Chapter 2
Mad for Method

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Innovation doesn't just happen by chance. It happens because smart, dedicated people work really hard. But arming innovators with an intelligent methodology to discover, test and spread innovations, certainly makes that job easier and more effective.

Every innovation featured in this book was the result of a concerted effort to solve a problem and every author in this book used various innovation methodologies to succeed. The most common was the PDSA (Plan-Do-Study-Act) experimental model. The PDSA model is a basic framework for solving problems., and it can be morphed depending on the nature of the challenge. It can morph into Lean[1] for efficiency challenges. It can morph into Six Sigma[2] for quality challenges. And it can morph into Human-Centered Design[3] to tackle experience challenges. There is powerful synergy when PDSA is combined with other innovation methods.

This chapter will focus on Kaiser Permanente Innovation Consultancy's brand of innovation method called Evidence Based Human Centered Design (EvHCD). The Innovation Consultancy (IC) is an internal design firm staffed by creative people who are part design, part strategy and part healthcare. They tackle complex, pervasive challenges when no known or acceptable solutions exist.

[1]See Wikipedia "Lean Manufacturing": http://en.wikipedia.org/wiki/Lean_manufacturing

[2]See Wikipedia "Six Sigma": http://en.wikipedia.org/wiki/Six_sigma

[3]See Wikipedia "Human-Centered Design": http://en.wikipedia.org/wiki/Human-centered_design

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EvHCD has six major buildings blocks or "anchors": Understand, Look for Patterns, Ideation, Prototyping, PDSA, and Piloting. The first four anchors were directly inspired by IC's work with IDEO (www.ideo.com), a world-renowned design and innovation firm, and PointForward (www.pointforward.com), gurus of innovation and masters of ethnography. The last two anchors come from the Institute for Healthcare Improvement (www.ihi.org), the nationally recognized healthcare improvement evangelists. This Kaiser Permanente blended method has been dubbed evidence-based human-centered design (EvHCD); meaning evidence is gathered to determine whether an idea should be adopted or abandoned.

It is important to note that each of these anchors is a complete method unto itself, and in fact can be a complete project. For example, a project might be in desperate need of Ideation in which case one could start at that anchor. But in combination, the power of their divergent and convergent natures have birthed many innovations for Kaiser Permanente, ranging from the ***Journey Home Board*** for new moms to the award winning shift change solution called ***Nurse Knowledge Exchange Plus***.

Let's explore each of the six anchors (all techniques are more thoroughly described in Appendix B).

Understand: This anchor helps reveal the true needs within a system. Often this phase starts with desk research to rapidly explore what is known about the topic area. However, ethnography and other qualitative techniques are the signature tools to provide deeper understanding. Ethnography[4] is a technique whereby users are observed and interviewed in the context of where they work, play or live. Other techniques include "draw your experience", "fly-on-the-wall" observation, and "cultural probes kits".

Look for Patterns: This anchor creates meaning out of all the data collected in the Observation Phase. It is where patterns are identified and translated into models and frameworks to help project participants better understand the true needs and opportunities for innovation. Expert Clustering and Storytelling are just a few of the techniques used in this phase.

Ideation: Various idea-generating techniques, such as Brainstorming, Analogous Observation and Provocation, are used to produce a large amount of ideas-the good, the bad and the ugly. In this divergent phase, liberating rules are employed to keep project participants on the creative and generative path. The most sacred rule is "defer judgment".

Prototyping: Through Storyboarding, Handmade Construction and Improvisation, ideas are turned into low-fidelity prototypes. Through iteration, the most promising low-fidelity prototypes are then turned into high-fidelity prototypes. Perhaps the most creative anchor, if not the messiest, prototyping is the poster child for innovation.

PDSA: In the context of the Innovation Consultancy methods, PDSA is used to take prototypes into a live environment (such as a hospital or clinic) to rapidly adapt, adopt or abandon. It is viewed as the perfect refining tool, using culture, context and creativity to shape and shave prototypes into real-world, workable concepts.

[4]See Wikipedia "Ethnography": http://en.wikipedia.org/wiki/Ethnography

Pilot: The pilot phase is when the most promising PDSA concepts are implemented and measured over time to understand the value impact on the system. Those concepts that show negative or no effect on the system are dubbed "failures", while those with a positive impact are called "innovations".

Although the IC method may seem sequential, it is more like a game of Shoots and Ladders® where data, insights and ideas move back and forth through the anchor activities, accumulating more and more knowledge. For example, when PDSA's are conducted, observations help to provide insight on how the ideas are working, and ideation and prototyping can continually add new and better ideas into the PDSA tests until solutions are found. This ability to move between these fundamental anchor activities is a key skill needed for organizations to innovate.

Mashing Innovation Methods with Health Information Technology

Now let's toss in the power of Health Information Technology (HIT). The benefits of innovating with HIT are exponentially greater than innovating without it. Data is accumulated faster. Results are more precise. Effects are detected quicker. HIT brings the innovation and the testing of innovation into the new millennium. However most organizations are still in the early stages of innovating with HIT. Let's explore each of the Innovation Consultancy's anchors again, but this time in the context of HIT.

Understand: By far the most powerful use of HIT for this anchor is in the gathering of Electronic Health Record (EHR) data to kickoff exploration. Before EHRs, observations were based on the availability of skilled people to provide hours of observations paired with pulling charts to obtain and aggregate data. Now imagine how many charts can be "reviewed" instantaneously and how much data can be swiftly aggregated.

Look for Patterns: At its core, synthesis is about identifying trends and patterns. Thus the use of HIT to analyze and display the massive amounts of data from the observation phase more easily and quickly identify both association and causation. Data warehouses, statistical packages, business intelligence tools and data visualization software will all be important components in this phase. Furthermore, as HIT systems continue to increase in sophistication, decision support functionality could additionally benefit innovation activities.

Ideation: This is where HIT goes wild. In this anchor innovation teams are hungry for inspiration. There are several types of ideation that the Kaiser Permanente teams have seen as valuable, including form factor and functionality. *Form factor ideation* involves generating ideas about the technical form. For example, if nurses need access to information, an innovation team would think about what form factor best fits into their workflow – a hand held device, a tablet, a mobile cart, or a wall mounted device?

Functionality ideation is more about the user's experience. This often involves optimizing the navigation involved in retrieving and entering data to make the most

intuitive sense. Technology demonstrations as thought-starters for design sessions have been an excellent way to both expose teams to new types of technology as well as to inspire new thinking in ideation. And of course, these technology brainstorms help teams imagine far-future and fantasy-type solutions.

Prototyping: If Ideation is where HIT goes wild, then it's in prototyping that it becomes imaginative. Design teams often use proxies and substitutes to begin the build process. Many organizations use "sandbox" HIT environments that run a version of their organization's HIT system so that they can test changes and ideas in the HIT environment without interrupting the live care setting. There are also extremely advanced systems that take prototyping ideas in an electronic form to a new level. Archimedes, a company affiliated with Kaiser Permanente, has developed a full-scale simulation model of human physiology, diseases, behaviors, interventions, and healthcare systems. By using advanced methods of mathematics, computing, and data systems, the Archimedes Model can even run clinically realistic virtual trials.

PDSA and Piloting: Similar to the Prototyping Anchor, HIT for PDSA/Pilot anchors comes in two forms. The first is running a PDSA or a pilot with the proposed HIT solution. This may range from the introduction of new decision support rules, to creation of a data dashboard, to introduction of telemedicine tools. The second is to use the EHR or other IT systems to measure the impact of a solution. This requires not only understanding the final impact, but also being able to measure and support the creative process along the way. In other words, leaders and designers can more easily make evidence-based decisions if it is easier to tap into the data contained within EHRs and other systems, easier to gain real-time data-driven feedback during field testing, and easier to measure the impact of an idea.

Case Study 1: Using the EHR to Understand Need and Validate Impact

Kaiser Permanente is a leader in electronic health record (EHR) systems, having implemented KP HealthConnect, their EHR system powered by Epic Systems (Madison, WI), across all its care-settings and geographies. While there are significant benefits to using this EHR, there are some darker half-truths to consider. First, there is the concern that EHRs "lock down" the ability to innovate on the fly, and lock in the current workflows, whether they are the most effective or not. There is also concern that creativity will be further blunted by putting in systems that are difficult for the end-user to manipulate. While partially true, we believe that the full truth is that most organizations are simply inexperienced at innovating with these new and complex tools. The following examples include an explanation and lessons learned about using HIT in an innovative manner to better quantify the effects of changes made in our system.

Prior to KP HealthConnect being implemented, metric collection was a laborious task. The Innovation Consultancy clocked hundreds of people hours gathering metrics through chart audits, surveys and other "feet on the ground" process observations. For example, in 2004 the IC had to measure the success of their innovative nurse shift change. With no automated data to be found, the team had to design a paper-based observation tool to be used by two observers three times a day for several weeks. The data from the paper forms were manually entered into Excel spreadsheets so that information could be graphed. Imagine all the additional prototypes that could have been built if data gathering and metrics analysis had been automated and not been so time consuming.

Fortunately, with the introduction of KP HealthConnect, data collection became streamlined. The trick was being able to ask the right question of the data. One of those right questions came along in 2010, when the Innovation Consultancy set out to create a safer, more responsive nurse-patient pain approach to pain management, called KP PainScape, on medical-surgical units in two KP hospitals. Because data was already being collected in the EHR, the team was able to co-design several metrics reports with the in-house analytics team. Hundreds of people-hours were reduced to just a few. The new reports helped the team to identify the real opportunities to impact pain management and they also provided sensitive and real-time feedback to show the impact of the tests of change during the project. In the end, the reports helped build the case for at least one innovative concept, the automated pain medication recheck timer to be included in the next upgrade of the EHR, as well as created an innovative set of actionable measurements for pain management.

Case Study 2: Low-Fidelity HIT Prototyping

Learning how to incorporate nimbleness in prototyping and testing within the EHR and other HIT has been a journey, from "oh my, that'll never work" to "hmmmm… what if we tried it this way?" Let's use the same two examples mentioned above, the nurse shift change project and the pain management project, to illustrate.

For the nurse shift change project of 2004, the inpatient EHR was not yet implemented but it was coming soon. A solution was needed that would be both a bridge to the EHR and, eventually, an integral part of the EHR. Using the IC's EvHCD approach, it was discovered that nurses deeply desired to have information at their fingertips during the shift change, and that patients wanted shift change to happen at the bedside. Combining these desires meant that a real-time EHR would have to be a part of the solution.

The team worked through several prototypes, but settled on a Microsoft Access database to replicate what would eventually be replaced by the EHR. The off-going shift of nurses would do some basic documentation in the database. This information would then be used to print a report at shift change for the on-coming and off-going nurses to have the close-to-real-time patient info at the bedside.

This project demonstrated that there are many ways to prototype for an EHR, including creating the initial prototype outside the EHR. Too often teams get stuck thinking they have to build their ideas in the EHR to test. But it turns out that approximating the tool in another system, such as the Access database and paper print-outs, can allow for increased efficiency, cheaper cost, faster development and more creativity than trying to do so in the EHR system itself.

With the pain management project of 2010, one of the ideas that emerged from this process was a way to help address the nurses' feeling of "task overload". Specifically, the IC developed the idea of an automated pain medication reassessment timer, which would be used to remind nurses to reassess their patients' pain within one hour of administration. To test what the reminders would feel like and understand their effect, the team first used egg timers (PDSA Cycle 1) and then Apple iTouches with a multiple alarm app (PDSA Cycle 2). These tests and results provided enough understanding and knowledge to build a business case, which incorporated the concept of automated pain timers in a future release of the EHR.

Since the EHR did not initially have time functionality, the team could have gotten stuck in a "we can't do that" phase. But instead, the team approximated this function with lower-fidelity prototypes to inform whether or not to move forward with higher-fidelity prototypes and solutions within the EHR.

Conclusion

Innovating involves taking risks. Fortunately, there are innovation methodologies to help mitigate them. And while the PDSA method is the foundation for trying and learning, it can be augmented with more divergent and creative methods to push thinking into new territory. Who would have thought that egg timers could be the precursor to innovative EHR functionality? Go wild with methods, and you'll be sure to discover other outrageous but valuable ideas.



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