Cycle, the innovation project team produces a written internal document to summarize the testing, learning, and updated theory. The innovation project team and organizational sponsor then assess the project as either Fail, Direct to Market, Hold, or Develop Further.

Link Learning and Testing Cycles

The overall goal of the disciplined innovation process is to address the innovation topic (usually, a complex and persistent challenge) by systematically and intentionally moving from observation to a proven idea. Depending on the complexity of the problem, the project may require one 90-Day Learning Cycle or multiple 90-Day Learning and Testing Cycles that are linked together, with each subsequent cycle building on the previous cycle. For projects with multiples cycles, sometimes the cycles occur immediately, one after the other, in succession; at other times, the team may decide it's necessary to pause between cycles, to allow time for the team to identify the best test sites and prepare the field for the innovation.

Figure 4 depicts the IHI innovation process, linking an innovation project's 90-Day Learning and Testing Cycles, with the goal of moving from initial observation of a new idea to a fully tested, proven idea that is ready to be piloted and eventually spread across an organization or even an industry.

Figure 4. IHI Innovation Process: Linking 90-Day Learning and Testing Cycles to Move from Initial Observation to a Proven Idea
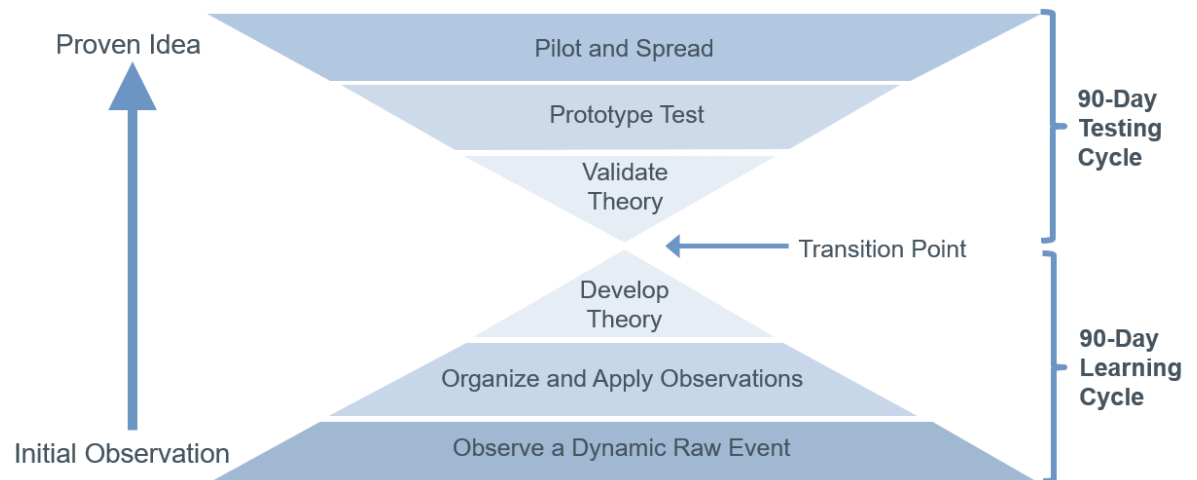
Example: An example of the arc of an innovation project "from initial observation to proven idea" comes from the Age-Friendly Health Systems initiative, led by IHI and The John A. Hartford Foundation. Leaders from the Hartford Foundation observed that, despite their ongoing efforts to improve health care for older adults, progress to implement well-understood geriatric care principles was woefully slow. IHI proposed that looking at the available evidence might help generate new ideas that could lead to better outcomes for older adults. IHI initiated a 90-Day Learning Cycle to identify best practices and begin to organize their core features.[10] The innovation project lead began to develop a theory about the primary drivers for systematic age-friendly health care, and then sought to validate the theory by testing it on a small scale with a group of external expert faculty. Through testing, the theory of how to create Age-Friendly Health Systems was validated and a prototype was developed. Five health systems began to test the prototype, adding implementation guidance to the theory. As those health systems continue to test the prototype under different circumstances, anomalies are surfaced and the theory is further updated. The theory — an Age-Friendly Health Systems model of care — then becomes ready to spread beyond the prototype sites.[11,12]

3. Establish Ongoing Management of the Innovation System

Just as important as developing a disciplined innovation process, reliably followed by each project within the portfolio of innovation projects, is establishing ongoing management of the organization's overall innovation system. At the highest level, the management structure for the innovation system includes consideration of the innovation drivers, mainstay processes, support processes, and overall outcome measures (as described above in the section on Establish the Aims/Goals of the Innovation System).

Innovation Drivers

Individuals, groups, and strategic priorities within the organization are the innovation drivers that help set the direction of the portfolio of innovation projects. Typically, for health care organizations, innovation drivers include customers, governance bodies (e.g., the board of directors), senior leaders, clinical and operational leaders, and organizational strategic priorities.

Key innovation drivers for IHI's innovation system are described below.

- **Strategic Partners/Customer Insight and Market Knowledge:** Observation and listening to customers to better understand their needs, either current or future, are crucial components of determining innovation priorities. IHI gathers input that's relevant to innovation efforts through relationships with our customers, particularly IHI Strategic Partners. In addition, we observe and conduct market analysis of the field at large, and listen for problems that emerge frequently. The need for new ideas or innovations will often not be articulated as a need at all, but rather as a persistent problem that is either an ongoing frustration or an accepted system flaw. Listening for these challenges is an important first step to initiating innovation efforts toward a possible solution.

- **IHI Board of Directors:** Innovation is discussed routinely and explicitly at IHI Board meetings,[13] and IHI innovation team members attend most meetings to actively listen and learn from what board members observe, both within IHI and in the broader health care context. The board of directors helps shape the future work of IHI, providing critical input to help IHI senior leaders determine how much risk the innovation team should be taking, given the ongoing operations of the business, and connecting IHI to valuable innovation partners and potential testing sites.

- **Strategic Priorities:** The organization's strategic priorities should anchor the work of the innovation system. Annually, IHI senior leaders review a set of strategic priorities to determine the continuation, addition, or removal of priorities. In 2018, for example, IHI strategic priorities include a renewed focus on patient safety across the care continuum, joy of the health care workforce, and health equity. There is an interesting dynamic at play here: The innovation team generated original content for these three areas last year, and IHI designated them as strategic priorities for this year. That strategic prioritization then further reinforces the need to invest resources to sharpen the focus and the models of care and services offered in these areas. In this way, innovation both contributes to shaping the priorities and responds to them.

- **Management:** By determining which priorities might benefit from further exploration via 90-Day Learning Cycles, IHI management helps guide the selection of innovation project topics aligned with the multi-year strategic goals established by the organization. In addition, linking back to IHI's strategic priorities provides a line of sight from the innovation system to the broader organization and helps to lessen isolation of innovation work.

- **Operational Leaders:** IHI's business is organized around defined portfolios of work (e.g., improvement science, safety, value, health, equity, joy in work). Leaders for each portfolio help articulate both the current needs and the expected future direction of the work in each area, which helps determine where innovation system resources will be deployed to advance a specific portfolio objective or begin to push beyond the portfolio's current work, without disrupting ongoing operations.

By maintaining regular touchpoints with these innovation drivers, IHI's innovation team ensures that its work is connected to organizational priorities and is not being conducted in isolation.

Mainstay Processes

Mainstay processes form the basis of the innovation system and drive toward the overall outcome of the system. IHI has defined four mainstay processes of an innovation system:

- **Harvesting:** A process that standardizes the collection, synthesis, prioritization, and selection of ideas for innovation projects. Harvesting is everyone's responsibility. IHI recognizes that new ideas can be identified by anyone at any time; however, senior leaders are most directly responsible for harvesting since their roles include more frequent connection with others outside IHI. Harvesting is a broad process; often IHI is not intentionally seeking a specific idea, but rather observing events and trends in different locations and settings around the world, both within and outside of health care. IHI continuously scans for the following:

  - Gaps in health care, health, execution/learning/implementation methods;

  - Something new, innovative, or exciting;

  - Successes to be shared more broadly;

  - Failures to be shared more broadly; and

  - Challenges in current work that need solutions.

  Ideas and information harvested from these and other sources are then synthesized and prioritized based on IHI's strategic priorities, needs in the field, and IHI's ability to impact change. The deliverable of the Harvesting step is identifying specific innovation projects that will move forward.

- **90-Day Learning Cycles:** Discussed in detail above.

- **90-Day Testing Cycles:** Discussed in detail above.

- **Implementation** (for completed innovation projects assessed as "Direct to Market"): The implementation process integrates tested ideas into existing IHI programs, or stimulates the development of new programs or services to further test and spread the innovation. In a health care system, implementation might mean integrating the innovation into everyday care delivery. This process requires a team of individuals skilled at implementation, with representation from the initial innovation project team, to help different groups within the organization implement the innovation (allowing for local adaption when appropriate) and to manage the spread and any initial local modification of the new idea. Implementation requires innovation system staff to work together with operational staff to integrate the tested idea into daily practice. Implementation, or full-scale deployment, of an innovation may require changes within the organization such as to policies, job descriptions, team structures, billing or financing, clinical and administrative processes, information systems, and other areas.
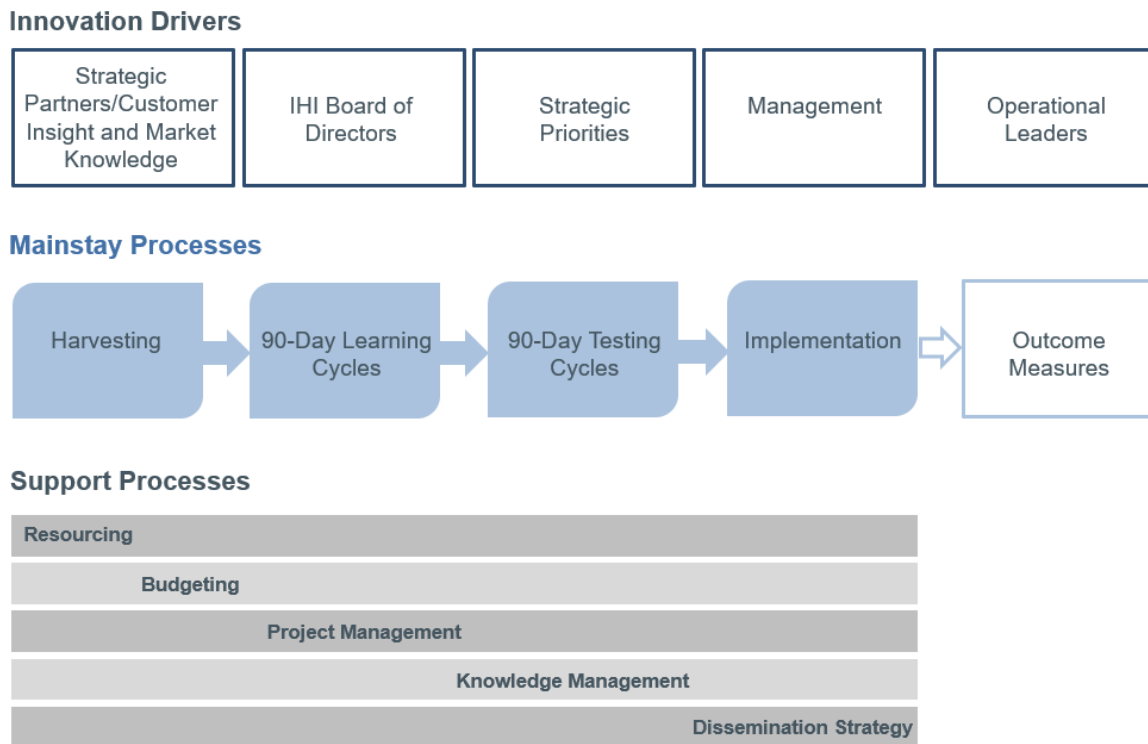
Support Processes

Support processes are the daily operations that are necessary for staff supporting the innovation system to run as a well-functioning engine: resourcing, budgeting, project management, knowledge management, and dissemination strategy. On a high-functioning team, these processes are part of everyday business under the watch of skillful project management. However, when these processes do not operate smoothly (i.e., holding together the innovation team and creating critical linkages between innovation and other parts of the organization), the innovation system deteriorates rapidly.

Project management for innovation requires coordination of many projects that may not be linked to one another. At IHI, at least five innovation projects are conducted simultaneously each quarter; in addition, during each quarter, continuous harvesting of new ideas occurs (for which ideas need

to be captured and prioritized), and some number of innovation projects from previous 90-Day Learning and Testing Cycles have progressed to implementation.

Figure 5 illustrates a high-level view of the innovation drivers and mainstay and support processes of IHI's innovation system, which provides a visual depiction of the work for all staff in the organization and drives synergy around innovation across departments. Strong leadership of the innovation system, vigorous project management, and a healthy dose of creative design are a potent combination for innovation at IHI.

Figure 5. IHI Innovation System: Innovation Drivers, Mainstay Processes, and Support Processes

Innovation Drivers

Strategic Partners/Customer Insight and Market Knowledge	IHI Board of Directors	Strategic Priorities	Management	Operational Leaders

Mainstay Processes

Harvesting → 90-Day Learning Cycles → 90-Day Testing Cycles → Implementation → Outcome Measures

Support Processes

Resourcing

Budgeting

Project Management

Knowledge Management

Dissemination Strategy

Innovation Challenges and Tips for Overcoming Them

The challenges inherent in IHI's innovation system fall into five categories, as described below.

Harvesting

The most significant harvesting challenge for IHI is not the observation of ideas, problems, or possible solutions, but rather creating strong mechanisms for capturing and cataloguing them. Ideas come from many sources, both solicited and unsolicited, including from IHI senior leaders, faculty, and staff who are often in the field making observations. A major challenge is creating a mechanism that allows for documenting these observations in a centralized system that informs decision making for selecting potential innovation projects.

When a member of the IHI innovation team conducts a site visit with the intent to observe a new idea in its local context, there is a reliable process to document what was learned. However, when there is another intent for such observation, or the observation is not made by an innovation team member, IHI struggles to capture what was learned in a consistent, timely, and reliable way. The current solution, while not perfect, is to set aside time during key internal meetings for IHI senior leaders, who are often traveling and observing new ideas out in the field, to verbally share their learnings. The discussion is broad, not focused on any one topic, and free flowing. The innovation team listens, learns, and documents ideas for current or future use.

Testing New Ideas

Because IHI is not embedded within a health care system, we do not have options readily available to test innovations in clinical environments. Testing new ideas often means relying on health systems, communities, or providers who are willing to try out unproven ideas. IHI is continuously seeking health systems and providers who have the time, experience, and willingness to test some of our early innovations. Key to overcoming this challenge is to demonstrate flexibility: to adapt the size and scope of the test to something that health system partners can do fairly easily, and from which both IHI and the testing organization can learn together.

Moving an Idea from One Stage of Development to the Next

As IHI gains confidence in an idea through the innovation process, the level of testing increases, gradually moving from early proof of concept, to theory validation, alpha and beta testing, prototype testing, pilot testing, and scale-up. In the majority of IHI innovation projects, several of these steps (except for scale-up) are managed by the innovation team. Different skills, testing sites, and resources are required at each level. Given that the innovation team is excited by what they learn, becoming enamored with the research and versed in the topic (i.e., preoccupied with "admiring the problem") instead of working toward an accessible and actionable output can be a challenge.

As a small innovation team with limited resources, we are challenged by managing the transition of an innovation project from one stage of development to the next, which requires deliberate focus on simplification and ensuring the innovation can be effectively translated at the next level of scale. Prototype testing is time consuming and resource intensive; therefore, IHI needs to have a high degree of confidence in the ideas we pursue to the next stage of development.

Implementation

Moving ideas out of the innovation system and into IHI's programs and project work can also be challenging. This transition requires the innovation project lead to hand off the work to others for the innovation to be appropriately modified for implementation in a broader context. This transition also requires the implementation team to accept a new idea that was created outside of their team. The best transition is one where there is a gradual shift in involvement and leadership of the idea, moving from the innovation project team to the implementation team. Clear documentation of the innovation, including detailed specifications for how the innovation should be implemented and possible adaptation, can ease the transition.

> *Example:* One IHI innovation project focused on creating a new approach to managing cost and quality at the front lines of clinical care. This method, called "continuous value improvement," was developed via the IHI innovation system and then tested in the NHS Scotland. As the innovation project achieved initial 12 to 15 percent cost savings, it moved

quickly from prototyping to spread, scale-up, and replication at other sites around the world. IHI innovation team members worked with IHI project staff to recruit additional coaches and faculty to implement the model elsewhere with additional customers. Innovation team members continued to serve in two primary roles: as coaches to those learning the methods, and as learners to continuously refine and improve the methods and the model that was originally created.[14]

Integrating Operations and Innovation

Innovation and operations have fundamentally different, but complementary, purposes, structures, cultures, competencies, and drivers. And appropriately, the individuals who are drawn to these two systems have different skills, styles, and even personalities. Both systems are necessary for success and, more importantly, both systems need to be optimized simultaneously for optimal performance. Table 4 highlights some of the differences between operations and innovation.

Table 4. Differences Between Operations and Innovation

	Operations	Innovation
Purpose	• Efficiency, current profit, predictability	• Growth, future value unknown
Structure	• Designed to deliver a specific product on time and on spec • Formal, mechanistic	• Designed to foster creativity and learning • Adaptive, loose
Culture	• Task mastery • Risk averse • Consensus driven • Customer driven	• Risk taking • Speed and agility • Experimentation driven • Seeking leading edges, not medians
Competencies	• Operational efficiency • Management	• Entrepreneurship • Design
Drivers	• Perform at a high level, reliably, each and every time	• Consistently develop new ideas • Meet milestones for growth

Without an internal process whereby operations and innovation continuously learn from each other, leaders within the organization will:

- Generate tension (and possibly competition) between innovation and operations;

- Fail to realize the potential of an innovation by suboptimizing the output;

- Fail to harvest and implement new ideas from operations; and

- Decrease joy in work across both systems.

Fostering a healthy interaction between operations and innovation is the responsibility of leadership. It requires recognition of the value both groups contribute, from senior leaders and staff throughout the organization. Whenever possible, it is best to publicly celebrate and champion

both systems together. Innovation may be celebrated when the innovation team first explains or publishes the development of a new idea. Operations may be celebrated when the idea is embedded as ongoing practice in the organization and producing results. However, because of the time gap between idea creation and broader implementation, innovation and operations are rarely recognized simultaneously, as two equal parts that have contributed to the whole.

New ideas may also be developed by operations, or both innovation and operations may be working on different aspects of the same problem. When this is the case, it is best to map where the two intersect, to reduce complexity and barriers to those intersections. Frequent communication, written project charters with agreed-upon aims, and leadership's acknowledgment of shared ideas and support for ongoing collaboration between innovation and operations are important to prevent rivalry, challenges of attribution, and competition for recognition.

Conclusion

In their December 2014 *Harvard Business Review* article, Nathan Furr and Jeffrey Dyer synthesized the key role of leaders in innovation: "What the great leaders we've studied know is that when competing on innovation, sustainable advantage comes not from the superiority of any particular invention, but from the superior ability of leaders to foster an organization that can learn from mistakes faster, more efficiently, and more consistently than competitors do."[15]

The success of an innovation system relies on an organization's senior leadership to understand the structures that need to be in place to embed innovation within the organization and to connect innovation to organizational priorities. Senior leaders can get started with establishing their organizations' innovation systems by learning from a few simple, but powerful lessons from IHI's experience, observation, success, and failure:

- **Set expectations for the innovation system; don't specify the outcomes.** Trust the creativity of your innovation and operational leadership to identify new ways to meet the challenges they face. Over-specifying the outcome of the innovation system artificially constrains the teams' thinking as they try to give you what you want, not what the customer needs.

- **Whenever there is conflict or uncertainty, try to develop a limited, rapid-cycle test to explore the question rather than make an executive decision.** Leaders can play an important role in helping to identify individuals, organizations, and opportunities to test ideas where there is ambiguity, to help the organization gain confidence in the theory.

- **Prepare the organization for new ideas by creating an internal learning process.** Leaders can help staff recognize that, if the organization is seeking different results, it cannot conduct "business as usual." A learning process might include virtual, online, or face-to-face opportunities to explore the key questions and challenges faced by the organization and enables stakeholders to agree on the need to innovate, surface new ideas for change, and identify problem areas that need disruption. Such a process can also improve the transfer of knowledge and discovery from innovation to operations.

  The role of innovation in an organization can be exciting; new ideas are enticing and may easily gain attention at the expense of ongoing operations, which will be responsible for integrating the end result of the innovation into everyday practice. Leaders need to generate excitement for the new idea by demonstrating its relative advantage, while also ensuring they do not dismiss or diminish the ongoing operations work that maintains the current state. It is

natural for staff to feel threatened when a new idea comes into their domain; leaders must neutralize this fear and bring everyone (not just the innovators) on board with operationalizing the innovation to become everyday work.

IHI developed an innovation system within our own improvement organization because we believe that both improvement and innovation are needed in today's health care environment. To optimize both health and health care, health system leaders must motivate continuous improvement in daily care delivery while also working to meet the future needs of patients and families with fundamentally transformed systems.

Appendix: Innovation Project Charter

Innovation Project Title:

Dates:

Project Type (select one)

☐ **90-Day Learning Cycle:** Scan, focus, validate, and document a new theory

☐ **90-Day Testing Cycle:** Develop a prototype of the theory, identify testers, conduct rapid-cycle tests, and document findings

Intent and Aim

Why is this innovation project needed? What is the "big picture" goal?

Background

What are the performance gaps that this project addresses, both in the organization's work and in the field? Do any previous innovation projects feed into this project?

Links to Operations

What operational area(s) will be working with the innovation project team and receiving recommendations for implementation, should the innovation progress to that stage?

Resourcing

Innovation Project Lead:	
Researcher:	
Content Lead:	
Team Members:	

Contacts

List 5 to 10 potential contacts that will inform this work.

Scanning

What journals and organizations, within and beyond health care, will you include in your scanning?

Focus

Are there any prevailing theories about the key question that already exist? What is lacking? What problems exist in these theories that warrant innovation?

Testing

What external organization(s) will help test and develop the innovation? What commitments will be required from them (personnel, time, specific setting or site, etc.)?

Anticipated Deliverable

What form will the innovation project final deliverable take (e.g., written report, presentation, concept design, change package, measurement strategy, framework, curriculum)?

Open Questions

What questions do you have as you approach the innovation project that could benefit from the team's feedback?

Anticipated Outcomes

(to be completed halfway through the innovation project)

Another Cycle: Will an additional 90-Day Learning or Testing Cycle be necessary to further refine the theory?	
Content: What content will be shared internally?	
Engagement: What content will be shared with another organization?	
Programming: What new programs will emerge from this project?	
Publications: What external publication(s) will emerge from this project?	

References

[1] *10 IHI Innovations to Improve Health and Health Care*. Cambridge, MA: Institute for Healthcare Improvement; 2017. http://www.ihi.org/resources/Pages/Publications/10-IHI-Innovations-to-Improve-Health-and-Health-Care.aspx

[2] Berwick DM, Godfrey AB, Roessner J. *Curing Health Care*. San Francisco: Jossey-Bass; 1990.

[3] Huston L, Sakkab N. Connect and develop: Inside Procter & Gamble's new model for innovation. *Harvard Business Review*. March 2006. https://hbr.org/2006/03/connect-and-develop-inside-procter-gambles-new-model-for-innovation

[4] Govindarajan V, Trimble C. *Beyond the Idea: How to Execute Innovation in Any Organization*. New York: St. Martin's Press; 2013.

[5] Anthony S, Duncan DS, Siren PMA. Build an innovation engine in 90 days. *Harvard Business Review*. December 2014. https://hbr.org/2014/12/build-an-innovation-engine-in-90-days

[6] Gibney R. "From Sweden to Texas via the IHI National Forum: Do-It-Yourself Dialysis." Institute for Healthcare Improvement Blog. August 3, 2016. http://www.ihi.org/communities/blogs/from-sweden-to-texas-via-the-ihi-national-forum-do-it-yourself-dialysis

[7] Shinkman R. Is "empowered dialysis" the key to better outcomes? *NEJM Catalyst*. March 15, 2018. https://catalyst.nejm.org/empowered-self-dialysis-better-outcomes/

[8] Trimble C. *How Physicians Can Fix Health Care: One Innovation at a Time*. American Association for Physician Leadership; 2015.

[9] Scoville R, Little K, Rakover J, Luther K, Mate K. *Sustaining Improvement*. IHI White Paper. Cambridge, MA: Institute for Healthcare Improvement; 2016. http://www.ihi.org/resources/Pages/IHIWhitePapers/Sustaining-Improvement.aspx

[10] Fulmer T, Berman A. Age-Friendly Health Systems: How do we get there? *Health Affairs Blog*. November 3, 2016. https://www.healthaffairs.org/do/10.1377/hblog20161103.057335/full/

[11] Fulmer T, Mate KS, Berman A. The Age-Friendly Health System imperative. *Journal of the American Geriatrics Society*. 2017;66:22-24. https://onlinelibrary.wiley.com/doi/epdf/10.1111/jgs.15076

[12] Institute for Healthcare Improvement. Age-Friendly Health Systems initiative. http://www.ihi.org/Engage/Initiatives/Age-Friendly-Health-Systems/Pages/default.aspx

[13] Hill LA, Davis G. The board's new innovation imperative. *Harvard Business Review*. November–December 2017. https://hbr.org/2017/11/the-boards-new-innovation-imperative

[14] Mate KS, Rakover J, Cordiner K, Maskell B. A simple way to involve frontline clinicians in managing costs. *Harvard Business Review*. October 11, 2017. https://hbr.org/2017/10/a-simple-way-to-involve-frontline-clinicians-in-managing-costs

[15] Furr N, Dyer JH. Leading your team into the unknown. *Harvard Business Review*. December 2014. https://hbr.org/2014/12/leading-your-team-into-the-unknown