Engineering Management: What's New in the Literature?

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THE US PRESIDENT'S Office of Science and Technology Policy has recently released a policy memorandum on increasing public access to the results of federally funded scientific research. Federal agencies with over $100 million in annual research and development expenditures are required to develop a plan for increasing public access to both printed and digital scientific publications. A number of mandatory key elements are included in the memorandum. The document is available at: http://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf

3-D PRINTING is a technology in which a three-dimensional solid object of any shape is created from a digital model. Compared to traditional machining techniques which generally cut and drill, removing materials (subtractive); 3-D printing is an additive process, where successive layers of raw material are brought together to form an object. Applications are believed to be substantial. Jeroen P.J. DeJong and Erik DeBruljn discuss many aspects of the technology and its benefits and how it fits into the trend of open-source innovation with collaborative online communities. ["Innovation Lessons From 3-D Printing." MIT Sloan Management Review. 54(2):43-52. Winter, 2013. www.sloanreview.mit.edu].

SOME BELIEVE that innovation and new technology development might be slowing. This is discussed in "Has the Ideas Machine Broken Down?" [The Economist. Volume 406: Number: 8818. pp. 21-24. January 12-18, 2013 www.economist.com] and also in another article in the same issue [pg. 11] "The Great Innovation Debate". The articles examine innovation historically, its environment, and accomplishments, presenting arguments on both sides. The article concludes with the interesting suggestion that "institutions have become too rigid to accommodate truly revolutionary changes."

TIMOTHY MACK, President of the World Future Society, discusses how we may need to modify our methods of forecasting to include change while not discarding the wisdom of the past in an article in The Futurist ["Foresight as Dialogue" 47(2):46-50. March-April, 2013. www.wfs.org]. He discusses a number of forecasting "Rules of the Road" that provide a path between inclusiveness and adaptation; and discretion and convention.Ramez Naam discusses how the world's most critical challenges could be met by encouraging innovation in another article in the same issue of The Futurist ["How Innovation Could Save the Planet". pp. 24-31] Interesting graphs are provided on food production, oil production, and the plummeting cost of solar energy. The author introduces his article discussing the "best of times" and the "worst of times", and then discusses ideas as a resource expander, resource preserver and waste reducer; ideas that will stretch the limit; challenges ahead for innovation; and finally directions toward a wealthier, and cleaner future. An inset reviews the authors' recent book A Better World Is Just a Series of Innovations Away.

THE COVER STORY of the January 2013 issue of Scientific American [308(1), www.scientificamerican.com] is titled "The Future in 50, 100, and 150 years." A series of articles by futuristic thinkers provide realistic visions of scientific and technological milestones that are envisioned for the world. The Economist published its inset "Technology Quarterly" in the 1 December 2012 issue [Volume 405, Number 8813, www.economist.com]. This 24-page inset provides snapshots of emerging and forecasted technological developments. Discussions focus on computer 3-D printing, medical add-ons for smartphones (Star Trek's "tricorder"), detecting oil spills in the arctic, indoor personal navigation technology, eye tracking, a profile of the drone father, Abe Karem, and many other brief articles of interest.

THE SPOTLIGHT FOCUS in the January-February issue of Harvard Business Review[91(1-2):57-64, www.hbr.org] discusses "The Future of Knowledge Work." Three articles: "Redesigning Knowledge Work" (pp. 58-64), "The Third Wave of Virtual Work" (pp. 66-73), and "Making Star Teams out of Star Players" (pp.74-78) focus on the management, future and motivation of knowledge workers. In today's world real success is dependent on effective management of both professional and technical employees. Christine Porath and Christine Pearson discuss the high cost of rudeness at work in a second article in the same issue of Harvard Business Review ["The Price of Incivility." 91(1-2):114-121]. The authors discuss the rise and types of rudeness on the job. Based on 14 years of interviews with more than 14,000 people in the United States and Canada, they have tracked the prevalence, types, causes, costs, and cures of incivility at work. They go on to provide strategies to counter rudeness.

IMPORTANT LESSONS learned with regard to archiving of data emerge from two reports in the December 2012 issue of IEEE Spectrum [49(12), www.spectrum.ieee.org]. The cover story "Finding the Source of the Pioneer Anomaly" [pp. 38-54] describes the challenges associated with finding, reconstituting old (40-year) data stored on obsolete recording media, and then analyzing the information to solve an important scientific question of why the two pioneer spacecraft launched in 1972 slowed unexpectedly. The second article "Forever Flash" [pp. 11-12] describes a new technology that will allow flash memory to last longer by healing itself. Technology used in USB devices wears out after being recorded and erased about 10,000 times. The lessons learned from these reports are stated eloquently at the end of the Pioneer Satellite article "Every experiment needs a clear plan in place to ensure that a record of the original observations is still available and readable even decades into the future" [pg. 62].

MORE THAN fifty short articles — categorized under the headings of business and economics, energy, environment and resources, food and agriculture, habitats, health and medicine, information society, science and technology, and world affairs — provide valuable insights important to personal and career success in the annual Outlook feature published byThe World Future Society. Authoritative forecasts designed to provoke thought and inspire action for building a better future today [The Futurist, 46(6): magazine insert, November-December 2012.www.wfs.org]. ■