Integration(s): The Value of Managerial Thinking in an Age of Technical Reason

In an age where the digital machine can outperform the human mind at any task that can be represented as an algorithm, Integrative Thinking is the best revenge.

**DOES THINKING MATTER TO SUCCESS IN BUSINESS?** If so, in what ways? Consider the null hypothesis: ‘the way to success in business lies in hustle and luck – not necessarily in that order: a lucky, thoughtless doer every time.’ If this were the case, the stories we delight in training hustlers and hope for good luck, or, co-opting luck by training lots of hustlers and letting the chips fall where they may, than to training ‘thinking doers.’ Which is it?

Appeals to ‘evidence’ will not turn up easy answers. Most of empirical Psychology can tell us whether or not individuals obey certain rules assumed to be useful to the achievement of success in certain environments, although that assumption never really gets tested. And most anecdotal evidence tells us that people exhibiting certain traits have achieved certain results – without answering the obvious question that it begs: what happens to the successful individuals who do not exhibit these traits and the unsuccessful individuals who do exhibit them?

Disappointed by the hallways of empirical Science, the only alternative to despair is to build new models of the role of thinking in business – models that allow us to ask new and sharper questions which, just maybe, are answerable by empirical studies. One possible approach to building such new models is to think – about the position that thinking has in an age where the marginal cost of a calculation is $0.

It used to be the case that we would declare someone who could quickly and correctly multiply $12074 and 7993 as ‘smart’ and someone who could only multiply numbers of fewer than 4 digits each as less smart. In the age of technical computing, these differences seem hardly worth mentioning. They certainly cannot be held up as paradigms of ‘managerial intelligence.’ And the fast computation of sums is just a barely significant beginning: the digital machine will outperform the human mind at any task that can be represented with the level of precision of an algorithm – that is, at any ‘algorithmic task.’ Moreover, if the marginal cost of the basic component of an algorithmic task – the operation – is $0, then, clearly, $0 is also a floor on the value that can be appropriated by a managerial mind that behaves in purely algorithmic ways.

This seemingly innocuous argument supplies a basic logic for the pursuit of connections between thinking and value creation: we must look away from purely algorithmic capabilities. OK, but, where should we turn our gaze? ‘Away from’ something is not exactly a valuable pointer to anything. What to do? When in doubt (and when empirical Science cannot help), we can follow the philosophers and do a thought experiment along the following lines: take a computational device, because of the fact that each area is based disciplinary product team in firms such as Nokia and Alcatel-Lucent – or, by a collection of low-skill workers employing some central coordination mechanisms (as we increasingly find in design projects that are outsourced and off-shored).

Now, here is the important point: within each area of explicit expertise, tasks are more or less algorithmic in nature, and therefore those who carry them out are more or less easily replaceable by a computational device, because of the fact that each area is based on a specific discipline (see Figure 2) that supplies the equivalent of a ‘unified programming language’ (like C++ and MATLAB, only with more adjectives and adverbs then either one.) Knowledge of programming languages and environments and of operating systems, for instance, provide, jointly, a unified programming language for the execution of Software Engineering tasks. The most important feature of such a unified programming language is that it
Supplies not only a common – and, commonly agreed upon – set of concepts and rules for resolving conflict, uncertainty and ambiguity, but also a set of ‘stopping rules’ that define solution criteria for problems within each area of expertise.

Simply put, the hardware designer ‘just knows when to stop’ working on a problem, and go from design work to testing or prototyping work. How does he know this – within some reasonable tolerance? Well (see Figure 3) he knows this because his expertise (hardware design) is embedded in a supporting set of disciplines (analog and digital circuit design and testing) that are themselves embedded in a supporting set of basic sciences (linear system theory, Boolean logic, statistical analysis of experimental results) whose main task is to turn ‘real world problems’ into tractable mental objects and knowledge structures that are themselves inhabited by individuals whose main task is to turn different languages, with different sets of optimization criteria and stopping rules. Accomplishing that entails integrating across domains of knowledge and experience that were not designed to ‘talk to each other’; so, the integrator at the centre of our map (see Figure 4) plays the role of optimizer.

Such ‘really valuable thinking’ is precisely what Roger Martin and I call Integrative Thinking – that part of thinking which cannot be captured by an algorithm because it has to do precisely with the successful integration of knowledge structures, mental models and patterns of reasoning and communicating that serve as the very foundations for radically different kinds of algorithms.

For example, you could find an algorithm for optimizing your inventory, given a set of cost and demand conditions; you can also find an algorithm for optimizing your design given a set of client-driven feature requests; but you cannot find an algorithm for optimizing both together, because the two algorithms are written in different languages, with different sets of optimization criteria and stopping rules. Accomplishing that entails integrating across domains of knowledge and experience that were not designed to ‘talk to each other’; so, the integrator at the centre of our map (see Figure 4) plays the role of optimizer.

In particular, three types of Integrative Thinking stand out for the value they create:

1. **Substantive integration**: the integration of different specialized languages and mental models of the business. First, the integrator will be called upon to produce constructive resolutions of clashes among the different mental models that organize the perceptions, thoughts and actions of experts in the different functional areas (Figure 5). To the CFO or the controller, a development project will look like a series of discounted cash inflows and outflows with precise time-lines and penalties associated with risk, uncertainty, ambiguity around deliverables and time lines. To a development engineer, the same project will take on the representation of a potentially non-linear optimization problem, with constraints supplied by the target cost of goods sold and technological limits and objectives supplied by product feature sets. To the software engineer, the project will look like a large scale search problem, with the search space constrained by the syntactical properties of the programming language, the functional constraints of the operating system and the structural constraints of the hardware platform.

Thinking integratively in this case relates to thinking that bridges between these different mental models of the task in a way that needs the concerns and constraints of all of the specialized experts that are called upon for the successful execution of the design and development task, by building and legitimizing new representations of the task that are agreeable to all of those whose contribution is needed for its success. This is not merely equivalent to the task of successfully translating the buzzwords and concepts of one area of
interaction requires bridging across disciplinary divides (to make their points. For this reason, the task of integration addi-
tively involves evidence in arguments that rely on inductive and abductive logics 
deductive logic alone as ‘clinchers’ of difficult argument and valid 
Moreover, what counts as a valid problem statement and as a test of 
or more disciplines will recognize a single translation as legitimate. 
own idiosyncratic way, there is no guarantee that experts from two 

terias of what counts as a successful translation will vary from one 

2. Interactional integration: the integration of different modes of 
interacting and communicating. As if it is not difficult enough, the 
integrator’s task extends to a very different set of models, which 
require her to consider a large class of other differences that make a difference. There are differences among different ways of 
interacting that members of different areas of expertise and disci-
plines bring with them as part and parcel of their professional 
identities. Teams, groups, divisions and organizations may be 
organized according to principles of authority (who’s the boss!), 
fairness, or equity (is everyone getting his/her fair share of the pay-
ofs or opportunities?), efficiency (is everyone getting the most 
evidence’ in arguments that rely on inductive and abductive logics 
to make their points. For this reason, the task of integration addi-
tionally involves bridging across disciplinary divides (Figure 6) that 
to much more than differences in words, but, rather, cut through differences in ways of formulating problem statements and 
solving problems.

3. Agency: the integration of seeing, feeling, thinking and action. 
Last but certainly not least, the high-value-added thinker provides 
a solution to what is perhaps the ultimate integrative problem: the 
problem of agency (Figure 7). The best way to get a feel for this 
problem is to ask yourself: why – given the great proximity of the 
human intellect to commit fallacies of reasoning and perception 
vis-a-vis ‘the normative’ workings of a digital computation device – 
do we rely on human experts for problems that ‘cut really close to the 
flank’ – such as medical, legal and managerial or financial ones? Why 
do we not sub-contract that thorny problem of making the 
right diagnosis that distinguishes between a benign atrial arrhyth-
mia and a potentially fatal one to a large computational device 
that can really pertinent to all of the correlations required for a statistical-
ly-relevant finding? Why trust to the so-called mind of a physician 
who depends so much on his own sleep patterns and a large host of 
other visceral factors for making the right call? I am not excluding the possibility that this may be the way of the 
future, but, for now, it is clear that, when results really matter, 
agency – and the responsibility assignment that it entails – also real-
ly matters. The task of claiming and establishing agency is 
ultimately one that a digital device cannot perform and that the 
exclusion of no algorithm can safeguard. It is also a task that is crit-
ical to he who must stand outside of any disciplinary language, 
safeguard, or pillar in order to effectively integrate across multiple 
ways-of-being-and-knowing.

Our integrator must, then, function as an agent – as one that 
shoulders the responsibility of his or her own perceptions, feelings, 
thoughts and actions and thus foregoes an appeal to the therapeu-
tic cocoon of any one set of professional ‘codes of conduct’ (I’m 
covered!), interaction rules (I did the right thing, outcomes 
notwithstanding!), or hierarchical rank (I was told to do it!). The 
reason for this is simple enough to state: there is no single set of 
codes or rules or single hierarchical structure that the integrator 
can simply defer to – that is precisely why he is an integrator. He has 
no ‘air cover’ – to put the matter in military terms: ground work is 
where his job is at. And, to come to grips with it, he can draw inspi-
ration from no less than the intellectual forefather of all integrative 
thinkers – Aristotle – who, besides positing that the faculty of rea-
sion is the queen of human faculties in virtue of being their integrator 
(!), also cautioned about the difficulties of establishing real agency 
when he admonished that ‘to feel angry is easy, but, to feel angry at
the right person in the right moment for the right reason – that is not so easy. Yet that is precisely what the establishment of agency requires of the integrative thinker.

In closing

To sum up: there is – I posit – a particular kind of thinking that matters to success in business, but, figuring out what it is and how to do more of it requires a new conceptualization of valuable thinking in terms of its integrative functions – the functions that produce successful integration across knowledge and interactional domains and confer agency upon decision makers.

Can these forms of thinking be taught? The answer is, ‘stay tuned’, but, here is a hint: transferring thinking skills across domains of experience (for instance, getting professional logicians to think logically about their own medical problems and their diagnoses) is an endeavor that is fraught with failures, which should tell you something about trying to ‘teach thinking’ in a vacuum. However, appropriating new ways of thinking by experiential immersion in new domains of expertise is not, which opens up a vast untapped, realm of pedagogical possibilities.

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