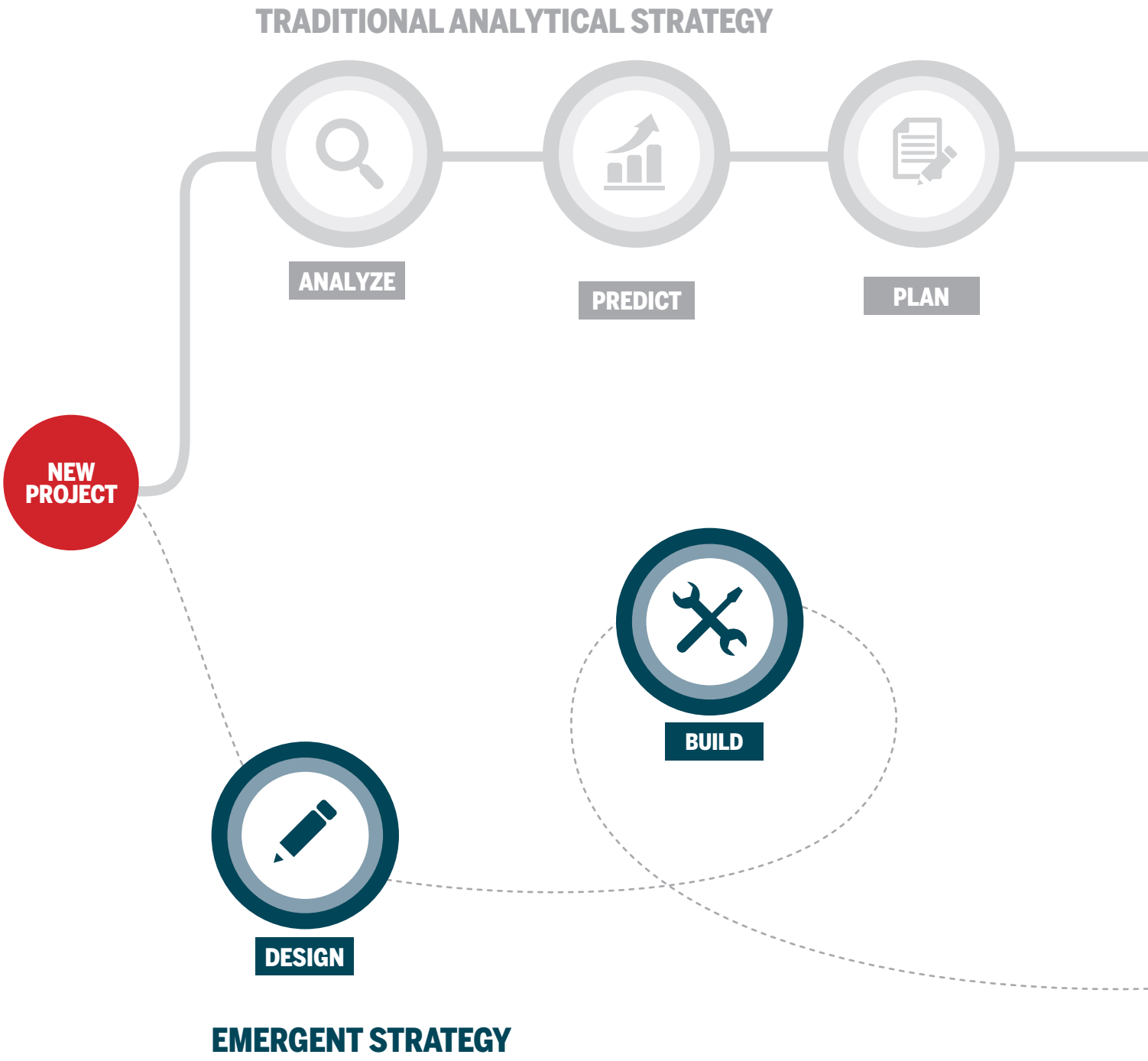
By Sebastian K. Fixson and Jay Rao

Analyzing a new business opportunity with traditional business tools, which are based on the logic of predictability, can handicap a new project before it even begins. That's why Babson educators teach emergent strategy, and they do it using design thinking.



Notes

1. "Healthcare.gov Plagued by Crashes on First Day," CBS News, October 1, 2013.
2. "Penney CEO Out, Old Boss Back In," *The Wall Street Journal*, April 8, 2013.

Learning Emergent Strategies Through Design Thinking

THE US GOVERNMENT'S LONG-AWAITED health insurance website went live in October 2013. It crashed almost immediately. An unanticipated level of traffic was among the causes cited, but even consumers 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. Although 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 Apple retail star Ron Johnson as CEO. Johnson's plan to reshape the 112-year-old company put mini-Martha Stewart shops in many stores and simultaneously overhauled the home departments in 500 stores. 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 leading online learning firm Coursera promised to teach 40,000 students how to create their own massively open online

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3. "Crash Sinks Course on Online Teaching," *The Wall Street Journal*, February 4, 2013.

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 website, 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 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—that is, unit sales, revenues, costs, IRR, milestones to be met, and so on—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 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: (a) all process and outcome variables are known and can be accounted for *ex ante;* (b) data from past projects can be used to predict the process and outcome of this new one; (c) some deviations from projections can be accommodated through managerial judgment; and (d) 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, such 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 ones 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. They deal with it all the time. Their approach, however, is 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 in line with design thinking principles such as user research, ideation, prototyping, and iteration, with which many of you readers are 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

4. Henry Mintzberg, "Patterns in Strategy Formation," *Management Science,* vol. 24 (1978), pp. 934-948.

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experience, and take more small steps based on what they 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 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.

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 application 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—for example, 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

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5. Rita McGrath and Ian MacMillan, "Discovery-Driven Planning," *Harvard Business Review*, July-August 1995, pp. 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,* Jan. 1986, pp. 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* (Pescadero, CA: K&S Ranch Press, 2012).
9. See Tim Brown, "Design Thinking." *Harvard Business Review,* vol. 86 (2008), pp. 85-92; and Roger L. Martin, *The Design of Business: Why Design Thinking Is the Next Competitive Advantage* (Boston: Harvard Business School Press, 2009).
10. Fixson, Sebastian K. and James M. Read. "Creating Innovation Leaders: Why We Need to Blend Business and Design Education." *Design Management Review,* vol. 23 (2012), pp. 4-12.
11. Fixson, Sebastian K. "Teaching Innovation Through Interdisciplinary Courses and Programs in Product Design and Development: An Analysis at 16 US Schools." *Creativity and Innovation Management,* vol. 18 (2009) pp. 199-208.

years later, Rita McGrath and Ian MacMillan proposed *discovery-driven planning*, later expanded as *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. The iterative *agile scrum* technique, based on the work of Takeuchi and Nonaka,[6] is distinctly different from 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* approaches[8] 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 various solutions.

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 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. The company has 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 in 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 of how we integrate design thinking into an experiential learning and emergent strategy orientation in 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

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

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their modest seed money, student project teams have developed a variety of 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 ensure fresh clothes and to reduce water consumption in the shower and when washing dishes.

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 composed of members who bring different value systems to the project. What one member considers too risky, another might consider just the start of an exploration. Accordingly, agreeing on a yardstick with which to measure the outcome of an experiment requires substantial and often emotionally charged negotiation. 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]

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13. Brown, *op. cit.*

14. J. H. Wilson and K. Desouza, "Finally: A Majority of Executives Embrace Experimentation," 2010 Harvard Book Review blogpost, online at blogs.hbr.org.

15. Developed by Tom Wujec at Autodesk.

Learning from "unsuccessful" experiments

An example of how we try to improve our students' mental strength so that they can deal with all possible outcomes of experiments comes from Product Design and Development, our MBA elective, which also challenges students to practice design thinking to foster their emergent strategy skills. Working in teams on semester-long projects, 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 students 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 *empathy, integrative thinking, optimism, experimentalism,* and *collaboration*.[13] 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.[14] 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 through games, experiments, simulations, and action-learning projects.

One simulation we have successfully employed to let managers experience how easy it is to overlook relevant variables is the Spaghetti Game.[15] 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 from 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 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 informs 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: (a) get out in the field where they can identify opportunities; (b) develop and shape opportunities through rapid prototyping and iteration; and (c) 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 a variety of industries. Under these conditions, purely analytical strategies carry the risk of producing substantial fiascos—like the failures of a health insurance website, 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 the 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. Consider the examples of Drew Houston (Dropbox) and Hamdi Ulukaya (Chobani), who 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—from undergraduates to MBAs and executives—how to integrate analytical and emergent strategies will better prepare them to succeed with innovative and change-oriented projects. ■

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