BOOK REVIEW

It's Alive: The Coming Convergence of Information, Biology and Business

Christopher Meyer and Stan Davis
Crown Business Publishing, 2003, 275 pages

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The Revolutionaries who are Our Neighbors

A colleague who teaches chemistry and physics and I were discussing his dissertation work. He told me he was creating a new compound that would bond with mercury. This compound could be used by water companies seeking to remove this dangerous heavy metal from water. He said that they did not know the specific mechanism by which this occurred because the material is opaque and thus cannot be examined through even a sophisticated electron microscope. What he did know is that he had created a brand new compound, and that the resultant compound, once bonded with mercury, was also brand new. In fact, both compounds were in the process of being patented. His work was being done at the molecular level in order to create an economically valuable substance.

Recently, I was attending a high school graduation party of a friend's 18-year old and struck up a conversation with a farmer. This farmer works about 600 acres each of corn, soybeans, and wheat in the Midwest. He has been farming for over 40 years. I asked him to talk to me about what had changed over that time. Most of his discussion dealt with genetic engineering of seeds, GPS-guided spraying equipment linked to in-cab computers which kept track of which parts of the field he had sprayed and which had not, and the economics of

futures markets and hedging funds (which he monitored from his dish network and home computer).

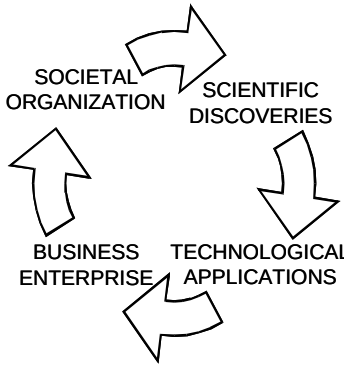
My teaching colleague and my new farming friend are living out professionally the revolution described by Meyer and Davis in their 2003 book *It's Alive: The Coming Convergence of Information, Biology and Business* (Crown Business, New York).

While the book is intriguing, we review it here in *JBIB* because of the profound implications its ideas have for the Christian men and women we are preparing to enter and/or succeed in the marketplace. Beyond its focus on technology and business arise issues related to the value-based issues that such enterprise developments may have.

Life Cycles and Economic Enterprise

Their approach to portraying the business environment of the future is to adopt an organic, life-cycle view of the development of business opportunities.

Meyer and Davis begin with the proposition that "the economy of the future derives from the science of today" (p. 7). They propose a pattern of economic development driven by scientific discoveries that lead to technological applications in production that help create business enterprises that influence the very way a society organizes itself. This is easily seen in the development of the basic science of electricity being applied to the creation of electric motors then used in automobile generators and alternators that then created the way we as a society choose to live in neighborhoods outside of towns.



Meyer and Davis contend that there have been two major

science-technology-business-organization cycles (p. 21, figure 1-6):

- The Industrial Economy based on the **sciences** of electricity and chemistry, giving rise to **technological** application in electrical equipment and steel plants, which encouraged such **businesses** as the automobile industry and high-rise construction, which then created such societal **organizing** phenomenon as large plants, application of scientific management principles, and organization hierarchies.
- The Information Economy based on the **sciences** of solid state physics and information theory, giving rise to **technological** application in computing chips, software operating systems and internet protocols, which encouraged **businesses** ranging from Microsoft and Dell to cell phones to wireless applications, which then created such societal **organizing** phenomenon as on-line communities (MySpace, blogs), identity theft concerns, and instant credit transactions through GPS-facilitated information systems.

Meyer and Davis argue that we are already now moving into a new revolution: the Molecular Economy. They cite the often exotic **sciences** related to biology, nanoscale exploration, and materials science (in which my friend and chemistry colleague is involved). They note the increased **technological** application of such sciences in arenas such as genomics and materials development that "have already changed how we reproduce, how we heal, how we develop our foods and medicines and fibers" (p. 23). They note that such applications have already greatly affected **businesses** in pharmaceuticals, agriculture, and materials. It is yet to be determined all the ways such businesses may shape the way we organize ourselves as a society, according to the authors.

The authors then voice the idea that we are between two

economic waves: the still developing information economy and the newly emerging molecular economy:

> Anyone trying to run a business — or live a life, for that matter — over the next ten years will be dealing with two major forces: first, an environment in which change has doubled its pace and volatility has increased, creating the imperative to adapt. And second, the beginning of a new economic life cycle, in which the make-up of our GDP, which has in the past migrated from agriculture to manufactured goods, from goods to services, from goods and services to information, shifts again, this time to value created by molecular technologies. (p. 23)

The remainder of the book seeks to establish a framework for understanding, first, the economic enterprise as an evolutionary phenomenon. The authors write, "We are finding that evolution is, in fact, a concept that describes many different kinds of systems and how they adapt to their environments" (p. 27). Second, the book establishes a framework for understanding the characteristics of adaptive businesses that will succeed in that evolutionary atmosphere. The authors share, "Looking at what these 'early adopters' have done to accelerate their own responses to change points us to measures that any company can take to make its processes, products, organization, and strategy more adaptive" (p. 95).

Learning from Evolution

Meyer and Davis identify a variety of concepts from the literature on evolution that can be instructive when applied to economic enterprise:[1]

CONCEPT	DISTINCTIVES[2]	IMPLICATIONS
ADAPTATION	Organisms change both their structure and behavior in response to environmental challenges.	Successful economic enterprise depends on the ability to both read and respond to the changes in the environment.
FITNESS	Successful organisms are those whose adaptations allow them competitive advantages in obtaining resources and propagating themselves.	Successful economic enterprise depends on the ability to detect and propagate the most promising adaptations that will grow the capacity of a business to attract capital, customers, and capable personnel, and allow the business to achieve productive fits in its market and industry.
AGENTS	Agents are the basic decision making units of an organism. These may occur at the cellular, organ, or body level.	Successful economic enterprise depends on the ability to identify and empower decision agents to observe, understand, decide, and act more accurately and quickly and with greater power.
SELF-ORGANIZATION	Successful organisms have the ability to change the pattern of the organization to create more complex systems.	Successful economic enterprise depends on the ability to adapt to complex market and industry developments by creating systems (e.g., marketing, transportation, and manufacturing) that allow more intelligent responses to these developments.
RECOMBINATION	Successful organisms, through cross-fertilization, gain greater environmental fitness by combining beneficial genetic changes into new life forms.	Successful economic enterprise recognizes the power of recombination as the most efficient engine of innovation (the Wright brothers combined the elements of an airfoil, a bicycle wheel, and an internal combustion engine to create a new form of transportation).
EMERGENCE	Successful organisms are the ultimate result of the failure of many adaptive efforts and the emergence, perhaps only temporary, of selectively successful organisms. And, success is only temporary, as organisms with greater fitness emerge, replacing older forms.	Successful economic enterprise is a process of trial and error and working through multiple versions of products, pricing strategies, promotion efforts, and placement activities. Therefore, success is incremental and emergent, encountering failures as a natural result of entrepreneurial effort.
CONNECTIONS	Successful organisms develop fitness not just through creation of individual components – just as important is the elaboration of connections within the organism though sensing, processing, and responding systems.	Successful economic enterprise is a process of connecting the various parts of a business to allow for greater and timelier information flows among decision agents. Successful businesses have always been active seekers of information capabilities.

The Adaptive Enterprise

Meyer and Davis state that "[their] purpose is to build a framework for management focused not on engineering and efficiency but on evolution and adaptability." They go on to argue that "our current models of management treasure stability and control, not the kind of change, diverse thinking, and experimentation that we associate with adpativeness" (p. 97).

They discuss six characteristics or mindsets of the adaptive organization:

- *Self-Organize*. Manage your organization from the bottom up. Influence the rules that affect individual choices rather than the overall behavior of the organization.
- *Recombine.* Proliferating connections make recombination — of software code, product attributes, people, and markets — easier. Turn your business into an open system to capture the value and innovation of diversity.
- *Sense and Respond*. Networks make real-time information cheap. Sensors help us filter and act on new information and even abundant forecasting altogether. Equip your business to sense changes and to respond immediately, accurately, and appropriately.
- *Learn and Adapt*. After getting feedback on what happened when you "sensed and responded," learn from the experience and incorporate the new information into your repertoire of responses.
- *Seed, Select and Amplify*. Test many diverse options, and reinforce the winners. Experiment, don't plan.
- *Destabilize*. The rate of environmental change demands internal instability for survival. Disrupt the static elements in your organization.

It is with these ideas that I want to build a table that elaborates on the meaning of each and then suggest some "uneasy" implications from a Christian perspective:

CONCEPT	AMPLIFICATION[3]	CHRISTIAN IMPLICATION
SELF-ORGANIZE	Allow maximum freedom for each individual to make decisions flexibly and adaptively, to be innovative, and to explore new ways of addressing issues.	To what degree do Christian higher education (CHE) institutions encourage independence rather than dependence? To what degree do Christian faculty model flexibility, innovation, and exploration before students in their professional and personal lives?
RECOMBINE	Seek to increase the diversity of thought within an organization by aggressively seeking the ideas of others and freely sharing information.	To what degree does CHE encourage diversity of any sort — given the rather homogenous nature of students, faculty, and staff at Christian colleges? What active steps are being taken to move all members of the community into new and uncomfortable environments?
SENSE AND RESPOND	Seeking more and freer feedback channels into and across the organization, taking advantage of information collection, processing, and response capabilities.	To what degree are CHE institutions run in collegiate versus command models that encourage maximum awareness and fast response to new environmental contingencies?
LEARN AND ADAPT	Creating opportunities for interaction among organizational personnel and outside through workshops, degree programs, and sabbaticals; encourage continuous improvement projects.	To what degree do CHE institutions encourage students to create learning communities where they can learn from each other? To what degree do such institutions create multiple, non-threatening forums for freely sharing ideas and concerns?
SEED, SELECT AND AMPLIFY	Encourage more tests, more early failures, and faster analysis of the basis for success and failure to encourage learning rather than blame placing.	To what degree do faculty at CHE institutions encourage students to experiment with new projects, self-directed teams? To what degree do faculty at CHE schools assess program and classroom level performance to help determine what really works educationally, and what does not?
DESTABILIZE	Create an environment where change is common, where the company can thrive in an atmosphere of constructive chaos, seeking to live close to the market "edge" of innovation and service.	To what degree do CHE institutions prepare students to thrive in a volatile and continually threatening economic environment? To what degree do CHE faculty and staff exhibit a readiness to embrace change, uncertainty, and risk in order to provide students the best education possible?

How Then Will We Respond?

This book is both exciting and worrisome. Meyer and Davis discuss these conflicting possibilities:

> What might actually improve … our sense of well-being is the availability of almost limitless computing power to make more of human learning available to more individuals. … This utopian vision – in which the accelerating progress of molecular technologies and understanding of adaptive systems leads us to a world in which we find ourselves more healthy, wealthy, and wise – is, of course, appealing but not certain or even likely. The capabilities described above may be created, but progress always has its downside. The Industrial Revolution spawned the hellish factories of Charles Dickens' London. The Information Revolution seems to be creating a more polarized, politicized, unequal, and vulnerable world. The key social downside of the industrial economy continues to be the condition of the environment, while that of the information era appears to be privacy. In the coming economy, the key issues will be ethical. These questions will range from the current debate on cloning to the rights we accord artificial entities once they appear to be conscious and feeling.

I am excited about the possibilities that Christians will have to be part of the conversation about these new ethical issues – and worried that we might be too woefully unaware of the issues, or too afraid of them, to be part of the conversation.

I recommend this book to everyone who is willing to expose themselves to uncomfortable and provocative ideas.

Endnotes

[1]The author of this review is not an evolutionist. I am a committed creationist. This being said, I can recognize the power of evolutionary concepts as analogies that can provide enterprise-related insights.

[2]Many of the distinctives and implications in this table are NOT drawn directly from the Meyer book — they are my ideas, but do closely reflect the basic meaning of the text material as I understand it. Consider this a form of intellectual evolution and literary adaptation!

[3]As with the earlier table, the amplifications are not simply "lifted" from the text. The Christian implications are, of course, my own ideas.