Book Review

Healthcare @ The Speed of Thought
Using a Digital Nervous System

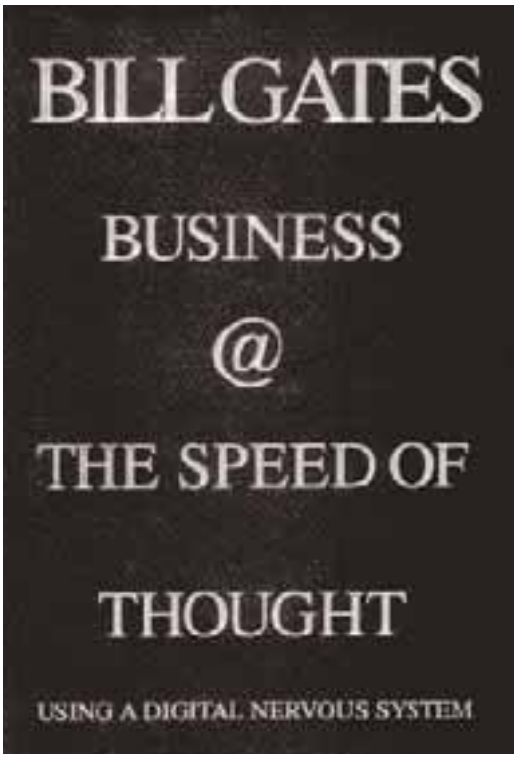
KEN TREMBLAY

Among healthcare professionals, a discussion of a nervous system is likely to elicit terms in the neurosciences. Our neural knowledge began with an understanding of cellular depolarization, the nature of the synapse (neurotransmitters and receptors) and, ultimately, the brain itself. The relative size and complexity of "nervous systems" became indicators of the relative sophistication of organisms. In Bill Gates' new book, *Business @ The Speed of Thought*, we learn that the digitally connected business world parallels our biological metaphor: that information systems and technology are as vital to the survivability of any corporation as our nervous system. While I don't intend to equate the evolutionary success of organisms with data management, I was struck with the applicability of the business premise to healthcare delivery.

Why would a review of *Business @ The Speed of Thought* interest Hospital Quarterly readers? Should we care about musings of the planet's wealthiest person, whose company has reshaped the landscape of the ubiquitous information superhighway? Should we be interested in his views of a digital world containing interactive descriptors like "automatically," "instantly" and "whenever and wherever" people need or want? Notwithstanding its "best-seller" status, could there be implications for healthcare leaders?

There have been many proponents in the discussion of whether healthcare is a business or social responsibility. And much of the debate has been along lines of responsibility and accountability. Core to the debate has been our ability (or inability) to track, measure and trend inputs and outputs: the genesis of evidence-based practice and system performance. Many have wondered what will happen when the "art of medicine" (acceptable variability within professional practice) is juxtaposed with real-time data and information. And as other service industries – from airlines and banks to our daily news – have been reinvented, shouldn't we expect a similar consequence in healthcare? As I read the commentary outlined by Gates, I began to consider the consequences of a possible variant: Healthcare @ The Speed of Thought.

Many chapters were particularly noteworthy for healthcare. They dealt with the paperless office, middlemen adding value, touching your customers, adopting a web lifestyle, knowing your numbers, increasing corporate IQ, processes that empower people, information technology enabling re-engineering and, lastly, treating IT as a



Business @ The Speed of Thought – Using a Digital Nervous System
By Bill Gates, with Collins Hemingway
Time Warner, New York 1999
ISBN: 0-446-52568-5

strategic resource. Let's take a closer look and consider the possibilities for healthcare.

Gates quotes that 20 to 30% of the annual trillion dollar cost of the U.S. healthcare system is tied up in paperwork, noting some authors suggest rates as high as 40 to 50%. We know that hospital stays generate hundreds of pieces of paper, from admission to discharge. The triad of patient, provider and data/information is the basic currency of care. Add the passage of time and the need to communicate among various providers: the logistics of ensuring that the right piece of information is with the right provider at the right time, each time, every time, the first time becomes the rationale for electronic records.

Consider the consequence of digital speed for all diagnostic information, patient scheduling, care planning and clinical pathway management. What will happen when patients become dissatisfied with the "hurry up and wait" artifacts of dysfunctional information systems (people, process and technology)? Are providers ready to deal with patients in "real time" and rise to the challenge of informed and discriminating consumers? Today's websites (Web/MD) are as current as any journal: witness direct-to-consumer advertising for brand-name pharmaceuticals. Who would have thought that the public would want to do their own e-trades on the stock market or purchase a car on the internet! Can elective surgery be next? Could or should booking a diagnostic test be as user-friendly as booking a travel itinerary? For healthcare, the paperless concept will have fundamental consequences for patient care processes – processes long overdue for overhaul.

Caught in healthcare restructuring have been senior and middle managers under the rubric of efficiency. As executive head counts plummet and organizations become flatter, middle managers and their management processes have been faced with the ultimate challenge: add value. It is no secret that measures of economic performance have targeted "overhead" resources for either reduction or redirection to customer-sensitive activities. Adding "value" versus "control" is a fundamentally new approach for many managers and organizations. But "adding value" will require information management processes, processes still in their design but inevitable in their application. Will we be able to measure the "benefit" of replacing supervisors with coaches and educators? Will consumers prefer "can do" care teams with tailored programs and transparent processes to facilities caught in an information vacuum? Absolutely!

The information age has enabled consumers to interact directly with suppliers and providers. Until recently, patients were largely considered, in a demographic sense, as "categorized" users rather than consumers, and planning processes focused on demographic change, market share and determinants of utilization (morbidity, mortality, incidence, etc.). The information age, with its websites and educational opportunities, has brought choice to many people who previously were not empowered. Will patients and families use their newfound information (and power) to shape their expectations of providers? Will the healthcare system become truly user-friendly? The power differential between professional/provider and patient/client will shift to the consumer with breakthrough speed. Thus, Bill Gates' point: know your customers because they'll know you and what you do!

I particularly enjoyed the chapters dealing with information and knowledge improving the strategic IQ (thought processes) of an organization. The challenge we face in healthcare is that much of our evaluation about quality, outcome and performance has been anecdotal. Interfacility comparisons have been next to impossible given variability in reporting. Arguments about relative performance have been mired in data sources, definitions, conversions, proxies – you know, the "stuff" that makes bureaucracies hum with activity. The information age will quickly dispense with this "heat versus light" phenomenon and focus attention and energy where it should be: accountability for performance and product quality. As relative performance among and between health professionals and providers become touchstones for client choice (and reimbursement systems?), planning processes will shift resources with fundamentally different approaches. Where will we store all those squeaky wheels? What will happen when professional/political anecdote must yield to unequivocal (evidence-based) data, or vice versa? At least this perennial debate will be well armed!

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If nothing else, information systems have made standardization (and variance analysis) commonplace. Imagine care maps, clinical pathways and practice guidelines as templates for all diagnostics, results reporting, care planning and interdisciplinary communication. The digital world sponsored CT, MRI and the digital progeny of robotics and telemedicine. Proximity of provider and client is becoming optional, albeit the antithesis of compassionate hands-on care. The human genome project is only possible because of software and information technology. The implications of this advance will unleash advances and debates unknown in the human experience. The rate-limiting elements for applications in

information technology seem to be the imagination, time and the "chip."

Gates states an obvious yet profound axiom: information technology enables re-engineering. Our redesign of the healthcare system has been thwarted by the inability to sponsor and sustain major behavioural change within professions, institutions, cultures and social policy – the number and complexity of agenda are staggering. The ability to track and trend resource use, processes and outcomes are the pillars of quality improvement and process re-engineering. Lessons learned from re-engineering include that multiple steps create process bottlenecks, opportunities for mistakes, delays and lapses in communications. The processes that patients must endure before, during and after their stay are great opportunities for IT-based improvements. Some might argue that if information technology were fully deployed in healthcare, the relative size and functionality of system components would be fundamentally altered. The question: Will IT applications create the new system or respond to it? That's like asking if the internet is a solution or an opportunity. Are computers an investment or a way of life? Bill's answer: predictably, the latter.

Another attribute of the digital nervous system: train and empower people to make a difference. As healthcare systems have shifted to program or systems-based management structures (anywhere in the community, from primary care to quaternary care), flattened their structures and function through interdisciplinary teams, the ability of individuals to make independent yet coordinated contributions to care will become the acid test of empowerment. If clients want personalized service, then it will be imperative that all members of the care team make their contribution within a framework of standards established through the team (or profession), ever mindful of client requirements. The implications for training are staggering and will not be in the traditional sense. Will we see more simulators and self-directed training in healthcare? I think the answer is obvious.

The authors have an understandable bias in their chapter reviewing IT as a strategic resource. However, the healthcare industry has been slow to pick-up this mindset. We have tended to value caregivers and their essential technologies (tools) as a primary need; secondly, facility infrastructure; and, somewhat lagging, information technology. However, what if we accept and fast-forward Gates' premise? Is it possible that caregivers supported by strategic investments in information technology might not require similar bricks and mortar expenditures? From a social and capital planning perspective, might IT investments be of greater utility in sustaining a reconfigured health system? How many community-based point-of-care computers could be had for the construction and/or renovation costs of one institution? A case in point: the story of home dialysis.

This Microsoft treatise also suggests that information technology enables businesses to shift the boundaries of their sphere of influence and service. Enter the concepts of upstream and downstream activities that provide synergy to one's core businesses. Imagine a hospital using information technology to increase the threshold of care in the community, thereby reducing the reliance on its emergency department. Imagine community agencies able to anticipate and respond to the needs of post-discharged hospital patients, facilitating earlier discharge or fewer readmissions to hospital. What would be the consequence to hospital length of stay in such an environment? What would that do to the capacity of the system? How would that affect the average acuity of patients remaining in hospital? Would healthcare reimbursement march in lockstep or undermine progress? Would public policy lead or follow? The debate about these issues should also occur at digital speed!

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Many organizations consider themselves as learning organizations, promoting a culture that constantly interacts with its environment and learns to incorporate best practices into everyday routine. This learning environment is often characterized as the epitome of total quality management or CQI. An essential precursor is a communication strategy that collects, assesses and distributes the information supporting the culture and individual behaviours. While I am not convinced that information technology, per se, is such a critical success factor, it probably helps.

It is unlikely that information technology will replace hands-on care. It is not in the interest of the healthcare system to substitute caring hands with robotic arms. And amid the concerns over confidentiality, access to information and data use, there will be the need for regulatory response. Information technology is no panacea for the ills plaguing the healthcare system. But we have come to a point in the evolution of our industry where our cottage roots must give way to technological advances at the system level.

The last 20 years of the 20th century heralded the information age. The consequences have been both sustained and logarithmic: the growth in applications will reshape healthcare as it has with other aspects of human endeavour. What is particularly interesting about this book is its matter-of-fact approach. The digital world is about a technology working its way into everyday interactions at work and home and, in many cases, blurring that divide.

But as Bill Gates and his colleagues also point out, big wins

require big risks. Risk, public investment and healthcare policy are measured ingredients for information technology recipes. This feature becomes particularly challenging for a healthcare system that has been traditionally risk averse. Public funding for volatile technology (i.e., premature obsolescence and the paradox that more powerful computers will "cost less" in the future) has been avoided with some finesse. And, in healthcare, mistakes are very high risk. It will be expensive to automate the healthcare system. But like air traffic control, banking and securities, the integrity of the system will require it, as will its users.

A feature of the book that I found provocative (in a positive sense) was that each chapter was capsulated into business lessons learned and flags to self-diagnose the digital nervous system of one's organization. Just as they spurred my reactions, I am sure they will do the same for other readers.

We didn't need *Business @ The Speed of Thought* to recognize and understand that information technology (Microsoft or otherwise) will play a substantial role in the evolution of the healthcare delivery system. Benefits of such investment clearly outweigh risks, and public expectation for quality, performance and accessibility, among other factors, will demand no less. But Gates opens a portal into the possibilities of a future, a future that so far parallels his vision. So, as PCs become TVs and vice versa, as the next generation grows up digital, as processors become more powerful and applications more pervasive, as "www.earth.com" shrinks the planet, think "Healthcare @ The Speed of Thought." For Bill Gates, anyway, "going digital" is not a reference to diagnostic imaging.

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Relevant Research

It may have been the great health-services paradox of the '90s – at the same time that demands for evidence-based medicine were growing across Canada and around the world, merging hospitals was almost universally seen as crucial to the survival of the health care system.

And yet, as a 1999 paper by three Quebec researchers makes clear, there is little concrete evidence that mergers do what they're supposed to, either by saving money or improving care.

The paper, "The Struggle to Implement Teaching Hospital Mergers," by Jean-Louis Denis, Lise Lamothe and Ann Langley, appeared in Vol. 42, No. 3 of *Canadian Public Administration*. It compares two teaching hospital mergers, each involving three large institutions.

In it, the authors conclude that despite the dominance of the "urge to merge" among teaching hospitals, it is far from clear that mergers achieve their ends. The recurrent mistake hospital administrators organizing mergers make, Professor Langley said, is underestimating the complexity of getting people to work together. Unless programs are amalgamated at one site, economies of scale and other efficiencies are unlikely to be recognized, but getting strangers to work together is tremendously hard, she said. "You're basically destroying something that worked to create something new, and it takes so much time and so much suffering and misery that when you finally calculate whether it was all worth it, you can't be sure," she said.

An abstract of the mergers paper is available on the Canadian Public Administration journal website at: http://www.ipaciapc.ca/english/publications/forthcoming.htm or in French at http://www.ipaciapc.ca/french/publications/forthcoming.htm

Relevant Research is prepared by the Canadian Health Services Research Foundation.

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