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A large, faint watermark of the University of California seal is visible in the background, featuring the text 'UNIVERSITY OF CALIFORNIA' and the year '1868'.

The Future Challenges of Business:
Rethinking Management Education and Research

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The Future Challenges of Business: RETHINKING MANAGEMENT EDUCATION

Paul J.H. Schoemaker

The traditional paradigm of business schools, with its strong focus on analytical models and reductionism, is not well suited to handle the ambiguity and high rate of change facing many industries today. Business educators have always faced the dilemma of academic rigor pitted against practical relevance (notwithstanding Kurt Lewin's astute observation that nothing is as practical as good theory). The dilemma stems from two seemingly conflicting notions. On one hand, universities must hold true to the time-honored tradition of scholarship and the associated principles of scientific inquiry. On the other hand, whatever universities teach and explore within their professional schools must be relevant to the clinical art that defines that profession at the time. Unlike such professions as law, medicine, engineering, or architecture, business has yet to develop a unifying professional identity or a standard for professional certification (which the MBA presently is not).

The need to balance the competing demands of rigor and relevance was scrutinized in a provocative 2005 *Harvard Business Review* article by Bennis and O'Toole as well as by Mintzberg in his 2004 book *Managers, not MBAs*.¹ Both works are highly critical of the dominant MBA focus on analytic and cognitive skills, stylized treatment of real business problems, self-centered careerism, and the limited recognition that management is as much a clinical art as a science. Other provocative perspectives on the challenges facing business schools were offered in a point-counterpoint section of the *Journal of Management Studies* (December 2004 issue).² Pfeffer and Fong highlight there that MBA programs have become big business driven by a market orientation to education in the

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absence of a unifying professional ethos. Starkey et al. contend that business schools have become morally bankrupt by pushing growth for its own sake through satellite programs and executive education, while instilling business values—such as winning at all costs and personal enrichment—that helped fuel the greed and corporate scandals of the 1990s (with Enron as its poster child). The latest criticism comes from Rakesh Khurana at the Harvard Business School whose well-researched book *From Higher Aims to Hired Hands* reviews over 100 years of business education. He argues that business schools have strayed from their lofty aim of educating far-sighted, moral business leaders to producing myopic, career technocrats.³

Some will argue that the explosive growth of MBA programs over the past several decades constitutes strong evidence that the current business school model is actually working very well. They may also note that many entrepreneurs and executives hold MBAs (as does President George W. Bush). How much credit MBA training deserves—relative to the USA being a magnet for global talent, the existence of top flight venture capital markets, technological innovations by engineers and scientists, or a social and legal climate conducive to business—is hard to untangle. For example, there was great innovation in the USA prior to the ascent of the MBA degree, and many of today's entrepreneurs obtained other types of degrees or dropped out of college altogether. MBA critics will emphasize that business schools have lost much market share to corporate universities, experience stiff competition from other non-academic sources, helped indirectly fuel greed and corporate scandals, and saturated the market with “me to” business degrees. They might also point to declining U.S. dominance in business research and teaching globally as evidence that the traditional U.S. business school model is past its prime and in need of renewal.⁴

The history of business education reveals an elusive balance between business and society. In the early fifties, business education was more akin to vocational training than to science. Some schools of commerce featured courses on basic bookkeeping or best baking practices in their core curriculum. In 1959,

they were justly criticized by reports from both the Carnegie Foundation and the Ford Foundation for lacking rigor and scholarly merit.⁵ Moving beyond just critique, these powerful foundations offered competitive grants to reinvent business education and imbue it with greater rigor and scholarly depth. Four centers of excellence were eventually funded (at Carnegie-Mellon, Harvard, MIT, and the University of Chicago), with economics identified as a common core academic discipline. Ever since, the

field has beefed up its academic standing by promoting faculty with deep scientific roots. Over time, however, these scholars often took business research in directions no longer comprehensible or relevant to business students and managers.

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As the field moved toward more analytical approaches, borrowing from the physical sciences as well as statistics and computer science, academic respectability increased while practical relevance often took a back seat. This, it was argued, would be the price of progress as scholars should not be handmaidens of narrowly focused executives or meddling school administrators. Carnegie-Mellon, MIT, Stanford, and the University of Chicago epitomized this more rigorous approach with occasionally striking results. For example, finance scholars raised profound questions about the optimal dividend policy and the capital structure of firms, as well as the pricing of risk in efficient markets, which resulted in major advances in both theory and practice. Multiple Nobel prizes in economics have been awarded to faculty whose primary appointments were in a business school rather than in an economics department.⁶

The highly mathematical models underlying such leading research tend to focus more on well-defined problems rather than the messy ambiguities of the real world. Heavily influenced by the academic discipline of economics, which often suffered from physics envy, business scholars were preoccupied with equilibrium solutions and optimality theorems in which analytic elegance could truly shine. In 1980, this reductionist approach was much criticized in a celebrated *Harvard Business Review* article by Hayes and Abernathy as underlying America's economic decline relative to Japan and West Germany at that time.⁷ They cited *managerial failure* as the root cause, rather than myriad other factors such as excessive government regulation and taxation, labor unions, high oil prices (OPEC), short-term focus in financial markets, or new technologies. The culprit, they felt, was an over-utilization of analytical techniques that shifted the focus from long-run technological development and strategy to portfolio management, financial control, operations management, and short-term optimization. Others concurred, criticizing the over-reliance on static economic models while paying insufficient attention to the dynamic nature of business, the crucial role of knowledge, the internal structure of the firm, the seminal role of entrepreneurship, and a focus on stylized markets rather than social networks.⁸

Although America has since regained much of its economic might, the world of business has become even more dynamic, uncertain, and multicultural. Driven by technological innovation, globalization, geopolitical turmoil, concerns about climate change, and ideological schisms, the notion of equilibrium seems a quaint artifact from a simpler time. As a consequence, the shift that started in the 1960s, coupled with some striking features of the new global knowledge-based economy, compels us to rethink our approach to business education and research, as well as perhaps the very nature of the university and the role of professional schools therein. Universities no longer have a monopoly on higher learning. When Google declares its mission as "organizing the world's knowledge," as corporate "universities" spring up, when consulting firms become think tanks in their own right, and the Internet permits remote learning, a new era is upon us. Business schools may become just one of many knowledge hubs. To remain relevant they must clearly articulate their comparative advantage in

light of the changing challenges businesses face now and will likely face in the future.

Challenges for Established Firms

The failure of established firms in coping with profound change is so widely recognized now that conventional wisdom holds that attackers from the outside have an advantage when a new business model threatens an existing market or technological regime.⁹ New entrants have used technology in desktop copiers, electronic calculators, mini-mill steel making, videotape recorders, and hydraulic earth-moving equipment to take market leadership away from incumbent firms. The computer industry has evolved from competition among vertically integrated stacks controlled by DEC, IBM, Wang, Amdahl, Nixdorf, NEC, or Matsushita to a horizontal industry model where competition occurs between component providers. Few of the leaders in the horizontal model—such as Dell, Cisco, Google, Microsoft, or Intel—came from the ranks of the old vertical industry.¹⁰ A similar story has unfolded in the hard disk drive industry where market leadership changed with each successive product generation.¹¹ Similar stories are currently playing out in the world's media, information technology (e.g., search engines), and pharmaceuticals, since leading incumbents often operate from outdated business models.

To what extent these industry dynamics reflect deficiency in business education is a complex question. Clearly, the leaders of the large companies that lost market share often possessed MBA degrees. However, so did the leaders of the startup companies that caused the disruptive innovation, although there were some notable college dropouts there (e.g., the founders of Microsoft and Oracle) as well as students from other walks of life (e.g., Google). Since the MBA has become so pervasive in both old and new industries, it increasingly serves as a gatekeeper and signaling mechanism for superior talent. Consequently, it is hard to untangle how much is due to the educational content of MBA programs versus their screening function, which is a major role of education as well.¹² My own belief is that the MBA culture inculcates a rational, reductionist mindset that serves business well in times of stability but not when discontinuity is upon us and entrepreneurship is called for.

More specifically, incumbents are often disadvantaged by their organizational structures, capabilities, culture, and mindsets. Established firms have mastered the existing game within their industry. However, their finely honed instincts, painstakingly acquired heuristics, deeply embedded skills, and implicit values make it hard to deal with the uncertain new realities of a changing market place. They tend to see the market in self-limiting ways while true innovators focus on the white spaces between markets.¹³ Nowhere are these challenges more evident than in the arena of emerging technologies, where uncertainty and complexity score high. We can view this domain as an instructive microcosm for the conditions all kinds of businesses will increasingly face.¹⁴

When confronted with profound ambiguity, commercial success depends on developing a different set of capabilities, tools, and perspectives than offered in the traditional business model for more stable industries. To illustrate this, I examine five significant challenges (labeled C1-C5 below) that managers in large, established enterprises face. These challenges are based on our own research at Wharton about the traps of managing emerging technologies.¹⁵ The five chosen here are meant to underscore our call for a new approach to business education in which the management of uncertainty and paradox, as opposed to analyzing well-structured risks or tradeoffs, assumes a more central place.

C1: A strong commitment is necessary, but you also have to keep your options open.

On the one hand, there are persuasive arguments that firms investing in innovative sectors should create a portfolio of options where the commitment of additional resources is subject to attaining defined milestones and resolving key uncertainties. These investments are viewed as options—akin to financial call options—that give the investor the right but not the obligation to make further investments.¹⁶ Additional funds are provided only if the project continues to appear promising. On the other hand, there is compelling evidence that long-run winners are often first movers who committed early and unequivocally to a technology path. Andy Grove of Intel argues that it takes all the energy of an organization to pursue one clear and simple strategic aim—especially in the face of aggressive and focused competitors—and that hedging by exploring a number of alternative directions is expensive and dilutes commitment.¹⁷ More recent research suggests that fast followers often win.¹⁸ Clearly, we need better theoretical guidance about when to bet strongly, hedge via options and portfolios, and when to opt out all together.¹⁹

C2: Winners are often pioneers, but most pioneers fail.

A paradox that follows on the first one is that the only way to arrive first in a new territory is to be a pioneer, and yet pioneers more often than not end up at the bottom of a gulch with arrows in their backs. Just consider the expensive land grabs attempted by hundreds of dot-com companies that no longer exist or the fate of more recent pioneers in sub-prime lending. The big rewards come from being a pioneer, so long as you survive, but patience is needed to increase the odds of success (as are deep pockets). Pioneering is inherently risky, but there is no need to take foolish risks. As noted above for the dot-com victims, some companies failed because they raced too quickly into an undeveloped market with an undeveloped product.

The essence of strategy is to know how to balance commitment and flexibility in a given situation.²⁰ One way to handle this problem is to make the organization sufficiently flexible so the investments needed to stakeout the opportunity, or change course later, are relatively small. Once uncertainty has been reduced to a tolerable level and there is a widespread organizational

consensus on an appropriate innovation path utilizing the firm's internal development capabilities—as in the case with Intel's bet on the personal computer rather than the television as the preferred information appliance—then full-scale internal development can begin.

There is a fine line between gambling and calculated risk taking, as Alfred Sloan emphasized when he transformed General Motors from a functional design to a multidivisional organization.²¹ By moving forward in stages, one can build settlements and supply posts along the convoluted path to success. This way, the organization will not outpace lines of supply or get trapped out in the wilderness alone. The outposts of small early niches provide a testing ground for strategies, an opportunity to learn how to survive on the frontier and to develop partnerships that are essential to success. Thus, companies betting on emerging technologies need to know how to navigate the promises and perils of pioneering.

C3: You need to leverage competencies, and yet organizational separation is crucial.

The very characteristics that have made large organizations successful also create traps for them in managing new opportunities, especially more radical innovations.²² Often, success seems to sow the seeds of its own destruction. To avoid stifling new business models, companies often set up incubators—separate spin-offs or divisions where these businesses can grow and develop without the burdens of the mature parent.²³ These separate organizations usually have different cultures, compensation structures, organizational designs, and performance measures.²⁴

The problem is that the more separate these operations become, the less they can draw upon the strengths of the parent. Xerox PARC engaged in creative leaps that led to innovations such as the graphical user interface, but it was not Xerox that benefited from it but Apple and Microsoft.²⁵ Saturn created a very different model for its organization, but the hoped-for impact on the General Motors organization overall never materialized and in some ways the new initiative was held back by the parent.²⁶ IBM, in its quest to develop a truly new PC, set up a separate unit in 1980 that failed to tap into any of IBM's formidable technological competencies. Consequently, the IBM PC became mostly an assembled product, without any real proprietary technology. It soon attracted clones, which turned it into a commodity, resulting in IBM's divestiture of its PC business.²⁷

There needs to be enough separation so the technology's progress is not unduly stifled. However, there should be just enough involvement to benefit from the synergies with the parent organization. Like parenting a teenager, the new venture has to be given enough freedom to experiment and make mistakes but still be kept alive and somewhat within the family. Given the distinctive personalities of these new internal ventures, this balance is often a challenge. Ideally, companies need to develop new forms of organization that are truly ambidextrous.²⁸

C4: Competition is intense, and yet winning requires collaboration.

Competition for emerging technologies can be brutal. With winner-take-all markets and firms that have staked their entire future on success, failure often is not an option. At the same time, no emerging technology company is an island unto itself. The trend is increasingly toward open innovation, reflecting a network-oriented approach rather than a firm-centric point of view.²⁹ For example, the success of a new gene therapy may depend on far-flung networks of researchers in specific fields. The success of a new information technology standard depends on upstream and downstream adoption by suppliers and customers. Managing alliances and other partnerships is one of the central activities in successfully developing and commercializing emerging technologies. In addition, the structure of these relationships determines the payoffs from the process (as IBM found out in its partnership with Microsoft and Intel). Very often the same companies that are collaborators in one arena are competitors in another. Sony and Philips are working together on setting standards in optical media and supplying components to one another. Pharmaceutical companies now team up with generic manufacturers when reaching patent expiration. A major challenge in managing emerging technologies is how to traverse complex webs of relationships with the right the mix of cooperation and competition.³⁰

C5: Focus is critical to success, and yet managers must scan the periphery.

In a two-year period, Mattel lost 20 percent of its share of the fashion doll segment to smaller rivals such as MGA Entertainment Company. This was largely due to Mattel's failure to keep its Barbie doll in tune with the subtle shifts of thinking inside the minds of pre-teen girls. A major market change allowed MGA's hip new Bratz line to erode the seemingly unassailable strength of Mattel's Barbie franchise. The edgier Bratz dolls appeal to girls whose tastes are maturing more quickly than in the past. This led to an age compression that narrowed Mattel's target market from girls ages 3 to 11, to the 3 to 5 age bracket, and a major loss of market share.³¹

The challenge faced by Mattel and many other organizations (see Table 1) is how to interpret weak signals when they are still at the periphery.³² As with human peripheral vision, the weak signals at the outer edges of an organization are very difficult to see and interpret—and yet could be vital to success or survival. Companies can discover many opportunities by identifying and acting on weak signals ahead of rivals. However, the price they pay is that resources are diverted from their focal vision, which is so critical to attending to the task at hand. How should leaders balance the competing demands of the mainstream business vs. the periphery of their world, especially when these entail very different challenges, traps, and capabilities?

In a fast-changing world, there is often only a narrow window of time to profit from today's hot new technologies as they become tomorrow's commodities.³³ Advantages are imitated and fads emerge or fade. Fashions go from Paris runways to Wal-Mart discount racks in short order. Cell phones go from a high-priced business tool to a fashion accessory on the ear of every teenager. Arrive

TABLE I. Weak Signals and Their Consequences

Domain	Changes in the Periphery	Who Were Blindsided
Technological	Napster and digital revolution	Music industry
	White LED lighting	Light bulb manufacturers
	Open-source software	Microsoft
	CD-ROM encyclopedias	Britannica
	Burst of tech bubble	Dot-coms
Economic	Overnight package delivery	USPS, United Airlines
	Outsourcing to China and India	Many Western companies
	Diet soft drinks, low-carb diets	Coke, Pepsi (at first)
	Sub-prime mortgage problems	Citigroup, Merrill Lynch
Social	Backlash to genetically modified foods	Monsanto
	Silicon breast implant lawsuits	Dow Corning
	Age compression	Mattel (Barbie)
	Anti-smoking sentiments	U.S. tobacco industry
Political	Attorney General Eliot Spitzer	Wall Street, insurance brokers
	End of Cold War	Defense industry
	U.S. restrictions on stem-cell research	U.S. biotech firms
	Unmanned aerial vehicles (drones)	Lockheed-Martin

too early for the party and there are no guests; arrive too late and one could be cleaning up the trash. While peripheral vision is more important than ever, there are strong indications that many organizations are not up to the task. A survey of 140 corporate strategists found that fully two-thirds admitted that their organizations had been surprised by as many as *three* high-impact competitive events in the past five years. Moreover, 97 percent of the respondents said their companies lacked any early warning system to prevent such future surprises.³⁴ A survey of more than 100 global senior managers found that the growing need for peripheral vision continues to outstrip the capabilities of organizations, resulting in a significant “vigilance gap.”³⁵ Over 80% of the respondents perceived their future need for peripheral vision to be greater than their current capacity.

Each of the above five challenges illustrate the need for a more well-rounded business approach in which managers learn how to live with paradox as well as ongoing dilemmas that may never be truly resolved. Excessive reductionism or functional specialization are unlikely to offer satisfying solutions. Holistic thinking, balancing analysis and intuition, living with ambiguity, and practicing strategic flexibility are increasingly important, as are some of the other skills shown in Table 2.

TABLE 2. Some Imperatives For A New Business Model

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- View planning as learning and reinvention rather than as prediction or control.^a
 - Always frame complex business problems through multiple disciplinary lenses.^b
 - Recognize the importance of intuition and seasoned judgment, while also understanding its heuristic and often unreliable nature.^c
 - Master the art of constructive dialogue with diverse global constituents, representing perhaps conflicting ideologies and values systems.^d
 - Cultivate the human side of leadership, especially in entrepreneurial and creative ventures.^e
 - Appreciate the counter-intuitive nature of complex systems, especially when non-linear.^f
 - Learn how to manage uncertainty rather than try to predict, control, or subjugate it.^g
 - Properly balance descriptive and normative models to arrive at truly practical solutions.^h
 - Move from a firm-centric view of business toward network and ecological perspectives.ⁱ
 - Practice the art of self-renewal, individually, in teams, and organizationally!^j
 - Reinsert ethics and morality in the training and development of tomorrow's leaders.
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TABLE 3. Implications for Business Schools

Teaching

- Improve the blending of clinical and research-based faculty and topics.
- Adopt a problem-centered teaching approach, using real world challenges.
- Encourage cross-disciplinary instructor teams who co-teach all classes.
- Bring in speakers from industry and government to add richness and context.
- Make students co-creators of the educational content and the learning experience.
- Foster student teamwork on real cases; reward student leadership and creativity.

Research

- Tackle big, relevant problems requiring a long-term commitment.
- Encourage more teamwork across multiple academic disciplines.
- Partner with thought leaders in industry, government, and consulting.
- Stimulate and fund field research—get researchers out in the real world.
- Validate and challenge guru advice and popular books—set the agenda.
- Participate in key industrial, national, and global dialogues about business.

Institutional

- Organize around clinical domains rather than purely academic disciplines.
 - Rethink the cost and benefit of tenure; create other respectable academic career paths.
 - Assess scholarship in terms of its broader impact, beyond a narrow specialty.
 - View the business school as not a place, but a set of complex stakeholder relationships.
 - Reward extended academic sabbaticals outside of academia, in business or government.
 - Orchestrate deep lifelong relationships with students, faculty, alumni, and donors.
 - Encourage deep alliances beyond the ivory tower, while preserving core values.
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Challenges for Business Schools

The above dilemmas are some of the challenges managers face today. They are not listed by priority but meant to illustrate why business schools may wish to rethink their approach to teaching and research. My list reflects our experiences at Wharton's Mack Center for Technological Innovation where I serve as research director. Our Center seeks to understand why established firms often adapt so poorly to external change, especially technological innovation where uncertainty and complexity are unusually high. Even though our research focuses on how to manage emerging technologies, this particular domain constitutes an instructive microcosm for the future of business at large, as uncertainty continues to rise. So, what do these various business challenges portend for business schools? I address this in terms of teaching, research, and governance (for a summary see Table 3).

Teaching Challenges

Considerable innovation has taken place in MBA teaching, by emphasizing social skills, leadership, teamwork and negotiation, cross-functional thinking, global perspectives, and multicultural sensitivity. However, the dominant role of academically oriented faculty will remain a limiting factor if the subject requires clinical intuition and nuance. Few business academics have ever founded or run a company, served on corporate boards, or conducted significant consulting beyond lectures or limited case studies. Although they can play an important role in separating wheat from chaff, and help build a cumulative knowledge base, they may not get at the core issues that managers struggle with. Just as medical schools need clinicians who see patients or have wielded the knife, business schools need experienced clinicians who are not viewed as second-class citizens. This problem is even more acute in executive education, which is the main bridge to practice, than in MBA or undergraduate teaching. Few academic faculty members can hold their own in the executive education classrooms of leading business schools because they lack sufficient business experience. At many leading business schools, there is a large reliance on adjunct faculty and guest speakers, much to the chagrin of many standing faculty who are simply not invited to teach in executive programs.

One reason is that the research issues core faculty focus on—in both their teaching and research—may connect only tangentially with the challenges future managers will encounter. Part of this problem is historical. Business schools were traditionally focused on training managers for large corporate enterprises, elite consulting firms, and financial institutions (e.g., Wall Street). This orientation reflects an era in which small companies wanted to learn from the large companies and tried to become like them. Increasingly, however, large companies want to emulate small companies in terms of wealth creation, dynamism, and entrepreneurship. We are locked into a teaching and research paradigm that changes only slowly due to various institutional and cultural constraints. For example, deep down, many MBA students hope some day to start and run their own companies rather than work in a large corporate enterprise. Thus, academia may face a disconnect between what the market wants and what the schools can readily provide given their history, skill set, and power balance.

Some will counter that business schools have responded strongly to market changes. And indeed, many B-schools have introduced new programs in strategy, international business, ethics, and entrepreneurship. Similarly, new course offerings, if not entire departments, sprung up around such industries as entertainment, healthcare, and sports, inter alia. Many business schools now offer cross-functional courses as a capstone experience to finish off and round out the MBA degree. Critics of my view will point to the continued success of the MBA degree, in the USA and increasingly abroad (which are both experiencing high demand). A more sobering view, however, is that these incremental adaptations will be inherently insufficient and that new entrants will steal market share. The explosion of corporate universities (like GE's famous Crotonville

campus), the rise of action learning interventions offered by consultancies (such as the Center for Creative Leadership), the success of independent entities (like Duke Corporate Education in the USA, IMD in Switzerland, or CEDEP in Fontainebleau, France), as well as a rich guru market fueled by speakers bureaus are steadily taking market share. Sophisticated companies now design their own executive education programs, cherry-picking the best faculty across business schools rather than entrusting their entire offering to one brand-name school.

The solution is to blend theory and practice better in teaching, form more strategic alliances with the aforementioned competitors and design the curriculum around business challenges rather than academic disciplines. Also, schools should orchestrate for students the kind of learning environments that better reflect the world of managers, for example by having them co-create their own educational experience. We should reward behaviors that foster teamwork and leadership, and lastly we should better reflect the global, multicultural, and inter-generational context of business. All this is easier said than done, although many business schools are moving in this direction. A critical element here is also the kind of research that business schools conduct, in the classroom and beyond.

Research Challenges

At a deeper level, business schools may need to reexamine their dominant research paradigm. Fragmentary and narrowly focused research, produced by soloists or specialized small teams within the traditional model, may simply not do justice to the issues that need to be studied to make a quantum contribution to both the theory and practice of management. The reason is that the more challenging problems of business are multifunctional, extend far beyond analytics, are imbued with value and ethical concerns, and tend to be too systemic for quick or partial solutions. Often, academic research is conducted to get tenure (i.e., approval from the senior faculty steeped in the old model) rather than to make a difference in practice.³⁶ The truly central problems of business—e.g., how to manage people, foster innovation, adapt to a changing world, and operate globally—may require a more centrally managed, large-scale field approach. The soloist or dyadic model is not well suited to address these kinds of multifaceted problems in their full complexity. Generalizations about managerial challenges and solutions can seldom be drawn from narrow case studies, functional perspectives, or fragmented canonical abstractions of business problems. Their uniqueness and contextual richness is often lost in such approaches. The case method has received much credit for keeping the real-world context of management problems central in the classroom. However, some critics, such as Henry Mintzberg, contend that even case studies cannot begin to capture the deep texture of the key issues encountered in business, especially the importance of interpersonal, emotional, organizational, and cultural factors.

The new research model may require multi-year field studies, where scholars work in-depth with organizations in studying selected problems, guided by a common overarching framework and set of initial hypotheses. This has

been done, with isolated success, via research centers. A good example of long-term foundational team research is the Center for Research in Security Prices (CRSP) at the University of Chicago. This program started in 1959 with a \$300,000 research grant from Merrill Lynch, Pierce, Fenner & Smith and with the inspired academic leadership of James Lorie. Other academic leaders joined, notably Harry Roberts and Merton Miller, and this path-breaking research initiative spawned numerous influential Ph.D. dissertations (e.g., Gene Fama, Richard Roll, and Myron Scholes) blossoming into a highly visible and influential school of thought. However, this team-based effort was not truly multidisciplinary (drawing mostly on economics, finance, statistics, and computer science). Better examples of interdisciplinary teamwork are Herbert Simon's efforts to create a non-disciplinary problem-solving culture at Carnegie-Mellon³⁷ or MIT's multidisciplinary study of the machine that changed the world.³⁸ Harvard has traditionally excelled at case and field research, such as Joseph A. Bower's in-depth study of the resource allocation process at four major corporations.³⁹ A more recent example of an influential long-term, multidisciplinary research program is Michael Porter's international research effort on the comparative advantage of nations.⁴⁰

Prestigious consulting firms like McKinsey, BCG, or Bain try to operate in this space as well, but they often lack the deep grounding in research needed for enduring insights. Training firms and corporate universities also try to bridge the gap between scholarship and practice, but similarly lack sufficient scholarly capability to be foundational.⁴¹ The limited research attempts by practitioners constitute a major opportunity for business school scholars. Much value and market share has migrated from academia to consultancies, in-house training, and research firms. The consultancy Bain publishes a ranking of tools most often used by managers, such as scenario planning, customer relations programs, total quality management, and strategic risk management, and many of these did not come from mainstream academic research. Too often, armchair speculation and guru books fill a void that should be addressed through relevant scholarship, especially since much of the guru advice does not withstand the test of time.⁴² The challenge is to find new means by which business schools can tackle the big, tough problems managers need help with, since they often don't fit the current research model. To illustrate how business schools might rise to the occasion, the sidebar outlines an approach that research centers can follow to produce relevant, long-term, team-based interdisciplinary research that has an impact on theory as well as practice. Although business schools are slowly moving in this direction, the percentage of academic articles produced by cross-disciplinary research teams remains modest. This brings us to the final and most difficult challenge for business schools, namely, changing how they are managed and governed.

Institutional Challenges

The teaching and research challenges enumerated above are embedded within an existing organizational context that contains various obstacles. For

A Roadmap for Problem-Centered, Multidisciplinary Research

Identify a critical topic facing business, such as *how to manage emerging technologies*. Connect it with theories or models from multiple disciplines and derive hypotheses that can guide the overall research effort. A core group of scholars will need to articulate the theoretical models, with appropriate grounding in relevant academic disciplines. For example, a core premise of our book *Wharton on Managing Emerging Technologies* is that managing technological innovation constitutes a “different game.” Although it is easy to talk about a different game, it is far more challenging to actually bring about a scientific paradigm shift (i.e., a new encompassing theoretical framework that is accepted by multiple communities). However, this is precisely the comparative advantage of business schools, and the effort can start small. For example, the earlier “different game” hypothesis could be tested by comparing successes and failures in innovation across various industries, companies, time periods, and cultures.

Select appropriate research contexts in which to operationalize and test the hypotheses. Again using the example of emerging technologies, assess which industries are best for testing whether different types of technologies entail fundamentally different management challenges. A conceptual framework would be needed to distinguish different types of technologies beyond their scientific bases (such as biotech vs. telecom), focusing instead on what sets them apart managerially, such as the role of intellectual property, networks, vertical integration, and alliances. This way, a well-balanced subset of industries can be selected and studied. Some of these managerial dimensions may reflect features inherent to the technology, but more likely they will reflect issues of scaling, infrastructure, regulatory context, market dynamics, and lock-in or path dependence. This taxonomy needs to be mapped out further.

Research teams composed of junior and senior faculty need to make a long-term commitment to the research program, ideally involving multiple business schools and several countries (in so far as cultural and institutional variables matter). Here we may encounter the restrictive role of

continued on next page

example, the MBA degree remains a highly successful product in the market place, having become a global standard of sorts, and thus few established schools would dare reinvent the very product that pays the bills. Essentially, business schools are locked into an MBA-paradigm that will be hard to change as long as it continues to achieve market success. The battle is for market share and funding, not yet for deep innovation. A second lock-in problem is the revered institution of tenure. It is suicidal at top schools for junior faculty to work in an area driven by applied problems without an established community of senior scholars. Junior faculty members need respected journals, as well as the support of extramural faculty members who can write “outside letters” in the all important tenure process. Often the young, who are the most open to change, are inhibited from venturing into new territory because it is hard to get the approval of the old guard.

Tenure has become an expectation among top scholars—and schools compete on this basis—although ironically the best scholars hardly need tenure

tenure; new incentives will be needed to entice talented junior faculty to choose this new path. Also, since large teams of researchers are required, clear prior understandings must be reached about publication rights to help motivate individual scholars without preempting the goal of seminal publications (in articles or books) that hopefully will become classics in the field.

Suitable companies must participate, from the research design to the execution as well as the long-term funding (in addition to granting agencies). CRSP (mentioned earlier) is a prime example of this approach, with high returns for academia as well as the sponsors. Since the research will be sector-specific and long-term, a more symbiotic relationship with sponsors needs to be fashioned, entailing significantly higher financial support than is customary in today's research centers (think tens of millions of dollars). Sponsors should be able to benefit directly from the research for their organizations through agenda influence, direct participation, early and easy access to results, faculty, and students as well as other corporate sponsors.

An organizational structure needs to be found that is suitable to this more ambitious research effort, including a (nearly) full-time academic director; an administrative director to help manage the relationships with sponsoring firms, and a project staff. The research unit should perhaps be allowed to appoint post-doctoral students and visiting scholars, in addition to engaging the help of doctoral and MBA students. Appropriate advisory boards will be needed as well, drawn from business, government, and academe to deal with the research's overall directions, conflicts of interests, governance model, and fiduciary oversight.

A research dissemination strategy and mechanism needs to be fashioned to help communicate with multiple constituents, the press, and other opinion-shaping entities. Both the wide scope and long duration of this research program would require intermittent publications and periodic research victories to keep morale high, participants engaged, and funding strong. Conferences could be scheduled, supporters honored, and preliminary insight shared—with connections to public policy debates or the agendas of non-governmental agencies—in order to keep the research relevant and grounded in the real world.

to secure employment. The historical rationale for tenure, to be shielded from undue political or administrative interference, remains valid; but it is not clear that researchers conduct more daring or innovative research after receiving tenure than before. Also, tenure itself may create an adverse selection problem by attracting risk-averse people or those with limited outside options.⁴³ Whereas tenure does help create institutional loyalty, it may also become an obstacle to innovation. As Thomas Kuhn showed in his seminal book the *Structure of Scientific Revolutions*, the old guard in an academic discipline is often the major impediment to the acceptance of new ideas.⁴⁴ So why ensconce the old guard in times of change (or ever)? Interestingly, some business schools, such as IMD in Lausanne, have largely abandoned the tenure system.

What the successful organizational model(s) will look like decades from now remains a matter of speculation. Business schools may no longer be defined by location and physical assets, but more in terms of networks, intellectual

property, and relationships with key stakeholders. Faculty may no longer work full-time at any one institution but hold multiple, roaming appointments. Clinical and basic research may gain comparable status and the teaching mission may be driven more by current business challenges than by basic disciplines or departments. Medical schools, for example, are increasingly organizing around therapeutic areas (e.g., a heart center) or patient-centric topics (e.g., women's health), away from basic science disciplines. Even basic research is tending toward systems biology and interdisciplinary teams. The relationship with students and alumni may truly extend over the life of these individuals, in terms of teaching, financial support, and perhaps even institutional governance. Importantly, the successful business school of the future may have to forge deep alliances with competing educational institutions, as well as corporations and other stakeholders.⁴⁵ As business continues to globalize, it is not enough to have a high percentage of foreign students or faculty on the main campus, or to maintain campuses on multiple continents. Instead, the winning school has to become a microcosm of the business world it serves, including the shift away from a firm-centric model of business to a network-based approach to teaching and research.

Although there are no simple answers here, we need to be mindful that organizational inertia may prevent business schools from adapting in a timely fashion to external change—as it has so often in other industries. Consider again the research program as outlined in the sidebar for the special case of managing emerging technologies. Business schools can learn much from the varied experiences in physics and biosciences, where large-scale, multi-team research is conducted more commonly. For example, physicists share expensive particle accelerators while biologists successfully joined forces with others to map our DNA code as part of the Human Genome project.⁴⁶ Not all collaborative efforts will necessarily succeed, underscoring the challenge of this more ambitious approach. For example, the war on cancer—as declared by the Nixon administration in 1971—has received enormous sums of money from public and private sources (there are over 120 cancer centers in the USA alone). Yet, only modest progress has been made when measured in age and quality-adjusted extensions of life relative to the many resources expended.⁴⁷

Nonetheless, pursuing challenging goals creates an organizational dynamic that is often conducive to innovation and as such may give a boost to business research that today has become incremental and derivative. Tackling big problems may spawn insights and principles that change the very nature of business education and research. For example, to really understand how best to manage innovation we need to study some core challenges that managers increasingly face in other areas of business as well. These would include how to manage uncertainty, cope with discontinuity, or how to handle complexity, legacy systems, outdated mindsets, and cultural differences. Also, it would require that we study in depth when and how firms can successfully reinvent themselves, which in turn calls for research on such challenging topics as the role of entrepreneurship, change management, leadership, incentives, and

strategic vision. Today, most innovation in business schools is around teaching programs, especially MBA and executive education. More innovation is needed along research and institutional lines, to overcome the silo problems associated with functional specialization. Research centers and/or institutes provide good mechanisms to do this, provided they do not become too donor dependent. Strategic alliances beyond academia constitute another promising avenue.⁴⁸

Embracing Ambiguity and Paradox

An important part of managing the challenges discussed above concerns the ability to live with paradox, surprise, and the associated ambiguities.⁴⁹ Simple, absolute answers are few and far between in a clinical field such as business. If there were simple answers, the rewards of winning in the business world would not be great since many players would master the necessary strategies and tactics. The ability to live with these ambiguities, and periodically to re-conceptualize them, may be the most important skill set managers must develop. It is the very complexity of the game, and its associated skewed payoff structure, that makes it worthwhile for organizations to learn how to play it well. As noted before, the new game extends well beyond the challenges we identified for the special domain of technological innovation. As businesses continue to experience a significant overall rise in uncertainty and complexity, we may need to develop a new approach.

Articulating and mastering a new model will require a significant shift in management education, which remains in the grip of a highly analytic and reductionist science paradigm.⁵⁰ The reigning approach, which for historical reasons is rooted in economics and finance, appears to be deeply flawed in its core assumptions about human rationality and its attendant focus on equilibrium concepts and closed-form analytic solutions. Based on our study of emerging technologies and innovation, we believe that many domains of business will require new approaches that collectively amount to a new model for business practice. Although it is premature to sketch out the new business school paradigm with any precision, it will likely include the items listed in Table 2.

These imperatives are just some of the elements that a new paradigm of business education needs to include. The scientific research process continues to play a key role in finding suitable answers. Perhaps we need a stronger decoupling of research and teaching so that whatever blind alleys the science explores, the teaching can remain closely tied to the real world. This means a renewed respect for the practice of management and the clinical wisdom embedded within this profession.⁵¹ Pursuing just a scientific path may trivialize the managerial challenges to canonical representations that abstract away the real world complexities that lie at their core. Clinical insight is needed to make sure we don't throw out the baby with the bath water—as is often done, for example, in game theory or principal-agent models that reduce business dilemmas to complex, but ultimately incomplete, mathematical puzzles. Such economical

models can serve a useful role in guiding our thinking, but the approach is inherently limited in practical settings.

Another critical ideological challenge of the new paradigm is to help restore the global image of business as a *force for good* rather than evil in the world.⁵² Corporate malfeasance, conflict of interest on Wall Street as well as in the real economy, American unilateralism, polarization of wealth, poor environmental stewardship of the earth, ideological schisms among world religions, and scary new bioscience technologies have fostered a climate of skepticism about science and capitalism. In part, these problems stem from old paradigm thinking, as taught in business schools and beyond, that favors short-term profit maximization and firm-centric solutions with limited regard to the broader social, cultural, or institutional implications.⁵³ How well can the old paradigm handle the relentless march of technology, the rise of global poverty, and the ill effects of overpopulation, including habitat destruction and global warming? We need to strike a better balance between competition and collaboration—in industry and government—to solve these large, seemingly intractable problems.⁵⁴ The moral legitimacy of business is increasingly under attack and so academic leaders as well as executives must build a stronger case that market-based enterprise—when conducted in open, stable democratic societies—is a force for good in the world at large. If business schools can help on this front, their viability will be assured.

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