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Introductory Article

Today’s definition of technology could merely be ‘a form of intellectual property’ (IP). Half of a company’s value could be its IP (Fisher III & Oberholzer-Gee, 2013). Pavitt identifies R&D as a source of technology (Pavitt, 1990). Products in the market are representative of the technology innovation achieved by a company, hence we can say that in the context of a business enterprise technology and technology innovation are synonymous. In searching for a more basic definition of technology, we can define it as the earliest resort by the human species to make tools (“Tools from the Stone Age,” 1996).

Scientists who study the evolution of the human brain make a distinction between it and that of lesser species in the context of tool making ability (Gibson, 2002). We could develop this vein of thought further to its logical conclusion and say that technology is a byproduct of the effort by a species as it exercises its quest for survival and propagation. This definition would be true if we replace the word ‘species’ with ‘corporation’ since corporations are employed in a continuous cycle of R&D work to invent new technology or extend the applications of current technology to fashion new products for the marketplace. We could extend our thought experiment and pose the question, ‘is all technology good?’ The answer to this is a definite ‘no’. Even technology that is birthed as a good eventually comes to be seen as bad due to insufficient study and research. The ‘Green Revolution’ is a good example (Basu & Scholten, 2012). Increased use of pesticide and fertilizer along with large quantities of water have been proven over the long run to be an unsustainable practice. Similarly nuclear power, once heralded as the answer to the energy crisis now stands exposed as an unsafe technology (Totty, 2008). We could also pose the overarching query of ‘can the over-propagation of a species be a good thing for the ecosystem?’ (Hartmann & Barajas-Román, 2009).

Bibliography


RECOGNITIONS/ AWARDS

Siham Lekchiri, a student in the HRDIT specialization won the Top 2015 White Paper at the ATMAE Annual Conference held in Pittsburgh, PA. Her paper was entitled “The Impact of Technology on Workforce Development”. White Papers identify, support and clarify central questions regarding “Meeting the Challenges of Future Workforce Demands”. The white papers address key challenges that academia and industry face regarding 21st century workforce development. These valued documents serve to inform and engage ATMAE member and industry, and are published on ATMAE’s website.

SUMMER 2015 GRADUATES

Matthew P. Carter  
Specialization: Manufacturing Systems  
Home Campus: ECU

Armen Ilikchyan  
Specialization: Quality Systems  
Home Campus: BGSU

Joseph Rudy Ottway  
Specialization: Manufacturing Systems  
Home Campus: ISU

Petulia Blake-Scontrino  
Specialization: HRD & IT  
Home Campus: ISU

FALL 2015 GRADUATES

Michael Carper  
Specialization: Digital Communication  
Home Campus: ISU

Michael Odigie  
Specialization: Quality Systems  
Home Campus: ISU

Angel Estrada  
Specialization: Quality Systems  
Home Campus: BGSU

Marcia Combs  
Specialization: Digital Communication  
Home Campus: ISU

Arezou Harraf  
Specialization: HRD & IT  
Home Campus: ISU

Jeffrey Guinot  
Specialization: Quality Systems  
Home Campus: BGSU
Construction Management

The Architects Role in Managing the Risk of Construction Worker Safety

The architect plays a prominent role in determining the materials needed to construct a project. The construction worker safety is directly related to the technologies necessary for constructing the design prepared by the architect. In light of this impact on construction worker safety, regulations and codes are being enacted around the world to formally establish the architect’s role in construction worker safety.

The adoption of green design and construction technologies are increasing and presenting additional risks for the architect and contractor. Risk management during the construction phase of a project has been demonstrated to be invaluable to the contractor (Ahmed & Azhar, 2004). The underlying concept in establishing and defining the roles and responsibilities is largely supported by the obligation of providing a safe work place. The owner and architect are responsible for providing a safe work place in the design and the contractor is responsible for providing a safe construction work place.

Gambatese (1998) addresses the master builder and how it has been fragmented to create an industry of specialists from designers to subcontractors each responsible for providing a safe work place for their employees. Gambatese explains that on the advice of legal counsel and their insurance carriers, architects’ are limiting their actions to address construction worker safety. This is contradicted by developments in the legal system expanding the responsibility to provide a safe work environment to include designers in construction site safety. Is not addressing construction worker safety resulting from their designs the best advice for the architect?

References


Digital Communication

Digital Forensics has grown from an obscure concept to a vitally important part of most enterprise, government and private investigations. Yet despite the acceptance of the field into the mainstream forensics community, the tools and techniques of the digital forensics community continually scramble to keep pace with the change (Ayers, 2009). The advances in drive size with a corresponding drop in price have created a vast increase in the average size of forensic images (Marziale, Richard & Roussev, 2007).

With the explosion of social media driving social media users to well over 1 billion people and the massive growth in cloud technologies it is reasonable to expect dataset sizes to increase even more rapidly. The digital forensics examiner is struggling to keep up in terms of processing time. A Distributed Processing Array (DPA) is one of the current solutions to this increasing problem.

Forensic processing of a 1TB drive with normal usage patterns can take over 100 hours to complete in a typical environment. Now consider that if 5 machines are used instead of one that time can be reduced to 8 hours in many cases. This is approximately a 12 to 1 gain and is significantly better than the 5 to 1 gain that one would expect. Much of the gain is due to more efficient use of hard drive I/O and the removal of bottlenecks in critical processing functions. As a result, the advantages of this better than linear gain with distributed processing have made it an implementation goal for many digital forensics labs across the country. Cloud based implementations have also begun to emerge making this an exciting area to watch in the Digital Communications arena.

References


Human Resource Development & Industrial Training

Technology & The Workforce

The fast paced business world comes to impact organizations and how they operate. In fact, the essential workforce dynamics of an aging generation of Baby Boomers, continuous technological advancements, the effect of worldwide competition have changed the way practitioners go by training and developing their workforce in order to prepare them to become high end performers. Being able to take a proactive approach differentiates between successful and non-successful businesses. Technology is one major element of the 21st century changes; it is clear that the fast technological advancements have shifted the workplace and modified the way we operate and learn. Accordingly, organizations are not only presented with competition challenges, but also with ensuring they remain up-to-date when it comes to advanced technology to ensure their continued growth and success (Johnston & Packer, 1987). Therefore, organizations, and employees must constantly update their skills and knowledge in order to stay valuable and successful. In that regard, a wide variety of skills and competencies are required of the workforce; nonetheless, there are no right skills and competencies to acquire in order to address the emerging needs of modern technology, but this is solely based on the nature of the job and the industry. Based on a thorough review of the literature, a list of select generic competencies and skills that are deliberated important are recommended in this article; Washington (2011) called these skills and competencies the 21st century skills, and which help the workforce be placed at the center of learning. These include Adaptability/ Flexibility, Motivation/ Self-Direction, Teamwork, and Problem Solving. This is only a short selection of some of the important skills expected of the future workforce, which makes the employees more prone to learning new knowledge and skills to address the rising needs affecting their performance, ensuring their continuous success in a rapidly changing business environment.

References


Manufacturing systems

A Disruptive Technology in Manufacturing

In early November, fast-food workers around the country went on strike in an effort to get a raise (Davidson, 2015). It is a highly political issue for sure. One side stands behind the workers; while the other predicts the unintended economic consequence that the raise in wages would provide the justification to eliminate jobs through automation. A start-up, who describes themselves as “the stereotypical group of San Francisco foodies and engineers with decades of robotics experience”, has produced such a job-eliminating device. The founder stated in an on-line newsletter, “our device isn’t meant to make employees more efficient, it is meant to completely obviate.” (Dorrier, 2014) Whether or not the start-up is successful at displacing fast food workers remains to be seen. The company expects their device to require up-skilling of the employees, which would drive a higher wage, but less people. Indeed, the remaining human contact with the system will need to be more than attendants, they will have to view themselves as “first-level supervision” for the process and assume an active role to ensure the machine operates at full efficiency. One company, Snyder-Lance, located in Charlotte, NC, recently undertook a major bakery automation project. While the management team knew that operations improvement was possible, they were convinced that they would not fully achieve results without changes to the “work system around the equipment.” The change began with kaizen events to engage employees, work standards development, and autonomous maintenance events designed to foster bottom-up change (Higgins, 2014).

The automation work reminds us of a key principle in socio-technical systems: the organizational structure of the human-side has a direct impact on the productivity of the new technology system.

References


Quality System Specialization

ASQ Certification Offerings

The American Society for Quality (ASQ) offers seventeen (17) certifications (including Certifications in Quality Engineering, Auditing, Management, Technician, Inspection and Improvement; Software Quality Engineering; Reliability Engineering; four (4) levels of Six Sigma certifications; and three (3) certifications associated with FDA-regulated organizations (Biomedical and Hazard Analysis and Critical Control Point [HACCP] auditors, and Pharmaceutical Professional); plus a Lean certification in partnership with several other professional societies. Certification is not a license; it is a demonstration of proficiency via validation of skills by an independent and competent third-party (ASQ, 2015).

Exam administration is provided throughout the world (although the majority are offered in the United States, most by local ASQ sections), with each exam being administered at least three (3) times per year: either in March plus October, or June plus December, and in May at the annual ASQ World Conference on Quality and Improvement (in May 2016, World Conference shall be conducted at ASQ’s home city of Milwaukee, Wisconsin. See http://asq.org/wcqi/ for information). Pre-requisite information regarding experience and education necessary for each exam can be found at http://asq.org/cert/index, and many ASQ local sections offer refresher courses and provide information regarding necessary submissions for the pertinent exams. Local ASQ sections can be found at http://asq.org/sections/find.html.

Reference

**Bowling Green State University**

BGSU has implemented a new Oracle PeopleSoft Human Capital Management (HCM) app for its supervisors and managers; the application developer Dave Weimer notes that the app “allow(s) faculty to see time and labor functions and timesheets (Kraft, 2015, p. 2).” The app allows supervisors and managers to track and approve their employees’ working and vacation hours as well as delegate tasks within the tool. For the employees, the app allows them to request paid time off and other leaves of absence. While Oracle discontinuing its technical support of the previous version of the application was the major driver for implementing this new app at BGSU, the new time tracking functionality is an added benefit for the supervisors and managers. Early trials with the BGSU staff have shown favorable opinions about the new app in regards to the added functionality, navigation and ease of use. BGSU sent out communications about the new app and offered several classes for supervisors and managers who were interested in learning more about the HCM app.

**Reference**

**East Carolina University**

Textbooks and real life experience are completely different learning techniques for students. Seeing the impact of air and speed on objects is one aspect engineering students get to experience as part of their aerodynamics principles courses at ECU. The College of Engineering and Technology at ECU has a wind tunnel, with speed reaching up to 150 mph, the 15-feet long and 6-feet high tube-shaped apparatus has a small compartment to test concepts like drag, lift and momentum caused by air flowing over objects. The wind tunnel is has given the students the possibility to understand concepts that are very difficult to explain in theory only; therefore, the students are given a first hand learning opportunity of how air flow occurs over wings, vehicles and different shapes. According to Baity and Turner (2015), “about 75 to 100 engineering and technology systems students use the wind tunnel each semester, using sensors and controls to conduct experiments. Real-time data is captured, monitored, displayed and interfaced with ECU’s computer network for students to access in future experiments”. The products tested in the tunnel are designed and made by the students using 3D printers and prototypes machines. The students enthusiasm and excitement about this experiential learning opportunity is very clear, giving them a hands-on tool to demonstrate the concepts and see the forces and reactions involved in fluid environment.

**Reference**

**Indiana State University**

One of the many benefits of the PhD Consortium is the sharing and interacting, which occurs across campuses. One such event recently happened with an ISU professor and one of his advisees.

On November 9 and 10, Dr. Tad Foster (ISU HRD professor and PhD Consortium campus coordinator), visited Ashland University in Ashland, Ohio to provide training on concept mapping – a topic Foster and colleagues are researching with grant funds from the National Science Foundation.

Foster was able to deliver 70 minute training sessions to two of Rebecca Schmeller’s Management classes in Ashland University’s Dauch College of Business. Students were enthusiastic and positive about the training, providing the following comments:
“I had never used VUE (Visual Understanding Enterprise, tufts.vue.edu) before. I am glad I have learned these concept mapping skills – I anticipate using the process in future MBA classes and projects.”

“Our instructor is requiring that we include a concept map in our next case study – so we were very motivated to learn the software.”

“Dr. Foster was funny and energetic – it was nice to have a guest lecturer and to learn how to use VUE to make concept maps.”

“I was a psychology major as an undergraduate, so I find this topic of cognitive mapping to be fascinating and practical. I am eager to apply it to my MBA classes.”

North Carolina A&T State University

Members As part of the growing importance of research and development, the faculty and students at NCA&T are constantly looking for ways to advance the technology and education. In that regard, North Carolina A & Teach STEM Scholars Program was awarded a grant of $ 1.19 million by the NSF (National Science Foundation). This grant intends to produce and support qualified K-12 science, technology, engineering and mathematics educators (STEM) who can effectively deliver inquiry-based instruction that is concurrently culturally relevant to students in high-need schools.

The funding for this project will be divided into a 5 year timeline, with Dr. Anthony Graham is the principal investigator (PI), and Drs. Tyrette Carter, Erekia Williams, Sayo Fakayode and Cailisha Petty are the co-PIs. This project is a collaboration between NC A&T State University, Guilford County Schools, Guilford Education Alliance and the Elimu Learning Center for Refugee Newcomers will recruit high-achieving undergraduate STEM majors at NC A&T and train them to simultaneously earn their bachelors’ degree is a STEM field and receive initial teacher certification in North Carolina. This presents an opportunity for the STEM graduates in finding employment as secondary STEM teachers in schools with an increasing need.

This grant given to NC A&Teach is to accomplish several objectives including the recruitment of graduates, engaging STEM scholars in curriculum development, prepare them to bring in about a positive impact on K-12 education through mentoring, field experiences, clinical practices, apprenticeship and internships.

Reference

University of Central Missouri

Being able to put theory into practice is one thing UCM Construction Management students have done this year. A group of construction management students were involved in an experiential learning project; this later involved serving the community by joining the Warrensburg Parks and Recreation Department in revitalizing the Lions Lake, which is a recreational area and community landmark. The students selected to be part of the project worked under the supervision of faculty members Aaron Sauer and Curtis Bradford; they completed the design of and participated in the construction of two footbridges on the 4,900-foot trail. Before the construction process started, the group of students worked on developing a construction budget for the bridges, a work schedule, work packages and investigated value-engineering options. The students’ work and preparation led to a decrease in the potential costs of the project.

Once the designs approved, the students partnered with crews from Warrensburg Parks and Recreation, Warrensburg Public Works and volunteers from Whiteman Air Force Base on the last installation of the bridges on site, and the students were in charge of installing the bridge foundations.

This project was an opportunity for students to gain hands-on experience in all facets of construction including working with experts in the field. This kind of opportunities only advances the students’ knowledge and learning in their majors.

Reference
Dr. Sinn was born and raised in the state of Indiana, receiving BS and MS degrees in the early 1970's from Indiana State University in Terre Haute. He taught in central Indiana for four years and went to West Virginia University (WVU) in 1976, completing his doctorate under Dr. Paul DeVore in 1979. His dissertation studied the relationship of technology and general education, primarily at the BS degree level for preparation of technologists, and this work has continued throughout his career.

Graduating from WVU in 1979, Sinn was assistant and associate professor at the University of North Dakota, teaching Industrial Technology for five years. Dr. Sinn has been at Bowling Green State University (BGSU) since 1984 where he was founding Professor of Applied Quality Science and founding Executive Director of the Center for Quality Measurement and Automation (CQMA). CQMA, attracted nearly 2.5 million dollars as a funded research project in its 8+ years of existence at BGSU. Sinn was named a professor at BGSU in the early 90’s.

His scholarly work has been in the fields of quality systems, technology as general education, change, and the preparation of technologists as leaders, authoring or co-authoring over 80 published papers in various journals since 1980. Approximately one half of these have been refereed papers, many a result of collaborative work with graduate students at the masters and doctoral level.

Dr. Sinn has a broad background and accomplishments in multiple disciplines and activities, both in academe and elsewhere. As well as being the founding Associate Dean for the College of Technology at BGSU from 1984-91, he has served as a consultant to numerous industrial, business and governmental organizations. Dr. Sinn was also Acting Dean for the College of Technology in the early 1990’s.

Dr. Sinn was Chair of the Department of Engineering Technology (DET) in the College of Technology at BGSU from 2010 until 2015. The DET offers degrees at the undergraduate and graduate levels in multiple areas of Engineering Technology through a faculty and staff of nearly 20 persons. One of the newest majors in the DET was launched in 2010 as a online completion BS degree in Quality Systems, which now has well over 100 students studying all around the world, many in the military. The Ph.D. online degree program DET participates in, is a consortium with Indiana State University, and Dr. Sinn was lead faculty in Quality Systems since its inception through his recent retirement chairing the dissertation research for 14 doctoral graduates of the program.

Dr. Sinn resides in Bowling Green, Ohio, with his wife of nearly 41 years, Jean. They have two adult children, Angie who resides in Bowling Green and Ethan, who resides in Longmont, CO, both with their families. John and Jean are the proud grandparents of four grandchildren. Dr. Sinn retired from BGSU in July 2015 as a professor emeritus.
Dr. Arezou Harraf is an Assistant Professor of Management and Head of Department of Business Studies at Box Hill College a satellite campus of Box Hill Institute of Melbourne, Australia. She holds a Master of Science in Organizational Leadership from Quinnipiac University, and a PhD in Technology Management with the emphasis on Industry and Human Resource Development from Indiana State University. In addition to Arezou’s academic duties, she is the Director of student entrepreneurship activities at Box Hill College. Arezou endeavors to further her research in the field of human resource development, and is a member of Academy of Human Resource Development, Academy of Management, and the Society for Human Resource Management.
GENERAL INFORMATION

The consortium program is offered in cooperation with Bowling Green State University, East Carolina University, Indiana State University, North Carolina A&T State University, and the University of Central Missouri. The doctoral program meets the needs of today’s technical professionals. An academically rigorous program of study, the Doctor of Philosophy Program in Technology Management offers research and scholarship experiences and in-depth study in a specialization selected from the areas of:

- Construction Management
- Digital Communication System
- Human Resource Development and Industrial Training
- Manufacturing Systems
- Quality Systems

For Additional information about the PhD in Technology Management, visit our website at http://technology.indstate.edu/consortphd/
You may also contact Dr. Shahhosseini:
Phone: (812) 237-3368.
Email: mehran.shahhosseini@indstate.edu

The Newsletter Staff

Editor: Dr. A. Mehran Shahhosseini
Co-editor/Writer: Siham Lekchiri, PhD Fellow
Writer: Gordon Vincent, PhD Student
Writer: Todd Koonts, PhD Student
Writer: William Vipperman, PhD Student
Writer: Grant Short, PhD Student

Profiles

Dr. A. Mehran Shahhosseini is the Director of the PhD Program Consortium.
Siham Lekchiri was admitted to the PhD program in Fall 2010. She specializes in Human Resource Development & Industrial Training.
Gordon Vincent was admitted to the PhD program in Fall 2014. He specializes in Construction Management.
Todd Koonts was admitted to the PhD program in Spring 2014. He specializes in Digital Communication.
William Vipperman was admitted to the PhD program in Spring 2013. He specializes in Manufacturing Systems.
Grant Short was admitted to the PhD program in Summer 2013. He specializes in Quality Systems.
Angela Huenerfauth, was admitted to the PhD program in Fall 2013. She specializes in Human Resource Development & Industrial Training.
Rebecca Schmeller, was admitted to the PhD program in Fall 2013. She specializes in Human Resource Development & Industrial Training.