Approximately 100 IT professionals participated in the 2014 IT Pro Conference on Information Systems Governance, held at the National Institute of Standards and Technology (NIST) on 22 May 2014 (www.computer.org/itproconf). Information systems governance focuses on properly managing IT resources to achieve organizational goals. The conference was designed to bring together IT professionals from industry, government, and academia to discuss new challenges in information systems and share ways of overcoming such challenges.

Sponsored by IEEE, NIST, and Noblis, the conference featured three keynotes and 12 presentations, focusing on the following key questions:

- How can we get the most value from IT while still delivering successful projects and reliable information systems and infrastructure?
- How can we secure critical systems while keeping pace with advances in technology?
- What changes are on the horizon for technology and business leaders?

In reviewing these questions, presenters addressed governance and key related issues, with keynotes challenging listeners to consider the future of information systems and networks.

**Understanding Networked Systems**

Ram Sriram of NIST gave the first keynote, entitled “Smart Networked Systems and Societies: What Will the Future Look Like?” Addressing the Internet of Things paradigm, Sriram discussed how, in the near future, there will be more devices than people on the planet. Furthermore, most people will never be away from net-connected sensors because sensors will be embedded into our bodies. Consequently, IT professionals will be faced with even greater challenges in system implementation and assurance.

George Hurlburt, from STEM-Corp, presented “Towards a Dynamic Design Architecture,” arguing that the Department of Defense Architecture Framework (DoDAF) is no longer adequate for today’s systems, and an improved design architecture approach must be used. Embedded software today is so complex that it must be treated as a network. The new approach makes it possible to isolate any element and reason about it mathematically.

**Developing and Testing Web-Based Apps**

Stephen Quirolgico, from NIST, presented “App Vetting Systems: Issues and Challenges,” discussing lessons learned from a NIST project in the DARPA Transformative Apps program. Static analysis tools can be applied to mobile apps, but no single tool is adequate, so a variety must be used. Despite automated code analysis, human reviewers must understand programming to determine if vulnerability reports are correct or false alarms.

Ariful Huq, from the Dubai campus of BITS Pilani, United Arab Emirates, described “A Comprehensive Mobile Application Development and Testing Lifecycle.” Conventional software development life-cycle processes don’t map directly to the needs of mobile app development. For example, it must be possible to check if a design works on a large number of possible platforms, including many varieties of mobile phones or tablets, and apps must look native to the device to ensure user acceptance.

Shailendra Kishore, from Progress Software Development, presented “WaFeR: Model-Driven Test-Framework for Testing Web UI-Based Applications,” a new test framework that allows properties and actions to be extracted and used to populate a template. Assertions for landing on a page and after-action assertions are also included. The tool includes a generic framework with a product-specific library.
William Kelly, of Metonymy Corp., presented “inVideo—A Novel Big Data Analytics Tool for Video Data Analytics,” which addressed the hard problems in obtaining useful information from large sets of video data. Kelly described applications for US Navy video data as well as educational software that indexes transcripts of video and audio by time, enhanced by pattern recognition for features such as identifying faces or particular objects.

Reviewing some of the history and great pioneers of computer science, George Strawn, of Networking and IT Research and Development (NITRD), presented “Masterminds of IT.” He argued that developers of information technology nowadays have two jobs—to address complexity and then hide it from the user.

Addressing Governance Issues
Jeffery Voas, from NIST, presented the lunch keynote on “A Transformative Internet?” He pointed out that scaling problems make it impossible to truly deal with an “Internet of Everything,” because scalability fuels complexity and heterogeneity exacerbates interoperability problems. Traditional reliability testing provides little help because of scale limitations, but approaches such as combinatorial methods offer hope for addressing the increase in complexity.

Art Friedman, from the National Security Agency (NSA), and Vincent Hu, of NIST, discussed “Attribute Based Access Control and Attribute Assurance.” The Gartner Group estimates that by 2020, approximately 70 percent of industry might be using some form of attribute-based access control (ABAC). ABAC involves the use of access-control rules that use attributes such as age, citizenship, or location, giving it a flexibility needed for large distributed systems. Friedman and Hu discussed the problems with ensuring that attributes are accurate and trustworthy.

Don O’Neill, of Don O’Neill Consulting, discussed the results of a survey of professionals in “Software 2015: Situation Dire.” Survey respondents believed the current state of practice is seriously deficient, especially in that many aspects of cybersecurity aren’t well understood. Concurrently, dependence on software is growing exponentially, as processors and sensors multiply and must be interconnected. O’Neill outlined a program for addressing the problem.

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Addressing Governance Issues
The closing keynote, “System and Software Assurance—Rationalizing Governance, Engineering Practice, and Engineering Economics,” was presented by Paul Croll, Executive Vice Chair of the IEEE Technical Council on Software Engineering. He noted that compliance with Federal Information Security Management Act (FISMA) and other security guidelines can be very expensive, and that IT governance needs to be applied to systems and software assurance throughout the engineering life cycle to verify that agreed best practices are really being used as expected.

Erran Carmel, of American University, discussed “Governance in Enterprise Crowdsourcing.” Businesses are increasingly turning to “crowdsourcing,” in which tasks are contracted out to large numbers of independent contractors, often individuals. Governance questions for this environment include how to make projects flexible for specialized, measurable tasks appropriate for crowdsourcing.

Seth Earley, from Earley and Associates, discussed the information systems ecosystem and essentials for information systems governance in “Information Governance in the Age of Big Data.” He discussed the importance of semantics and agreement on terms when integrating information systems between organizations, stressing that consistency of meaning provides data consistency.

Xuefei (Nancy) Deng, from the University of Hawaii at Manoa, presented “Promoting IT Service Employees’ Customer-Oriented Behaviors: An Empirical Study of an ERP Support Center in a Healthcare Enterprise.” The research was motivated by changes in skills needed for IT—in particular, the need for more interpersonal skills for user support. The IT governance focus led to answering two research questions—what customer-oriented behaviors were demonstrated, and how do these behaviors affect the enterprise?

Naga Venkata Sudhakar Kolluru, of Tata Consultancy Services, discussed “Enterprise Governance Model for Hybrid Cloud.” He pointed out that there might be some overlap between traditional IT governance and cloud governance.
FROM THE EDITORS

governance, but significant differences exist. In particular, many international entities adopt different cloud governance models, leading to differences in locus of control and possibly contradictory policies.

Participants had strongly positive appraisals of the content and subjects of talks, with an interest in possible future IT Pro conferences. Of particular interest were the keynotes, and the fascinating possibilities raised for new directions in IT. Readers are encouraged to consider these and other topics to contribute to the magazine!

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Any mention of commercial products or reference to commercial organizations is for information only; it doesn’t imply recommendation or endorsement by NIST; nor does it imply that the products mentioned are necessarily the best available for the purpose.

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