# The Paradoxical World of Design Thinking

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**Abstract**

Facing ever-changing and increasingly complex environments, today's organizations struggle to balance the worlds of analytical and creative thinking in their operational methodologies. This article looks at how organizations can apply and benefit from both, by embracing a culture which accepts the tension between the two approaches and celebrates the gains they offer.

Whether recognized or not, articulated or not, a tension has always existed in the world of business enterprise between two perspectives on how to stay competitive and create value for the organization. The first perspective emphasizes analytical thinking, logic, and predictability. The other sees raw creativity and intuitive thinking as the essential components necessary for success. "On the surface, the two seem irreconcilable," indicates Roger Martin in his book *The Design Business.* However, "the battle between analytical thinking and creative thinking is somewhat misguided," he cautions, because both are necessary. It is in the "dynamic interplay" between these two world-views, he asserts, where one encounters the world of design thinking.

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## Dancing with Innovation

The analytical, logical, and predictable approach of doing business, often called efficiency thinking, matured and was popularized during the 19th and 20th centuries, indicates Gary Oster, Professor of Innovation and Entrepreneurship at Regent University. As technology and industrialization increased, organizations searched for ways to be more efficient and streamline operations in order to reduce costs and generate more profits. The world of manufacturing turned to the assembly line and the business office to motion-efficiency and time-management practices. The business culture it produced was one of standardization, where companies sought the "right way" to do things. Built on inductive and deductive logic, it generated reams of policies and procedures and sought to create a predictable environment that reinforced certain operational habits and patterns. In its golden era, writes Tim Brown in his book *Change by Design*, it was quite effective, producing goods in greater quantities and at lower prices, which helped, at least in the West, launched a whole new middle class.

However, points out Oster, toward the end of the 20th-century efficiency thinking hit its zenith, and the profit margins could no longer be sustained. Many businesses that had built their empires on these principles began to falter, forcing them to seek new ways to differentiate themselves in the marketplace. A window of opportunity for creativity and entrepreneurship opened as businesses began to seriously look at innovation as a way forward. Professors Mary Benner and Michael Tushman, from the Universities of Minnesota and Harvard, respectively, point to 3M as an outstanding example of a company born in that era that embraced innovation and was able to maintain it. It did so until the era of James McNerney when they briefly tried to implement an efficiency approach called Six Sigma, faltered, and dropped it. But 3M is the exception. Old habits die hard and most companies find it difficult to go beyond lip service and faltering efforts to incorporate it into their operations. The culture of innovation, as Brown points out, can be a "battle." Jeanne Liedtka and Tim Ogilvie, authors of *Designing for Growth,* describe the differences as being quite deep. "Even the very values on which each approach rests diverge dramatically," they write, describing most business executives as people who "value order and control above all else—and structure their organizations to produce it." In contrast, they describe innovation as "just plain messy and often inefficient…[where] ambiguity and uncertainty are like crack cocaine to designers."

## The Birth of Design Thinking

It was practitioners and students of urban planning, design, and architecture that first started formally seeking solutions to the tension between these two approaches. Kate Gibney, in an article entitled *Awakening Creativity*, documents how Stanford architecture professor Rolf Faste recognized that architectural students who only applied their mathematical skill and scientific knowledge to their work were less able to resolve "open-ended and often interdisciplinary problems that have no 'right" answers." He sought ways to develop mental ambidexterity in his students, helping them tap into their intuitive side and develop their artistic

abilities. During those same years, Design and Innovation Professor Richard Buchanan wrote an article called *Wicked Problems in Design Thinking* in which he proposed that knowledge from both art and science be brought together to solve some of the most challenging modern day problems. He recognized that creativity and intuition were especially necessary for tackling real, complex, and difficult issues, which he labeled "Wicked Problems," a term previously coined by Architect and Urban Planning Professor Horst Rittle. Buchanan proposed that design thinking could not only be applied to architectural design, but should be applied across a variety of fields such as visual and symbolic communication, designing material products, activities and services, and complex systems and environments. In essence, he was inviting just about any type of organization or professional field to tap into the methods and tools of the design world.

Another critical piece to the emerging design thinking puzzle came through American Pragmatist Philosopher Charles Peirce, who Martin lauds for recognizing that neither inductive reasoning (moving from a specific premise to a general conclusion) or deductive reasoning (moving from a general premise to a specific conclusion) could adequately explain how new ideas are generated because both depend on prior or existing knowledge. Instead, Peirce proposed that new ideas were somehow "logical leaps of the mind," or "inference to the best explanation," and labeled this type of thinking "abductive logic." In design thinking, this provides a tool to focus on "what might be" rather than "what is," one of the most important elements that open the door for new ideas and creativity within the innovation toolbox. Martin explains that its use is not "to determine if something is true or false; you employ it to indicate a new path to a possible truth," which can then be tested.

## Making it Practical

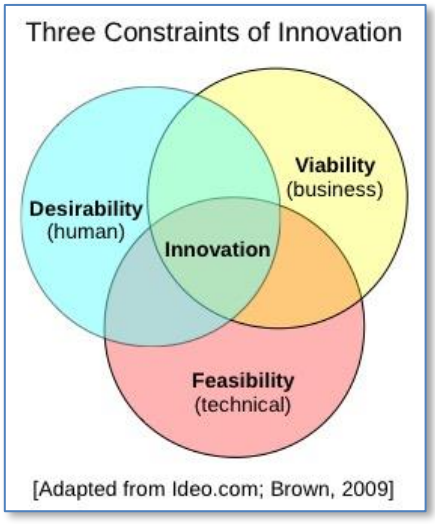
True to the classic field of design principles, other aspects of the practice were adopted into design thinking. Professor Charles Owen from the Illinois Institute of Technology, lists the following aspects that characterize design thinking: a focus on creativity and invention, human-centered, environmental concern, a systemic or holistic perspective, visualization, optimism, adaptive to the needs of the users, using language as a tool to communicate and explore, team-based design, exploring alternatives, avoiding quick choices, freedom to dream yet seeking practical application, and working systematically with qualitative information. Owen points out that design thinking does not process ideas in terms of true or false, right or wrong, but seeks to provide practical and usable solutions to human and environmental needs by seeking functionality and utility as a means of measuring effectiveness. It seeks to measure such things as appropriate or inappropriate, if it works or doesn't work, is it elegant or inelegant, which option is better or worse, is it sustainable or unsustainable. In his very recent article *Design Thinking Comes of Age*, Jon Kolko, the chief designer for Blackboard educational learning software sums up the following principals he has seen emerge in design thinking: a focus on user's experiences, especially their emotional ones; the creation of models to examine complex problems; the use of prototypes to explore potential solutions, a tolerance for failure, and demonstrating thoughtful restraint, defined as the deliberate choice to tend toward producing simple products rather than complex. This balance between open-mindedness and practicality,

with a focus on real human needs, has helped design thinking build a bridge into the no-nonsense world of business and organizational operations.

To assume that incorporating design-thinking principles into the fabric of an existing organization is a simple step-by-step process would be a mistake. Benner and Tushman argue that just as the efficiency thinking marketers of the past produced many managerial "tools" such as TQM, Six Sigma, and others, promising results, design thinking proponents should not make the same mistake of trying to market it as a formula, or process-driven approach, with implications for guaranteed success. Scholars Johansson-Sköldberg, Woodilla, and Cetinkaya credit IDEO's Founder, David Kelly and their CEO, Tim Brown, as the primary agents who have helped communicate the vision, values, and methodologies of design thinking to the broader organizational and business world. IDEO today is a design consulting firm that is perhaps the most recognized company linked to design thinking worldwide. Kelly was (and still is) a fellow professor with previously mentioned Rolf Faste at Stanford in the early years of design thinking's evolution, and developed a passion for finding practical ways of turning design thinking theory into practice. He took his own design firm and merged with Moggridge-Associates in London, ID in San Francisco, and Matrix Product Design in Palo Alto to form IDEO. Their approach, as seen in their own literature and Brown's books and articles, is to help organizations build design thinking capacity by establishing an innovative culture with the necessary internal systems to sustain and launch new ventures.

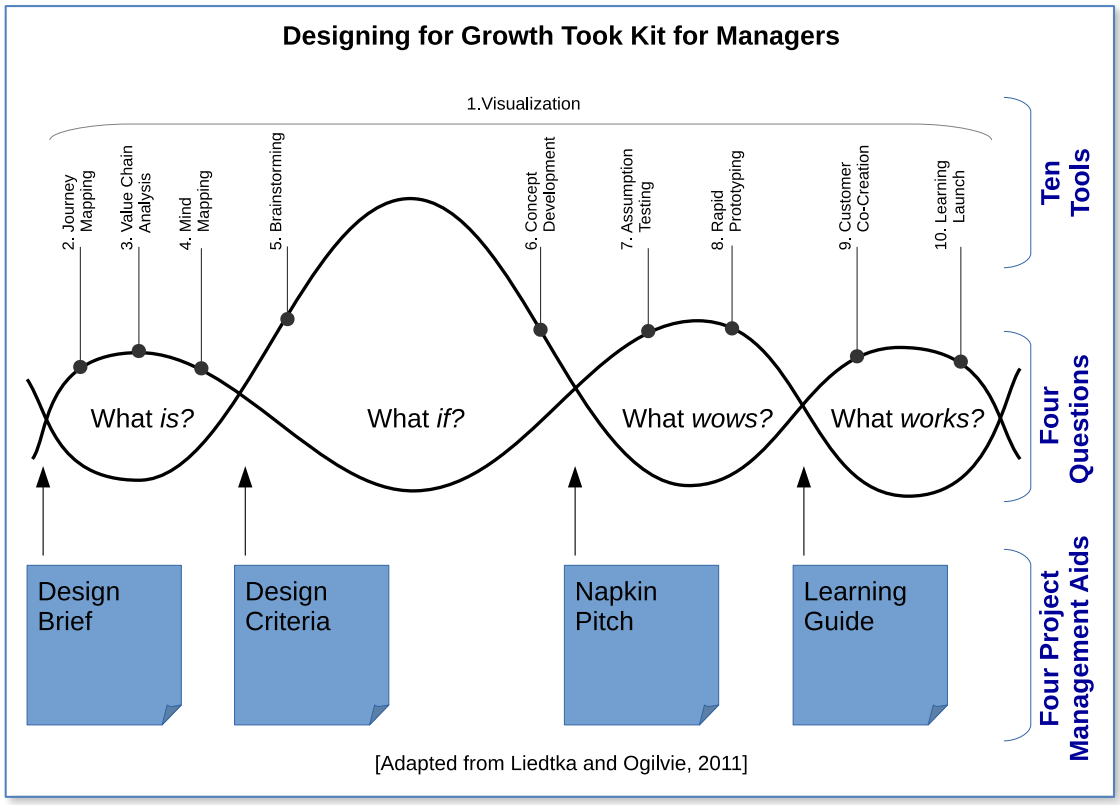
## What it Looks Like

In his book *Change by Design,* Brown points out that there is no "simple, easy to follow recipe…no 'one best way'" to ensure success in design thinking. Rather, he argues it is an exploratory process, often yielding unexpected results, which may or may not integrate into an ongoing process, and may even force the organization to "revisit its most basic assumptions," which calls for real commitment. We will look at two approaches, one presented by Brown which has been used at IDEO, and another presented by Liedtka and Ogilvie.




Within IDEO the application of design thinking is viewed as "a system of overlapping spaces rather than a sequence of orderly steps." These spaces Brown defines as *inspiration*, where information and insights are sought from every source available to identify the core issue; *ideation*, where insights are turned into ideas; and *implementation*, where ideas are tested and developed into a concrete plan of action. The *inspiration* space starts with a focus on people, learning from others by listening, observing, empathizing, and thus bringing users into the process to define the issue to resolve, or as Brown defines it: "Converting need into demand." The *ideation* space involves a process of deep exploration where divergent thinking (expanding the options), is applied through

experimentation, optimism, brainstorming, and the use of visualization tools to release the creative juices and generate a multitude of ideas. This helps build a "mental matrix" from which the team can then shift to convergent thinking (reducing the options) to select the best possible ideas to test. Part of the convergent thinking is dealing with the constraints of innovation, which




Brown categorizes as the human element (desirability), the market viability of the product (business), and the technical realities of implementation (feasibility). The *implementation* space is where the ideas are tested by experimentation via prototyping with the co-operation and co-creation of the users. It may be a physical model, a process, a field test, a pilot project, a simulation exercise, or other means, but the guiding principles are to keep it simple, quick and dirty, and avoid the use of any more resources than necessary. The goal is to learn, involve the users, receive feedback, and go at it again. These iterative cycles of testing are the quickest and most economical path to the right product, argues Brown, because when it is finally released it has been thoroughly tested within the consumer market.

Liedtka and Ogilvie offer a more detailed approach but reflect the same principles as IDEO. They use three primary elements to help in the process: four questions, ten tools and four project management aids (PMA's). They also emphasize visualization throughout the process and use visual aids repeatedly in their book to drive this process home. The four "what" questions are used to generate abductive thinking for each phase, setting a pattern of divergent and convergent steps to create a discipline of deep exploration, followed by an equally disciplined process of filtering and decision-making. The "What is?" phase starts with the "Design Brief" as the first PMA. This phase is aimed at helping the team develop a depth of

understanding and insight into the human problem or opportunity so as to establish "a reference point for change, the constraints that shape it, and the criteria for what success looks like." The tools it uses are journey mapping, value chain analysis, and mind mapping tools to achieve this. The second question is "What if?" This question is truly at the heart of the innovative process. It is the optimistic "what might be" question that is at the core of design thinking. The aim in this phase is not to come up with a lot of ideas, but to "arrive at robust concepts that can be evaluated, prototyped, and developed." It leads to the assumptions that must be tested. The tools offered are brainstorming and concept development and the PMA is the "Design Criteria," which is really an "addendum" to the Design Brief (in the 'What is?' phase), further defining the scope and direction of the project. The third question is "What Wows?" In this phase, the goal is to uncover and test the assumptions from the previous phase. It "tests the future" first through thought experiments, and then real models and actual users. The two tools used in this phase are assumption testing and rapid prototyping. The PMA is the "Napkin Pitch," in which the team identifies the need, the approach, the benefits, and the competition. The fourth and final question is "What works?" The goal here is to involve the customers in "walking with you into several possible futures and co-create a solution." In this phase, enough feedback is gained to assess the investment that can be put into the product and whether the product is ready for a "learning launch." The tools in this phase are the customer co-creator and the learning launch. The PMA is the "Learning Guide" outlining the strategic intent of the project, the remaining key assumptions to be tested, the in-market test plan, and the financial capital to be expended.

## Making a Difference

Do these approaches to design thinking really work, and do they make a difference? Brown and Martin, in one of their more recent articles entitled *Design for Action,* tell an intriguing story that comes out of Peru. It is about Carlos Rodriguez-Pastor Jr. who inherited Banco Internacional del Peru upon his father's death. It is one of Peru's largest banks and had been government-owned until his father led a consortium to buy it. Rodriguez-Pastor had the desire to do more than just be a banker, he dreamed of somehow positively impacting Peru's economy. He was convinced that the traditional "caudillo" (big man) approach to business was wrong and wanted to build a broader base with many more stakeholders. He renamed the bank "Interbank" and began looking for new ideas by convincing a broker in the U.S. to let him and four of his colleagues tag along on an investor tour of U.S. banks. It was the beginning of building an innovative management team that began to expand its assets and diversifies into middle-class businesses such as department stores, supermarkets, movie theaters, and pharmacies. He also began building a learning organization by sending his managers to top universities and companies, including IDEO, then launched their own learning center called La Victoria Lab. They were now employing over 55,000 people and generating revenues of $5 billion USD.

But Rodriguez-Pastor was not satisfied. He was disillusioned with both the private and public school systems and took steps to enter into the education business. Aware of the difficulty of the task, he partnered with IDEO to map out a plan. The first step was to gain visibility by launching a program that focused on the best teachers, awarding a car to "the

teacher who leaves a footprint" in each of Peru's 25 regions. This opened the door for them to purchase a small private group of schools, and bring in a group of professionals from various fields to work with IDEO to create a new model called "Innova Schools." The goal was to offer a superior education at affordable prices. In a student, parent, and teacher focused process, they ran multiple tests with a variety of prototypes, ultimately arriving at a teacher-as-facilitator model incorporating new technologies. The pilot program was well received and with some more tweaking, they launched. Enrollment capacity was being filled even before new schools would open, and public school teachers were applying to teach even though the salaries were lower.

Another issue that concerned them, was the effect their business efforts were having on the poorer communities. Their creative response was to launch the Peru Pasion program in cooperation with a regional NGO and local government, to help poorer farmers build capacity by sourcing their grocery chain products from these areas. This practice has spread to other suppliers such as baked goods and dairy products. What started out as a troubled banking business is now impacting several layers of society in Peru, thanks to a man who wanted to learn, took the initiative and built a team of innovators around design thinking concepts.

## Is design thinking for everyone?

Allan Shearer, Professor at the Center for Sustainable Development at the University of Texas at Austin, reminds us in his article *Abduction to Argument: A Framework of Design Thinking,* that abduction should not be embraced "to the exclusion of deduction and induction." They are complementary. In both IDEO's and Liedtka and Ogilvie's approaches to design thinking, inductive and deductive logic are used to analyze and filter information arrived at by abductive exploration. The goal, Shearer argues, is "to strive for balance". If we think back to Faste's architectural students, the goal was to use both sides of the brain, the logical, systematic side, and the innovative, creative side, so as to build things that are both beautiful and functional, as well as meet people's needs. Understanding when to apply one or the other, according to Shearer, is knowing when one needs to tap into information from the past to make a decision, and when one is facing the unknown and need to "operate in the realm of what-might-be.

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## About the Author

David Johnson, a doctoral candidate in Strategic Leadership at Regent University, has a diverse background in both the for-profit and non-profit worlds, including leadership roles in professional sports, university faculty and administration, and a media and medical NGO. He is currently a senior consultant with Development Associates International. Contact the author at djohnson@daintl.org).

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