

White Paper

Get their heads into the Cloud

Business school curriculums must qualify
future corporate leaders
to reach workable “bet-your-business”
Cloud Computing decisions.

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Introduction

The Cloud is real and the Cloud is growing!

“Cloud Computing will balloon up to US\$241 billion by 2020, up from just US\$40.7 billion in 2010 according to Forrester Research’s report *Sizing the Cloud* released in April 2011”

Lauren Barack reported in a September 2011 article in *Registered Rep* – an influential magazine for financial planning professionals.



The IDC Cloud market sizing prediction for 2009 to 2013 reads as follows:

- Software as a Service – (SaaS) to grow at 21% CAGR (compound annual growth rate) to US\$17.6 billion
- Platform as a Service – (PaaS) to grow at 20% CAGR to US\$14 billion
- Infrastructure as a Service – (IaaS) to grow at 35% CAGR to US\$13.3 billion

If you need more intellectual stimulus to convince you as to what will be a seismic compelling event on your business horizon, then type “Cloud computing” into your favorite flavor of search engine. The Internet will then obligingly deluge you with over a hundred million articles explaining, extolling the value of, disparaging, and marketing various Cloud Computing wares.

Irrevocably, Cloud Computing is here. Cloud Computing may very well be the next seismic evolution in the history of computing ... and business. Are our future corporate leaders sufficiently knowledgeable and confident enough to reach workable “bet-your-business” Cloud Computing business decisions? This is the topic this white paper will focus upon.

Goal

This white paper delivers a synopsis of the efforts planned, or in some significant cases, underway, to impart Cloud Computing training to the students at institutes of higher learning. The two autonomous categories that will be discussed are:

- Cloud technical training
- Cloud business decision-making

The white paper concludes with a clarion call to action for universities and other institutions to urgently remedy the currently observed shortcomings in the current training's emphasis, breadth and content structure.



Cloud Computing technical training



Cloud Computing technical training has been launched and is growing in scope and range at many universities ... burgeoned in some notable instances, with new and sometimes really innovative learning content and delivery options.

Here are a few selected examples:

- In August 2010, the Stanford University Center for Professional Development collaborated with the Computer Science Department to offer courses on Cloud Computing.
- In August 2011, the University of Washington revealed the outline of a new certificate program offered by the university in Cloud Computing.
- Both Stanford University (“Developments in Cloud Computing software and applications”) and DePaul University (“Cloud Computing fundamentals”) now offer Cloud Computing courses online.
- The University of Maryland is engaged on an ongoing effort to explore Cloud Computing, particularly as it relates to massive data analytics
- Back in 2007, IBM and Google announced a joint university initiative to help computer science students gain the skills they need to build Cloud Computing applications. Initially, six universities were involved in this initiative; they are Carnegie Mellon, Massachusetts Institute of Technology, Stanford University, the University of California Berkeley, the University of Maryland and the University of Washington

Cloud Computing undoubtedly has the capacity to be a substantive disruptive force in the use of technology in the near future. Although initial indicators are encouraging, the nation’s universities still need to magnify the scope, range and availability of Cloud Computing courses. It is encouraging to see that some of the foremost players in the IT marketplace are stepping-up with alacrity to help the universities.

“We’re trying to create the easiest possible on-ramp for universities into this world of Cloud Computing,” said Stuart I. Feldman, a vice president of engineering at Google and a former senior researcher at IBM. “But yes, this kind of computing is a core value to Google and IBM. We have an interest, no doubt.” (*New York Times* – October 2007).

The Google and IBM initiative was substantively augmented, as Rick Hodgin reported (*In Geek.com - April 2009*): “The National Science Foundation announced it had awarded \$5 million in grants to fourteen universities as part of its Cluster Exploratory (CLuE) program. The program works with IBM and Google on their Cloud Computing University initiative, and is designed to look at the infrastructure requirements to make leading-edge Cloud Computing systems which many believe will power the next generation of the World Wide Web.”

Companies like Red Hat, VMware, Rackspace, Eucalyptus, Microsoft and others have also rapidly recognized the Cloud’s business potential and are rapidly contributing to the fulfillment of the need for suitably skilled people; with predictably, their products and solutions as the nucleus of the learning.

The universities need to also hastily recognize, acknowledge and address the marketplace’s issue that Cloud Computing security is a major trepidation for business leaders. The universities need to examine Cloud security knowledge delivery and certification as launched by the Cloud Security Alliance (CSA) as a model. The CSA’s Certificate of Cloud Security Knowledge (CCSK) is an worthy step in addressing these issues by demonstrating the IT professionals’ understanding of Cloud security challenges and the best practices that will potentially lead to improved trust and increased use of the Cloud services and attributes.

Another question is: are universities beginning to realize the potential of Cloud Computing to enhance their own research and education mission?

Speaking at a recent ‘inside government’ forum on Cloud Computing in the public sector, Rachel Bruce, the Innovation Director for digital infrastructure of the UK’s influential Joint Information Systems Committee (JISC) said: “There is a compelling case for using the Cloud for research. It’s clear that universities need the right infrastructure for the right job, and hybrid infrastructure with local and public provision is required. But investment in the Cloud is often driven by cost - so Cloud Computing is a particularly attractive option for smaller institutions who can’t afford to replace their physical hardware to do the same job.”

Rachel went on to describe some of the compelling reasons that universities are increasingly looking to use the Cloud for their research and education:

- Reduce environmental and financial costs - where functions are only needed for short periods, for example
- Share the load - when a university is working with a partner organization so that neither organization need develop or maintain a physical infrastructure

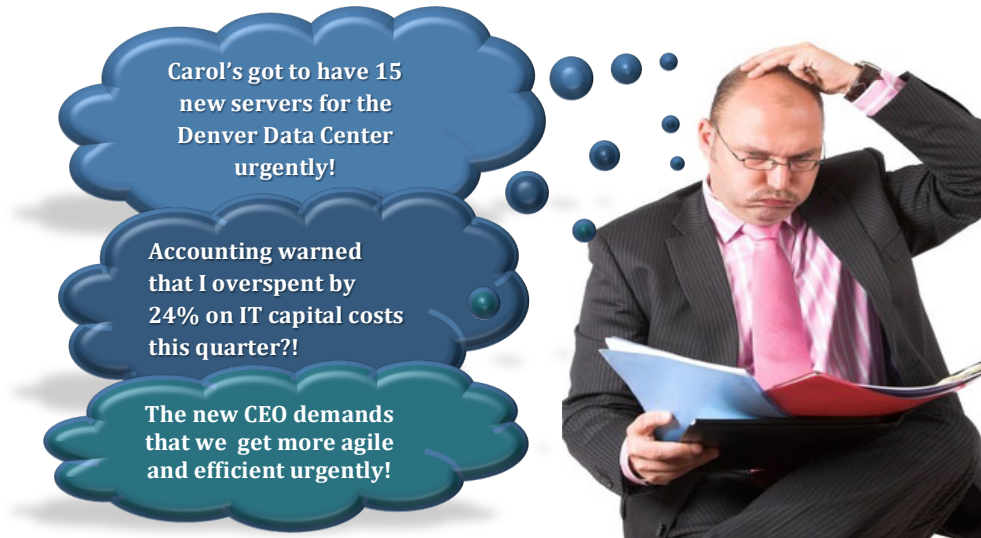
- Be flexible and pay as you go – researchers and lecturers may need to use specialized Web-based software that cannot be supported by in-house facilities or policies
- Access data centers, Web applications and services from any location
- Make experiments more repeatable - write-ups of science experiments performed in the Cloud can contain reference to Cloud applications like a virtual machine, making the experiment easier to replicate

Malcolm Read, executive secretary of the JISC, in supporting the assertions in Rachel Bruce's speech pleaded for more investment in Cloud Computing. "It's essential that we prioritize. Cloud Computing so we can give universities access to economies of scale which offers real financial benefits – as well as the potential to improve your carbon footprint and deal more flexibly with the changing needs of students and staff in the fast-moving university environment."

Here are three instances where IT companies have stepped-up to partner with universities to address the need for internal Cloud Computing research and education capabilities.

1. In May 2011 Red Hat announced that it has expanded its Cloud Computing technology partnership with the University of Wisconsin-Madison.
2. In July 2011 Indiana University and Citrix Systems announced a partnership to create a "Personal Cloud" for students, faculty, and staff. Users will be able to access applications and data from any computer, tablet, or smartphone.
3. The University of Texas and SunGard Availability Services have agreed to be partners on a Cloud Computing research center. SunGard Availability Services plans to make a "high six-figure" investment in the center starting in November 2011.

I made this comment at the commencement of this section of the White Paper ... "Cloud Computing technical training has grown at many universities." Certainly the highlighted endeavors described herein are anecdotal evidence that the limitless benefits of Cloud Computing to universities and their students, the future IT leaders, are beginning to sprout in recognition and scope.



11:30 AM: The bi-weekly Finance Steering Committee meeting

Cloud business decision-making

Every day promises of Cloud Computing's higher accessibility, availability, and efficiency are exhorting businesses and government agencies to consider Cloud-based services. The financial benefits stemming from the efficiency argument alone will likely resonate even more today in a down economy.

Many Cloud Computing consultants find that conversations around Cloud Computing with their clients can be awkward and messy, because of the misperceptions at the CEO, CFO and in many instances, at the CIO level on how to specifically utilize the technology to focus on and solve real everyday business issues. These executives often admit that they question or doubt their current level of Cloud Computing knowledge; and whether it will significantly contribute to them making smart, effective and ultimately successful "bet-your-business" Cloud Computing decisions.

To these executives growing the business is, and will always be, the prime motivator. They must first, foremost and continually:

- Appreciate that they will only arrive at Cloud Computing success when the business decisions drive the technology decisions!

Then they must ...

- Be able to answer the question ... "Where is my data?" This is probably the most fundamental question because it impacts many of the remaining questions and business decisions on Cloud Computing.

- Learn where, when and how Cloud Computing can help.
- Understand the risks and benefits of the Cloud decisions they make.
- Develop an appreciation of Cloud Computing's ability to attack accounting woes such as ensuring a clear correlation between costs and value .
- Gather information on and carefully study what Cloud Services are available. Cloud Services are those consulting services provided by independent consulting organizations or by Cloud Service Providers (CSP) to facilitate migration to the Cloud and the management of the Cloud for their business.
- Be familiar with Cloud security practices; and the specifics of how their data is protected. They must ensure that their Cloud Service Providers (CSP) infrastructure, personnel, policies, and procedures will enable them to provide the appropriate level of security.
- Recognize their businesses computing performance demands and be certain that [a] the Cloud service will be fast enough to meet response time goals and [b] be able to react quickly to business-driven change.
- Identify the businesses uptime needs; when their systems must be available for them and their customers.
- Be aware that they don't have the same control over [a] the data in the Cloud, [b] the data-in-motion across the Internet and [c] the data within their chosen CSPs facility.

Now the inescapable question must be asked ... what are our universities doing to provide future CEOs, CFOs, COOs and other business leaders with the knowledge and skills to ensure that they arrive at Cloud Computing success when their business decisions effectively drive the technology decisions? Following are some exemplars of an initial "groundswell" of both recognition and activity to satisfy this *sine qua non* for business.

IBM is clearly supporting and encouraging the need for developing and deploying this genre of business training in their 2010 White Paper "Getting Cloud Computing Right; The key to business success in a cloud adoption".

There is also recognition and activity at the Federal Government level. The Office of Management and Budget (OMB), the group that oversees the activities of federal agencies in the United States, will require agencies to adopt Cloud solutions by June 2012. The Graduate School USA is a premier provider of adult learning opportunities for federal, state and local government professionals as well as many individuals in the private sector. It, in partnership with GovernmentCIO, now offers

a series of Cloud Computing courses to assist IT professionals, acquisitions professionals, and project managers at federal agencies in determining Cloud solutions for their agencies.

In his thoughtful and powerful White Paper, “Cloud Computing in the Curricula of Schools of Computer Science and Information Systems” (*Information Systems Educators Conference 2010 Nashville, TN*) James P. Lawler, the associate professor of information systems in the Ivan G. Seidenberg School of Computer Science and Information Systems at Pace University, defined a very detailed and logical learning model for a curriculum that delivers Cloud Computing business acumen to IT technologists. The selected quotations from Professor Lawler’s WP convey indelible support for the need for a “business first” approach:

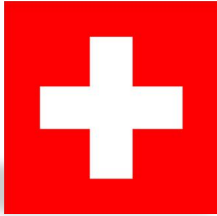
- “Though the cloud currently is immature in methodology, this study defines a model program by which computer science and information systems students can learn needed skills in Cloud Computing strategy and technology.”
- “The study emphasizes problem-solving skills relative to elements of performance, process and security of Cloud Computing systems that are limiting investment in the Cloud Computing paradigm.”
- “Firms have to include particular process requirements in ‘cloudification’ initiatives, so that innovation investment is maximized on the Cloud.”
- “Literature indicates a movement of the profession from the technical requirements to business process requirements. Technologists have to learn more business skills than technical skills.”
- “The model program is formulated on the implication that students might learn more business skills, along with the nuts and bolts of the technology.”

Several research directions provided very scant information regarding university business school curriculums that offered Cloud Computing related or specific business decision-making skills and knowledge.

Deeper searches into specific business school curriculums at the course content description level also did not provide much more enlightenment. This is not to say naught on the topic is offered; it might well be a learning component of the “Business Management” and “Information Technology” modules.

It is evident from the research that it is vital that this learning essential must elevate rapidly in scope, value and availability throughout our universities. Cloud Computing will substantively re-shape business; we must give the future decision makers the skill, knowledge and assurance to use it as a business growth tool.

Who should the universities turn to for help?



Given the obvious need for rapidly tackling the provisioning of this prerequisite, it is strongly recommended that universities take the fullest advantage of currently available Cloud Computing business focused training. There are several Cloud consulting and services companies who have realized that their clients must have this knowledge to make sound Cloud business decisions; and already have courses to fulfill the need. Most of these companies would be more than willing to reach a mutually beneficial agreement to help universities get a head-start. It is further recommended that the training must initially be “business Swiss” ... that’s vendor-neutral! Vendor bias early in the students’ knowledge quest may be a severe restrictor to distinguishing all the Cloud’s potential in direct relationship to their organization’s unique business needs. When inaugurating the student’s Cloud Computing learning journey, wholesome knowledge fiber is much more important than knowledge flavor!

Universities are encouraged to visit Cloud Computing consultants and services provider’s Websites and intensely investigate the learning on offer and the qualification of their learning designers, developers and facilitators. Devote time to understanding the courses’ modules and how they blend with, and will contribute directly to the existing business curriculums.

Devote abundant time and due diligence to researching these Cloud Computing training offerings. Find courses that will successively and logically take the students on the business decision to technology journey. Delve deeply into the course content; not just the training’s marketing hyperbole.

Beware; in some instances Cloud Computing courses have a shallow “the Cloud is great ... and you will love it!” first module then dive with delight into what technology the organization is principally trying to peddle. There will be ample time later in a logical learning sequence to acquire the necessary “brand name” technical knowledge on Cloud models, types, services and solutions.

A summary and conclusions; with a clarion call!

The Cloud
will help
students
grasp
success!



Cloud Computing technical training has legitimately become inclusive in the “mainstream” of IT curriculums at many universities and other institutions of professional training. Certainly the highlighted endeavors described herein are robust anecdotal evidence that the limitless benefits of Cloud Computing to universities and their students, the future IT leaders, are beginning to sprout in recognition and scope.

It is evident that the Cloud Computing learning imperative must elevate rapidly in scope, value and availability throughout our universities. Cloud Computing will substantively re-shape business; we must give the future decision makers the skill, knowledge and assurance to use it as a business growth tool.

The time for rapidly tackling the provisioning of this prerequisite is right now! It is again strongly recommended that universities take the fullest advantage of currently accessible Cloud Computing business focused training to swiftly grow their curriculums to meet this need.

On the other side of the equation, the Cloud consulting and services companies need to immediately become part of the solution. They are encouraged to seek opportunities to offer the universities their existing courses to provision the Cloud Computing curriculums ... technical; and uniquely business decision oriented.

It is a quest we must grasp with speed and alacrity ... to provide future business leaders with the knowledge and skills to address and resolve real underlying business problems like these:

- A growth in the demand for computer resources
- Increasing ability and agility to take advantage of new technologies
- The growth in power, air conditioning, and space needs
- A dramatic drain on finances and people
- The need for constant agility to stay ahead of the competition

Today the status quo is a “no-no” We must get the student’s heads into the Cloud!

Author Biography

David Wesley Tonkin is a proven and award winning entrepreneurial training thought leader and strategist. He is expert in identifying critical knowledge and skill needs and initiating ingenious time and cost-effective learning solutions that energize and boost employee and organizational performance. He is currently Vice President, Purposeful Clouds Academy. In his prior assignment David was the Director of Training Design and Development for the Unisys Corporation's Technology Consulting and Information Systems business unit. In this role he developed the training strategy, learning designs and substantial content for instructor-led, Web-based and e-Learning Cloud Computing courses for technical, services, and sales delivery professionals worldwide.



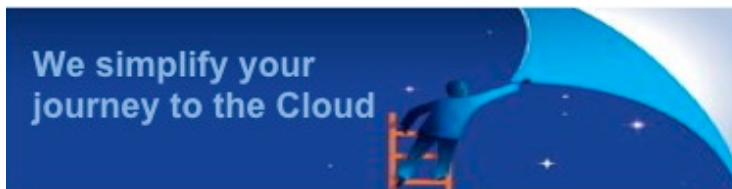
In 2008 David and his team were honored with the “Excellence and Innovation in Corporate Learning” Award at the 9th Annual Corporate University Xchange Awards. This coveted and prestigious worldwide tribute is co-sponsored by The Wharton School of Business and Training Magazine.

David's passion for, and dedication to, business training effectiveness will ensure that the Purposeful Cloud customer's specific knowledge and skills needs will motivate and guide every offering in the Purposeful Clouds Academy's curriculum.

About Purposeful Clouds

Purposeful Clouds (<http://www.purposefulclouds.com>) provides customized and standard consulting and training services to large and small organizations looking to improve agility, reduce aggravation and save significantly on IT costs by using Cloud Computing technology. These organizations rely on Purposeful Clouds experts to simplify their journey to the Cloud as they securely transition their business, processes, and applications to the Cloud or build and grow new Cloud business and related services. Because Purposeful Clouds is vendor neutral, they select the best-in-class combination of open or proprietary technologies, products, services and Cloud Service Providers. Purposeful Clouds services cover all phases of planning, implementation, on-going support, and reviews plus an all-encompassing training array to meet their client's specific short and long-term business and technology needs.

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