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The Concept of Context-Aware Computing

Technology has adapted and evolved according to the needs of individuals and organizations. It has also been led by the development of new communication tools and discoveries. This is especially true with the emergence of mobile devices. During the last few years we have seen an increased flow of innovation for these mobile electronic devices, especially in their size and complexity. These devices are becoming an indispensable gadget in the life of almost everyone. Mobile devices have supplanted desktop computers and laptops and are now the most popular platform for Internet access. The convergence of mobile telephony and web services is just the beginning of what can be considered as true ubiquitous computing. The paradigm of access anytime, anywhere and in any way has become a fact of daily life in a very short space of time.

Creating mobile services for devices that are relevant to users for their everyday life has become a major goal and challenge for organizations. This challenge has given birth to the concept of context-aware computing (CAC); that is, understanding a user’s environment (who, what, where, when, how?) in order to assist the decision-making process. CAC is the ability to detect, collect, process, or exchange data with the user’s environment in order to identify their needs and improve the user experience. We then say that an application is considered context aware when there are mechanisms that allow it to perceive and process the user context in order to help the user make decisions (Schilit, Adams & Want, 1994).

The mobile context-aware interface could decide whether the user is in a situation that can be interrupted to receive an incoming call (in the dorm room) or whether it is better to send the caller to voicemail (in a classroom). It could also provide useful information to the user in that context. For example, if you are traveling in a car, it could automatically turn on traffic information service such as Google maps. If it is near lunch time, it could suggest nearby dining halls that match the user’s preference and are having special meal deals. If the user is found in a bookstore, it could suggest audio summaries of books and download them for use.

In order to extend the user’s interests and behavior to a specific environment, CAC requires complex algorithms and demands knowledge of systems engineering, artificial intelligence, psychology, and sociology, to name a few. The application has to know and understand the environment to be able to offer relevant services to the user. This requires collaboration between the user’s device and other devices (most likely in the form of agents). CAC development could also be an important step on the road to superior artificial intelligence systems, as it would allow the machines to learn and react appropriately to their environment. According to research done by Budzik and Hammond, there exist four agents that assist in context-aware computing: feedback on the relevance of the results, user profiles, eliminating ambiguity in word meaning, and knowledge of engineering approaches. These agents monitor the activities and interac-
Context-aware computing coexists within ubiquitous computing. In comparison to CAC, ubiquitous computing means to have access to a wealth of information independent of the location of users. Ubiquitous computing is based on the computer device being present anytime and anywhere. This computing power can be present in any object, and it is invisible to the user. In this way, the user will be using these computational elements without really being aware of their interaction. A clear example of this invisibility can be found in the use of eye glasses. Thanks to their invisible use, it helps to keep focus on the task at hand and not the glasses themselves. Mark Weiser defined this feature of computing and its goal of being woven into the fabric of everyday life until it become invisible. Another important aspect of ubiquitous computing is that what really matters is the user and his or her needs and not the device itself.

But context-aware information may be imperfect, or ambiguous, due to uncertain physical factors. If a context-aware application does not consider that the context may be inaccurate, it may generate inadequate information or services to the user. With current technologies, the gap between what the user means by context and what the computer can interpret is very wide, so it is important to integrate the user into the design of these systems and let him/her decide what actions to take.

So, you say, what does this mean to me as a member of the ACUTA audience? Certainly the concept of context-aware computing is here and growing and is being led by large companies and startups that do NOT understand the university environment. I believe our best role would be to either help sensitize these companies to the university environment, or, develop these CAC environmental contexts internally. For example, a unit within IT that develops apps that recognize a classroom environment and adjust accordingly; an app that directs the user to the location of the lecture proactively (especially useful at the beginning of the term); a CAC app that links group members together. Whatever the outcome, CAC is here to stay and it would behoove us to (1) Stay aware of its developing nature (through ACUTA conferences, seminars, webinars and articles) and (2) to proactively create some really cool apps for our unique environment. Whatever the case, let’s share our results in the ACUTA fashion we have become accustomed to.

References:

Nominate Now for Ruth A. Michalecki Leadership Award

The ACUTA Awards Committee is pleased to invite nominations for the 2014 Ruth A. Michalecki Leadership Award. This annual award recognizes an outstanding leader among the institutional, associate, and corporate affiliate membership.

The person selected for this award:

- Engages in activities that have produced results directly benefiting the ACUTA organization and/or the broader higher education community
- Motivates and fosters collaboration to accomplish goals, objectives and the mission of their institution while demonstrating exceptional leadership qualities
- Actively participates in and promotes the education, professional development, and mentoring of other professionals
- Demonstrates initiative – the ability to take charge by creating or developing a program, project, or activity that impacts the community
- Demonstrates leadership in the information technology industry

We encourage you to nominate someone by completing the nomination form online at www.acuta.org/ram. There, you will also find a listing of previous recipients and their accomplishments.

Deadline for nominations is December 20. Nominees must be representatives of ACUTA institutional member schools, corporate affiliates, or associate members.

ACUTA extends appreciation to Windstream for their continued sponsorship of this award.
Collaboration Is Not Automatic

Gary Audin, Delphi Inc.

Simply deploying a new IT or communications tool does not mean it will be used effectively. It may not be used at all. Effective use of collaboration tools means a change in behavior and new habits for those using the tools. The objective is to get users to want to use the collaboration tools, not feel they have to use the tools.

Goals for Collaboration

Before introducing collaboration tools, enterprises must answer the most basic question of why they're doing it. We have read a lot of hype about Unified Communications (UC) and its set of communications and collaboration tools. There are several possible goals for UC:

- Increase productivity
- Reduce costs
- Improve employee retention
- Reduce employee stress
- Increase the pool of employees that can contribute to a project and improve a business process
- Increase customer satisfaction and loyalty
- Generate greater trust among remotely located users (a benefit of video conferencing)

The goals should be prioritized based on their value to the organization. Start with the goals that are both most beneficial but are also easily attainable. Do not strive to satisfy every goal with the initial offering of UC tools; start with only one or two goals. Set some metrics for the goals so that there will be criteria for measuring their success.

Some examples of metrics include reduced travel costs, more frequently meeting project deadlines, lower employee turnover, etc. The metrics should be quantified so that there can be a comparison between the costs of offering the UC tools and the effect on the business budget and profit. Just stating that some improvement has been delivered is not enough.

Training to Encourage

We have all attended some type of training in our organization. Since the introduction of the UC tools can have a profound effect on the users, one or more C-level managers should introduce the UC training. It can be a pre-recorded video that introduces the organization's commitment to pursue the implementation of the UC tools. This emphasizes the role of UC in the organization.

A PowerPoint presentation is not good enough for training. The training should include not only the knowledge to use the UC tools, but also how the tools make the work easier, less stressful, and faster to deliver. There should be multiple video scenarios that show how to use the tool, an example of the tool in use, and finally the benefits of using the tool. Not all users will have the ability to imagine the tool's use and its benefits. The training should be focused on changing the behavior of the user and producing new communication habits that encourage the tool's use.

One Step at a Time

I have attended classes where I learned too much and then needed to select those items that seemed best for me and ignore the rest of the information. This is not the way to introduce UC.

Select one tool of UC, possibly one already in partial use by the organization, that is easy to learn and easy to convince others to use. Remember, collaboration takes two or more users to make it work successfully. I may use the UC tool well, but if those on the other end of the collaboration consistently fail to use it effectively, then I will stop using the tool myself.

The success or failure of a UC tool should provide lessons about how to introduce the next UC tool. The success can also be used to justify the expenditure for implementing the next tool. Even though the IT implementers believe that the entire tool set has value, do not become too ambitious in the introduction of collaboration tools. Success with the first tool will encourage user acceptance of additional collaboration tools.

Monitoring and Measuring Success

Measure the success of the UC tool. The ability to generate tool-use metrics and their value may be part of the UC offering, or you may have to procure a third-party measurement solution or use a cloud service. Some of the benefit information may have to be obtained from existing business-processing systems.
Continued from page 3

Just because a tool is used more does not mean its use produces measurable benefits to the organization. It is up to the UC tool implementers to relate tool use to improved business metrics that show how the collaboration tool met one or more of the goals set for its adoption.

People like numbers. Create a presentation for management showing the business process before the introduction of the collaboration tool use. Then measure the same business process at about 3 to 4 months into the tool use. Show how the tool use generated the improvements. Use this to justify the further introduction of collaboration tools and create user buy-in for the introduction of additional new tools.

**Behavior Can Limit Collaboration Success**

A user may have a favorite tool such as Instant Messaging (IM) and use it exclusively, avoiding other collaboration tools. While monitoring IM traffic, an organization found a user who sent about 4,000 IMs a month while the average user in that organization sent 300 IMs a month. The heavy IM user rarely used his desk phone (calls seemed to always go to voice mail), video, or wanted to be part of conferencing sessions.

This means that others are forced to use the IM tool exclusively when they communicate with this user and cannot avail themselves of other collaboration tools. This behavior placed the collaboration control on only one end of the communications. This behavior severely limits the values and benefits of collaboration tools and should be discouraged. Collaboration requires two or more participants selecting the best tool for collaboration, not just one user insisting on just one tool.

*Gary Audin is the president of Delphi Inc.* (delphi-inc@att.net), an independent communications consultancy. *This article appeared online at www.nojitter.com on October 30, 2013, and is reprinted here with permission from the author.*

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**Nominations for Board of Directors: Deadline November 18**

As previously announced, ACUTA’s Nominating Committee has issued the call for nominations for President-Elect and two Directors-at-Large.

**President-Elect:** As stated in the bylaws, “Candidates for the office of President-Elect must have served as a member on the Board of Directors for a minimum of one year or served as the Chair of a permanent committee for a minimum of one year.” Nominees for this position must also be prepared to serve the following two years as President and Immediate Past President.

**Directors-at-Large:** Two positions are elected each year for two-year terms. Directors-at-Large whose terms will expire this year are Walt Magnussen from Texas A&M and Sharon Moore, Smith College. Sharon is eligible to serve another term if she chooses, but Walt is serving his second term and is not eligible to run for Director-at-Large this year.

Nominations must be received by 5:00 p.m. EST, November 18, 2013. Send all nominations to Jennifer Van Horn at jvh@indiana.edu. Phone nominations will not be accepted.

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**Register Today!**
**Winter Seminar**

January 12–15 • Phoenix, AZ

Pointe Hilton Tapatio Cliffs

1. The Changing Landscape of Communication Technologies
2. Empowering Collaboration through Technology

[www.acuta.org](http://www.acuta.org)
The Evolution of Control Systems Security Brief

As a follow-up to National Cyber Security Awareness Month in October, ACUTA is pleased to offer a free webinar for members and additional colleagues. As a benefit of membership, an unlimited number of employees of your university or company may register at no cost.

Lisa Kaiser (Control Systems Security Program Chief of Control Systems Cybersecurity Standards and Metrics, U.S. Department of Homeland Security) will discuss the evolution of the industrial control systems cybersecurity landscape, describing significant activities and events affecting industrial control systems and the most current threats to control systems environments observed in the last several years. Kaiser will provide real-world examples of the consequences of cyber incidents in critical infrastructure and outline the most recent cyber security recommendations by the DHS Control Systems Security Program (CSSP) and the Industrial Control Systems-Cyber Emergency Response Team (ICS-CERT).

CSSP offers support in this area through ICS-CERT’s continuous monitoring and response to cyber threats ranging from APTs to malicious insider activity. Working within the National Cybersecurity and Communications Integration Center (NCCIC) in coordination with US-CERT, the ICS-CERT deploys “fly-away” teams to provide onsite assistance to asset owners in response to cyber incidents. This webinar will emphasize lessons learned during recent and ongoing incident-response efforts, addressing such topics as:

• How asset owners can be better prepared to handle cyber threats by practicing defense-in-depth, developing appropriate logging procedures, practicing appropriate network monitoring, and knowing the available resources for combating this type of event
• How timely information-sharing related to threats and analysis plays a critical role in empowering and protecting public- and private-sector partners
• How spear phishing attacks are used to gain footholds into well-protected corporate networks
• How organizations can improve detection measures and evaluate all connections into their control networks

Check the website (www.acuta.org) for more details or to register, or call Joanie Profitt, 859/721-1658.

What’s on Your Desk?

Cathy O’Bryan
Director of Client Support, Indiana University

As I ponder this “What’s On Your Desk?” column, I’m struck by something that I am still learning as a director of IT. When I first became a director, I struggled to answer the question What do directors do? Five years later, I’m certain that directors don’t really “do” much. This was quite the struggle for me as an active, engaged, passionate, one-might-even-say-detail-conscious manager. So my answer to What’s on Your Desk? is really What connections need to be made soon?

There is simply not much on my “To do” list, but lots of connections that I need to make. In fact, a mentor-friend of mine suggested that a director was most like a conductor — someone who puts all the wonderful notes played by others together.

Today and often, there are so many groups on campus that have common needs that are unaware of each other and of potential solutions. There are experienced and new managers who need to connect their staffs’ skills, passions, and time to prioritized project goals. There are colleagues at peer institutions who have resources and issues that align with my own. How can we connect to learn from each other, to share resources to achieve common, shareable products, services?

At Indiana University, there are many pockets of IT staff across the schools, colleges, and units. We meet regularly, both formally and informally. Currently, we are examining how best to design and build SharePoint systems that can be re-purposed across our units. What are the gaps in our resources, staff skills, and communication processes? How can we best be aware of our mutual needs and work together to build extensible solutions? Clearly, my role is now to figure out who needs to be in the discussion. In what role? How quickly? How can we position the larger question of proactive collaboration so that it is not a burden to be avoided? I won’t actually have a “to do”! I will probably facilitate a number of these discussions.

So what’s on my desk.... A list of people to meet with, listen to, dialogue with, and help them to learn from and with each other.

Reach Cathy at caobryan@iu.edu.

Thursday, November 14, 2013, 2:00 - 3:00 pm Eastern Time
Bring 8 Fall Seminar Sessions to Your Desktop or Tablet

ACUTA now streams select sessions from its seminars and Annual Conference right to your iPad, Android tablet, or Windows or MAC computer. The session streaming also includes synced presenter slides that advance automatically with the presentation. You may navigate within the presentation to any slide or point in time of the video, as well as resize the viewing window to zoom the slide or video as needed.

Eight sessions from the Fall Seminar in St. Louis are available now at the ACUTA Store:

Track 1. Turning ICT Service and Support into a Strategic Asset
1. (Joint Session) Ahead in the Clouds—Is IT Outsourcing Right for Higher Education IT?
2. Beyond a White Paper—Implementing Identity Management and Deriving Big Business Value
3. The Support Team—Extending the Service Desk
4. Leg/Reg Developments Impacting Higher Ed Technology
5. Working With the Generation Me!

Track 2. All Things Wireless, Mobile, and Cloud
6. Social Media Applications in Higher Ed
7. Moving Into the Cloud: Promises and Experiences
8. Implementing a DAS System without the Delays and Surprises

If you couldn’t attend the seminar, we hope you will see this convenient offering as one more reason to continue to make ACUTA your “go-to” resource for professional development.

Purchase the video streaming through the ACUTA store for the low price of $149. Once your order is received, you will receive an email with the video streaming links.

Order today at the ACUTA Store (http://www.acuta.org/ws13spurchase).

Thanks to Fall 2013 Seminar Exhibitors and Sponsors

Thank you to the following companies that participated in the success of our Fall Seminar in St. Louis. As you have opportunity, please remember these companies for RFIs/RFPs. They support ACUTA!

American Tower  Crown Castle  Plantronics, Inc.
Apogee       Gigamon          SMS, Inc.
Aruba Networks  Graybar     Stealth Concealment Solutions
Avaya, Inc. IntelePeer, Inc.  Taqua, LLC
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Connectivity Wireless Solutions  PCR, Professional Computing Resources  Xirrus

Get Your Logos Here

ACUTA school and corporate member logos can be used to identify you and your institution as an ACUTA member. They can be used on press releases, e-mail signatures, websites, marketing materials, and more. Please email Amy Burton (aburton@acuta.org) to request your logo.
Info Links

Frequently, vendors, associations, governmental bodies, and others provide white papers and other informational documents which are announced through a variety of media sources. While some admittedly have a certain slant or opinion, others are quite objective; however, they often contain valuable information. Below are links to selected documents.

- CompTIA – Annual Trends in Enterprise Mobility: http://www.comptia.org/research/complimentary-research-reports.aspx
- Becker’s Hospital review/HIT E-Weekly: http://visitor.constantcontact.com/manage/optin?v=001Mro14wcDZccCGd-KX-mJJ_jWokzvECGqN
Add Names from Your Campus to Your ACUTA Roster

Do you have new employees who would benefit from access to ACUTA resources? Would people in other departments like to know what’s new in technology, emergency notification systems, or legislation? Consider adding these names to your campus’ ACUTA roster.

The number of personnel from each member campus who receive full benefits of the institution’s ACUTA membership is not limited. School members may name an unlimited number of campus personnel to their membership rosters. All named members receive full benefits of membership, including access to members-only sections of the ACUTA website; subscriptions to the ACUTA Journal, eNews, and Leg/Reg Update Newsletter; and access to the online ACUTA Community.

Each member school still has just one primary voting member who is authorized to add new individuals to the roster. To add new people or to see a list of the current named members for your institution, e-mail Amy Burton at aburton@acuta.org or call 859-721-1653.

NOTE: This policy applies only to schools, not company members. Companies choose their level of participation (Copper, Bronze, Silver, and Gold), which determines the number of named members.

Board Report

The Board met face-to-face at the Fall Seminar in St. Louis on October 5, 2013, and approved the following:

A. August 2013 Financial Statements
B. Monthly Committee Minutes and Reports
C. Membership Reports
D. Committee & Subcommittee Nominations
   Legislative/Regulatory Affairs Committee: Doug Stoyko, University of Manitoba
E. For Ms. Hoch to prepare a draft RFP for a marketing plan and implementation
F. Fiscal Year 2013-2014 Budget and Modified Event Numbers based on the new normal
G. Event Task Force Recommendations

The Board invited two anonymous guests (a provost and a student) to participate by phone to get their perspectives on IT expectations and best practices.

Respectfully Submitted,

Riny Ledgerwood
ACUTA Secretary/Treasurer

ACUTA Annual Conference
Dallas, Texas
March 30–April 2, 2014

Communicate... Integrate... Innovate!

Updates available at
www.acuta.org
Welcome New Members

Institutional Members
University of Minnesota, Duluth, MN. T3 ........................................... www.d.umn.edu
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Ilya Yakovlev, CIO (262/595-2010) yakovlev@uwp.edu

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Check It Out
Press Releases, Job Postings, & Corporate Webinars
The ACUTA website lets you communicate with other members—share some exciting news, fill a position, or find just the right vendor. Check the website for the latest postings frequently. Here are items that have been posted since our last eNews.

PRESS RELEASES: www.acuta.org/wcm/acuta/pressroom/pr.pdf
Send press releases to Amy Burton (aburton@acuta.org)

• Campus Televideo and Mute are Offer EAS Messaging System Integrated Cable Television

JOB POSTINGS: www.acuta.org/jobs
Help your colleagues who are looking for work! To send job postings, go to www.acuta.org. Click on one of the jobs listed there and you will link to the jobs listed now and a link where you can post a job.

• Communications Network Analyst - Senior, The University of Arizona, Tucson, AZ
• Director Computer Store and PC Labs, University of Central Florida, Orlando, FL
• Administrative Telecommunications Specialist, University of Wisconsin-Madison
• Senior Network Engineer, University of Oregon, Eugene, OR
• 2 Positions: Application Developer & Application Database Administrator, Northeast Community College, Norfolk, NE
• Systems Administrator, University of Central Florida, Orlando, FL

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Many free webinars are available through ACUTA Corporate Members. Check the website at www.acuta.org/corporatewebinars to see what is currently available. (Corporate members e-mail Amy Burton at aburton@acuta.org to get your free webinars listed.)