August 2018 @ CTM

THE DIRECTOR SPEAKS - Teamwork Drives Success so you want a great Team

On July 15, France won the FIFA World Cup – hats off to France, they earned their championship. As a team they are an inspiration to everyone, soccer and non-soccer fans alike. What can we learn from the fact that neither Lionel Messi nor Cristiano Ronaldo, two of the best soccer players in the world of soccer never made it into the final rounds? Soccer, like so many other things in life is a team sport and while having great players is important, it is a team effort to pull together in order to achieve something great. This not just true for soccer, the same lesson applies to societies and even to technology. In fact, the Magazine Inc recently printed an article outlining how ecosystems trump masterful individual efforts (https://goo.gl/vvWNtB).

The Institute for Communications Technology Management (CTM) is a consortium that has grown up with a mission of identifying and then embracing business disruptions driven by technology. CTM is hosted by USC’s Marshall School of Business and it operates as a non-profit organization funded by the consortium members, large organizations that welcome change as means of making societal and economic progress. Over the last few years, CTM has been working with its board to create additional membership classes that will allow us to bring individual voices into the CTM tent as a compliment to the existing corporate memberships. In creating this membership level, we have set the dues low enough to allow for larger based of CTM participation while still providing a basis to allow members to support the mission of CTM and creating the means to fund student involvement in the program. You can join the CTM member by going to https://goo.gl/Thmxso. And, because we believe in the program, we have set it up so the discount afforded to CTM members more than covers the cost of an individual CTM membership.

UPCOMING EVENTS

- August 2-3, 2018, Global Supply Chain Summit, University of Southern California, Los Angeles, CA
- August 11, 2018, Big Data Day LA 2018, University of Southern California, Los Angeles, CA
- Aug 28-29, 2018, Los Angeles Digital Government Summit, LA Grand Hotel, Los Angeles, CA
- Sept 12-14, 2018, Mobile World Congress Americas, Los Angeles, CA
- Nov 2-8, 2018, Innovate LA 2018, held throughout the Los Angeles area.
- Nov 5-9, 2018, CTMs Fall 2018 Advanced Management Program (AMP), gives your high potential employees the skills they need to anticipate, prepare, and communicate in an increasingly dynamic and technology-driven world. More details can be found in the course brochure. Registration is open and can be found here.
- Nov 9, 2018, SoCalBio Digital Health Conference, City of Hope, Long Beach, CA
- Nov 15-17, 2018, LA Commotion, Los Angeles CA
- Nov 28-29, 2018, IOT Tech Expo, Santa Clara Convention Center, Santa Clara, CA
- Nov 9-Dec 9, 2018, Los Angeles Car Show, Los Angeles CA
- Dec 4-5, 2018, Impact > Cities Conference/Workshop, Las Vegas NV.
- Dec 1-4, 2018, DataWest 2018 Conference, UCSD San Diego, CA
- Jan 29-Feb 1, 2019, IOT Evolution, Caesars Palace, Las Vegas NV
- Feb 20-22, 2019, NIST GCTC Expo, Washington DC
- May 13-16, 2019, IOT World, Santa Clara Convention Center, Santa Clara CA

If you have an event that you would like us to include in our newsletter, please send an email to ctm@marshall.usc.edu

STEVE SHEPARD: THINKING AMP: Was It Good for You?

For the longest time, Quality-of-Service (QoS) was the vaunted indicator of a company’s level of delivered service. Those of us in the telecom and IT industries became intimate with such terms as Mean-Time-to-Repair, Mean-Time-Between Failures, Uptime, Jitter, Delay, Percentage of Packets Lost, Call Hold Times, Peak-to-Average Ratio, and a plethora of others. Out in the world of the network or deep in the data centers, we lived and died by these measures. But there is a problem with every single one of these: they’re all inward-looking. All of them look toward the network, or toward the data center—none of them look outward, toward the customer. And therein lies the problem.

Today, things have shifted. Now, before I go any farther, let me go on record: Those QoS measures are crucially important elements of the service delivery equation. But they’re not the only ones. From a visibility perspective, a far more important measure is customer experience (QoE). It comes in many forms, yet strangely, relatively few companies focus on it, compared to those who focus on the Quality of Service indicators. I’ve heard IT Directors say, “What’s the problem? My uptime is solid, my network is secure, data is flying, what is there to complain about?” Well, let’s answer that question. How hard was it for the customer to find the company, online or otherwise? How hard was it to find the desired product? How hard to order? How difficult was the delivery process, and how long did they have to wait? Once it arrived, how hard was it to use the product? How hard to get support? And, finally, did the customer feel good about the purchase? News flash: The opposite of a satisfied customer is NOT a dissatisfied customer: It’s a customer who is indifferent, and they are deadly. Happy customers are, well, happy. Dissatisfied customers will make a ruckus until the provider gets it right—an opportunity to turn dissatisfaction into satisfaction. But an indifferent customer? You’ll never hear from then again—but your competitor will.
It doesn’t matter what business you’re in—this applies to all, large and small. It affects product companies, service companies, content providers, even citizens in the context of a government service provider. I go back to an earlier observation: Amazon didn’t kill retail; poor customer service did. And that is a universal truth.

THE I3 CORNER:

The I3 Consortium has incorporated all suggestions and comments to the I3 Membership Agreement and has sent the resulting document to USC’s General Counsel for a final review. With that, we are about to close the door on the foundational phase of the I3 Consortium and about to move into a general operational state. With that, we have set a technical meeting to consider the architecture for the R1.0 release of I3 on Aug 9 and we will have our first open meeting (founders and non-founders) on Aug 17. If you are interested in attending the Aug 17 (or Aug 9) meeting, please send an email to me at manager@i3-iot.net for logistics details.

We wish to express our heartfelt thanks for the companies and organizations that helped get the I3 consortium established and moved into an operational state through the creation of our by-laws, membership structure, and membership agreement. A big thank you to the following companies: Avata, The City of Los Angeles, Cradlepoint, Discoveryiot, Entertainment Technology Center, Ether2, Fantasmo, Information Sciences Institute, Inria, Keck, Kiana Analytics, Korea University, Marshall, Metro Transport Authority, MiMocloud, netObjex, Nixsun, Orange Barrel Media, smartINK, Stevens Center for Innovation, Synchromatics, Tech Mahindra, Traction Labs, USC Facilities, USC Information Technology, USD Group, Urban California, Valarm, Verizon, Viterbi, Warner Bros, Wizr.

READER CONTRIBUTIONS - We need a new Operating System for the Fourth Industrial Revolution by Murat Sonmez

Murat Sonmez is a Member of the Managing Board of the World Economic Forum and currently the Head of the Forum’s Center for the Fourth Industrial Revolution at the Presidio in San Francisco, California. He holds a BSc in Industrial Engineering, Bosphorus University, Istanbul, Turkey; MSc in Industrial Engineering and Operations Research, Virginia Tech. 1989-1993 various roles from software engineering to product marketing management with Consilium, Inc. provider of semiconductor factory automation software, Mountain View, California; 1994-1997 product management with Teknekrion Software Systems, provider of real-time financial trading systems, Palo Alto, California; 1997-2014 member of the founding team Tibco Software, a real-time predictive data analytics software company in Palo Alto, California; various positions including Head of Global Field Operations, General Manager, EMEA operations and Chief Marketing Officer.

Society’s operating system needs an upgrade. The model we have been using is simply not up to the challenges of the Fourth Industrial Revolution. A new era is unfolding at breakneck speed. It has huge potential to address some of the world’s most critical challenges, from food security, to reducing congestion in big cities, to increasing energy efficiency, to accelerating cures to the most intractable diseases. But it also raises a host of social and governance issues that need addressing. Given the speed and scale of the changes, and the slow pace of processes defining governance models to handle them, present solutions to these questions are being rapidly superseded. We end up operating in the “too late zone”.

We need to think and act quickly. At the World Economic Forum’s Center for the Fourth Industrial Revolution, we are laying the foundations for a new, global “operating system (OS) to facilitate delineation between the rights and responsibilities of different stakeholders. This is all part of efforts to ensure this new phase of civilization is human-centric, benefitting not just the privileged few and driven not by the imperatives of technological development, but serving all of society. We must ensure that algorithms driven by vast data harvesting are trustworthy; that artificial intelligence and machine learning are as ethical as they are intelligent; and that data ownership is clear. These questions and many more are coming at us faster than we can formulate answers.

Maximizing the potential of the Fourth Industrial Revolution while minimizing its negative impact requires us to adopt “human-centric design” principles. In this future world, data will play a key role but only if a data governance system can be developed that considers the following issues: where does data come from, who owns it, what you can do with it, and who takes the rewards.

IoT plays a key role in providing the data needed for such system that there are already more connected IoT devices than people. By 2020, more than 20 billion IoT devices are anticipated. This represents a massive opportunity to collect and use data to solve our most intractable problems. But to protect ourselves from potential data misuse, and to provide the foundation for a healthy, secure and equitable data economy, crucial IoT components are required. First, there must be a way to ensure data comes from trusted sources, otherwise data-driven decision making may be skewed by “fake data” being pumped into the system. This authentication system must be highly secure, cross-industry and not under any single governmental control. Second, human-centric values, based on ethics, must be embedded in the system so the data can applied to the myriad practical situations confronting it every day. Such a rule based ethics heuristic should be adaptable to reflect the legal framework of the relevant jurisdiction (city, state, nation, region). Thirdly, the system has to be adaptable so that software and security features can be upgradable so the devices can respond to an evolving security/legal landscape.

A key concern for governments and citizens is data privacy. In the absence of any other means of control, governments tend to prohibit the movement of data outside borders if they are unable to apply the laws of the jurisdiction in which the data is created outside their borders. Such restrictions on the movement of data will restrain innovations intended to improve agriculture, the environment, traffic, energy and health.

Another concern that needs to be considered by this new environment relates to taxation, intellectual property rights and insurance. If 3D technology can be used to locally print a product based on a digital file developed in another country, that product has effectively been imported, even though it has not passed any physical border. Taxes, fees, and other restrictions that have historically been used to a) ensure the creator of the product was compensated in a global market, b) ensure the authenticity of the design specification, and c) track insurance and liability chains across borders.

Existing regulatory frameworks and governance models are getting in the way of such advances. At the Center for the Fourth Industrial Revolution, and through our global network, we are working with governments, business, academia and civil society to co-design this new operating system. It will provide transparency, accountability and innovative ways to solve the complex challenges of the new technology revolution. We need to think big, act quickly, and lay the foundations for a new, fairer, technology-based and global society.
READER CONTRIBUTIONS - Measuring Cognitive Load and Emotions in Students using an Array of Sensors by Ken Yates

At Rosser, Ken works with faculty and staff to design professional improvement, curriculum and evaluation programs. He also conducts research in, and applications of, cognitive task analysis methods to improve human performance, instructional design, and educational technology with a specific interest in how information communication technologies can be used to deliver instruction more efficiently to a wider audience. With over 30 years of national and international experience in media and technology, Ken has also held executive positions at various electronic media companies.

USC Rosser School of Education and the USC Viterbi School of Engineering is working to find ways to improve educational processes by providing instructors with real time feedback about student learning engagement. CHARIOT (Center for Human Applied Reasoning and the Internet of Things; www.chariot.usc.edu), a joint center between the two schools, is developing an intelligent system that reports students’ cognitive-emotional states in real time so the instructional material can be adapted to maximize results. The system uses sensor devices such as wristbands and video cameras to collect multiple streams of data from students and uses machine learning algorithms to suggest real-time content adjustments.

Based on research undertaken at USC, it has been shown that when students are under stress or anxious, they display different physiological responses such as changes in skin temperature and heart beat intervals. It has also been shown that under such conditions individuals respond differently when asked to take on different cognitive tasks. Based on these efforts, it appears clear that learning outcomes can be improved if we are able to actively measure physiological conditions and adjust training/teaching content accordingly.

It is anticipated that the findings from the study will point the way forward for the next generation of corporate training and academic teaching programs. Many such programs are already modularized as sectionalized programs are easier to keep up to date. In addition, modularized programs are adaptable to mixed teaching environments where some components might be taught in a classroom setting, some on-line, etc. The outcomes from this research will provide pointers for re-thinking the teaching process from being based on a fixed series of modules to one where the sequencing of the modules dynamically adapts to reflect the student’s current learning state. For example, if a student appears to be in a heightened state of anxiety, the learning algorithm could suggest lowering the anxiety by incorporating a hands-on learning experience into the lesson.

As the world continues to become more complex, students and employees will need even more training/education to remain productive members of society. New training technologies are on the horizon that have the potential to make these training processes more effective because we will be able to tailor content and the teaching process to the individual.

READINGS FROM THE EDITOR’S DESK

- Ecosystem based strategies produce more value than value-chain based strategies because ecosystems self-organize around a common vision rather than striving to compartmentalize participants in structures that have difficulty adapting to change. https://goo.gl/KoP4mT
- Deloitte outlines a planning process focused on a longer, long term vision and supported by several sprints - a targeted agility process. Suggests the vision should be defined around anon-tech specific need/desire that serves as a guiding north star. https://goo.gl/VtK3vX
- Super article on Blockchain that develops a construct to determine blockchain’s fit against application needs. The results suggest that private-permissioned applications are a sweet spot for blockchain technology. https://goo.gl/dBUHtY
- An interesting take on congestion. Says congestion is driven by desire so reducing desirability is the best cure for congestion. Instead of reducing the desirability of congested areas, perhaps we should consider making other places more desirable. https://goo.gl/Ea6Wqg
- Edison, often portrayed as the individualistic, tireless inventor/futurist, might be better viewed as a collaborative consortium with a flair for public relations, someone who understood that ecosystems can achieve more by working together. https://goo.gl/Ea6Wqg
- McKinsey report on smart cities includes material on applications AND spotlights how systems have to serve people that have access to many applications, have to be built on a common infrastructure, and have to enable continued open innovation. https://goo.gl/vg6Goi
- Marketing has to collect metrics to test campaign success. If the metrics are wrong, the campaign is a learning experience; if the metrics are wrong, a campaign success many produce business success. The campaign has to link to the corporate strategy. https://goo.gl/x9WtU
- A ‘trust’ revolution is upon us and for companies, marketing and the salespeople are at ground zero. Trust changes the focus form an individual sale to the total lifetime value that is rooted in the end-to-end customer experience. https://goo.gl/V6LZUd

CTM RESOURCES

CTM has a history of making topical and thoughtful information available to the CTM community. In support of your community, CTM has made the following available for those interested.

- The Need for a Fourth Industrial Revolution Operating System. The adoption of Fourth Industrial Revolution thinking to our data-centric world may require that we rethink the macro systems that govern the way that humans relate to the data that surrounds them. In the 4th Industrial Age it is interesting to think of the technology around us as resources which could be managed by a societal operating system. https://goo.gl/3a7JrG
- How AI Could Tackle City Problems Like Graffiti, Trash, and Fires (free). Cities operate fleets of diverse vehicles to serve their citizens. If these vehicles were equipped with video cameras, the captured images could be used by video analytic programs to self-detect many city operational issues in need of attention so appropriate crews could be dispatched without waiting for citizen complaints to be registered. https://goo.gl/Oc4j3c
- I3: An IoT Marketplace for Smart Communities (free). I3 (The Intelligent IOT Integrator) is a data governance vehicle that manages IOT data flows for many independent device owners. It supports the user’s need to self-manage their own data streams, manages participation incentives, privacy, and monitors device security. This curated environment creates the free and open IOT data marketplace needed to accelerate IOT adoption. https://goo.gl/hR1D5K
- The Evolving Internet of Healthcare Things (free). Healthcare IOT applications can be divided into hospital, doctor, and consumer applications. Over time these isolated worlds will blur and there will no longer be a single administrator that oversees the network infrastructure; healthcare data networks will be an open and fluid environment. New systems will be needed to manage vendor neutral data repositories and to govern data flows. https://goo.gl/3a7JrG
• **The Fan Multiplier Effect (free)**, Marketing Programs should be driven by behavioral objectives and measured by metrics. Instead, many marketing campaigns focus revenue driven objectives even though campaigns designed to increase fan engagement can often drive greater strategic value. This paper focuses on efforts to drive fans to advocate for a product or service so that they become your revenue drivers.

• **Platforms, Real-Time & Partner Management, and Collaborative innovation**, This report investigates 1) how leaders have incorporated digital platforms in their communications programs, 2) how companies are evolving to become real-time companies, 3) how companies manage their technical partners in a networked age, 4) how collaborative innovation creates new opportunities, and 5) how open innovation practices are allowing firms to outpace the competition. Please click the pictures for more details.

• **Privacy, Security, Analytics, Supply Chain & Teamwork in Modern Ecosystems**, This report focuses on six areas that directly impact the bottom line. These areas include 1) managing tradeoffs between speed and accuracy, 2) customer privacy, security, and trust, 3) applications of data analytics, 4) managing geographically-distributed teams, 5) evolving supply chains as a competitive advantage, and 6) innovations requiring the attraction of two parties.

• **Future of Media Program: Evolving Revenue Models**, The media industry is in the process of undergoing a radical transition that appears to be accelerating. At play are deep changes in the way consumers view entertainment and how the industry makes money. This report looks at the evolving business models for media monetization from advertising to subscription and transaction. Special attention is paid to Millennials who will outnumber non-Millenials by 2030.

• **Internet of Things (IOT) Model**, CTM has developed an Internet of Things (IOT) model that allows users to identify profit pools within the larger IOT market, test how changes in pricing will affect demand, and see how different functional characterizations impact the model. The modeling tool is sufficiently flexible that the users can adjust the parameters in order to develop a personal view of market evolution.

• **AR/VR Serves to Humanize Interactions (free)**, Augmented Reality (AR) and Virtual Reality (VR) are two poised to change the way humans interact with computers. AR/VR is having significant impacts to many different industries with applications that include advertising, customer engagement, employee training, and consumer entertainment.

**SUPPORT CTM**

Please feel free to forward this email to your friends and colleagues who you believe would benefit from participation in the CTM community. For those of you who wish to be included in the CTM family of people who believe that technology is a tool and that business success is achieved by skilled wielding of the tools available to us, you can join the CTM family by registering on our home page. A voluntary subscription would be appreciated for those that want to give back and help grow the CTM community (click here to contribute). If you have suggestions, topics you want to see included in future newsletter updates, or other general inquiries, feel free to email us at ctm@marshall.usc.edu. For physical mail correspondence: USC-Marshall-CTM, 1149 S Hill Street, 9th floor, Los Angeles CA 90015.

The idea expressed in this newsletter are intended to stimulate conversation and dialog that will lead to a better understanding of our collective future. The opinions may not necessarily reflect the opinions of USC, Marshall, CTM or the wider CTM community.

**GOT A BUSINESS, TECHNOLOGY, STRATEGY ISSUE?**

The CTM team is dedicated to working with its member companies to better understand the increasingly dynamic business world in which we live. We believe that companies must lead in order to prosper in a world where the threats and opportunities facing us are constantly evolving. Feel free to reach out to the CTM team via email at ctm@marshall.usc.edu if you would like to start a conversation.

**ABOUT CTM**

*Founded in 1985, the Institute for Communication Technology Management (CTM) is the world’s foremost institute at the intersection of technology and content and represents a powerful network of industry leaders involved in every facet of the digital media value chain. For more about CTM go to marshall.usc.edu/ctm.*