

Designing the Thinker of the Future: An Educational Opportunity in Post-Modern High-Capitalism

*Mihnea Moldoveanu
Associate Professor and Director,
Marcel Desautels Centre for Integrative Thinking
Rotman School of Management
University of Toronto*

*Roger Martin
Dean and Professor of Strategic Management
Rotman School of Management
University of Toronto*

Abstract

We argue that contemporary approaches to developing MBA's face a fundamental challenge arising from (a) a crisis of legitimation of conventional knowledge and authority associated with 'normal science'-based expertise, (b) a quickly growing dependence of successful managerial action on recognizing and resolving tensions and conflicts among alternative and radically different views of the world and (c) a renewed importance of turning useful knowledge into intelligent action in the face of uncertainty, ambiguity, *anomie* and moral ambivalence. We describe an approach to managerial skill development based on the recognition of a new and disruptive opportunity in the market for managers: the growing need for the high-value decision maker who successfully manages interactions across multiple, potentially incommensurable conceptual, epistemological and behavioral domains. We propose to address this opportunity via the integrative development of *cognitive-behavioral modules* that are both useful and important to successful management in post-modern high

capitalism and that can be developed from the resource base of existing MBA faculty and on the background of existing communities of practice in business academia.

1. Post-Modern High Capitalism: The ‘Interactions revolution’, Tacit Skills, the ‘Ingenuity Gap’ and the New Educational Opportunity Set.

Future-looking analyses of the MBA face the difficult task of attempting to do what markets for MBA-educated managerial talent do not easily do. This is the task of *articulation*: of introducing the new categories and concepts that will be causally relevant and instrumentally useful to the MBA educators of the future. While markets are proficient at attaching values to well-defined possible outcomes (via salaries for new MBA’s), to ranking alternative paths for achieving these outcomes (via independent rankings of MBA programs incorporating program-specific ‘measures of value’) and even to producing accurate point-predictions of particular events (such as the transition of a particular program from one tier to another), they cannot *produce* new concepts and categories that will make the MBA of the future a high value decision maker: markets are concept-takers, not concept-makers. The intellectual entrepreneur, the educational venture capitalist, the pedagogical visionary must ‘stick their neck out’ and fulfill this function, and this is the purpose of our introduction.

We begin with a rapid excursus into the semantics of our title:

‘Post-Modern’: Why ‘Post’? Not because we want to knock modernity and its *paraphernalia*, but, by contrast, because we want to highlight the recent and abruptly growing failure of absolute norms of legitimation and justification of knowledge, desire, belief and action. What Jean-Francois Lyotard [1979] conceptualized as the demise of the ‘master narratives’ – such as Marxism, laissez-faire capitalism, positivistic science, Lockean liberalism and the systemic and totalitarian philosophies of Hegelian and post-Hegelian philosophers – has given rise to a multitude of ways of thinking and patterns of behavior – indeed, ‘life-forms’ – that are equally ‘legitimate’ or ‘illegitimate’. There are, now, *many* value systems, *many* ways of knowing, *many* ways of acting and relating – many ways of managing - and *many* ways of choosing among them. Panic, inaction, malaise, *akrasia* (or, weakness-of-the-will) and Durkheimian *anomie* are the symptoms of the new pluralism. The manager of the future must act in the face of the breakdown of certainty and self-evidence for the reasons of action; must *think* in the face of the paralysis induced by an awareness of the multiple ways of thinking available to her; must *experiment* and tabulate results in the face of doubts about the

incontrovertibility of ‘data’ and the ultimate meaning of the ‘data’ vis-à-vis a particular course of action; must *believe* in order to induce the right action and *act* in order to produce the right beliefs in herself and others - all without falling into the epistemic and moral relativism that empties her of the vital trust in a better outcome. She must be competent to internalize the *clash* among multiple, incommensurable views of the world and resolve this clash productively (Figure 1).

Indeed, ‘post modern’ management may be understood as the percolation into business scholarship and managerial practice of (unanswered) dilemmas and conundrums that have already inhabited the core of epistemology and scientific practice for several decades (Figure 2): *Ontological relativity* (Quine, 1951) posits and explicates the radical indeterminacy of translation from one way of viewing the world to another; the hermeneutic circle of theory-method-observation-interpretation-new theory {Mannheim, 1935; Kuhn, 1962} makes clear the extent to which ways of representing the world and ways of investigating the world are coupled and connected together (into paradigms, in Kuhn’s formulation); the under-determination of theory by observation statements [Duhem, 1913] and the under-determination of observation statements by ‘raw perceptions’ [Anderson, 1978] make the selection of theories a matter of *choice* that is only partially based on data; relatedly, paradoxes of confirmation [Hempel, 1941] complement the paradoxes of induction [Goodman, 1975] to undermine the trust that one can reasonably place in regularities as the building blocks of worldly knowledge. These tensions find expression in the ‘paradigm wars’ among scholars of organizations that emerged in the mid-to-late 1990’s [Moldoveanu and Baum, 2002], in the legitimation crisis that has started besetting academics in the MBA classroom in the 2000’s, and, increasingly (we predict) in the increasing autonomy of specialized “knowledge power” from practical reason.

‘High Capitalism’: Whither ‘High’? Not because we want to extol the virtues of capitalism and highlight its triumph over other modes of organizing production and exchange; but, rather, because (a) the basic habits of the mind and heart that characterize progress in contemporary human dominance hierarchies – such as cost-benefit analysis as a decision making technology, instrumental reason as a lens for understanding the self and others, the conceptualization of ‘world’ as a set of problems to be solved – have become sufficiently wide-spread as to become ‘common knowledge’ and even ‘self-evident’ and (b) because the techniques for resolving ‘simple’ and ‘complicated’ problems in theory (via the

computer, the algorithm and their appendages) and in practice (via the increasingly successful out-sourcing of increasingly complicated manufacturing and design tasks), have become *commoditized*: in-forming, open-sourcing and off-shoring combined [Friedman, 2005] have made it possible to take a fresh look at the ‘core’ of managerial practice – that which is left over when all algorithmic activities have been efficiently sub-contracted to algorithmically competent agents. And, what do we find there, at the core?

The “Interactions Revolution”: Articulating the ‘Tacit’ to Help Bridge the Ingenuity Gap.

We find silence. Johnson, Manyika and Yee (2005) argue that the skills of the ‘high-value decision maker’ of the 21st century are ‘tacit’ skills, involved and employed in managing complex interactions among multiple production and exchange agents with different ways of thinking and behaving. Their ‘new kind of worker’ is a worker skilled at performing activities that are precisely those which cannot be turned into algorithms for turning matter into matter or information into information – what they call ‘transformational’ activities (see Figure 3, based on Exhibit I of Johnson, Manyika and Yee, 2005). According to the authors, the high value decision maker of the future *is* the manager of complex interactions: the manager ‘whose tasks cannot be automated’: As the marginal costs and benefits of task automation have decreased to the point where very high start-up costs can be rationalized, virtually any algorithmically specifiable task can and will – in the end – be automated. The manager’s skills are tacit in the sense that they are not explicit in the same way that the task-specific skills of a futures trader, a computer programmer, a production line manager or a chief development engineer are: they cannot be represented by adherence to a set of rules which can be put together into algorithms that deterministically or statistically turn certain inputs into certain outputs.

There are two ways in which we can interpret the ‘tacit-ness’ of these tacit skills. The first is to resign ourselves to the notion that these skills can never be made more explicit, can never be developed or selected for. This approach is resonant with a lot of the literature that has evolved from the realization that ‘mind is not (actually) a computer’ – but only, perhaps, metaphorically so; that there are tasks which we can do that computers can never do

[Dreyfuss and Dreyfuss, 1986]; that we will forever outclass computers at solving the (meta) problem of problem selection or formulation; but which often draws the erroneous conclusion that it is sufficient – as a pedagogical goal – to simply identify and label the wicked problems *qua* wicked problems – and tacit skills *qua* the skills involved in solving wicked problems, marvel at our ability to identify this new category of problems in the first place and leave matters at that. An alternative approach – the one we pursue in this paper – is to attempt to make progress on exactly the ‘wicked problem’ of identifying and attempting to develop the tacit skills that make a difference to the solution of wicked problems – and thus to engage in the kind of articulation that we have expressed doubts that markets can successfully undertake.

These new skills are a current and emergent phenomenon. They are not presently ‘trained’ or cultivated. They are aimed at bridging the ‘ingenuity gap’ identified by some as the real limit to human development [Homer Dixon, 2000] as the (negative, and growing) differential between the supply and demand of ideas that solve the (social, economic, technical, moral) problems that we - collectively - have created: man-made solutions to man-made problems are in short supply. The answer to the ingenuity gap suggested by the nature of the tacit skills that have emerged may be that it is not a quantitative, but a qualitative one: it is not a ‘know-what’ gap in numbers of ideas or of other purely cognitive objects, but rather a gap in know-how-to – in the *cognitive-behavioral modules* required to bridge between fact and value, thinking and action, different modes of thinking; between different ontologies, different epistemologies, different logics; between different forms of life - all while “retaining the ability to function” – in F. Scott Fitzgerald’s resonating formulation. They are the required for us to (locally and fallibly) transform “wicked problems” requiring constant interpretation and negotiation of the nature and criteria of ‘acceptable solutions’ into complex or simple problems that can be tackled by the algorithmic processes and procedures that we have created and optimized over the course of three centuries (in fact, since the original development of the Anglo-American accounting system and the increasingly sophisticated technologies for counting and calculating that have culminated in the computer and the Internet) (Figure 5).

“High Value Decision Makers”: An Excursus on the Essence of the New Managerial Competence

To make progress on the task of articulation we have set for ourselves, let us consider a (complicated, yet, still considerably simplified) example of the high-value decision maker - a general manager at a major telecommunications manufacturing firm (i.e.: Nokia, Nortel, Lucent, Alcatel, Siemens) (see Figure 4) attempting to bring to market (or, beta release) a new wireless cellular base station for voice and data applications. Even at the purely technical-economic levels, she must motivate, monitor, coordinate and negotiate and argue with experts with disparate disciplinary backgrounds, producing arguments patterned on the underlying logics and discourse ethics of different basic sciences, each based not only on a different vocabulary and technical code drawn from mutually disjoint basic disciplines, but also on a different set of standards of argumentation, reasoning and interaction. An argument about the optimality of a queuing process, for example, will have different standards for logical closure than will an argument about market timing, and will rely for this closure on a different combination of analytical and empirical reasons than will an argument about market timing. Moreover, different domains of expertise are embedded in fundamentally different modes of inference (inductive, deductive, abductive) and different logics (modal logic – granting epistemic and ontic status to possibilities; declarative logic – denying such status; second-order logics, allowing statements about statements, etc.). The (modal) logic of design used by the system architect must be brought – through the medium of our manager – into dialogue with the non-modal language(s) of the programmer and the network theorist; the (inductive and abductive) logics of the marketer and the product line manager must be brought into dialogue with the (deductive) logic of the hardware engineer. Because different disciplines entail not only different communication communities but also different communities of practice and interrelating (standards of punctuality and probity, standards of honesty and intellectual honesty, standards of ‘appropriate reason’ and ‘just cause’, all of which differ between engineering, accounting, core strategy and marketing/sales backgrounds) , integrative management in this example will also require understanding and impacting the fine mesh of embodied social action norms that rise from the different fields represented in the project.

Successful integration of different worldviews and different modes of behavior and communication is essential to our manager both for building credibility and legitimacy around her arguments and actions, and also for successfully monitoring and credibly monitoring and sanctioning the tasks and auditing the arguments of the contributors. As information becomes “currency” within the organization and task-specific, hard-to-transfer knowledge confers *de facto* decision-making authority upon its legitimate holder, the value of the decision maker to the organization increases with her ability to successfully resolve the fundamental model clashes, tensions and incongruencies (at all levels: logical, ontic, epistemological, behavioral) that emerge among contributors. (It may be tempting, at this point, to characterize the high-value decision maker in terms of various levels of *super-modularity* of the resulting production function [Topkis, 1998] for the project or task as a whole, but this would be merely to describe the *effects* of the successful exercise of the tacit skill we want to render explicit; the approach we have taken is to try to characterize the underlying components of the skill itself.)

There are two features of the integrative function that announce themselves in the previous discussion: it is at once *necessary* and *not efficiently out-sourced*.

(a) It is necessary in that the firm as a whole does (more or less well) achieve an integration among different knowledge bases, ways of acting, knowing, communicating, representing, and so forth, in the sense that any global outcome brings together the chain of activities of the firm in to *some* causal nexus, *some* denouement: Bankruptcy and failure are *integrative* outcomes; in them, integration of all of the causal chains making up the organization *happens* - even though no-one sets out from the beginning to make them happen. The manager becomes a high value decision maker by making integration happen more successfully;

(b) The integration function is *not efficiently out-sourced* because the result of outsourcing it is a loss of the full benefit associated with it (along with the contracting costs). Kreps' [1990] analysis of the non-subcontractibility of the *culture* of the organization - defined by him as a set of (stored and commonly known, but often tacitly so) focal points in a set of (often unconsciously played out) coordination games - applies here as well:

Integration happens largely in the tacit domain, and depends for its success on hard-to-specify behaviors. Sub-contracting – by contrast - requires an explicit and algorithmic

representation of ‘deliverables’ that makes the contract between principal firm and sub-contractor a computable function of observable variables [Anderlini and Felli, 1994] – precisely what integration is not amenable to.

Because it is at once unavoidable and inescapable, integration has appears to be a fundamental managerial function. However, it is not thereby the easier to describe and further analyze. Therefore, it is useful for the purpose of our analysis to get a little more reductive in order to make progress. Call integrative thinking *the ability to think and act responsibly and responsively in the face of multiple, incommensurable and possibly conflicting models of oneself, the world and others*. The successful integrative thinker builds value through the creative resolution of tensions among such models. We can modify Porter’s [1996] analysis of strategy as the achievement of new combinations that push outward the Pareto frontier of the organization’s production function and claim that successful integration is what the high-value decision maker does to create value beyond the current operational efficiency limit of the organization (see Figure 6). On the other hand, *pure optimization* – instantiated by algorithmic activity sets – can be understood as taking the organizational *to* the operational efficiency frontier.

Stories can help the enterprise of intellectual entrepreneurship, by giving it energy and relevance: Here is how some recent breakthroughs in ‘embodied strategy-making’ instantiate the integrative skill:

Isadore Sharpe created the Four Seasons experience in response to the seemingly irreconcilable tension between the need to provide the intimacy and comfort of a small hotel with the range of amenities and services and attending economies of scale of a large hotel by designing and rapidly prototyping and perfecting the medium-sized luxury hotel with intimacy and amenities funded by a massive end-customer price premium (Figure 7);

Herb Kelleher made Southwest Airlines into the short-haul, point-to-point frequent departure airline of choice for leisure and business travelers in response to an articulated aim to simultaneously become *both* the lowest cost and highest profit airline in North America and the highest employee satisfaction airline in North America, a vision that

incorporates multiple goals that one usually thinks of trading off quasi-linearly against one another (Figure 8);

Jack Welch resolved the tension between embedding stretch goals in the organization and keeping budgeting and planning meetings efficient and productive by de-linking discussions of executives' hopes and dreams from conversations about budget (Figure 9);

Dick Currie created the President's Choice high end private label products as a way of resolving the conflict between the (stated) goals of providing both low end-customer prices and high profit margins for Loblaw's (Figure 10);

Moses Znaimer made CityTv into the 'quintessentially local' television station – a globally licensed concept successfully replicated in 22 other countries, as a way of providing a strategy that is responsive to both the globalization of the media business and the yearning of viewers for local feel and content (Figure 11).

Stories may be 'bad science' – but they are useful for making progress on the hard problem of articulation, of bringing to language intuitions about a new dimension of managerial being-in-the world that is as yet poorly articulated, and that is what we attempt to do next: for it is articulation that must precede any foundational, qualitative change process, and it is articulation that cannot be relegated to the otherwise very effective market mechanism for aggregating information.

If it is the case that an integrative skill is essential to the high-value decision maker –that integrative thinking is an essential component of the mix of tacit skills that will drive value creation in post-modern high capitalism - then it makes sense to ask: what are the new managerial *virtues* that we should aim to cultivate and develop? We note the productive resolution of seemingly intractable tension must be rooted in the recognition of different ways of thinking and acting – of *being*, more generally. The 'local television station' that Znaimer thinks about is a *micro-world* – a community of practice and discourse - that is radically different from the cosmopolitan station – another such micro-world. They entail different patterns of interaction, different capital budgeting constraints, different organizational rule sets, different inter-organizational network structures. To 'integrate' successfully, one must possess the *nimble-mindedness* to understand the different micro-worlds *in their radical other-ness*, to walk around in them in order to internalize just how deep the

tension between them really is. Once the tension has been understood (at ontological and behavioral levels, as well as logical ones), the integrator requires the *big-mindedness* to simultaneously *behold* the competing models - 'while retaining the ability to function'. Her mind must *contain* the radical *other-ness* of several different possible worlds that are in tension with one another without falling into paralysis. We conjecture that the creative resolution of the tension is causally related to the *full and loyal* comprehension of the tension that must be resolved. Subsequently turning the new insight into action – *embodying* the idea, *producing* the revolutionary behavior– requires *tough-mindedness* – the willingness of the high value decision maker to 'try out behavior' and allow her ideas to die in her stead – not coincidentally Karl Popper's view [Popper, 1979] of epistemic rationality *tout court* – the will to carry out experiments aimed at refuting the mental objects that cannot fruitfully be embodied into organizational action.

2. 'The Scientific-Educational Complex Faces the MBA of the Future.'

We will argue in the remainder of this paper that business academics are currently well equipped to develop and cultivate such virtues in MBA students. The tools are already in place; but, the ethos and the institutions of business scholarship and teaching must be understood in a new light in order to bring about such change. Here is a sketch of the argument: first, the epistemological and ontic pluralism of business research, positively and constructively understood, creates a favorable breeding and proving ground for nimble, big-minded thinkers. The paradigmatic mental models of the different core disciplines 'come together' in business schools – and this presents them with a unique opportunity for developing the conflict-competent thinker. What is needed is a re-conceptualization of (substantive, epistemological, ontic) tension and conflict as fundamentally 'a good thing' – a productive phenomenon – one to be brought forward in new pedagogical experiences aimed at legitimating the experience of the conflict or tension. The nimble minded student can come to *walk around* in the shoes of *homo economicus*, *homo psychologicus*, *homo sociologicus* and in the end becomes big minded by feeling *comfortable* along the way of the walk. The self grows through confrontation with other possible selves that cannot be reduced to a single entity - and through a visceral - as well as cognitive and comportmental - understanding of their irreducibility.

Second, the *tough-minded* manager acts out a version of the sophisticated methodological falsificationism that Imre Lakatos [1970] posited as a neo-Popperian logic of scientific discovery – one that gets around the technical problems [Miller, 1994] associated with Popper’s original [1959] approach to ‘method’ in science yet is a better descriptive instrument for what the scientist actually does than its precursors. It is a ‘falsificationism for the thinking doer’ – who must – in the end – make a choice among competing theories in the face of multiple, plausible alternatives in the interpretation of any ‘data’ set. Given the self-understanding of scholars and teachers as falsificationists, as designers of experiments and quasi-experiments, all that is required for a (mimetic) transfer of this valuable skill to students is for the educators to ‘walk their own talk’ and embody the model they espouse in the *actual* ways they search, re-search and teach. The shift from ‘knowingness’ to ‘unknowingness’, from “scientisticity” to scientificity, from justificationism to falsificationism is not altogether straightforward, for reasons that we will discuss below; but the “hardware” exists and the “software” required to configure it is at hand.

2.1. Obstacles to Ontic Pluralism: Two Forms of Departmentality and the (New) Structure of the Market for Ideas.

We begin with a critique of old and new forms of departmentalism in business schools and discuss the very specific kinds of challenges they pose for the development and cultivation of the integrative, high value decision maker. A sketch of ‘Business School 1.0’ (circa 1908) (Figure 12) reveals an organization of teaching and research that mimics the functional structure of the business organization. There are ‘problems of production’, ‘problems of accounting’, ‘problems of finance’ to be handled by methods specific to each individual problem area. Business cases come pre-sorted into ‘productions’, ‘operations’, ‘finance’ and so forth: the label is all important, as it groups likes with likes in terms of business situations and pre-configures the mind of the student to deal with specific areas before hand.

John Ralston Saul has cogently argued that the labeling process (coupled with the rationalist discourse that makes places basic categories outside of the realm of the discussable and negotiable) strips away the richness of situational detail from the predicaments with which future MBA's are confronted as being 'prototypical' of business situations [Saul, 1992] and that this loss of detail leads to "the technocrat's illusion": that the world is nothing but a straightforward instantiation of a (single and often algorithmically simple) mental model. We argue that the mono-paradigmaticity of the individual silos of Business School 1.0 is the *mechanism* by which the detail is 'flattened out'. Detail always stands out against a background of relevance and salience: different facts about an 'organizational behavior' case study would stand out in relief in a finance-oriented discussion of the same case than they do in 'OB class'. The 'ethical' dimension of a "productions case" does not fit into the dimensions of the dialogue carried out in 'productions class' - and 'ethics' class discusses different cases, many of which have productions-relevant details that do not get discussed. Each silo conjointly develops rules of thumb for adequate contributions to classroom and scholarly discussions and (often inductively derived) 'laws of business' that are (sometimes) used to buttress the rules of thumb in question. True tension has little opportunity to flourish in this setting. In particular, there is no room for:

- a. *Ontic pluralism*: the simultaneous understanding of multiple, incommensurable cognitive models or images of the organization, the manager, society at large;
- b. *Epistemological controversy*: tensions among alternative ways of creating knowledge, validating belief or auditing theoretical truth claims;
- c. *Ontological insecurity*: anxiety about the foundational categories that one feels 'cut the world at the joints' [Nozick, 2002];
- d. *Logical pragmatism*: the self-consciously instrumental deployment of multiple logics (descriptive, modal; tensed, untensed) and modes of inference (deductive, abductive, inductive) as structuration devices for thinking and communicating.

But – these are precisely the core characteristics of *model clash*, the very clash that is both prevalent in the business world (where predicaments do not come packaged as specialized problem statements and it is up to the high value decision maker to adjudicate among radically different approaches) and which we have identified as a beneficial to the important

process of integration. Introducing *model clash* as a consciously pursued pedagogical intervention in the Business School 1.0 model would also go some way towards alleviating Saul's 'abduction of reality' problem embodied in "Voltaire's bastard": for multiple 'lenses' brought to bear simultaneously on the same case would make *more* details of each case stand out against the new and richer background of relevance. It is, however, against the background of Business School 2.0 that model clash takes on an even greater significance.

Fast-forward to the mid 1970's - to give the Ford Foundation funding strategy aimed at making business education more 'scientific' some time to take effect: Business school 2.0 (Figure 13) is a structure that is similarly departmentalized to that of Business School 1.0, with the exception that the silos are buttressed by 'basic social sciences' – such as economics, psychology and sociology. Not all basic sciences are 'in contact' with all disciplines, of course: knowledge transfer only occurs where there is already a common 'code' that enables communications. The axiomatic system of rational choice and rational belief theory, for instance, functions as a code that is shared between finance and microeconomic science, and which allows ideas from microeconomics to be used in finance theory without the messy (and fundamentally ambiguous) of inter-disciplinary translation [Moldoveanu and Nohria, 2006]. The language of microeconomics, by contrast, is suspect to cognitive and social psychologists teaching organizational behavior courses and to sociologists teaching strategic management; the functional disciplines that result are, consequently, also foreign to the 'ethic of axiomatization' and to the axiomatic approach to understanding behavior that confers 'logical auditability' upon economic models of behavior and thought [Saloner, 1991].

The basic conceptual strategy ("simplify and specialize") of the social sciences (Figures 14, 15) is accepted in the new functional silos, where the (again, messy, indeterminate) processes of conceptual articulation, reduction and elimination are effectively 'sub-contracted' to the basic disciplines. The complex, ambiguous object 'organization' is reduced, for instance, by different mono-paradigmatic approaches (such as classical sociology, neoclassical economics, modern agency theory) to simple descriptions ('hierarchy', 'market failure', 'nexus of contracts', respectively) that allow narrowly defined research programs held together by core assumptions and basic 'empirical questions' to flourish (Figure 14). The complex, ambiguous object 'person' is apprehended by various disciplines (economic, behaviorist psychology, neuropsychology) that build their practices on

simplified representations of personhood (‘nothing but a set of preferences and choices’, ‘nothing but a set of conditioned responses’, ‘nothing but a set of causally connected neurophysiological events’) (Figure 15). (The search for ‘invariants of human behavior’ [Simon, 1990] – or, of organizational behavior, or, of human behavior in organizations - achieves an unification of sorts among the various functional disciplines and a more or less falsificationist approach pursued with greater or lesser rigor becomes the new standard that confers legitimacy on academic speech acts. With regards to research, the functional silos are largely ‘net importers’ of ideas from the basic social sciences [see Baum and Dobbin, 2000, for strategic management, for instance] - with the exception of finance, that lives inside the communicative space of microeconomics but is no longer a net importer of core ideas from micro-economics, but rather a user of models and techniques from real analysis, combinatorial optimization, stochastic systems theory, statistical mechanics, algorithmic complexity theory, cognitive psychology and affective neuroscience.

The situation in the ‘new world’ seems in some respects dangerously similar to that of Business School 2.0. There are several ‘differences that do not make a difference’ to the fundamental nature of MBA training:

- (a) The inductive and abductive logic of functional explanation has been largely replaced by the deductive methods and the hypothetico-deductive method for testing theoretical explanations;
- (b) The use of experimental and quasi-experimental methods for validating theories and beliefs are de facto ‘gold standards’ – and good cards to play in legitimation contests inside the classroom and in academic circles;
- (c) The conceptual base of the functional disciplines has been ‘cleansed’ and quite often replaced by the conceptual base of the tributary basic sciences (usually: microeconomics, psychology and various strands of sociology).

Most faculty of Business School 2.0 are trained in doctoral programs that imprint them with the methods and concepts of one (and only one) of the basic social sciences. In

the classroom, they derive legitimacy from the academic studies that they can cite to buttress a particular opinion, and, of course, from the fact that these studies are themselves considered 'legitimate' tokens of validity by their students. They are hard-pressed to come up with answers and to 're-generate the dialogue' when studies from alternative sources or different basic science traditions are deployed to buttress an opposing point of view, and also when the theoretical underpinnings of the studies they cite are openly challenged, but their discomfort is often limited to the classroom in which these difficulties are voiced and forgotten afterwards. They struggle to formulate prescriptive injunctions that 'solve or crack the case' for would-be managers ('take-aways') by combining (often hidden) normative approaches to management (most of which remain implicit) with descriptive studies that purport to show characteristics of 'the human mind' or 'organizations' or 'markets'. They get tenure on the basis of numbers of papers published in journals that are often not read by practitioners and whose importance is rated by academics that are not managers. Their output contributes to the welfare of their schools and departments *via* the value that rankings of business schools attach to such publications (without the benefit of an empirical test of the impact of the specific journals' precise content on the "business world"). They are aware of the challenges of applying highly simplified and structurally explicit models to understanding human behavior and experience, but have few outlets for voicing these difficulties. Over time, they become increasingly adept deployers and users of arguments and counter-arguments in interactions with peers and students. Because of the strong civilizing force of hypocrisy, they remain on the right side of academic dishonesty, even as they seem to fall ever short of an internal standard of intellectual honesty.

However, there are encouraging signs in the world of Business 2.0, signs that, taken together amount to the seeds of a new way of teaching and researching business:

- (a) First, the new business academia is a self-consciously multi-paradigmatic discipline (which makes it a *pluri*-paradigmatic discipline). Its collective consciousness is heavy with the memory of "paradigm wars" punctuated by reasoned attempts to narrow the epistemological foundations of the discipline [Pfeffer, 1993], to keep it broad [Van Maanen, 1995] by textured discussions of its epistemological foundations [McKelvey, 1997], and by an understanding of the misunderstandings that these

discussions have often fostered [Moldoveanu and Baum, 2002]. Ontological relativity [McKelvey, 1997, *ibid*] (better: *ontic pluralism*) is accepted and encouraged even by those who want to restrict the admissible range of epistemological regimes in which ‘knowledge’ is pursued. The communicative and coordinative functions of academic language are beginning to be recognized, in conjunction with its representational functions [Astley and Zammuto, 1992]. The political functions of disciplinary language and the intimate connection between ‘is’ and ‘ought’ in the models used to represent people, organizations and markets have been cogently signaled [Ghoshal, 2005], and the heavy moral background that embeds theories that purport to merely ‘describe’ the world. A foundation therefore exists for carrying out dialogues that transcend the boundaries of narrowly construed basic science disciplines. These dialogues and the research that they have generated have brought into sharp relief the depth and quality of the tensions between alternative models of humans and organizations, the relative value of “theory”, “evidence”, “method” and “conceptual framework” in the adjudication of claims to validity, and have helped to elucidate the cognitive commitments of those working in the tradition of various ‘basic social sciences’. As a result, a ‘fabric’ for training integrative thinkers exists.

- (b) Second, the disciplinary straitjackets of the existing basic science disciplines are being vigorously challenged by the realization that they are themselves net importers of ideas from a set of ‘generative sciences’ (analytic philosophy, evolutionary and co-evolutionary theory, real analysis, complexity theory, hermeneutics, theoretical physics – see Figure 16) and therefore that business scholarship is not *ontically beholden* to the basic sciences (economics, psychology, sociology) - just as they are not *epistemologically beholden* to any one tradition for creating and validating beliefs, but rather free to choose and sculpt its own foundations in ways that are responsive to the ‘practical problems of business’ as much as to the intellectual heritage of many different fields. Paradigmatic pluralism naturally extends to the realm of theories, models and metaphors for representing the self and the world. New disciplines – organizational neuro-psycho-socio-economics, the NK(C) approach to modeling value chains and their linkages, the new science of organizational network dynamics based on the theory of random graphs, the affective neuroscience of financial

behavior, the economics of linguistic conventions and managerial semiotics— are taking root in *business schools* without having gone through the apprenticeship of successive years or decades of validation in the antechambers of the traditional, ‘basic’ social sciences. This trend amounts to the achievement by business researchers of the epistemological maturity required to take over new concepts and deploy them in imaginative new explanatory *schemata* without waiting for independent validation from their more ‘respectable’ brethren – the sign of a real appropriation of the ‘spoils of science’;

C) Third, the performative dimension of knowledge has recently come to light among business scholars. Karl Popper’s view of social science as ‘piece-meal social engineering’ [Popper, 1961] guided by a stubbornly empirical process of trial and error never came to fruition in the traditional social sciences (concerned with discovering ‘invariants of human behavior’) but rather in the new self-understanding of social scientists as designers of intelligent behavior [see Roth, 2003 for an argument and a powerful example from auction design; Simon, 1986 for the classic article on the sciences of the artificial]. It took 100 years for the ‘basic idea’ that makes game-theoretic analyses of social (and intra-personal) interactions possible to ‘percolate’ through the sieves of various social sciences and become a ‘design tool’ for the Federal Communications Commission (FCC) auction of the 1900 MHz Personal Communications Systems (PCS) spectrum. By contrast, it took 20 years for the basic ideas behind the combinatorial optimization of double-matching markets to become embedded in real practice [Roth, 2003, *ibid*], and 10 years for the Viterbi algorithm for decoding Trellis-coded signals – doubling the capacity of some wireless channels - to be embedded in wireless radios and (later) in cellular handsets (fuelling the large and growing royalty-based revenue stream of Qualcomm, Inc.). Interestingly, the ‘engineering’ approach to the creation and deployment of knowledge is not by any means foreign to Popper’s original ‘logic of scientific discovery’ [Popper, 1959]: conceptual pluralism, dogged empiricism and rabid fallibilism pay off (we conjecture) at least as well in the world of organizational and behavioral design as they do in the world of science. Perhaps it is not fully the case, as J.S. Mill argued, that ‘the logic of science is the same as the logic of business and

the logic of life'. But, as Herbert Simon pointed out [1986] –the addition a logical infrastructure that allows for logical *possibility* and the resulting logically possible worlds to play substantial epistemic roles in thinking and deliberation [see also March, Sproull and Tamuz, 1991] - while the process of *validating solutions* remains essentially the same as that which has worked successfully for empirically minded scientists – goes a long way toward turning scientific thinking into ‘thinking for action’.

We are faced, then, with a significant opportunity for momentous change in the MBA that makes use of a lot of good work and a lot of resources currently under the control of business schools:

- (1) We can exploit the conceptual and epistemological self-awareness and pluralism and the reasoned dialogue that has emerged around it during the past ten years in business academia to design educational experiences that develop big and nimble minds, capable of dealing with radical conceptual conflict and used to seeing situations through multiple ontic and epistemological prisms; by bringing such pluralism *into the open* and thus exposing the trainee to the fundamental tensions that arise in attempts to explain, predict, shape or justify human behavior, the rich background of situational detail that is kept hidden by mono-paradigmatic approaches is freed up (often, of course at the expense of simple ‘take-aways’); the result is a complexification of the mind that increases the competence of the decision maker to deal with radical conflict;
- (2) We can harness the new emphasis in business academia on the use of knowledge as a design tool to create experiences that allow the thinkers of the future the room to experiment with ideas in action, to ‘live it’, to design and devise their own experiments , to engineer their own situations, to appropriate knowledge in the performative realm and thus to turn the ontic dimension into an ontological dimension. Not psychological ‘science’ – a dead textbook affair – is worth imprinting on the thinker of the future – but: the mental habits of the tireless designer of experiments for answering questions about human behavior; the tricks that get her to

produce the right effects; the obsessiveness over the ‘demand characteristic’ of the experimental design; the recklessness of the questioning of the original insight. Not ‘strategic frameworks’ is what we should burden the integrative thinker with in strategy classrooms – but: a generative semantics for building new models, a basic repertoire of mental objects (images, metaphors, systems of coupled equations, relational, kinematic and dynamical schemata, narratives and meta-narratives) that can be adaptively deployed to create new models for new situations;

- (3) We can use the (already well-developed) falsificationist ethos of scientific inquiry to help cultivate a tough-minded awareness of the fallibility of human enterprise and a willingness to walk on the “uncomfortable side”. Empiricism (not the metaphysics that grows on top of it) and fallibilism form the *lingua franca* and the regulative framework of science, and all we need (assuming we practice it) is to teach it in ways that impart it not only to the mind, but to the flesh, to behavior.

If we pursue these opportunities, we will have graduated as a field from ‘science’ to ‘engineering’, from *episteme* through *techné* and *phronesis* to *poiesis*, from the questioning of Being to the prototyping of new forms of Being. If we do not, we are in danger of remaining mongrels: not-quite-competent managers, not-quite-competent psychologists/economists/sociologists who are nevertheless dependent for money on competent managers and for ideas on competent social scientists, forever cautious and tentative lest an already-suspect educational and professional background should be shown up by an unexpected confrontation with a real problem, one calling for either deep knowledge or prescient action.

3. Business School 3.0: The Design and Development of Integrative “Cognitive-Behavioral Modules” for the Thinker of the Future.

As we have argued above, the fundamental ‘building blocks’ for designing the thinker of the future exist today on the premises of business schools worldwide. However, designing the program that puts these building blocks together is a difficult and delicate enterprise. Here is why:

- a) business schools are *already* multi-disciplinary collectives; but, they are not *interdisciplinary* ones. The limiting function of communication *codes* common to some disciplines but not others and idiosyncratic institutional practices of various disciplines make the coordinated delivery of complex , mixed or heterogeneous conceptual structures very costly;
- b) the micro-incentives of untenured and tenured academics alike make cross-disciplinary collaboration on either teaching or research difficult to mandate, and even more difficult to plan. Indeed, the ‘success stories’ of interdisciplinary innovation (behavioral economics, for instance) have been unplanned activity sets, linked (later on) by favorable narratives;
- c) the spectatorial-gladiatorial structure of the interaction between the instructor and the students in the MBA classroom setting makes difficult the pursuit of authentic dialogue aimed at *unpacking* assumptions, *opening* avenues for exploration and *raising* questions (rather, the emphasis is ever on achieving some kind of ‘legitimate closure’);
- d) the cognitive-representational dimension of knowledge that is emphasized as that which is ‘transferred’ in the classroom inhibits a full appreciation of the full performative dimension of ‘business knowledge’ – of the causal import to the self of adopting a particular model of the self and living with that model as a regulative framework. MBA talk is ‘idle’ talk, most often: even when the dramaturgical dimension of speech acts does not ‘take over’ the classroom speaker and lead him in directions that run counter to ‘open’ dialogue, the interaction that emerges, when collated, remains at the level of ‘just so’ stories and arguments: the question of how to get ‘skin’ in the game from the participants remains open, and the problem of turning academic understanding (explanation or prediction) into embodied understanding (poiesis and the intelligent production of behavior) remains unaddressed;

- e) not least importantly, the ‘consumer’ model of the student [Pfeffer and Fong, 2002; 2004], coupled with the “knowledge as food” (or, “valuable stuff”) model for the outcome of the classroom experience (which could include the experience itself, as in various forms of *info-tainment*) makes it costly for any single instructor to single-handedly undertake changes that violate a zone of ‘ontological security’ for the participants or for other instructors.

Any pursuit of the opportunity that is bound to succeed must at least grapple with these problems – without creating additional ones.

3.1. The Practicum: A Structural Solution Concept for the MBA of the Future.

An MBA Practicum is an interactive experience for MBA students and educators that unveils the epistemological, ontic and performative dimensions of the technical knowledge imparted in the MBA classroom (Figure 17). It *takes advantage* (rather than suppressing or attempting to do away with) of the fundamental tensions and problems that are implicit in the ‘amphi-theatrical’ experience of the MBA classroom (the suppression of sharp dissent or radical difference, the *unidimensional* discursive authority structure, the *mono-paradigmatic* approach to validating knowledge) – of which students are to greater or lesser degrees aware – and *uses* these tensions to produce learning experiences that cultivate not only erudition, knowledge of the ‘codes of business’ and communicatively competent use of ‘buzz-words’ and ‘frameworks’, but, rather, functionally useful cognitive-behavioral modules that begin to address the gap between the skills currently trained and the skills of the MBA of the future.

The form of the Practicum is patterned on the musical *master class* and the psychotherapeutic training session. In the musical master class, the student attempt to come to a better, deeper – but always embodied -understanding of the score and of her own performative capabilities with regards to the score; the purpose of the instructor is to guide the process of forming and shaping this understanding, offering suggestions for improvement and criticisms but leaving ultimate decision rights firmly in the hands of the student. The psychotherapeutic training session allows the trainee the latitude to experiment with different modes of being relative to a situation in which she has a complex goal

admitting of many possible interpretations, and gives her the benefit of feedback about the products, processes and procedures that she designs and enacts.

While the *form* of the Practicum is new – and, thus, *foreign* to the MBA culture, the cognitive behavioral modules that comprise it are not new to business school scholars, who always-already *are* modelers of human behavior, experimenters, epistemologists, and (perhaps less often) effective producers of organizational effects. For this reason, the Practicum concept promises to *dissolve* the tension between the need for a radically new approach to MBA education that trains the tacit skills we have attempted to name and the current endowment, resource base and culture of business academia and scholarship. It takes advantage of the promising new trends that we have identified in business academia and efficiently uses these trends to new pedagogical purposes.

Module I: Articulation: The Adaptive Generation of Models and Representations.

The first module aims to teach students to become creators and developers of models of human and organizational behavior, to build model-makers and model-shapers, rather than model-takers. This is, essentially, already one of the fundamental crafts of the social scientist, who creates representations of people and organizations out of basic explanatory logics, such as rational choice and rational belief axioms, interactive epistemology (‘game theory’), evolutionary schemata based on the logic of variation, selection and retention, learning and adaptation schemata based on selective reinforcement and selective validation, diffusion schemata and representations of the evolution and dynamics of rule-based systems (cellular automata models, including NK(C) models of co-evolutionary processes and dynamical network models).

Together, these building blocks can be understood as a *library of forms* – a basic repertoire of cognitive productions (in the language of Simon (1990)) that can be deployed to build detailed models of actual human and social processes. Students are introduced to model building as an activity – a *praxis* – as a way of (a) solving problems that do not come pre-packaged in a disciplinary language and (b) as a way of unpacking narratives – of understanding others’ representations, articulated in ‘lay language’. Since lay language is always-already metaphorical in nature [Lakoff and Johnson, 1999], this first module faces the challenge of getting students to conceptualize the models that are already embedded in the way they speak and think and of ‘re-formatting’ their representations using the (more

precise) generative semantics of social science models – a process that often takes place unconsciously as a result of prolonged training in one of the basic social sciences.

Module 2: Validation: The Selective Retention of Useful Mental Objects and the Analysis of Subterfuge.

The second module attempts to develop applied falsificationists and experimentalists. To the trained social scientist, the world often appears as an ‘experimental playground’ – as a sequence of experiments designed to test interesting hypotheses [Abelson, 2004; Langer, 2000]. The architecture of belief of the scientist is (ideally) maximally responsive to the results of experiments carried out with the aim of refuting such hypotheses. What makes the results intriguing and worthwhile understanding is precisely the ‘danger’ in which the experimenter has placed her own hypotheses. The module aims to develop the applied behavioral correlates of the empirically minded falsificationist, by getting students to understand the often counter-productive (self-sealing, self-justifying) architectures of belief that they cultivate and practice, in ‘everyday’ managerially relevant settings, the logic of optimally combining advocacy (hypothesis formulation) with inquiry (hypothesis testing through empirical experimentation). The challenge that the module must face and successfully resolve is to confound the artificial boundary between ‘science’ and ‘life’, by abstracting from science the essential cognitive and emotional landscape that can turn a ‘mere conversation’ into a ‘sequence of maximally informative experiments’.

Module 3: *Poiesis*, or the Production of Behavior. The third module aims to stimulate and develop the design capability of the ‘social engineer’ into the trainee, by getting her to re-engineer and reverse engineer her own behavior according to her aims. The basis of the module is close, phenomenologically precise self-observation and analysis in controlled settings, followed by opportunities to take on new ways of interacting that are guided by a higher level goal. Defensive interpersonal communication strategies, for instance, articulately described in organizational settings [Argyris, 1993, for instance] become subjects for personal, behavioral re-engineering when the defensive strategies of the subject herself are examined through the lens of a normative ideal of open communication and tough-minded inquiry. The module enables the *imprinting* (not only the teaching) of axiomatic, normative frameworks that are ‘tough to get across’ by reference to rules alone (such as the axioms of

rational choice and rational belief, that are cheerfully violated by students even after learning about them and (apparently) agreeing with their ‘correctness’ [Dawes, 1998]) : the axioms of rational choice and rational belief can be taught as ways of producing trading strategies that ‘sucker the suckers’ and that avoid ‘being suckered, oneself’ in large, interactive trading or betting situations and internalized as *behavioral* axioms (rather than just merely cognitive or analytical ones) if they emerge as the result of a process of *design* (rather than a process of proselytization or normative imprinting – see Figures 18, 19, 20). Basic intuitions about modeling beliefs and desires are first probed openly and the rationale behind representing beliefs as measure-theoretic probabilities and utilities as (ordinal or cardinal) measures is allowed to emerge as an *engineering solution* to the problem of representing individual choice behavior in a way that optimally satisfies the concomitant needs for universalizability and goodness-of-fit (Figure 18). The rational choice framework appears as a solution to a problem of representation, rather than as a normative rule set of dubious foundation and descent. The *inverse problem* of inferring personal probabilities from the observation of choice behavior is then used to introduce the Ramsey-de Finetti subjective probability framework (Figure 19), but, perhaps more importantly, as a managerial *tool* for getting individuals to ‘walk the talk’ by forcing them to lay (implicit or explicit) bets in accordance with their underlying beliefs. Finally, the question of ‘*why follow the axioms of probability theory in forming judgments?*’ is not answered on purely normative grounds (‘because it is the right way to think’) but rather via an interactive introduction to the design of “money pumps” (or, utility pumps, or *Dutch Books*) that extract a positive payoff with a high degree of reliability from traders whose personal probability measures *do not* obey the axioms of probability theory (Figure 20). (This approach accords well with recent evidence that seasoned traders [List, 2004] do not exhibit many of the infamous ‘biases and fallacies’ that are thought to unavoidably plague the human – and by extension the managerial – mind: they *learn* to be rational.)

These three modules draw their life from the contemporary culture of the MBA classroom and MBA academia. They develop skills that are (ideally) well-understood by academics, as they are useful for the intellectually honest production of knowledge by means of analysis, experimentation and quasi-experimentation. They rely on modeling ‘engines’ – on generative semantics and grammars that are the very foundations of theorizing in social science. They use basic models in the social sciences as *engineering tools* for designing more

successful behaviors and as lenses for re-formatting and re-engineering the participant's own behavior. Indeed, the modules can be understood as exploring the ontic, epistemological, phenomenological and performative planes of the basic science based business 'knowledge' that is currently being taught in MBA classrooms (refer to Figure 17). The basic technology for mounting them is here, now: what is required for bringing the opportunity to fruition is a new self-understanding of business academia, along the lines that we have attempted to draw, and as an extension of already-existing trends in the field.

The approach to development based on the cultivation of *cognitive-behavioral modules* that are common to both researchers/academics and practitioners can be understood as a foundational building block for successful 'medical scientist training programs', and more generally for the success of professional, science-based medical training. Conventional medicine has achieved an effective monopoly over the technologies of investigating and intervening in human disease processes through the successful rapprochement between science and practice [Starr, 1982; Abbott, 1988], which has led *both* to the embodiment of a scientific ethos into practice and a practically relevant 'problem base' for medical science. In turn, this rapprochement has led to both greater practical relevance for medical science and greater scientific legitimacy for medical practice. How is this accomplished? If we map the 'deep structures' of behavior and cognition associated clinical activity (Figure 21) and examine the logic of argumentation (declarative, modal), the allowable forms of inference (deductive, inductive, abductive) and the basic logics of explanation (causal, functional, intentional), we find that the process that takes the clinician from recognition of symptoms through the articulation of a differential diagnosis and the prescription of tests aimed at discriminating among the various possibilities to the prescription of a course of action (or of a set of potential courses of action) smoothly incorporates the basic cognitive-behavioral building blocks of the 'tough-minded scientist' (an emphasis on deduction, logical closure, empirical testability, refutability and *de facto* refutation as a way of discriminating among hypotheses) and seamlessly appends to the elements from a 'designer's toolkit' (modal logic alongside declarative logic; abductive inference alongside inductive and deductive inference; intentional and functional explanations alongside causal ones). The contribution of the 'scientific mindset' is unambiguously clear and valuable. Its integration into the overall 'production function' of the medical education process (i.e. the process by which the medical-scientific complex produces physicians) is accomplished without – at any point –

having to explicitly address the problem of legitimacy, because the ‘logic of science’ is (always-already) part of the logic of practice and does not need independent justification as a guarantor of legitimate or usable knowledge.

The same kind of deep structure analysis can also be used to explain ‘why finance works’ as an educational experience in MBA programs. We note that both MBA critics [Porter and McKibbin, 1988] and critics’ critics [de Angelo, de Angelo and Zimmerman, 2004] agree that finance scholarship produces useful, transferable and actually transferred knowledge to MBA students, knowledge whose ‘market value’ is both measurable and significant. Why? Because – we argue – ‘finance training’ rests upon a self-evident set of problem statements accepted by both academics and practitioners, an unproblematic ontology – a set of objects that ‘matter’ and ‘are real’, and a self-reinforcing mechanism for belief validation and selection – one that penalizes counter-normative ways of making bets (Figure 22). Together, this ‘installed base’ of problems, objects and epistemologies make up the normative base of ‘finance theory’. Training in ‘financial engineering’ not only gives one *point prescriptions* for action, but also inculcates a *way of generating* such prescriptions, by the imprinting of a mindset that (similarly to the medical training model) seamlessly and unproblematically integrates elements of ‘science’ with elements of ‘design’. The “‘installed base of self-evident foundational knowledge and practices” allows the discipline of finance to transfer its “science” into “practice” seamlessly and to claim for itself the value associated with the inculcation of science-based skills that are already *in practice*.

This example is *not* meant to encourage other managerial disciplines to emulate finance theory via the narrowing of their axiomatic bases and a purely technical and reductionist approach to problem solving – indeed, it should be understood as explaining why other disciplines should *not* attempt it (they lack the unproblematic ontological and epistemological “‘installed base”). Rather, the example is meant to highlight the importance of developing – from the current repertoire of behavior – transferable and useful cognitive behavioral modules that will make the MBA of the future a high value decision maker. Rather, as the successful ‘scientificization’ of medicine suggests, it *is* possible to *design* the toolkit of the scientist *into* a practitioner-oriented training program – and thus to impact the very definition of the MBA and of the value the degree brings to the individual and the organization.

4. In Lieu of Conclusions: A Sally Against *Fear* and *Mimesis*.

Consider the following – highly deflationary - sketch of the MBA (Figure 23). In this sketch, the MBA program is part of a series of *selection processes* that begins during the years of elementary and secondary schooling, and includes college admissions processes, university grades and recommendations, work assignments, GMAT scores and grades in graduate school classes. The MBA herein is *nothing more* than a selection mechanism: it provides would-be employers with information about the *quality* of its graduates, in the form of easily interpretable grades and a degree from a school with a known set of selection criteria (i.e. a minimum entry standards and admissions rate). ‘What characteristic is selected for in this process?’ is not a simple question to answer for many reasons, but, because ours is a grim and simple picture, we pick two variables that are both significantly *correlated* to career success and plausibly *selected for* by the successive elimination process: general intelligence (*g*) (correlated to 0.37 with 15 year job performance) and conscientiousness (*C*) (correlated to 0.3 with 15-year-horizon job performance [Higgins, Peterson, Pihl and Lee, 2006]). These correlations seem low, but, understood as ‘compound rates of return’ on personal capital, they are highly significant.

There are good reasons to assume that the successive selection processes do indeed pick out these two characteristics: standardized testing is weighted toward selecting for working memory and speed of association (both correlated with *g* and together almost exhaustive of the variance in *g*), and grades are well correlated with conscientiousness [Higgins et al, 2006]. Whatever the value of such a filtering process to the market (a question that *can* be answered empirically), we can stipulate it as a lower bound on ‘the value of the MBA’ – one that can be achieved regardless of the ‘skill boost’ or the ‘content boost’ that the MBA provides. Some will argue that, if the ‘selection value’ of the MBA is high enough, then MBA ‘subjects’ can profitably be cut from the training process and replaced with any work that requires conscientiousness and ‘*g*’-related skills. Such an approach seems consistent with the existence of programs for ‘re-training MBA’s after business school’ [Pfeffer and Fong, 2004] that have taken shape in large consulting firms, which is used to buttress pessimistic views of the *development* value of the MBA experience itself to the students.

If various critiques of the *development* value of the MBA are correct (and the development value of the degree is nil) there is still a plausible explanation for the value that markets attach to the MBA degree, which stems from the role of the MBA as a *selection engine*. If we add to this value the gain in social capital (through informal networking and trust-building through informative, task-specific interactions) and the gain in communicative competence (the simple gain associated with teaching students the ‘code words’ and ‘buzz-words’ of business such that they look and feel knowledgeable in prototypical business situations – even if they confuse communicative adequacy with real competence), we can already build a case for why the value of the MBA will exceed its costs. Given that this value is to some degree independent of the development value of the program, our deflationary argument has produced good news: there is *room to experiment* with the pedagogical experience of the MBA, to develop new experiences and new ways of thinking about the degree, and to thus break out of the mimetic imprinting that has stultified the industry for a long time: if the development value of the program is low, we do not have much to lose., and if the non-development value of the program is high, we have room to play. Educating the thinker of the future will require business academia to make good and efficient use of this *Spielraum*.

5. References.

- Abelson, R., K. Frey. And A. Gregg, (2004), Experiments with People: Revelations from Social Psychology, New Jersey; Erlbaum.
- Abbott, A.G. (1988), The System of Professions, Chicago: University of Chicago Press.
- Anderlini, L. and L. Felli, 1994, *Underscribable States of Nature: A Theory of Incomplete Contracts: A Theory of Incomplete Contracts*, Quarterly Journal of Economics, Vol. 109: 1089-1145.
- Anderson, J.R. (1978), *Arguments Concerning Representations for Mental Imagery*, Psychological review, Vol. 85:249-277.
- Argyris, C. 1993. Knowledge for Action: A Guide to Overcoming Barriers to Organizational Change. San Francisco: Jossey-Bass.
- Astley, W G, and Zammuto, R F (1992), “Organization Science, Managers, and LanguageGames”, Organization Science, 3(4), 443-460.
- Baum, J. A. C., & Dobbin, F. (2000). *Doing Interdisciplinary Research in Strategic Management - Without a Paradigm War*. Advances in Strategic Management, 17, 389-410.

Dawes, R. M. (1998). Behavioral decision making. In D. T. Gilbert, S. T. Fiske & G. Lindzey (Eds.) *Handbook of social psychology* (4th ed., Vol. 1, pp. 497-548). Boston: McGraw-Hill.

De Angelo, H., L. De Angelo and J. Zimmerman, (2005), *What's Really Wrong with US Business Schools?*, Working paper.

Dreyfus, H.L, Dreyfus, L.E (1986), Mind over Machine: the Power of Human Intuition and Expertise in the Era of Computers, Free Press, New York.

Duhem, P., (1913 [1989]) , The Aim and Structure of Physical theory, New Jersey: Princeton University press.

Friedman, T. (2005), The World is Flat, New York: Basic Books.

Ghoshal, S. (2005), 'Bad Management Theories are Destroying Good Management Practices', *Academy of Management Learning and Education*, 4, 1 : 75-91.

Goodman, N. (1974), Fact, Fiction and Forecast, Cambridge: Harvard University Press.

Hempel, C. (1941), Philosophy of Natural Science, New York: prentice Hall.

Higgins, D., J.B. Peterson, N. Pihl and A. Lee (2006), *Prefrontal Cognitive Ability, Intelligence, Big Five Personality and the Prediction of Advanced Academic and Workplace Performance* , forthcoming, *Journal of Personality and Social Psychology*.

Homer Dixon, T. (2000), The Ingenuity Gap: How Can We Solve the Problems of the Future?, New York: Knopf.

Johnson, B., J.M. Manyika and L.A. Yee (2005), *The Next revolution in Interactions*, *McKinsey Quarterly* 2005, Issue 4: 20-34

Kreps, D. (1990), *Corporate Culture and Economic Theory*, in Alt, J. and K. Shepsle, eds., Perspectives in Positive Political Economy, New York: Cambridge University Press.

Kuhn, T. (1962), The Structure of Scientific Revolutions, Chicago: University of Chicago Press.

Lakatos, I. (1970), *Falsification and the Methodology of Scientific research programmes*, in Lakatos, I. and A. Musgrove (eds). *Criticism and the Growth of Knowledge*. Cambridge: Cambridge University Press.

Lakoff, G. and M. Johnson (1999), Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought, New York: Basic Books.

Langer, E.J. (2000), private communication.

List, J.A. (2004), *Neoclassical Theory versus Prospect Theory: Evidence from the Marketplace*, *Econometrica*, Vol. 72: 615-625.

Lyotard, Jean-Francois (1979) The Postmodern Condition. Minneapolis: University of Minnesota Press.

Mannheim, K. (1935 (1989)), Ideology and Utopia, Chicago: Northwestern University Press.

March, J.G., L. Sproull, and M. Tamuz (1991), *Learning From Samples of One or Fewer*, *Organization Science*, Vol. 2: 1-13.

McKelvey, B. (1997), *Quasi-Natural Organization Science*, *Organization Science*, Vol. 8: 352-380.

McKelvey, B. (1999), *Avoiding Complexity catastrophe in Co-Evolutionary Pockets: Strategies for Rugged Landscapes*, *Organization Science*, Vol. 10: 294-321.

- Miller, D. (1994) Critical Rationalism: A Restatement and Defence, Open Court, Chicago, 1994.
- Moldoveanu, M. C. and J. A. C. Baum, 2002. *Contemporary debates in organizational epistemology*, in J. A. C. Baum (Ed.), *The Blackwell Companion to Organizations*, Blackwell Publishing, Malden, MA, pp. 733-751.
- Moldoveanu, M. and Nohria, (2006) , Codes: The Communicative Structure of Sociality, mimeo manuscript.
- Nozick, R. (2001) Invariances: The Structure of the Objective World , Cambridge, MA: Belknap Press.
- Pfeffer, J. "Barriers to the Advance of Organizational Science: Paradigm Development as a Dependent Variable," *Academy of Management Review*, 18 (October 1993), 599-620.
- Pfeffer, J. and C. Fong, (2002), *The End of Business Schools? Less Success than Meets the Eye*, *Academy of Management Learning and Education*, Vol. 1: 78-95.
- Pfeffer, J. and Fong, C. (2004). 'The Business School "Business": Some Lessons from the US Experience', *Journal of Management Studies*, 41, 8, 1501-20.
- Popper, K. The Logic of Scientific Discovery. (translation of *Logik der Forschung*). Hutchinson, London, 1959.
- Popper, K. The Poverty of Historicism (2nd. ed). Routledge, London, 1961.
- Popper, K.R. (1973), Objective Knowledge, London: Routledge.
- Popper, K.R. (1979), Knowledge and the Body-Mind Problem, London: Routledge.
- Porter, M. (1996) "What is Strategy", *Harvard Business Review*, Nov-Dec 1996.
- Porter, L.W. and L.E. McKibbin, (1988), Management Education and Development: Drift or Thrust into the 21st Century?, New York: McGraw-Hill.
- Quine, W.v.O. (1969 (1951)), *Ontological relativity and Natural Kinds*, in Quine, W.v.O., (1969), Ontological relativity and Other Essays, New York: Columbia University Press.
- Roth, A.E. (2003), *The Economist as Engineer: Game Theory, Experimentation and Computation as Tools for Design Economics*, *Econometrica*, Vol. 70: 1341-1378.
- Saloner, G., (1991(1994)), *Game Theory and Strategic Management*, in Rumelt, R.P, D.E. Schendel and D.J. Teece, eds., Fundamental Issues in Strategy, Boston: Harvard Business School Press.
- Saul. J.R. (1992) Voltaire's Bastards: The Dictatorship of Reason in the West (1992). Macmillan.
- Simon, H., (1986(1969)), *The Science of Design: Creating the Artificial*, in Simon, H.A., The Sciences of the Artificial, MIT Press, Cambridge, Mass.
- Simon, H.A. (1990), *Invariants of Human behavior*, *Annual Review of Psychology*, Vol. 41:1-19.
- Starr, T. (1982), The Social Transformation of American Medicine, Cambridge: Harvard University Press.
- Topkis, D.M. (1998), Supermodularity and Complementarity, New Jersey: Princeton University Press.
- Van Maanen, J. (1995). *Style as theory*, *Organization Science*, 6(1), 133-143.

Figure 1. The Educational Opportunity in Post-Modern High Capitalism

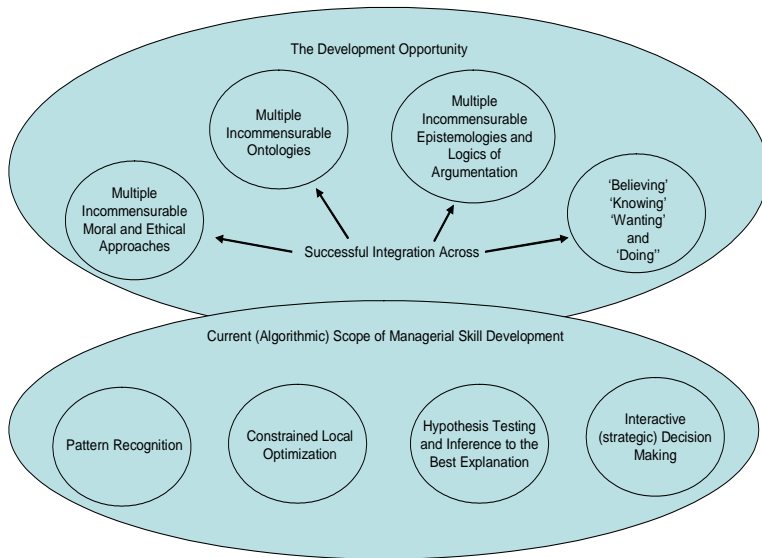


Figure 2. The Percolation and Diffusion of Legitimation Crises into Business Academia and Managerial Practice, 1990-2020 AD.

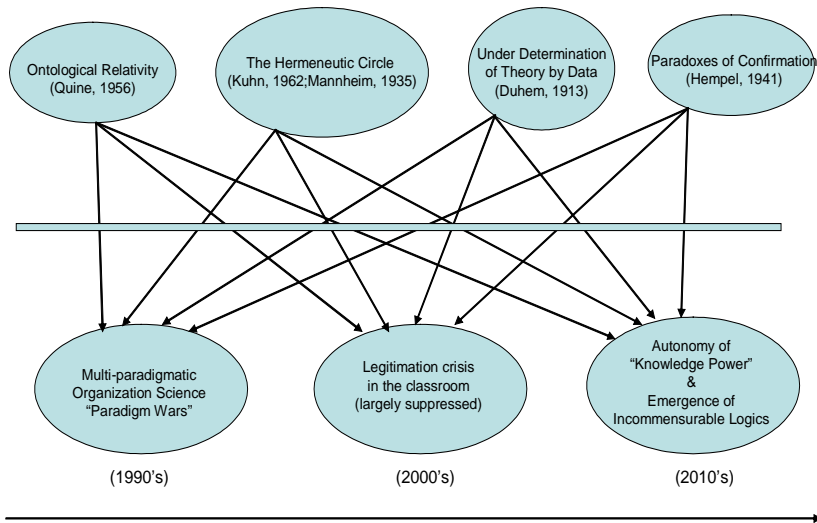


Figure 3. The Market Opportunity for the High Value Decision Maker

NEW JOBS, 1998-2004
(ADAPTED FROM (JOHNSON, MANYIKA & YEE, 2004)

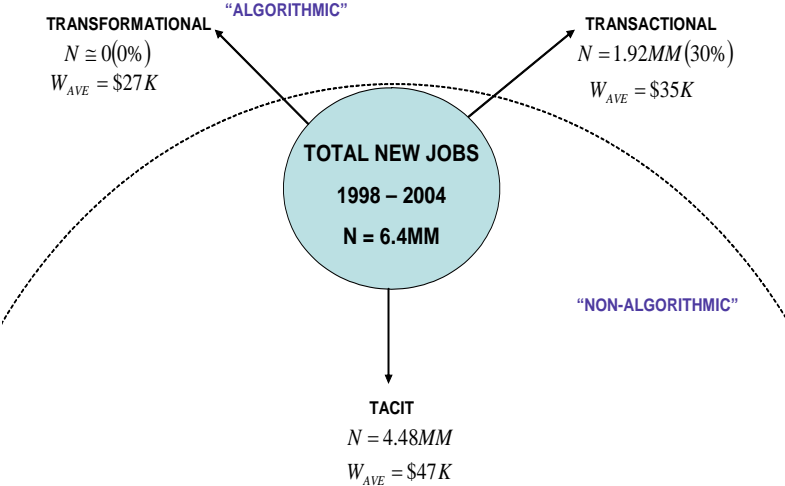


Figure 5. Requisite Expertise Map General Manager in Large Telecommunications equipment Manufacturer (eg.: Nortel Networks, Nokia, Lucent, etc.)

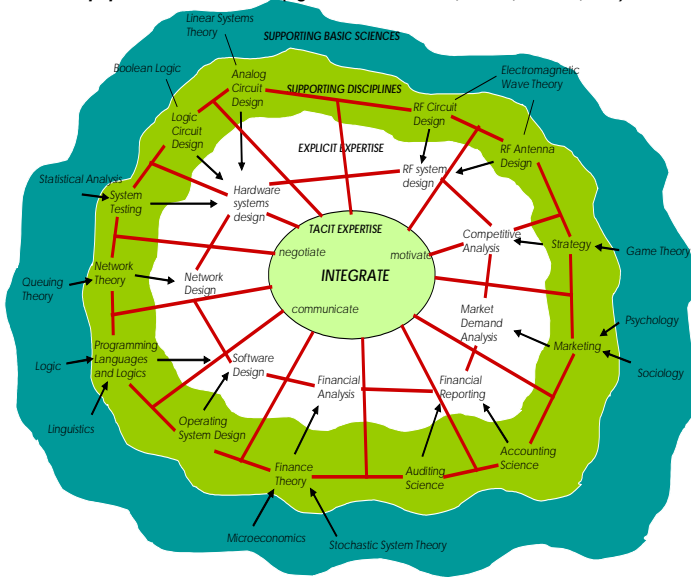


Figure 4. The Problems of the World: A Map

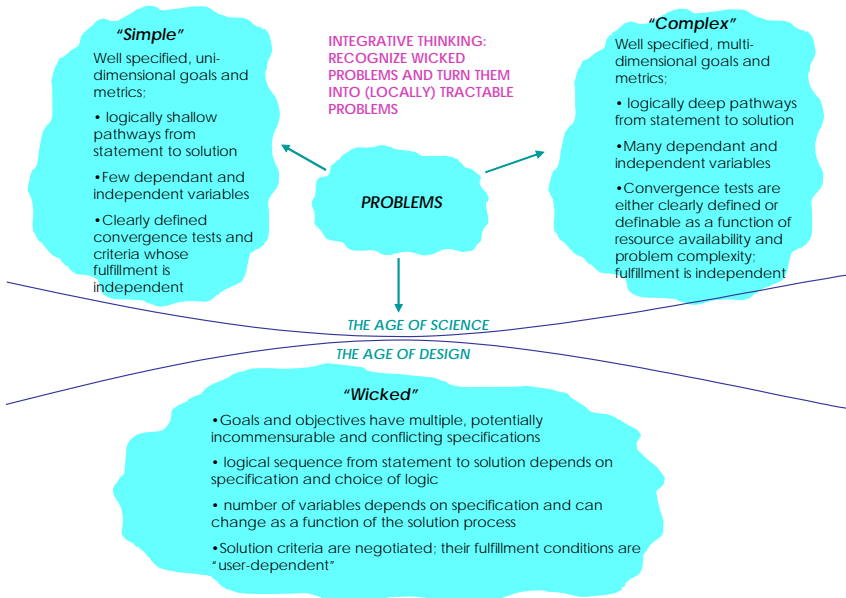


Figure 6. The Integrative Function of Management
(Adapted from Porter, HBR (1996))

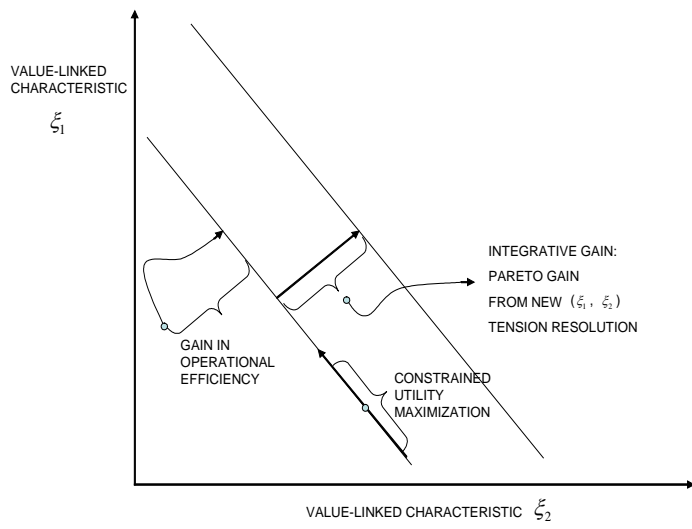


Figure 7. Isadore Sharpe, Four Seasons Hotels & Resorts

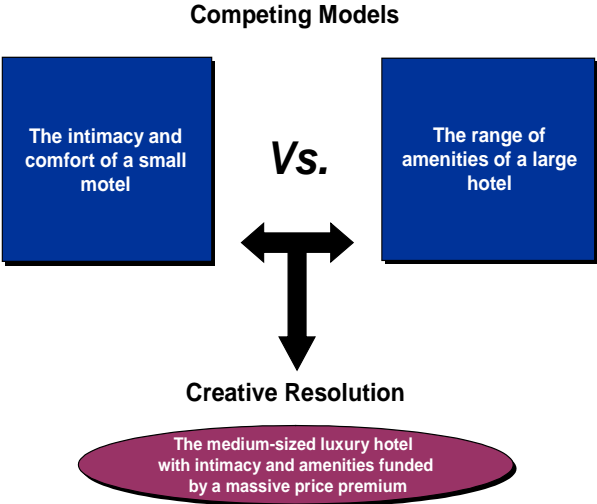


Figure 8. Herb Kelleher, Southwest Airlines

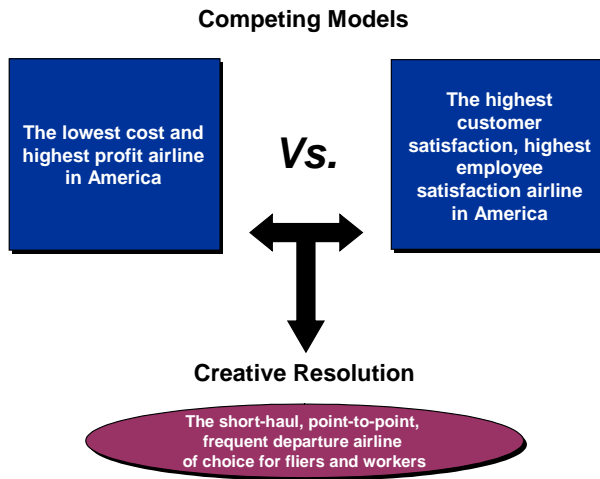


Figure 9. Jack Welch, General Electric

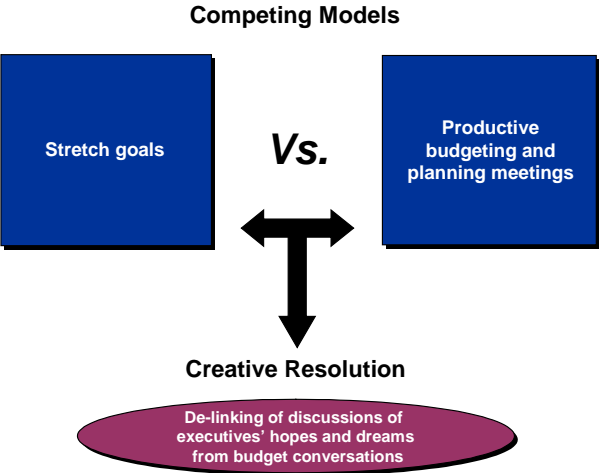


Figure 10. Richard Currie, Loblaw Companies Limited

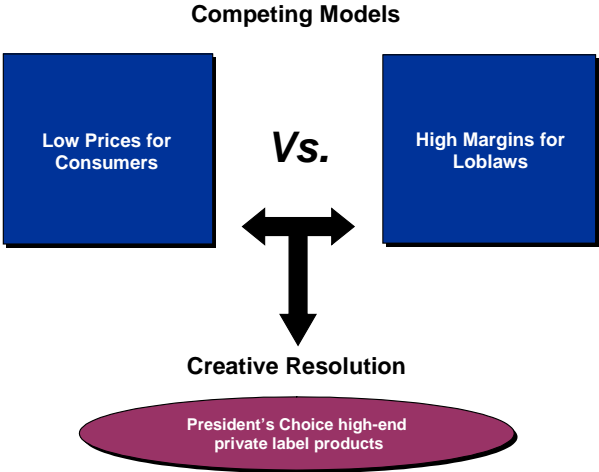


Figure 11. Moses Znaimer, City TV

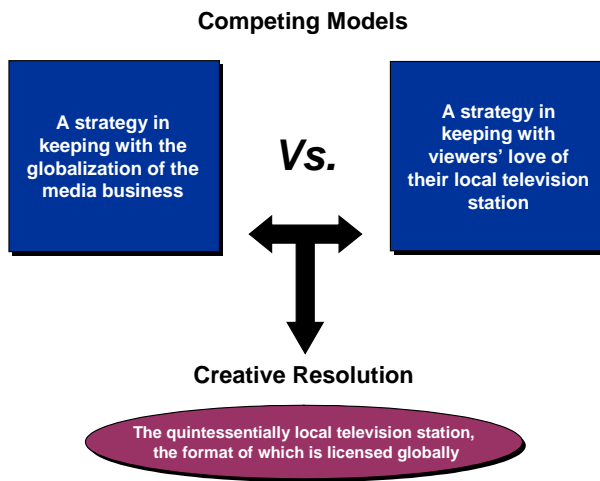
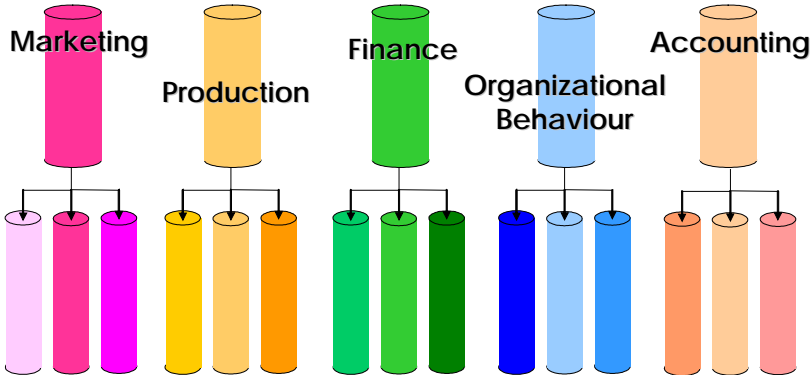
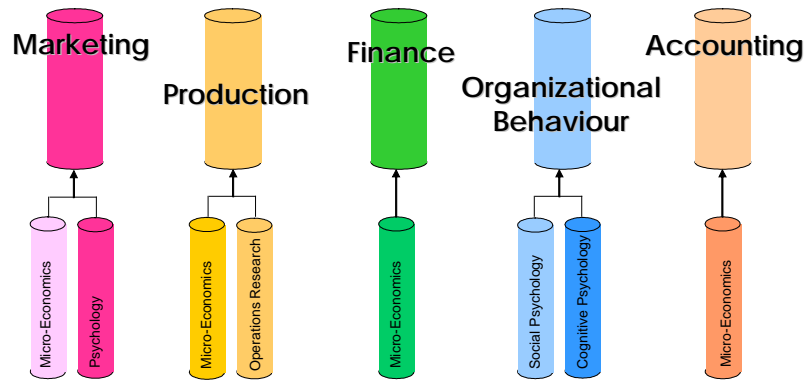


Figure 12. Business Education: Version 1.0



- Release date: Harvard Business School, 1908

Figure 13. Business Education: Version 2.0



- Release date: 1960-1970

**Figure 14: Simplification and Specialization
Around Complex Object 'Organization'**

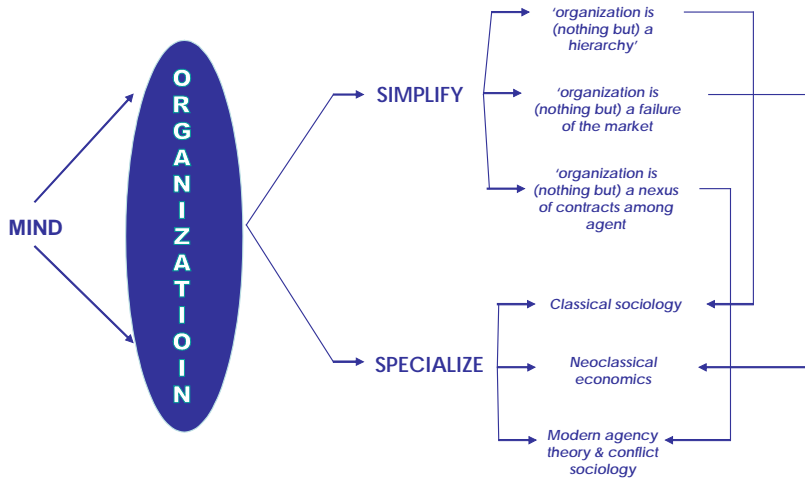


Figure 15. Simplification and Specialization Around Complex Object 'Person'

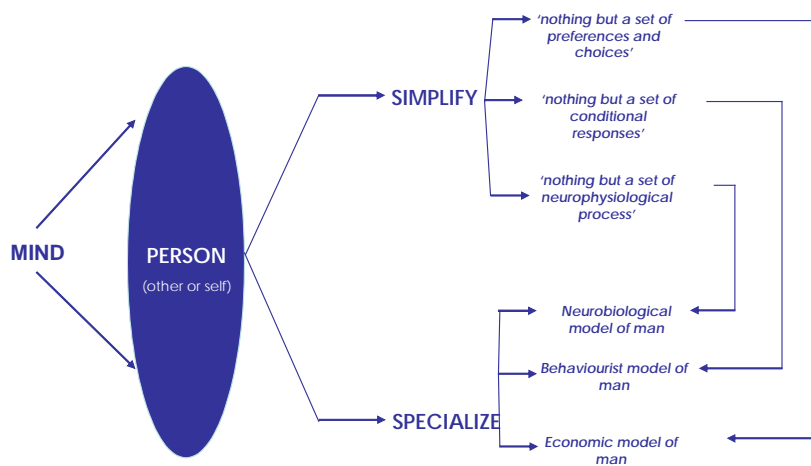


Figure 16: The Communicative Structure of the 'Idea Business'

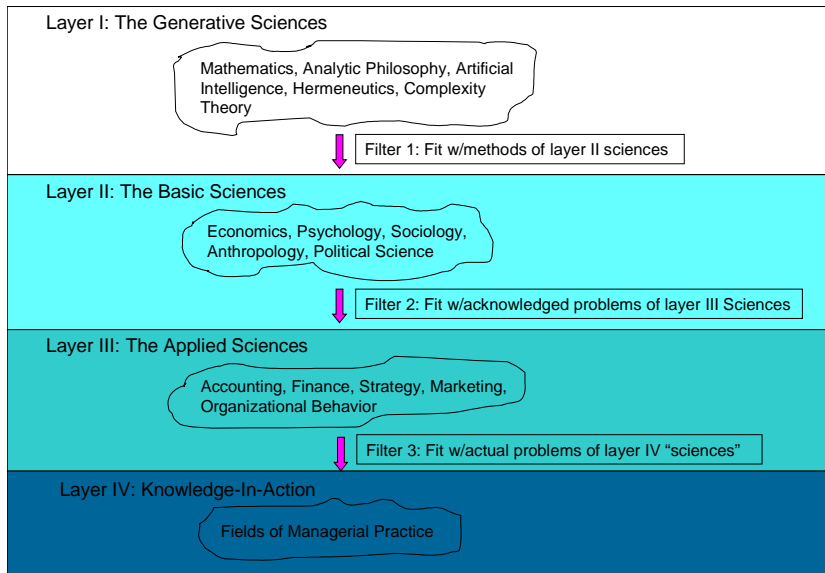


Figure 17. Basic Dimensions of Business Knowledge

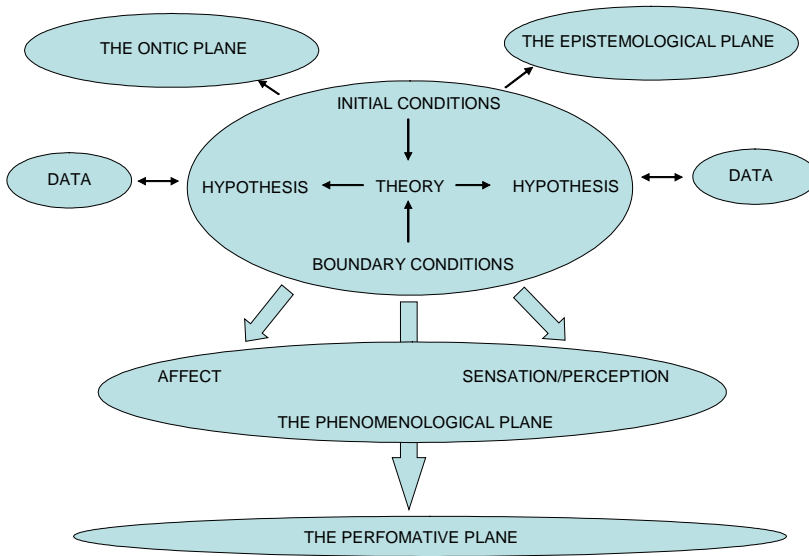


Figure 18: An Engineering Approach to Modeling Human Choice

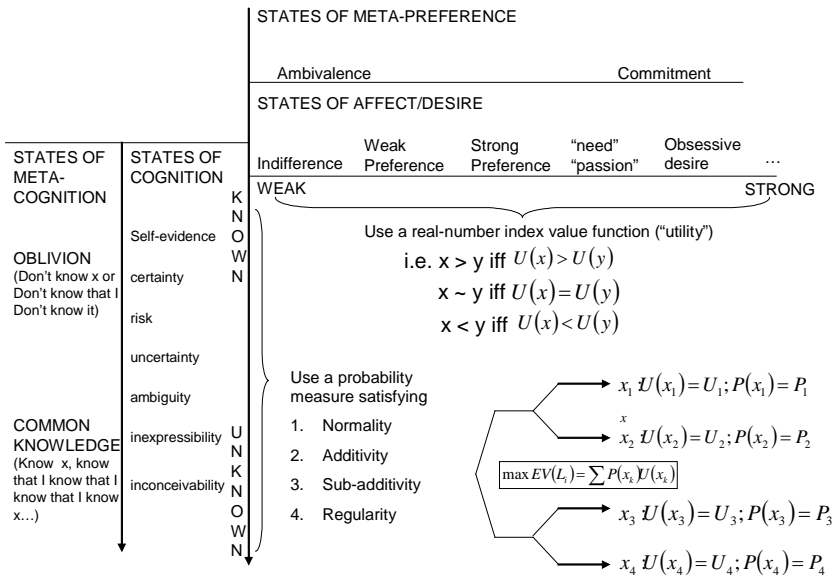
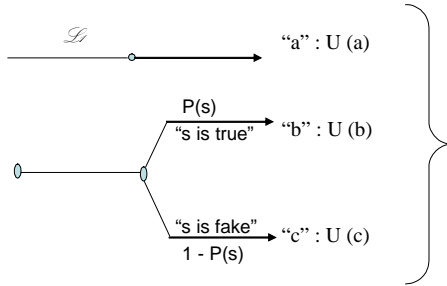


Figure 19. How to Extract Probabilities From People by Observing Their Choices

Consider choice between \mathcal{L}_1 & \mathcal{L}_2 :



At the indifference point:

$$U(a) = pU(b) + (1 - p)U(c)$$

$$= p[U(b) - U(c)] + U(c)$$

Solve for p:

$$p = \frac{U(a) - U(c)}{U(b) - U(c)}$$

In practice: $U(a) = 0$; $U(c) = -(\text{stake})$; $U(b) = \text{take}$.

So: "how probable do you think s is"? "how much would you bet to win \$x if s is true and nothing otherwise?"

Figure 20. A Money Pump: How to Extract a Positive Payoff (for sure) From Someone Whose Beliefs do not Satisfy Probability Axioms

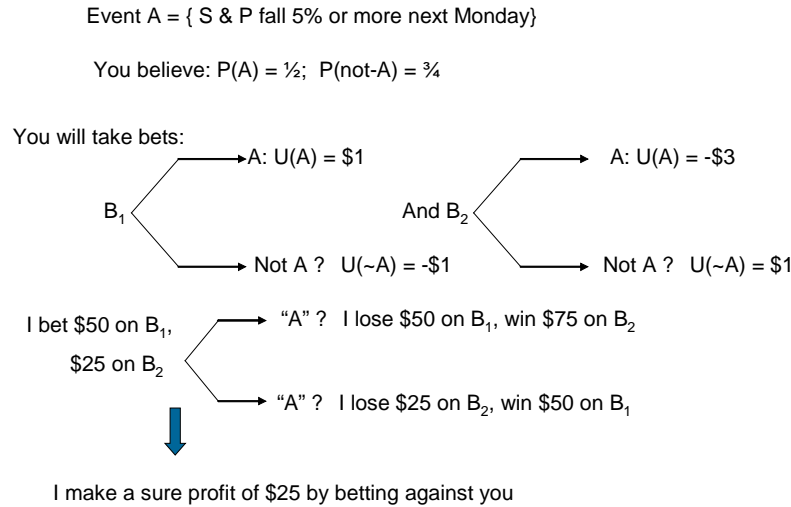
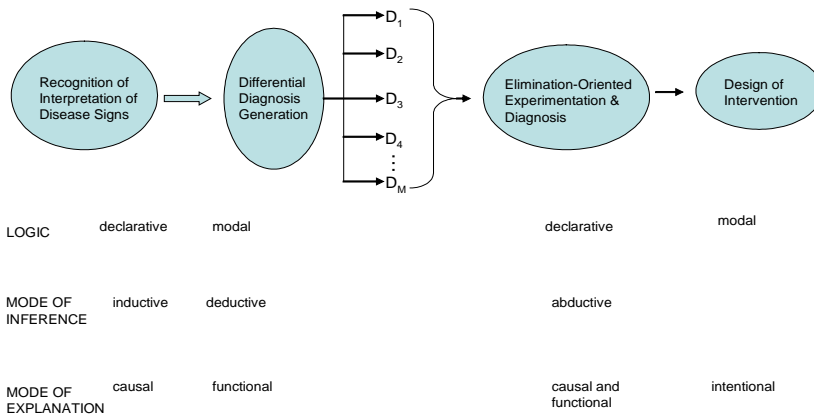


Figure 21. The Physician-Scientist Training Program: A Deep-Structure Analysis



"Basic medical science generates inputs in the form of disease models, causally plausible generations, hypothetico-deductive logic of experimentation"

Figure 22. Why Finance Training “WORKS”

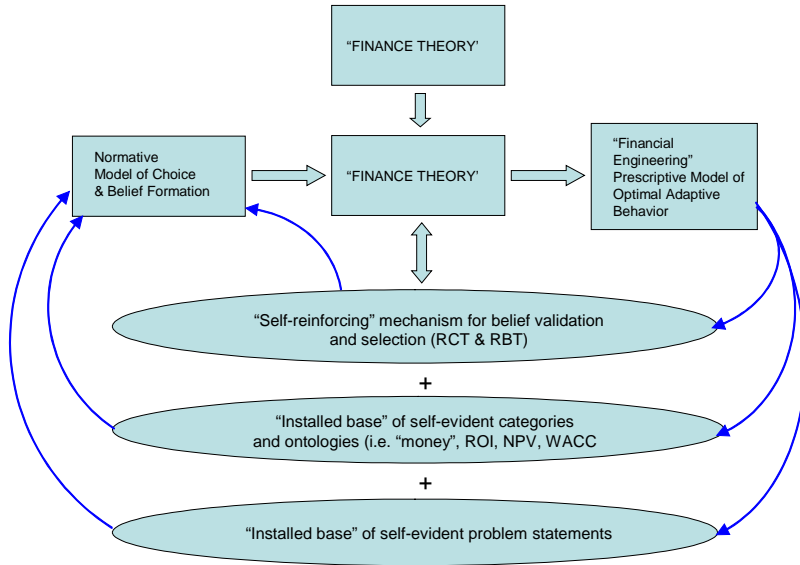


Figure 23. A Deflationary View of the MBA Industry: The Selection Engine Argument

