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Learning Emergent Strategies through Design Thinking

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By Sebastian K. Fixson and Jay Rao

The U.S. government's much awaited health insurance web site went live in October 2013. It crashed almost immediately. An unanticipated level of traffic was among the causes cited. Even site visitor who successfully got through were not home free. They faced a multitude of problems: confusing instructions, missing drop-down tools, unexpected hang-ups and puzzling design. Those who gave up and called customer service fared no better since service reps couldn't access the site either.¹

In late November 2013, JC Penny (JCP)—a member of the S&P 500 since 1957—was kicked off the list because of its sharp decline in market value. While JCP still had more than 1,000 stores and 2012 revenues stood at \$17 billion, its fortunes had fallen sharply during the economic downturn. Just two years earlier, JCP's board had brought in former Apple's retail star Ron Johnson as CEO, who had a plan to reshape the 100+ year-old U.S. retailer. That plan put "mini-Martha Stewart shops" in many stores. An overhaul of the home departments in 500 stores was launched simultaneously. These initiatives backfired. By the end of the first year of Johnson's turnaround strategy, JCP had amassed nearly a billion dollars in losses and a 25 percent drop in revenues.²

An online Internet course offered by Georgia Tech and hosted by a leading online learning firm, Coursera, promised to teach 40,000 students how to create their own massively open online course. Participants were asked to sign up using Google Docs. Unfortunately, course planners had overlooked a small but important detail: Google Docs allowed only 50 people to edit a document at one time. Georgia Tech's site crashed as large numbers of students tried to use it.³

These three failures—a health insurance Web site, a brick and mortar retail makeover, and an online course—seem unrelated. But they have one thing in common: each followed a traditional "analytical" strategy that we describe as Analyze → Predict → Plan → Full Scale Launch. These three cases, like all change or innovation projects, involved significant uncertainty. The analytical approach, based on the logic of predictability, inspires confidence that the uncertainty that is present has been minimized if not mastered.

This traditional approach follows a typical pattern. Big Hairy Audacious Goals are announced with great fanfare. The uncertain future is then examined through environmental scanning (with tools such as SWOT, STEP, and Value Chain Analysis). Future outcomes (e.g., unit sales, revenues, costs, IRR, milestones met, etc.) are forecasted using historic data and collective judgments. From these forecasts, key performance indicators and milestones are set and budgets are allocated. The Great Leap into the future is made. If project performance fails to meet projections or reach milestones, money and energy is

¹ "Healthcare.gov plagued by crashes on 1st day," CBS News October 1, 2013.

² "Penney CEO Out, Old Boss Back In," The Wall Street Journal, April 8, 2013.

³ "Crash sinks course on online teaching," The Wall Street Journal, February 4, 2013.

spent getting the project back on to its anticipated trajectory. If that doesn't work, heads may roll.

This familiar approach to strategic change and project management—the analytical strategy—makes several assumptions: (1) all process and outcome variables are known and can be accounted for ex-ante, (2) data from past projects can be used to predict the process and outcome of this new one, (3) some deviations from projections can be accommodated through managerial judgment, and (4) failure is not an option. Most large firms, governments, and institutions use an analytical strategy and make those assumptions as they move into the future.

Regrettably, those assumptions are seldom valid in projects that involve radical innovation and complex change, which, almost by definition, venture into uncharted territory. Project teams must deal with both *known* unknowns and *unknown* unknowns. Known unknowns are the uncertainties we acknowledge but whose dimensions are obscure. For example, we know that people would benefit from a new and improved tablet computer but we haven't been able to determine how many people and at what price. Unknown unknowns are the uncertainties that no one has even thought about or has any reason to expect—the one's that will blindside us as we move into the future. Unfortunately, analytical strategies do not account for these hidden variables ex-ante. So, when there are many unknown variables, predicting outcomes a priori is a futile exercise.

Emergent Strategy

Seasoned entrepreneurs, innovators and venture capitalists can teach us a lot about uncertainty and how best to deal with it. These people deal with it all the time. Their approach, however is very different. Instead of following the “analyze-act” model, they “act-analyze” through an “emergent strategy” that follows this general pattern: Design → Build → Test → Learn → Redesign → Iterate → Launch → Scale Slow. This approach is very much in line with design thinking principles, such as user research, ideation, and prototyping and iteration, with which many of you readers are surely familiar.

Devotees of emergent strategy do not tie themselves up only in analysis of historical data (which may have limited, if any, value) and traditional forecasting. They don't tinker with best-case/worst case projections. Instead, when seasoned entrepreneurs, innovators and venture capitalists recognize an opportunity, they pursue it through small, calculated steps—experiments—observing what happens with each step. They take measured action, learn from experience, and take more small steps based on what they have learned. Like a person entering a dark and unfamiliar room, they probe, learn from what they encounter, and redirect as experience dictates. Each forward step uncovers a previously concealed obstacle and informs the next step. That's an emergent strategy.

Seasoned entrepreneurs, innovators and venture capitalists make hypotheses and then test them through rapid prototyping and market inquiry. Knowing that their initial hypothesis may be no better than an educated guess, they aim to fail fast and fail cheap, uncovering unanticipated problems and discovering data where previously there was none. Every scrap of new data helps them to refine their hypotheses and perfect their concepts and

business models. And because emergent strategy is an iterative process, one experiment leads to another, and to another, in each case closing in on a workable solution.

Two strategies to approach the future

Analytical: Analyze → Predict → Plan → Full Scale Launch.

Emergent: Design → Build → Test → Learn → Redesign → Iterate → Launch → Scale Slow

Emergent Strategy and Business Education

The problem with the analytical strategy is not its methods, but the highly uncertain situations to which its tools are so often (and inappropriately) applied. Analytical tools can be powerful when applied to appropriate situations—version 3 of a software or incremental innovations to existing products and technologies; in others, particularly blue sky projects with substantial uncertainty, they are apt to create a false sense of certainty. Business schools have contributed to this problem through their emphasis on analytical tools training: e.g., statistical analysis, discounted cash flow, and internal rate of return. These quantitative tools give people a false sense of certainty in an uncertain world. And so, like an army of hammers in search of nails, newly-minted business school grads go looking for opportunities where they can apply the tools they worked so hard to master. People being what they are, they find what they are looking for.

To their credit, business scholars have given us an alternative, or complement, to analytical strategy. Almost 40 years ago, Henry Mintzberg, a Canadian management professor, introduced us to what he labeled *emergent strategy*⁴. Twenty years later Rita McGrath and Ian MacMillan proposed *discovery-driven planning*, later expanded to discovery-driven growth.⁵ At about the same time the world of software engineering gave us a working example of design thinking in *agile product development*, which promotes the notion of growing through rapid loops of testing and iteration of small work packages. This iterative *agile scrum* technique, based on the work of Takeuchi and Nonaka⁶, is distinctly different than the sequential and analytical techniques of the traditional *waterfall* methodology. More recently the start-up world has given us *lean start-up*⁷ and *customer development* approaches⁸ that encourage us to generate real market response data as early as possible. The design thinking approach familiar to most readers offers similar advice.⁹ In addition to striving for deep user understanding and the generation of creative alternatives, design thinking promotes early prototyping and testing as a way of supporting and shaping of various solutions.

⁴ Mintzberg, Henry. 1978. "Patterns in Strategy Formation." *Management Science* 24:934-948.

⁵ Rita McGrath and Ian MacMillan, "Discovery-Driven Planning," *Harvard Business Review*, July-August 1995, 44-54; and *Discovery-Driven Growth* (Boston: Harvard Business School Press, 2009).

⁶ Takeuchi, Hirotaka and Ikujiro Nonaka. 1986. "The new new product development game." *Harvard Business Review*:137-146.

⁷ Eric Ries, *The Lean Start-Up* (New York: Crown Business, 2011).

⁸ Steve Blank and Bob Dorf, *The Start-Up Owner's Manual* (K&S Ranch Press, 2012).

⁹ See, for example, Brown, Tim. 2008. "Design Thinking." *Harvard Business Review* 86:85-92. and Roger L. Martin, *The Design of Business: Why Design Thinking is the Next Competitive Advantage* (Boston: Harvard Business School Press, 2009).

But while knowledge of methods and tools is necessary, it is often not sufficient. What is also needed is a culture that promotes experimentation, and views unsuccessful outcomes not as failures but as learning opportunities. Consider, for example, W.L. Gore. W.L. Gore, the chemical products company that most of us know through its Gore-Tex® high performance material, demonstrates the same preference for experimentation over analyze-act. At Gore, failures made in the pursuit of novel solutions are accepted as valued parts of the innovative process. They have learned what Thomas Edison learned more than a century earlier—that every failed experiment provides useful information. In effect, “We know that this won’t work--let’s move on to the next alternative.”

If applying an emergent strategy approach requires both knowledge about relevant methods and tools and a different mindset, then business schools today should strive to create learning experiences to accomplish both. Owing to its emphasis on entrepreneurial thought and action, Babson College, our institution, has developed educational offerings on various levels with precisely that goal. We have found that experiential learning—active engagement in real life situations—is the most effective method for developing emergent strategy skills of students. Two aspects are particularly important for this type of learning.¹⁰ The first is teamwork. Success requires the participation of people with different competencies. Trust and psychological safety are essential if team members are to embrace open experimentation and the possibility of failure. Second, the choices of type, scope, and context of a learning project are important. An innovation project should challenge a team to *stretch* but not present an impossible goal. At the same time, it needs to be sufficiently unspecified to allow teams to work their way through the problem or opportunity.

The following describes briefly a set of examples how we integrate design thinking into an experiential learning and emergent strategy orientation into our educational programs.

Learning to negotiate different value systems in interdisciplinary teams

One of the most powerful tools we have for experiential learning in an interdisciplinary setting is our undergraduate course *Integrated Product Design*¹¹. The course brings together students and faculty from three different disciplines and three separate institutions: business (Babson College), engineering (Olin College of Engineering), and industrial design (Massachusetts College of Art and Design). Working in interdisciplinary teams, students experience the process of product development from opportunity recognition to prototype construction to economic and environmental analyses of the proposed solution. Teams learn about users and markets, create novel ideas, and develop and refine prototypes. Faculty members introduce tools and methods through brief lectures, in-class exercises and discussions, and studio-style assignments. Using no more than their modest seed money, student project teams have developed a variety of

¹⁰ Fixson, Sebastian K. and James M. Read. 2012. "Creating Innovation Leaders: Why We Need to Blend Business and Design Education." *Design Management Review* 23:4-12.

¹¹ Fixson, Sebastian K. 2009. "Teaching Innovation through Interdisciplinary Courses and Programmes in Product Design and Development: An Analysis at sixteen U.S. Schools." *Creativity and Innovation Management* 18:199-208.

innovative products such as new public water fountains, intelligent energy-saving power extension cords, and solutions that prevent traffic accidents involving pedestrians and automobiles. Most recently, the teams designed and developed products to improve the sustainability of private homes; products included solutions to reduce water consumption in the shower, when washing dishes, and to ensure fresh clothes.

Throughout the course, testing, experimentation, and learning from failure are experienced as key pieces of the product development cycle. We encourage students to abandon concepts – even entire projects – when testing and experimentation indicate that their project is going nowhere. This process is particularly challenging for teams that are composed of members that bring very different value systems to the project. What one member considers too risky, another might consider as just the start of an exploration. Accordingly, just agreeing with what yardstick to measure the outcome of an experiment requires substantial negotiation, often emotionally charged. This experience in the sheltered world of a college course helps students build the confidence they need to articulate relevant hypotheses, design appropriate tests, and use learning to shape decisions. In fact, research shows that prototyping is related to higher team performance, even in cases of novices learning the tools and methods of design thinking.¹²

Learning from ‘unsuccessful’ experiments

An example of how we try to improve our students’ mental strength to deal with all possible outcomes of experiments comes from our MBA elective, *Product Design and Development*, which also challenges students to practice design thinking to foster their emergent strategy skills. Working in teams on semester-long projects, the students inevitably reach a point at which they must decide which of several concepts they will select for further development. Earlier versions of this course spent considerable time teaching analytical decision-making tools. We have since shifted our emphasis to the testing procedure itself. Instead of asking for the results of in-depth analyses, we ask student to develop hypotheses and procedures for testing them. The deliverable in these exercises is not the selected concept, but the hypotheses, the data collected, and the learning extracted from that data.

This focus on prototyping and testing product concepts forces students to engage with the uncertainty inherent in novel ideas. Interestingly, more often than not students, like most managers, stubbornly hunt for ways to rescue unworthy projects--the sunk-cost fallacy in full display. As educators, we encourage them to redirect their energy and resources, and apply what they have learned to a more promising project. Again, this approach can create uncomfortable situations for some students when, for example, their team must make a presentation on a project that has fallen short of expectations. But disappointment, and what can be learned from it, is part of every student’s education in emergent strategy! IDEO CEO Tim Brown made that point in an article in which he identified the qualities of a design thinker as follows: empathy, integrative thinking, optimism, experimentalism, and

¹² Seidel, Victor P. and Sebastian K. Fixson. 2013. "Adopting Design Thinking in Novice Multidisciplinary Teams: The Application and Limits of Design Methods and Reflexive Practices." *Journal of Product Innovation Management* 30 (S1):19-33.

collaboration. Experiencing a failure during experimentation, and learning from the results, he argued, is an important way to nurture these qualities.

Learning about how little we know about the Unknown Unknowns

Emergent strategy is spreading in the corporate world. In a recent Babson Executive Education survey of global executives, 51 percent said that experimentation was their organization's preferred approach to understanding and acting on potential opportunities.¹³ Scientists and engineers, and especially designers, are generally more comfortable with this logic and practice than their managerial counterparts, many of whom are either unaware of this approach or apprehensive about it. One reason for this behavior is that knowing when to apply emergent strategies requires recognizing existing uncertainty in the first place. Babson Executive Education is working to help executives to develop better sensing skills this through games, experiments, simulations, and action-learning projects.

One example for a simulation that we have successfully employed to let managers experience how easy it is to overlook relevant variables is the Spaghetti Game.¹⁴ In this simulation game, participant teams face high levels of uncertainty, and pursue – often only subconsciously – either an emergent *or* an analytical approach. Teams that pursue an emergent approach, for instance through rapid prototyping, usually perform better; teams that pursue analytical planning for a longer period of time usually fail in this context.

A few elements of these programs are central to teaching executives how to engage in both emergent and analytical strategies. First, by putting teams into novel situations, we force them to break away of traditional thinking and expose them to different skills. Finding themselves in unfamiliar situations, participants are jolted into alertness and opened to learning. In addition, these simulations and games encourage participants to uncover hidden variables through experimentation, rapid prototyping, and through mistakes. In the process they learn to reflect on what, why, and how failures occur.

Second, most of these simulations and games are played in several rounds. There are opportunities to pause between rounds to reflect on consequences of actions and decisions. Participants enter subsequent rounds with new knowledge and new data that inform future actions.

Third, well-designed simulations and games help participants practice both emergent and analytical strategies in alternating fashion. Participants identify and exploit innate and otherwise dormant entrepreneurial traits and leadership skills.

Finally, we integrate real world programs into our educational programs. The best of these programs push teams of executives to use emergent strategies by encouraging them to: (1) get out in the field where they can identify opportunities, (2) develop and shape

¹³ J. H. Wilson and K. Desouza, "Finally: A Majority of Executives Embrace Experimentation," 2010 *Harvard Book Review* blogpost, online at <http://blogs.hbr.org/research/2010/12/while-he-was-at-amazon.html>).

¹⁴ Developed by Tom Wujec at Autodesk

opportunities through rapid prototyping and iteration and (3) introduce products and services into test markets. Together these help Babson's executive education program fulfill its ultimate goal: to make entrepreneurial leaders more effective in guiding innovative projects within their organizations.

Conclusion

Many observers report increasing levels of uncertainty in many industries. Under these conditions, purely analytical strategies carry the risk of producing substantial failures like the ones of a health insurance Web site, a brick and mortar retail makeover, and an online course. We know that one of the causes is that large enterprises, governments, and institutions have traditionally approached change and innovative programs through a linear sequence: Analyze → Predict → Plan → Full Scale Launch. This strategy has serious limitations when uncertainty and ambiguity are high. In these situations, an emergent strategy sequence of Design → Build → Test → Learn → Redesign → Iterate → Launch → Scale Slow is a more prudent option, as the examples of Drew Houston (DropBox) and Hamdi Ulukaya (Chobani) illustrate, who both scaled their products and ultimately their companies only after confirming the market need through small-scale carefully designed experiments. Key principles of design thinking are extraordinarily useful for teaching that emergent strategy approach. Business educators who teach students—undergraduates, MBAs, and executives—how to integrate analytical and emergent strategies will better prepare those students to succeed with innovative and change-oriented projects.

About the Authors

Sebastian Fixson teaches operations management, innovation, and design courses at undergraduate, graduate, and executive education levels at Babson. Prior to joining Babson he taught at MIT's Sloan School of Management, the University of Michigan's College of Engineering, and Northeastern University's School of Technological Entrepreneurship. His research has been published in the *MIT Sloan Management Review*, *DMI Review*, and others.

Jay Rao teaches innovation strategy and organic growth to graduate students at Babson College and in Babson's Executive Education programs. His research and teaching interests include Innovation Strategy, Culture of Innovation and Leading Innovation and Corporate Entrepreneurship. His research has appeared in the *MIT Sloan Management Review*, *European Business Review*, *European Financial Review*, and others.