A Framework to Accelerate Universal Design Literacy

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Design has historically been a specialty, something practiced exclusively by engineers, architects and all manner of design professionals. This is changing. Just as arithmetic was once a peripheral skill until the industrial age brought about the need for math literacy, the socioeconomic conditions of our current age are heralding the need for millions of people to level up in design. The expanding role innovation and collaboration play in our daily work, combined with the ever-increasing complexity and rate of change of today's products, services, and systems are making the case for design literacy. This paper: 1.) makes the case that design is poised to become the next universal literacy; 2.) argues that in order for such a literacy to arise, there must first exist a framework of agreed-upon skills that are taught and practiced by the masses; and 3.) proposes such a set of skills along with the research and reasoning that support this proposed framework.

Keywords: Design, methods, literacy, taxonomy, framework

Everyone Designs

During a client meeting in London, I said something I believe deeply and share often: "Everyone designs." Immediately, a young professional designer in the group challenged me. "That is not true," she said. "Everyone does not design, and it's an insult to me—a professional designer—to insinuate that 'everyone is a designer.' Not everyone has the expertise and experience to do what my team and I do."

I wasn't taken aback by her remarks. This wasn't the first time I had encountered this perspective, and it's understandable among those who have formal training in design and years of experience. That young designer was simply voicing her frustration with the idea that anyone could assume design competency or the role of a "designer" especially after taking a few "design thinking" workshops, something very much in vogue today. She had earned a professional standing that took years of education and application. And she is not alone. Many professional designers and design educators feel this way. They believe the growing popularity of design among non-designers cheapens the value of design and trivializes their profession.

However, I find this perspective shortsighted, counterproductive and futile, especially as more and more organizations—desperate to get their employees to be more innovative, more customer-centered, and more agile—embrace design and attempt to integrate it into their wider work culture. It's shortsighted because it shortchanges the true power and intent of design. It's counterproductive because it reflects a worldview rooted in an outdated, twentieth-century belief that design is a profession for only the special few, and that it should stay that way. And it's futile, because as I argue later, our times are demanding that everyone level up in design.

The reality is that everyone already designs. No one needs permission. Humans have always lived in a world teeming with millions of tangible and intangible things calling for change, and we are hardwired to pursue

ways to bring about that change. As Nobel Laureate Herb Simon (1969, p. 55) said, *"Everyone designs who devises courses of action aimed at changing existing situations into preferred ones."* As such, products are designed. Services are designed. Policies are designed. Laws and strategies are designed. Business models, negotiations, and curricula are designed. Everything manmade is designed. When something fails, it fails because it is not useful, usable, or desirable for the people and situation it was *designed* to serve. And in a world littered with poor design and in desperate need of change, design professionals, design educators, and leaders in all sectors, have an opportunity — a duty, even — to expand design from the profession that it is now into the liberal art it also needs to become and help as many people as possible hone their natural impulses to *change existing situations into preferred ones.*

Everyone designs who contributes to the creation of something new. To design is to play a role, however big or small, in the creation process of all sorts of intangible and tangible things people rely on every day. Whenever and wherever a person finds themselves collaborating with others in the work of bringing something new into this world — whether it is a new product, a new process, a new plan, a new policy, or a new perfume — they are engaged in the vital and communal act of design.

The Case for Design Literacy

Although math has played an important role throughout the history of mankind, it wasn't until the onset of the Industrial Age (1780 - 1840) that math transformed from a skill taught to and used by very few — scientists, engineers, and bankers — into a universal literacy taught to and used by society at large.

In their *Handbook on the History of Mathematics Education*, Karp & Schubring (2014) wrote:

> *In the eighteenth and nineteenth centuries, economic development, no longer exclusively based on agrarian modes, led to an enormous increase in urban populations. Basic numeracy skills such as the ability to tell the time, count money, and carry out simple arithmetic became essential … Within the new public education systems, mathematics eventually became a central part of the curriculum from an early age.*

While knowledge of the local terrain, agriculture, weather patterns, and various farming technologies was important and widespread, one didn't need math to work the land. That all changed with the arrival of the Industrial Revolution and the human exodus from field to factory that marked the age. This was the cultural tipping point for math because a very real need emerged to better educate millions of agrarians relocating to cities looking for work in factories. Lawmakers, industrialists, and educators — faced with a willing but unskilled labor force — responded accordingly. New education policies and education offerings were designed to teach the basics of mathematics to the general public. Research by Soysal & Strang (1989) suggests that these reformations made school compulsory to the age of 10 and made arithmetic a central part of school curriculum from an early age for the first time in history.

Today, we are entering a new age. The socioeconomic reality of our time is calling for design literacy much in the same way the socioeconomic reality of the industrial age called for widespread literacy in mathematics. Consider the following:

- 88 percent of CEOs are concerned about the loyalty of their customers and 82 percent about the relevance of their products or services. (2016, KPMG)
- Only 27 percent of leaders feel they've mastered the elements needed for innovation success over the next decade. (2014, BCG)
- According to a major IBM survey of more than 1,500 CEOs from 60 countries and 33 industries worldwide, chief executives believe that — more than rigor, management, discipline, integrity or vision — successfully navigating an increasingly complex world will require creativity. (2010, IBM)
- The Partnership for 21st Century Skills, a government-sponsored consortium of state-run and privately-run organizations dedicated to education reform, and authors of the book ***Leading 21st Century Schools,*** Schrum & Levin (2009) believe that *"Learning and innovation skills are what separate students who are prepared for increasingly complex life and work environments in the 21st century and those who are not."*

In the Harvard Business Review article *Design Thinking Comes of Age* (2015) Jon Kolko writes, *"There's a shift under way in large organizations, one that puts design much closer to the center of the enterprise. But the shift*

isn't about aesthetics. It's about applying the principles of design to the way people work." Add to this the growing numbers of Fortune 100 companies investing in designers and design training, and studies by the likes of McKinsey & Company, Forrester Research, and the Design Management Institute, that extol the business benefits of design and the ROI of "design-minded" companies[1], the shift is clear – design is poised to become humankind's next universal literacy.

Creating a Universal Framework of Design Skills

The existence of any literacy, by definition, assumes there is a fundamental and agreed on set of skills that is taught, understood, and practiced by society at large. The approach by which one teaches or learns such skills can vary, but without widespread agreement on what those skills are— and a single framework or taxonomy with which to organize and refer to these skills — technically, there can be no literacy.

According to the U.S. Department of Education, traditional *literacy "is an individual's ability to read, write, speak, compute, and solve problems at a level of proficiency required to be productive workers, family members, and citizens."* (OCTAE, 2018) This advisement suggests another way to frame the challenge: What skills should be taught and learned by the general public so that they can apply design at a level of proficiency required to, *likewise,* be productive workers, family members, and citizens?

Below are the heuristics a small team at LUMA Institute established to guide the research, reasoning, and creation of a proposed framework of skills that could serve as a suitable answer to this question. A proper taxonomy of design skills would need to be:

17. Based on extensive and thorough research of all known design methods
18. Organized in a way that is relevant and timeless
19. Essential; a collection of methods used by a multitude of people for a multitude of design situations
20. A comprehensible and accessible framework for the masses

The First Heuristic: Basing our work on extensive and thorough research

For the most part, I think we can agree on what it means to be math literate as opposed to being a math expert or a mathematician. We are talking about the basic skills of math like arithmetic, algebra, geometry, measurement, and statistics, which we learned in our formative years and find ourselves using on a daily basis and without which we would have a difficult time getting by. We are not talking about mastery of specialized forms of math that a physicist might use such as calculus, or actuaries might use like differential equations. We are talking about basic skills that are well within the full range of everyone's cognitive ability and can be employed in the midst of our everyday challenges.

If we apply this same logic to design literacy, it helps frame what it means to be design literate, as opposed to being a design expert or design professional. We are talking about basic skills such as problem framing, learning about the people we are designing for, and prototyping. We are not talking about mastery of specialized forms of knowledge that an industrial designer might employ, like color theory, or advanced techniques an ergonomist might use, such as a Psychological Workload Assessment. We are talking about basic skills that are well within the full range of everyone's cognitive ability and can be employed to navigate everyday challenges. But what are these basic skills? And how should we go about determining them?

This line of reasoning. and these questions yielded the first of our four heuristics. In order to identify these basic skills, and guard against our own bias as design professionals and educators, we believed strongly that we first must conduct extensive and thorough research of all known design methodologies.

To gain this understanding, we conducted an audit. Initially we spent about six months identifying and familiarizing ourselves with dozens of scholars and practitioners who, throughout history, had ever developed a model or published any sort of method compendium on design, problem solving, engineering, or creativity. We were careful to be inclusive and quite divergent in our pursuit of this knowledge. We considered anyone who had created a collection of tools with the primary intention of helping people design, solve problems, or bring about change and improvement. Our first wave of research yielded more than 200 methods. Our subsequent auditing included everything from classics such as John Chris Jones' book ***Design Methods***, published in 1970, to more recent and well-researched compilations like Vijay Kumar's book, ***101 Design Methods***. Included also are the methods of Six Sigma and Kaizen. In addition, we examined system engineering and design curriculums of top schools like the University of California Berkeley, Carnegie Mellon

University, Domus Academy, and the Illinois Institute of Technology. We also spent considerable time familiarizing ourselves with the favored techniques of dozens of creative consultancies like the UK Design Council and IDEO, as well as innovative product companies like Steelcase and Procter & Gamble.

Overall, we would uncover just over 900 distinct design methods. This collection was, to the best of our knowledge, the largest compilation of design methods ever assembled. While many of the methods were variations on a common theme or differed only in name or protocol, the sheer size of the list surprised and humbled us.

However, during our research, we noted that many of these methods were conceived during specific business eras and for specific industries. As such, while relevant for those times and trades, they are less so in today's business climate. For example, not all, but most methods associated with Six Sigma, while popular in the 90's, and within manufacturing, are no longer in vogue today due to sweeping changes to many facets of business and society.

This got us thinking. If design literacy is the goal, then not only do we need to identify the most fundamental methods, we need an organizing principal for these methods that everyone can relate to, but also stand the test of time. This led to the creation of our second heuristic.

The Second Heuristic: Organizing design methods in a way that is both relevant and timeless

While reviewing the different collections of methods during our first phase of work, we noticed that each group of methods came organized in one of two ways. The first way was by a process. The second way was by skill or ability. Our assumption was that our taxonomy should be based on one or the other of these two schemes. However, we were open to another if such a scheme presented itself.

Design Processes

Design practitioners and educators such as John Chris Jones and Vijay Kumar, as well as many schools and companies like Stanford University and IDEO, chose to organize their compilation of design methods by way of a design process. These processes tended to fall into three categories: linear, like many Stage-Gate and New Product Development Processes; cyclical, like Vijay Kumar's variation on Boehm's Spiral model *(figure 1*); or nonlinear, like Stanford's well known "Honeycomb" Design Thinking process *(figure 2).* Design methods were grouped under each phase or mode of work and recommended in order to become skilled at that phase or mode of work. For example, in the first mode of Stanford's Design Thinking process, which is labeled "Empathize," methods such as *Interviewing* and *What? How? & Why?* are advocated and taught in order to develop the student's capacity for empathy.

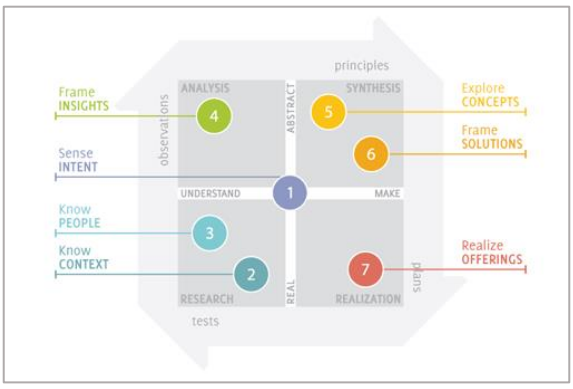

Figure 1: Source: Vijay Kumar. 2012

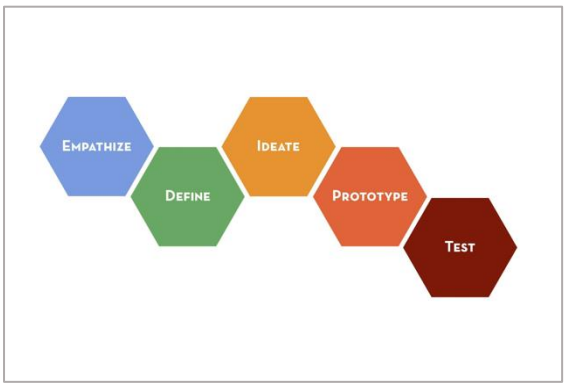

Figure 2: Source: Stanford D-School. 2010

Design Skills or Abilities

In our research, we also learned that some experts and organizations preferred to organize design methods by meta-skill or ability. Clayton Christensen, Jeff Dyer, and Hal Gregersen's book ***The Innovator's DNA***, Tom Kelley's book ***The Ten Faces of Innovation***, and IDEO's***, Method Cards,*** *(figure 3)* epitomize this way of

revealing the underlying discipline of design. All of these resources are well-researched and come to understand the practice of design from either observation and interviews with innovative leaders and organizations, or from the actual practices of a design consultancy. For example, in ***The Innovator's DNA,*** the authors identify "observing" as one of the five key skills an individual needs in seeking to be a disruptive innovator. After sharing the research and case stories that led to this insight, the authors identify a handful of principles and methods individuals and teams can use to develop this innovation "muscle." Principles like "Observing with all your senses" and practicing a method called "Dialog in the Dark" are recommended for each of the key skills.

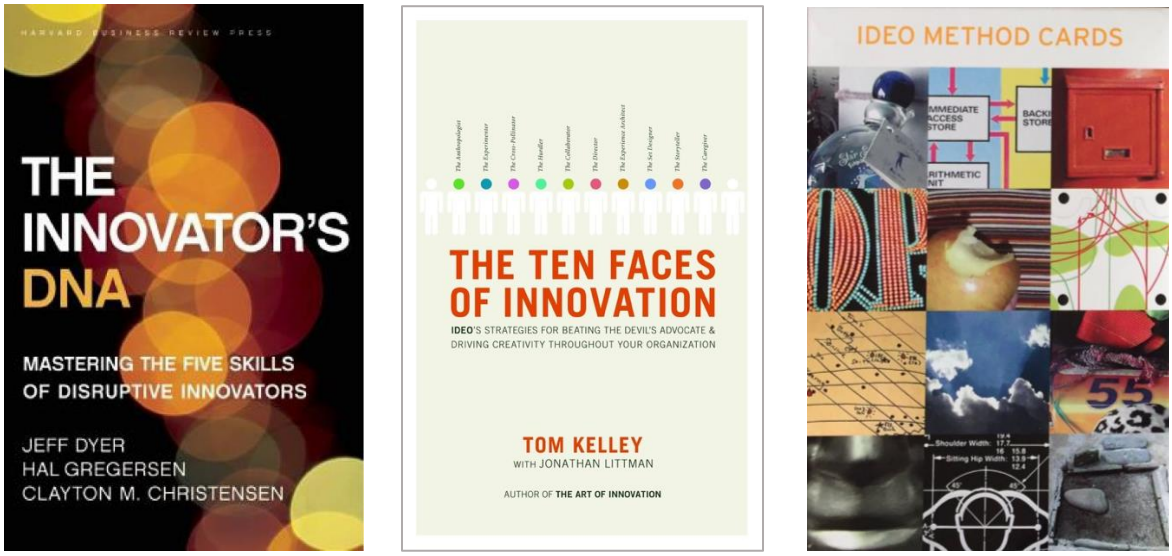

Figure 3: Covers of three publications that organize design/innovative/creative skills by ability in contrast to process.

When we began to consider both design processes and design skills as ways of organizing design methods, we quickly determined that organizing them by way of a process was suboptimal for several reasons:

- Processes varied from industry to industry.
- People and organizations do not tend to follow one-size-fits-all processes.
- Branded processes are not timeless. They come in and out of vogue.
- Some methods could be used in multiple steps of any process. For example, interviewing as a method could be used at the beginning, middle, and end of any process, design or otherwise.

For these reasons we ruled out organizing methods by way of a process.

Aligning on design skills as an organizing principle

These insights, and our early observations suggested that organizing design methods by "skill", as opposed to "process" might be a better way to construct a framework of design methods that would remain relevant to the general public over the course of time.

While we were certain, skills and abilities already identified by experts such as "observation" and "iteration" would in some way play a significant role in our final assessment, we were careful not to jump to conclusions. After all, we felt it important that our framework be as relevant to millions of people 100 years now, as it would in today's society. To our knowledge, no one had ever undertaken a census of all design methods. And when we considered the rich data-set we had assembled, we saw an opportunity to build a taxonomy from the ground up by analyzing this amazing compendium of ways man had devised to solve problems. Our hypothesis was that if we carefully compared and contrasted these methods, a unifying principle might naturally emerge. So, we began to employ one of these 900 methods, an activity called Affinity Clustering, to see what we would find.

Figure 4 shows an early version of this affinity cluster. After analyzing only about 200 of the methods, the contours of a framework of skills began to emerge.

Figure 4: Early Affinity Cluster of the design methods. At this point we had mapped just over 200 methods, but already n organizing principle had begun to emerge. Source: LUMA Institute

We discovered that these methods could be grouped into three meta-skills everyone can relate to:

- **Looking** — methods for observing human experience by watching people and listening to them.
- **Understanding** — methods for analyzing and synthesizing information, uncovering insights, and framing problems.
- **Making** — methods for envisioning future possibilities through concept ideation, modelling, and prototyping.

As we began to examine subsequent methods, this basic organizing principal remained unchanged — meaning the other 700 or so methods fit easily into the categories we had identified at this early stage.

However, upon further examination of all these methods, we realized that the hundreds of methods under each of these three meta-categories could be organized into related subcategories. (*Figure 5)*

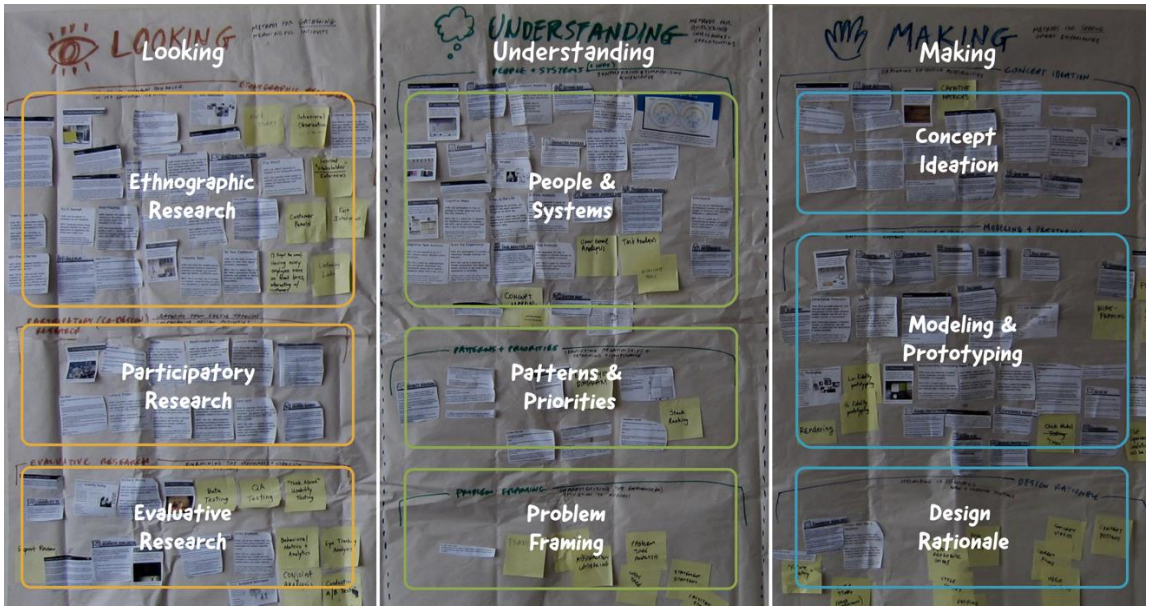

Figure 5: The subcategories. Source: LUMA Institute

While these subcategories represented skills that might not be as familiar to those new to design, they gave our model some necessary structure. Sub-grouping the ways in which people go about **looking**, **understanding,** and **making** helped us understand each practice in more depth, and quite frankly, made our taxonomy feel more like a discipline and less like a cluster of related techniques. After completing a full analysis of all the methods, here is how the taxonomy looked.

Skill 1: Looking — Observing human experience

Subcategories:

- **Ethnographic Research**— studying behavior in its natural setting; methods like Interviewing, Shadowing and Fly-on-the Wall Observation.
- **Participatory Research** — inviting people to participate in cooperative design activities; methods like Journaling and Build-Your-Own exercises
- **Evaluative Research** — examining the usefulness, usability, desirability, and reliability of solutions; methods like User Testing and Focus Groups.

Skill 2: Understanding — Analyzing and synthesizing information

Subcategories:

- **People and Systems** — making sense of relationships and the way things work; methods like Stakeholder Mapping and Experience Diagramming.
- **Patterns and Priorities** — revealing unseen structures, relevance and significance; methods like Affinity Clustering and Importance/Difficulty Matrix.
- **Problem Framing** — characterizing the situation to address; methods like the Five Whys and Root-Cause Analysis.

Skill 3: Making — Envisioning future possibilities

Subcategories:

- **Concept Ideation** — coming up with ideas; methods like Brainstorming and Alternative Worlds.
- **Modeling and Prototyping** — building representations of future solutions; methods like Storyboarding and Business Model Canvas.
- **Design Rationale** — justifying the future that we envision; methods like Concept Poster and Cover Story Mock-up.

As this organizing principle was not tied to a particular era or industry but in fact was informed by analyzing methods used thorough history and across disciplines, and employed labels like **looking**, **understanding** and **making** that everyone can relate to, we felt we had arrived at a taxonomy that held universal promise.

The Third Heuristic: The collection of methods must be essential; able to be used by a multitude of people for a multitude of design situations

We had arrived at a trustworthy taxonomy of design skills, one not influenced by our own biases or current business trends, but rather, from a careful examination of all the design methods we had gathered. The next step was to identify the most essential methods — those that would serve the goal of propagating design literacy.

But how does one go about choosing which methods are the most essential? How do you determine which are going to be the most indispensable to all manner of people and in all manner of design situations? And how many should that be? This proved to be a bit of a puzzle as we had no way of knowing how often each of these 900 methods had ever been used. Nor did it make sense to conduct a survey that asked people to name their go-to methods because we had arrived at a taxonomy that included categories and methods that were unfamiliar to all of the design professionals we had interviewed. The same was true for us. Each of us, having been professors and/or practitioners of design for a combined 60+ years, were familiar with only a few dozen *(a fraction!)* of the methods we had found.

We decided at this point, that the best way to determine what the most essential design methods are, was to create an algorithm — a string of questions or rules that would automate our reasoning. Again, this would guard us against bias and honor this incredible collection of methodologies. Below is the algorithm *(Figure 6*) that we created and used to scrutinize each of the 900-plus methods in order to determine their essentialness.

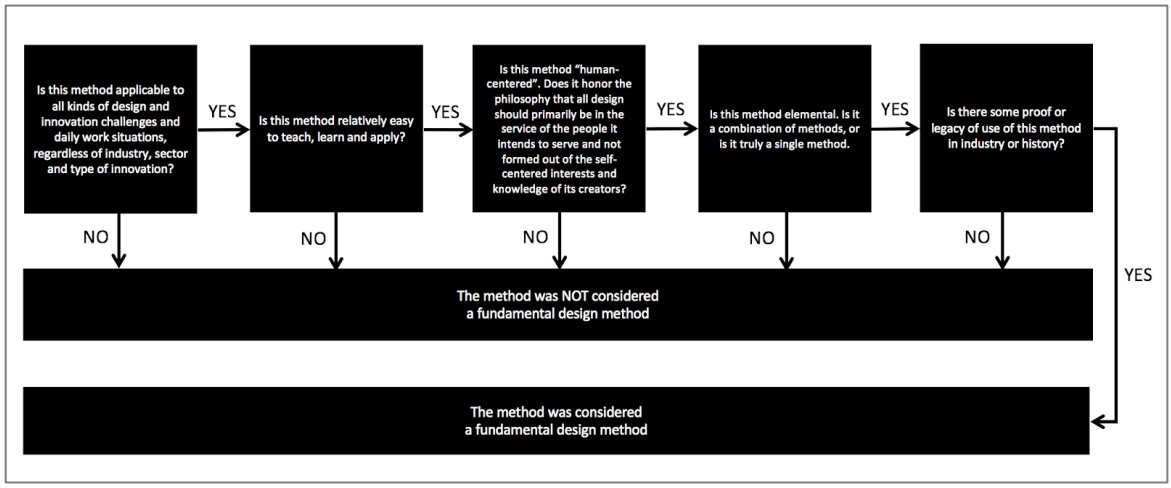

Figure 6: Our algorithm for determining the most essential design methods. Source: LUMA Institute

We used five key tests to evaluate each method. Only if the method passed all five tests was it deemed worthy to be considered an essential method. That is, a method that should be taught to and employed by everyone.

Test 1: Determining the universal applicability of the offering. A method was considered essential only if it could be applied to a wide spectrum of challenges, not just the design of new products but also new processes, programs, policies, etc. We believed that a method that could be used in a variety of contexts, industries, and sectors would appeal to the design specialist and general public alike. For example, Stakeholder Mapping *(Figure 7)* passed this test because this method helps teams gain an understanding of the domain or ecosystem of people who have a "stake" in the solution they are working toward, no matter the challenge or sector. All potential design solutions are intended to serve an ecosystem of specific people and understanding that ecosystem is critical to success.

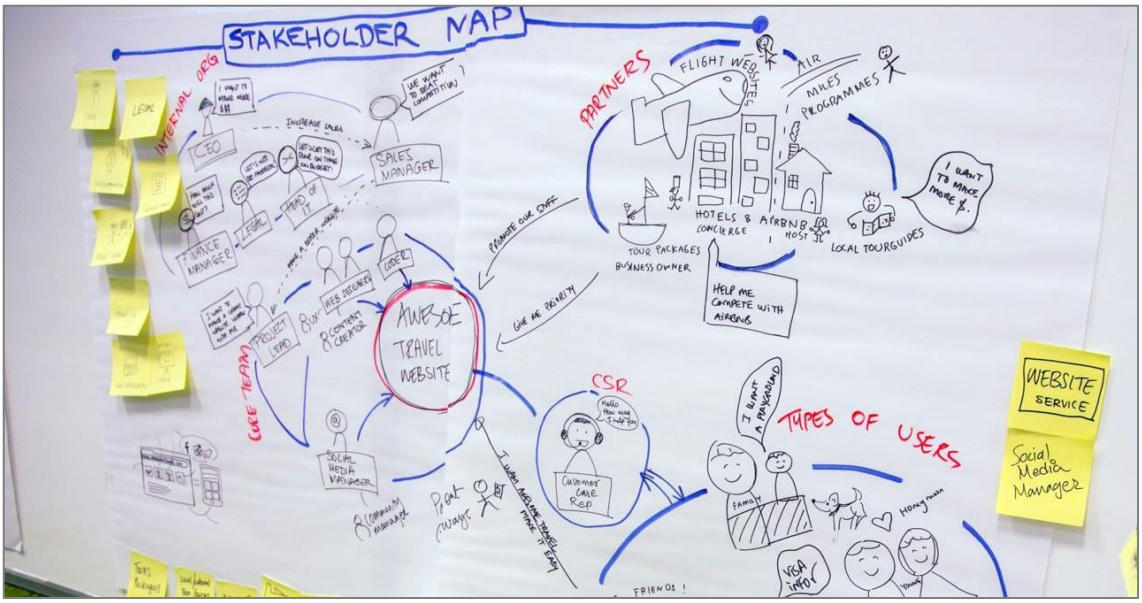

Figure 7: An example of a Stakeholder Map. Source: LUMA Institute

Compare Stakeholder Mapping to a more specialized method like Wireframing, which creates a two-dimensional illustration of an interactive interface and specifically focuses on layout, navigation and the prioritization of content and functions. Wireframing is a great method, especially for UX designers. But it is not universal enough to be considered an essential method because it was devised to support a particular kind of design — interactive interfaces.

Test 2: Determining the ease by which the method could be taught, learned, and applied. A method was considered essential if it was "portable," meaning its benefit is easily grasped and it is not difficult to perform. This value is quite qualitative and as such we took liberties that might cause a scientist to scoff. However, for the purposes of our exercise, we had to draw a line somewhere. We considered a method easy to teach, learn, and apply if it could be shared through experience. In contrast, if a method required continuous reference to a detailed protocol, it was deemed difficult. If one could share a method by showing it, that method was considered easy. It also helped if the method could be performed effectively in different ways.

Our reasoning behind this test reflected our hypothesis: methods whose purpose and procedure can be quickly grasped will have a higher likelihood of being shared with others and used repeatedly, thus creating the conditions for mastery and therefor literacy. For example, a method like Interviewing passes this test because it is familiar to most people, can be approached in a variety of ways, and is easy to teach and perform. A few well-crafted questions and a notepad, combined with some good listening skills, will produce reasonable results. Over time, one can master Interviewing because the barrier to execute this method is low. Compare this to a more complex method like the Modified Cooper Harper Scale (MCHS) *(Figure 8),* which is a Human Factors technique for assessing mental workload. It is a great method, but it did not pass this test because it is a very specific protocol and requires in-depth explanation and training.

Test 3: Evaluating the method's "human-centered" quality. In order for a method to pass this test, it had to increase the likelihood of an outcome that successfully served people. Our reasoning behind creating this test was the common observation that when a design fails, it's because that design is not useful, usable, desirable,

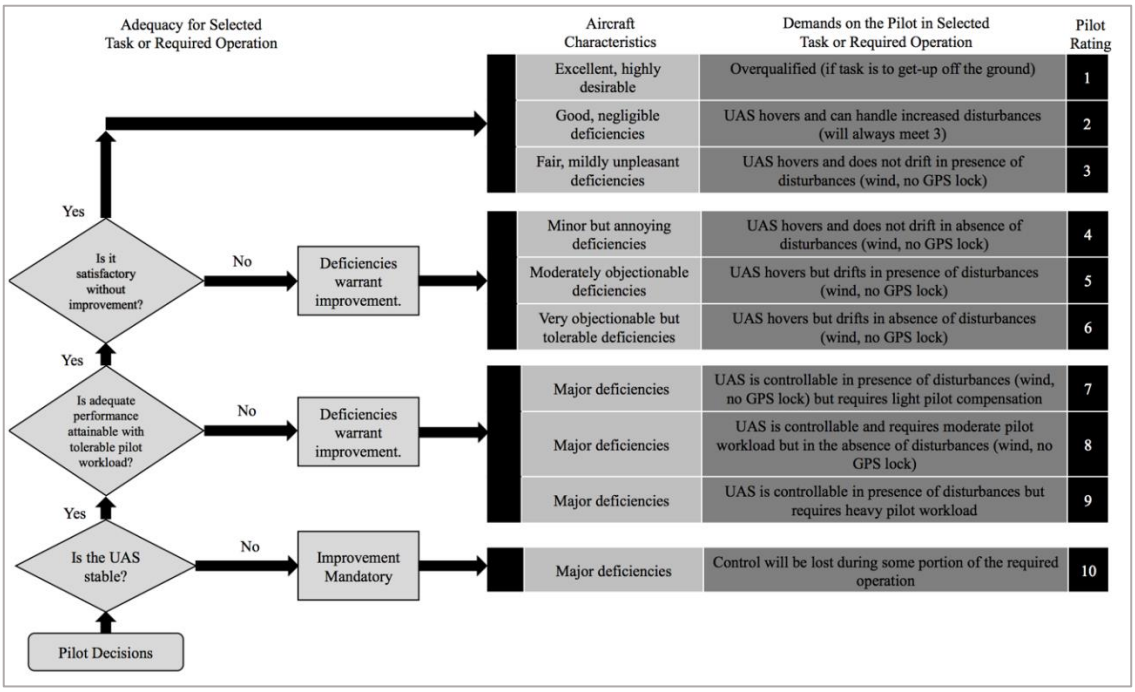

Figure 8: An example of a Modified Cooper Harper Scale. Source: Travis Fields. University of Missouri, Kansas City, Department of Civil and Mechanical Engineering.

or reliable to the people it is intended to serve. For example, a method called Importance/Difficulty Matrix *(Figure 9)* made the cut as a human-centered method. On the surface, it looks like any other "quad" method, of which there are many varieties. But in reality, its protocol helps teams debate and focus on two of the most centrally humane questions about any need, idea, feature, or initiative: How important is it to the key stakeholders? How difficult will it be to deliver it to them? Compare this to more internal or business-centric methods like Break-Even Analysis, which while good for understanding financial risk, puts the needs of the creating-entity first, instead of the people for whom one is be designing. This isn't to imply Break-Even Analysis is a bad method, but only that it didn't pass the human-centered test because it is concerned with understanding profit, instead of people.

Figure 9: Examples of an Important/Difficulty Matrix. source: LUMA Institute

Test 4: Determining if the method was a single method. Many of the methods we gathered were not really individual methods. Instead, they were combinations of methods. For example, the IDEO Method cards include Experience Prototype, which instructs users to "*quickly prototype a concept and use it to learn from a simulation of it."* Upon closer examination, this is actually two methods. The first method is building a prototype using variations such as paper prototyping or click-through prototyping. The second method is simulating use of the prototype in order to learn, using variations such a cognitive walkthrough or a user test.

Experience Prototype is really a compound method, or what we call a method set or a recipe. The distinction is important because we were looking for elemental methods. If a proposed method could be broken down into individual methods, it did not pass the “single method” test.

Test 5: Examining the method’s legacy. It was important that any method we could consider essential have a history of use in industry. We determined this through evidence of use. For example, many books and papers have been written about the method called *Experience Diagramming*, also known as Journey Mapping or Story Mapping. *(Figure 10)* There are numerous case studies and real-world examples of how Experience Diagramming has been used. Compare that with a method called “WWWWWH,” which was included in a number of design method collections we found and consistently defined, but for which we found little evidence of use in pictures of artifacts, books, papers, or case stories. Therefore, it did not pass this test.

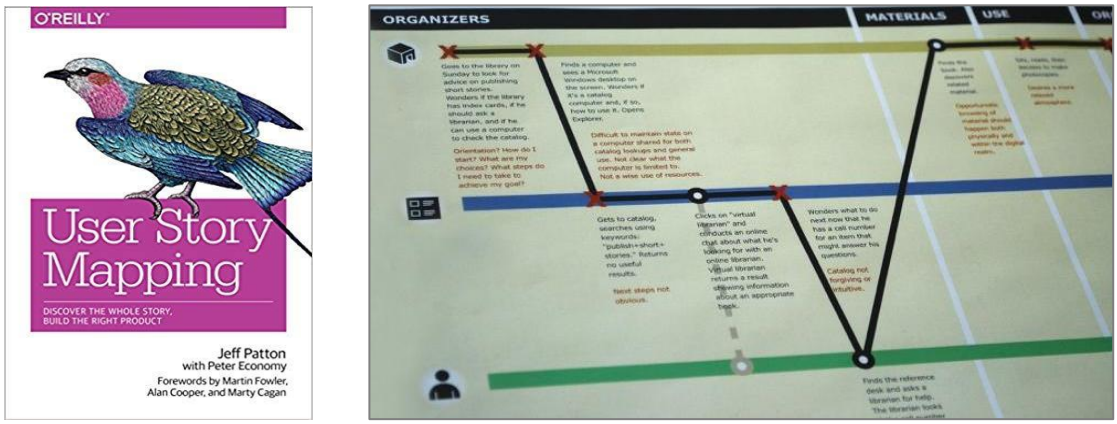

Figure 10: Examples of experience mapping in use. The cover of Jeff Patton’s User Story Mapping and an example of an Experience Map courtesy of MAYA Design. sources: Jeff Patton & O’Reilly Publishing (2014), and MAYA Design (2010)

Using this algorithm, we were able to spotlight the most essential methods and thus reduce the number of potential candidates for universal framework from hundreds to dozens. However, we had something of a mess on our hands. For example, there were dozens of ethnographic research techniques still in consideration, but only a handful of design rationale methods. And while quite a few problems framing methods passed the test, some were so similar, like *The Five Whys* and *Abstract Laddering*, that we had to consider if both should be included. When we took a step back and considered what we had, it was uneven and lacked a clear sense of ‘a whole’. What we had, looked a bit random and complex — something the general public might have a hard time comprehending and accessing, which was the very opposite of what we desired.

After presenting our findings to key stakeholders for feedback, it was clear that our collection needed to be curated and designed if it was ever to become a framework the general public might embrace.

The Fourth Heuristic: The Framework should be designed to be comprehendible and accessible by the general public

In cognitive psychology, there is a technique known as “chunking” in which *“individual pieces of information are bound together into a meaningful whole”* (Neath & Surprenant, 2003). It is well studied and understood among psychologists that when this technique is used, the information presented is more easily remembered than when this same information is presented as individual items. It is also understood that in order for chunking to work, the optimal size of the *chunks* generally consists of no more than three-to-five items. For example, when recalling a number such as 4105551367, grouping the numbers as 410, 555, and 1367 creates a mnemonic in the form of a U.S.-based telephone number. Instead of remembering 10 separate digits, which is beyond the "seven plus-or-minus two" heuristic, we recall only three groups of numbers, each containing only a few digits.

With this in mind, we began to edit and iterate. We developed and presented a successive series of candidate frameworks to key stakeholders, who offered us insightful feedback regarding the coherence, relevance, and usability of each version. After several iterations, we arrived at what we called the LUMA System.

The LUMA System *(Figures 11 & 12)* is a collection of 36 methods presented as a simple aphorism that summarizes design into the three fundamental skills of **looking**, **understanding**, and **making**. The simple acrostic **"L-U-M-A"** is offered as a mnemonic for the fundamental skills of design. The final letter, "A," stands for "adapting," which is a synonym for change and is the main concern of design.

Figure 11: The LUMA System. Source: LUMA Institute

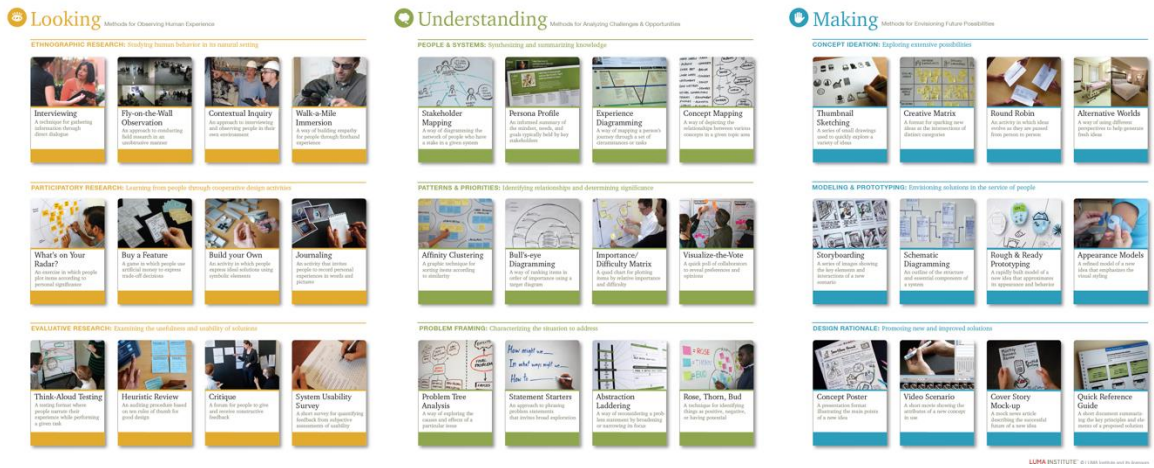

Figure 12: An alternate representation of LUMA System. Source: LUMA Institute

To grasp the combinatory power of this system, it's helpful to think of this system like karate or common foods in your kitchen and pantry.

Years ago, a client and colleague of mine, Seth Starner, who today heads up Advanced Development at Steelcase, and is a blackbelt in karate, mused about design and innovation in one of his very thoughtful blog posts. He wrote: "*In the end the martial arts are about a state of mind, yet if you have ever been involved in taking a Karate or Kung-Fu class, you spend a good portion of your time practicing forms called katas (figure 13), over and over and over again. The same moves in the same sequence until you dream about them. We think of design and innovation in the same way. It is a state of mind, but to get there you have to know the tools and approaches and then you need to practice them."*

Figure 13: Sochin is a kata practiced in several styles of karate. Source: https://www.karatedo.asia/shotokan-ryu-katas/sochin/

I've always found Starner's comparison of karate to design and innovation a powerful one. His analogy is a good reminder of how one becomes skilled and fluent in anything. The reason anyone is fluent, whether that be in karate, or reading, writing and arithmetic for that matter, is because at some point that person was taught a system comprised of atomic elements and *how* to combine those elements in a variety of ways for a variety of reasons and contexts. In Starner's karate example, it is the 36 katas which, once you understand them, can be combined in thousands of configurations and used in many offensive and defensive situations. In mathematics, it is just a handful of methods such as addition, multiplication, and simple algebraic formulas that, once you understand them, can be utilized when, where, and how you need them. In reading and writing, once you know the 26 letters of the English alphabet, you can read, comprehend, and utilize any word in the Oxford English Dictionary.

Since publishing the LUMA System in 2012, we've looked for ways to help people understand what it is, and how to use it. One analogy we've found particularly effective is to think of this system of design methods like the common foods you keep in your kitchen and pantry, such as everyday fruits, vegetables, and carbs, plus dairy products, your favorite protein, and go-to seasonings (Figure 14).

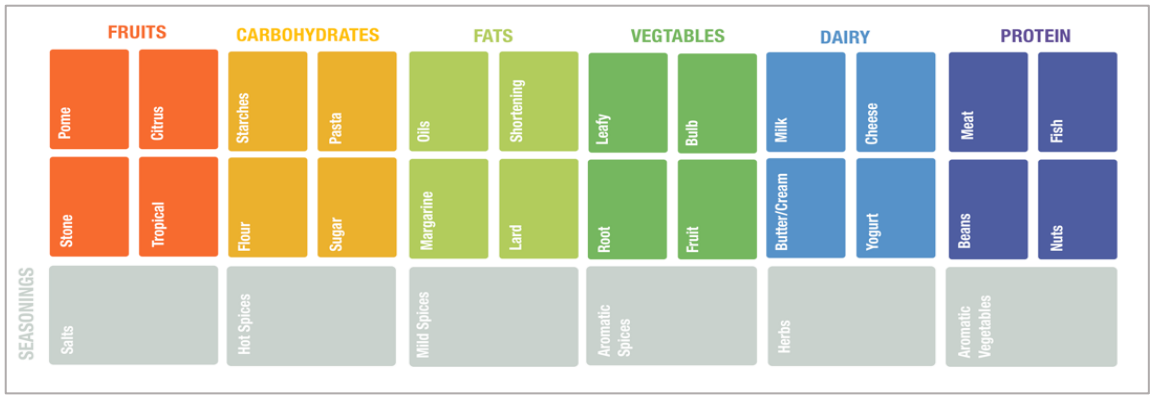

Figure 14: Source: LUMA Institute

Just as everyday recipes like Pasta with Cheese and Pepper or Peach Cobbler are made up of these essential food staples, so, too, can all sorts of everyday work experiences be made up of essential design methods used to address challenges such as improving the employee onboarding process or uncovering customer insights. (Figure 15) We have found the recipe metaphor particularly helpful in explaining what the LUMA System is and how to use it, to people without formal design training and who are new to the idea that *they* design.

Figure 15: Source: LUMA Institute

This is a system, not a process, for everyone. No matter what they do or what challenges they might face

Recalling our second heuristic, and the fact that the LUMA system's organizing principle is design skills, not design processes, the system is able to be utilized in all kinds of processes, whether Stage-Gate, Product Innovation Process (Figure 16) or Google Ventures Design Sprints. (Figure 17).

Recalling our third heuristic, and the fact that the LUMA system is comprised of only the most universal and essential design methods, it can also be employed by everyone – from business consultants to human resources managers, to solve common challenges, whether that's coming up with better ideas or working with remote teams. (Figure 18)

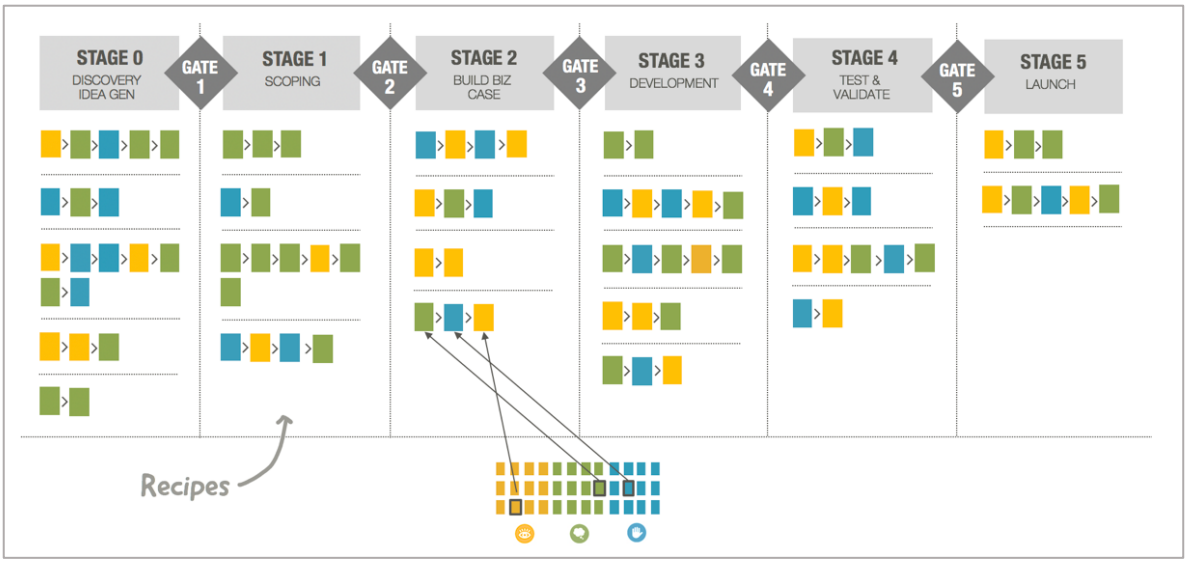

Figure 16: How the LUMA system underpins a typical Stage-Gate® innovation process. Source: LUMA Institute

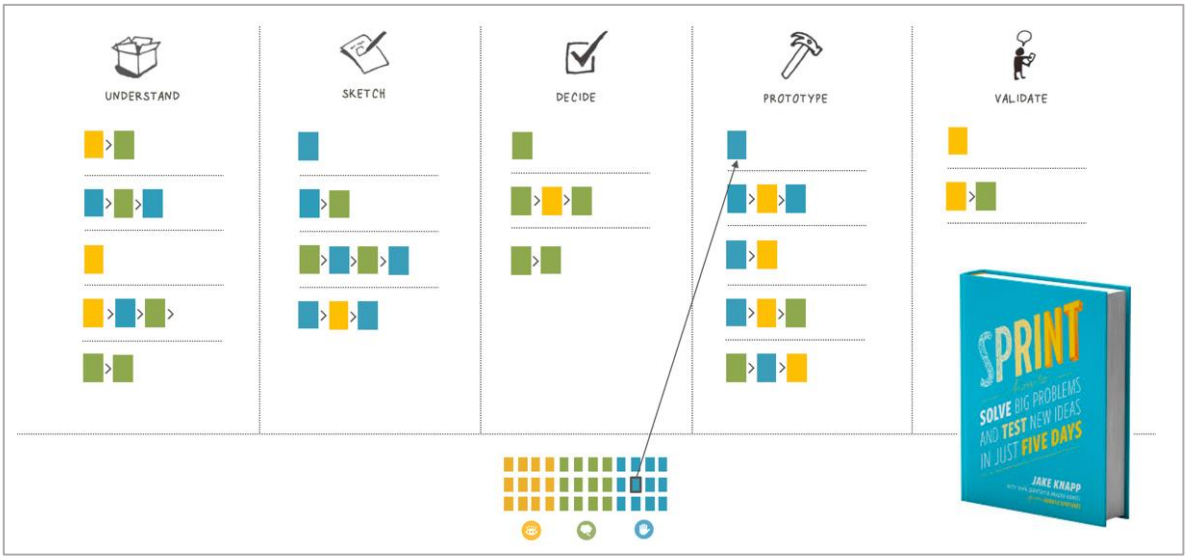

*Figure 17: How the LUMA system underpins Google Ventures Design Sprint process. Source: **SPRINT** by Jake Knapp & LUMA Institute*

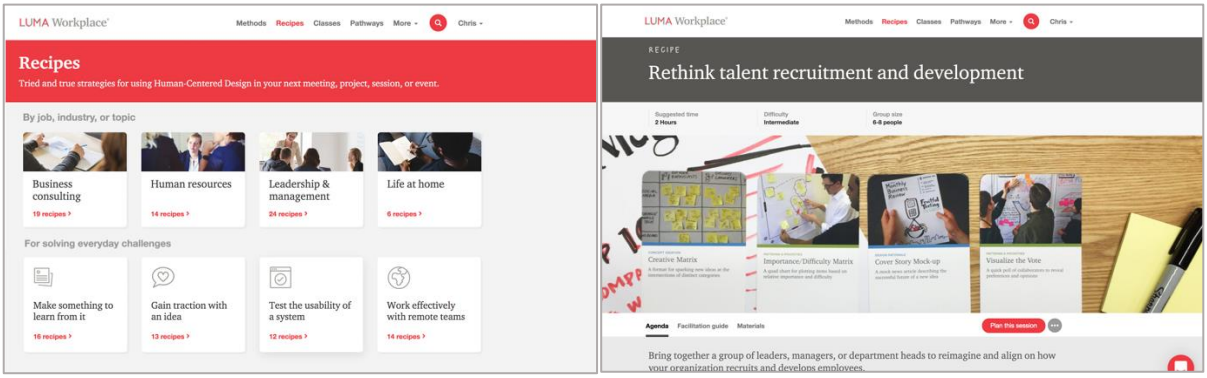

Figure 18: Recipes from our SaaS LUMA Workplace, are everyday examples of the combinatory nature of the LUMA system. Source: LUMA Institute.

Even popular design activities such as iteration and empathy are supported by this framework. For example, iteration is a really just a combination of a making method, followed by a looking method, followed by a making method. For example, a popular recipe for iteration might include building a Rough & Ready Prototype, followed by Think-Aloud Testing of that prototype, followed by building a new and improved Rough & Ready Prototype based on the feedback. Empathy is a combination of a looking method, followed by an understanding method. A popular recipe for building empathy might include conducting a Contextual Inquiry, which is a looking method, and then codifying the data collected using the Understanding methods of Rose, Thorn, Bud and Affinity Clustering.

Our goal was to create a design framework that was relevant, timeless and that anyone could learn and apply to all manner of challenges, no matter where they work or what problems they and their teams may face

But how is this system being used? And how effective is it?

The LUMA System: Usage and Impact

We created the LUMA System in response to a clear, unmet need among organizations around the world to elevate design and innovation, and in response to our core belief that the socioeconomic reality of our time is heralding the need for universal design literacy. Since its inception in 2012, the value of our framework has always been measured by its reception, adoption, and efficacy in real-world settings. Here is what we have learned.

Reception

- In 2015, *Harvard Business Review* featured the LUMA System and called it "A Taxonomy of Innovation."
- Our book, Innovating for People, (Figure 19) has a 4.6-star rating on Amazon based on 109 reviews.
- Our workshops and digital platform LUMA Workplace, currently have a Net Promoter Score of 80.

Adoption

- The LUMA System has been used in over 78 countries including mainland China (Figure 20).
- It has been employed at over 600 organizations worldwide, including dozens of Fortune 500 companies. This list includes organizations such as Accenture, Autodesk, Standard Chartered Bank, U.S. Department of Defense, and Knight Foundation.
- About 100,000 people have been introduced to the LUMA System through the book, ***Innovating For People***, in-person and online workshops, and our digital platform, LUMA Workplace®.
- We have certified about 200 instructors worldwide to teach the LUMA System. In addition, hundreds of teachers worldwide are using our system, including K-12 and post-secondary settings. While we would love to include stories of how they are using this system in the classroom, this is outside the frame of this paper.
- Launched in 2016, LUMA Workplace® currently has more than 5,000 monthly active users, a number that has grown more than 60 percent year-over-year.

Efficacy

- The taxonomy is very durable and sound. To date we have received no strong indication or feedback that the organization of the methods is flawed. Also, since our original research, we have uncovered dozens of new methods and each has fit precisely into our framework.
- Not everyone needs 36 methods. In no cases has an individual, team, or organization adopted and used all 36 methods on a regular basis. We have received feedback numerous times that 36 was still too many methods and we have no evidence that all 36 are essential. The data gathered to date indicates that people use a subset of anywhere between nine and 18 of the methods on a semi-regular basis, although not the same ones.
- We are in the process of examining the use of the system and expect to be updating and republishing our framework sometime in 2020. It is likely that a few methods will be removed and/or replaced with more effective candidates.

- We have more than 100 documented case stories shared by users of how they have employed the LUMA System. We assume there are thousands more that our clients have not shared with us.

While we can in no way claim that this framework has produced "universal design literacy," these statistics indicate that the LUMA System is helping to make progress toward this future state. We have much to learn, but we are confident that a system configured such as ours, but not necessarily ours, is necessary to the propagation of design literacy.

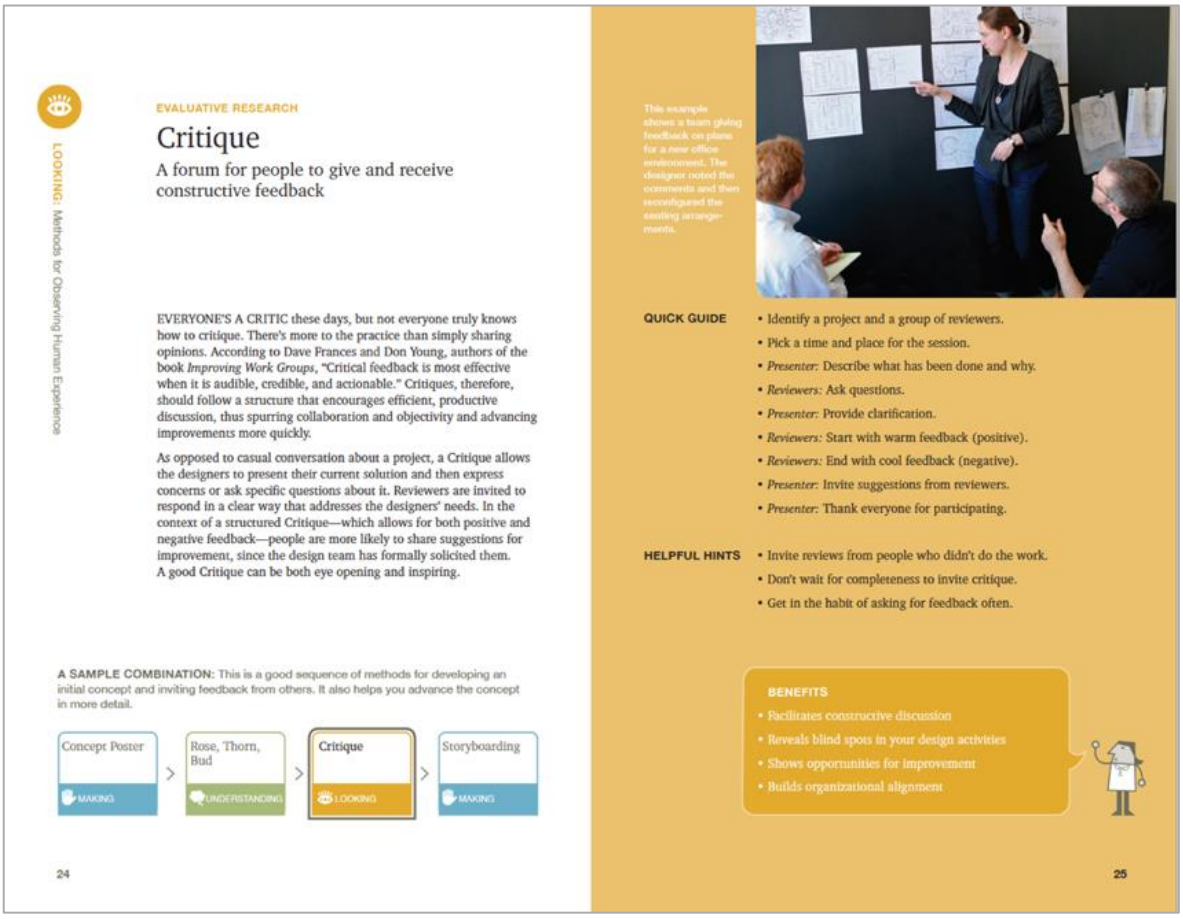

Figure 19: A spread from the book about the LUMA System called **Innovating for People: Handbook of Human-Centered Design Methods**. *Source: LUMA Institute*

Figure 20. Photos from a workshop in Shanghai, China. This team is using Creative Matrix and Important/Difficulty Matrix, to diverge and converge on concepts for how to improve the car buying experience. Source: LUMA Institute

Conclusion

Imagine a world in which hundreds of millions of people have mastered basic design skills so they can frame problems, deeply understand people and situations, pull insights from a complex sea of data, generate unconventional ideas, sketch, build prototypes, test assumptions, and iterate quickly — the hallmarks of good designers.

Imagine a world in which everyone is as competent at looking**,** understanding, and making as they are at doing arithmetic, simple forms of algebra and geometry. Imagine that they possess the creative confidence and capability to take on all kinds of opportunities calling for change.

It's hard to see that future clearly. But I predict that it will be a world in which people enjoy their work more, collaborate more, and tackle more of the world's problems, big and small, easy and wicked. I can't help but wonder if that world would be an entirely different place than it is today.

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[1] These include but are not limited to: UK Design Council (2011) Leading by Business Design; Frog (2018) The Business Value of Design; The Danish National Agency for Enterprise & Housing (2003) The Economic Effects of Design; Forrester (2017) The Total Economic Impact of IBM's Design Thinking Practice;