Dr. Canton Interviewed by People Soft
for SUNY Human Resources Textbook

Bizarre but Likely: Radical Changes

In the past, people made things in a manufacturing-centric economy. Now people service things and other people in today's knowledge-centric economy.[i] As the dynamics of the Knowledge Age point toward increasing emphasis on human capital, we face the likelihood of technologically enhanced humans and biologically enhanced robotics— perhaps not in the coming decade, but likely before we're prepared. Unfortunately, people can only see technology as far out as they can touch it.

The ongoing challenge for HR will be balancing the use of technologies with the variability inherent in the human element.[ii] As lines become blurred, HR must also distinguish between the two.

In *Technofutures: How Leading-Edge Technology Will Transform Business in the 21st Century*, Dr. James Canton combines research and little-known facts of the technologically feasible with imaginative exploration of future realities. Founder of the Institute of Global Futures[iii], Dr. Canton describes in his book what he calls the four Power Tools that together will drive future change: computers, networks, biotech and nanotech.[iv]

Computers.[v] Computers of the future will become intelligent agents that make decisions and deliver information to workers on demand. Reduced in size, systems will be far more powerful, intuitive and interactive. Dr. Canton even sees the computer as becoming a close model of the human brain.

Computers already dwarf the efficiencies of human-run processes. Onboard computers manage aircraft flights and recommend action in threatening conditions. Computerized data mining and analytic functions suggest online purchases and help make business decisions. The list goes on. Reliance on computers to manage and improve upon functions customarily performed by humans will increase as computers provide valued extensions of human faculties and boost organizational productivity.

The computer-in-a-shoe and a mouse that reads emotions already exist. By 2015, some scientists predict that microchips will be embedded not only in appliances, but in clothes and human hearts and brains. It's possible that in many instances computers will think with and for people. The highly functional computers of the future—robots—will be able

to see, hear, smell, taste, touch and talk. Computers are beginning to embody the dream of artificial intelligence.[vi]

Software is critical in and of itself. "Software may be the digital cognitive glue that makes this emerging intelligent infrastructure of commerce work. It means now that what I can do as a human, I can do so much more with the right software tied to the right infrastructure that's tied to the right on-demand global supply chain for products or services."[vii]

Cognitive software can help maximize the capabilities and productivity of a workforce increasingly limited in numbers.[viii] "The next generation of cognitive software will help us make decisions faster, make connections faster, and build networks and supply chains. The task will be to enable companies to build tools so human beings can multiply their capability set. That change will occur by 2020."[ix] Transformations in cognitive software will bring an additional HR challenge: integrating the technology in a way that empowers, instead of threatens, workers.

Networks. [x] Earlier we mentioned the upcoming interchangeability of telephony, video, e-mail and fax. The convergence of the Internet, digital TV and various wireless communication devices will incorporate communication technologies into a network of networks that will transform the way the world does business.

This vibrant network system is already in the making. Every 90 days, the size of the Internet doubles, and by 2005, more than a billion people will have online access. Wide ranges of consumers on the Internet will provide expanded opportunities for e-business. The highly efficient virtual supply chains of e-business will connect the manufacturing supply chain right to the customer or end user. As early as 2005, e-business might be generating in excess of $2 trillion in revenues across the globe.[xi]

Human capital strategists must balance the corporation's struggle to compete in e-business with the basic human need for rest, coupled with computers' tireless capability of working non-stop.[xii]

Biotech. [xiii] The revolutionary manipulation of DNA to redefine human life, health and science, biotech uses the microchip to advance gene research. The biotechnology industry creates biochips, which resemble the integrated circuits of a PC but incorporate portions of DNA. Biochips placed in analytical instrumentation sharply reduce the time and costs involved in biochemical experimentation.

As scientists increase their understanding of the human genome, affordable analytic tools based on biochips will help physicians predict, diagnose and custom-treat illnesses. The computer world will boost translation of human genetics to make people healthier and increase life expectancy. We will see smart drugs, implants and innovative medical devices and bio-engineered food as better medical care become commonplace.[xiv]

The HR practitioner must be prepared for the possibilities of an artificially enhanced workforce. "Cognitive science and HR have not become friends, and part of the reason they haven't become friends is that we have not invested in this science and know very little about it," stated Dr. Canton in an interview. "Some people may be enhanced in the future by having actual devices at the nano scale embedded in their brains to give them advanced capabilities they need for their jobs." Such capabilities might include total recall memory or the ability to download and learn several spoken languages in an afternoon. However, given advanced future research surrounding cognitive science and the human brain, "we may be able to create new kinds of learning, human capital enhancement tools and education to help people acquire the same types of capabilities without having to have invasive or synthetic augmentation."[xv]

Nanotech. [xvi] The fourth of Dr. Canton's Power Tools, nanotechnology refers to extremely minute, atomic-level engineering. To grasp this radical, hardly imaginable phenomenon, consider Star Trek, where the mechanical race called Borg powers and controls drones.

Industry leaders such as IBM, Lucent and Sun, in company with scientists from well-respected institutions—MIT, Cal Tech and NASA, for example—apply extensive resources toward nanotechnology. Their efforts to develop equipment one-thousandth of the diameter of a human hair might one day result in injecting machines into the bloodstream for such purposes as attacking cancer cells. These infinitesimal machines could also rearrange atoms to create food, energy, steel and water.[xvii]

Is this science fiction? After all, it was only a little more than one hundred years ago when Henry Ford first introduced his horseless carriage to the world in 1896. In light of technology's quantum leaps in the last 40 years, the ideas outlined from Dr. Canton's work—as well as numerous others' predictions—could easily become day-to-day reality. [xviii] Our focus on the next decade of HR points to awareness and preparedness, while at the same time we continue to deal effectively with concrete issues we face in the present.

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[i] Baruch Lev, "Intangibles: Management, Measurement, and Reporting," The Brookings Institution, June 30, 2001.

[ii] Bob Stambaugh, "Hard Systems, Soft Systems: New Challenges for Twenty-first Century HR Systems, Stakeholders, and Vendors," *Heads Count: An Anthology for the Competitive Enterprise*, PeopleSoft, Inc., Pleasanton, CA, 2003; page 108.

[iii] The Institute for Global Futures Web site is located at www.futureguru.com

[iv] James Canton, Ph.D., *Technofutures: How Leading-Edge Technology Will Transform Business in the 21st Century*, Hay House, Inc., Carlsbad, CA, 1999; pages 9-13. The Power Tools discussion also incorporates elements from Henson's article "2020: A Look at HR Technology in the Next 20 Years."

[v] The material in this section is taken from Henson, "2020: A Look at HR Technology in the Next 20 Years," as well as Row Henson's book review, "Technofutures: How Leading-Edge Technology Will Transform Business in the 21st Century, by James Canton, Ph.D.," In Review, *IHRIM Link*, April/May 2000; pages 62-63. Canton covers this topic on page 11 of *Technofutures*.

[vi] Ibid.

[vii] Canton as interviewed by Henson.

[viii] Ibid.

ix Ibid.

x Henson addresses this material in "2020: A Look at HR Technology in the Next 20 Years" and the book review "Technofutures: How Leading-Edge Technology Will Transform Business in the 21st Century, by James Canton, Ph.D." Canton covers this topic on pages 11-12 of *Technofutures*.

xi Ibid.

xii Henson also addresses this in "Human Resources in 2020: Managing the Bionic Workforce."

xiii Henson addresses this material in "2020: A Look at HR Technology in the Next 20 Years" and the book review "Technofutures: How Leading-Edge Technology Will Transform Business in the 21st Century, by James Canton, Ph.D." Canton covers this topic on page 12 of *Technofutures*.

xiv Ibid.

xv Canton as interviewed by Henson.

xvi Henson addresses this material in "2020: A Look at HR Technology in the Next 20 Years" and the book review "Technofutures: How Leading-Edge Technology Will Transform Business in the 21st Century, by James Canton, Ph.D." Canton covers this topic on page 13 of *Technofutures*.

xvii Ibid.

xviii Recommended additional reading on the technology of the future: Joseph H. Boyett and Jimmie T. Boyett (contributor), *Beyond Workplace 2000: Essential Strategies for the New Corporation*, Plume, 1996.