

IT Executive Exchange

Emerging Technologies (ETs)

Executive Summary

With the speed, complexity, variety, and sheer volume of new technologies that appear every year, firms use a variety of techniques to track what is happening. Communities of practice dedicated to following certain technology areas and rotation of developers through R&D roles may help develop a culture that embraces innovation. While IT should have the expertise to lead the business side to new technologies, evaluate how they fit into the existing infrastructure, and help develop business cases for them, the business side should provide the actual justification (be it ROI or not), for their use. Firms should be ready to pull the plug on pilot projects that are not working out. Among the list of new technologies discussed was Service Oriented Architecture, which can involve reuse of internally created objects and use of objects created by others, including major vendors such as SAP and Oracle.

The IT Executive Exchange (ITEE) is a group of IT Executives and College of Business Administration professors at The University of Akron that meets about every six weeks to discuss pressing and leading edge IT issues faced by IT executives. The purpose of this forum is to have a healthy exchange of ideas that will be useful to all attendees. It is sponsored by the Center for Information Technologies and eBusiness (CITE) of The University of Akron's College of Business Administration. For previous topics and summaries, refer to <http://cite.uakron.edu>

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Complete Summary of the Session

Definitions: Although the group did not specifically address the question of what distinguishes an emerging technology from a more mature one, one of the participants said that an ET is “anything that we do not have.” The list of technologies that was mentioned during the course of the discussion ranges from well-known devices, such as tablet PCs, to developments that are just gaining commercial traction. No one was talking about following laboratory-type developments.

General agreement: it’s impossible to keep up with all the emerging technologies, especially when IT can have responsibility for everything from copy machines to the phone system.

How do companies get information about emerging technologies?

- Exposure to conferences
 - Comdex used to be a great place to find out about everything that is new in the IT world. Now that it has morphed into the consumer electronics show, interest among out IT Exchange group has greatly diminished.
 - According to one participant, the general Gartner conferences are “a waste of time” because they are too generic. Another participant found that going to the more specific Gartner conference on data centers was worthwhile
- Reports from marketing research firms such as Gartner Group
 - Valuable for getting a bigger picture about where the market is heading. Gartner can open the mind to multiple disciplines.
 - Valuable for justifying why certain vendors are good candidates, even if on the surface they appear to be too new, small, etc.
 - One case was cited on using the supply chain firm I2 a few years back. At the time I2 appeared to be very healthy, and got a good report from Gartner. However, within a year the firm had disintegrated and never delivered anything it promised.
 - For a couple of the companies present, Gartner has priced themselves out of the range that these companies can justify. \$100,000 per year is too expensive.
 - An ideal way to use Gartner is to get them to come to your company directly for a consultation. That ensures that their analysis is much more specific to your needs, rather than being too generic, as it can be in some reports.
- Discussions from counterparts in other firms, even competitors
 - One example was cited where the marketing department of one firm observed what the marketing department of another firm was doing. The other firm was distributing advertising using RSS as a means of bypassing SPAM filters on emails.
 - The implication, not stated explicitly, is that IT may need to play the role of doing some competitive intelligence to see what new technologies the competition is trying to role out.
- Discussions with vendors
 - One participant recommended inviting vendors for meetings at which the vendors disclose their near term plans for new packages and releases. This can be done if your firm signs a non-disclosure agreement with the firm. The Kellogg School of

Management was able to do this, bringing a number of vendors into a roundtable discussion.

- Vendors are not shy about presenting their developments, especially to your end users. You have to weed out what may be vaporware (software the vendor may or may not end up really building and selling), however.
- Discussions with end users
 - In one firm with a heavy engineering orientation, end users are quite savvy about IT. They may receive information about new developments from vendors or from conferences. They come back and are all enthusiastic about it, but then IT has to figure out if it will work or not.

Emerging technologies (ETs)

During the course of the discussion several ETs were raised as examples or mentioned explicitly as technologies that are being followed.

- Fiber into the home, making possible the transmission of very large quantities of video and information
- Podcasting professors' lectures or other marketing materials
- Development tools: Coding, Quality & Assurance
- Infrastructure Management Tools
- Hardware such as tablet and convertible machines
- Providing a single mobile device that has everything on it.
 - This keeps the communications flow going all day, rather than having the sales rep wait until evening to put everything into a laptop.
- Microsoft SharePoint Portal for collaboration for the whole workforce, here and abroad
- VOIP
- E-signatures, allowing some customers to perform complicated transactions completely and wholly without human interaction over the web
- Rich client technologies, to provide Flash experiences that are generated in real-time like HTML can be. Flash sites cannot be handcrafted.
- Customer data management systems
 - It turns out that there are big savings to be had by improving data quality. There are firms now that offer services to continually upgrade customer data with corrected and updated information
- Web services and web services registry internally, Service Oriented Architecture
- Virtual servers, where there are numerous logical servers being implemented in one box, also server farms that have 1000s of identical servers in them

What are mature technologies here may not be mature technologies abroad. Problems related to this can be especially difficult in China. One firm was trying to get a broadband connection in Beijing. It was working with China Unicom (CU). CU sold them a 20MBps connection, but they tested it and felt they were getting only 5MBps. However, CU had no service for documenting the speeds, and refused to accept this firm's claim. In another example, a T-Mobile phone that worked fine in Europe worked very poorly here. The reverse can also be true, and executives are still forced to carry two phones.

Who Should Drive New Developments? The Business Side, or IT?

There was a lot of discussion about how important it is to let the business side drive what types of new technologies should be explored. A strong case was made for using the following paradigm: Understand what the business problem is, then what technological solutions may address it, then investigate which firms are starting to put forth workable implementations. Do not put the technology cart before the business problem horse. One example cited was the case of a firm that wanted to roll out a new product on a global basis, but it was too expensive to fly out sales people to do it in person, especially at first. They needed to be able to demonstrate this product using text and video over the web. The need for this intensive information support in the sales process led them to become an early adopter of WebX technology, such as could be used for real-time virtual meetings, as a means of leveraging sales talent and supplying video in the field. This was successful because they had a business problem driving the technology adoption.

A problem with the method can be if a senior executive requests a technology innovation for inadequate reasons. They proverbial example was given of a CEO who sees a new device in an airplane magazine and has to have one the next day was cited. (E.g., the executive sees a Treo 700, which is a pocket device. Everything in the firm is now oriented towards phone devices. But the executive wants it.) Sometimes IT can get stuck with investigating a new technology for what seem to be the wrong reasons.

Because of the amount of potential topics to follow, decisions must be made to try to follow only technologies that will help the bottom line of the business. In the case of one participant, this meant figuring out ways to lower operating costs, share networks and services with other institutions as possible, and outsource technology like email. (This underscores the definition of emerging technologies as those we don't have yet.)

Who should lead the process? IT or the business side? One participant expressed the strong preference for IT to lead. It should be perceived as carrying out a "consultative" role. It is not good if IT is perceived as a necessary evil. This leads to situations where CIOs do not stay around very long.

Who pays for ET?

A question that soon emerged in our discussion was who should pay for researching, piloting, and deploying new technologies in the firm. Several opinions were expressed about the necessity of showing a business case with explicit return-on-investment (ROI) numbers for the new technologies.

In one example cited, many UNIX boxes were being installed in various places in the firm (they were popping up like "rabbits"). A rational ROI model was needed to guide this investment. Who should pay for it? Business units had to pay for applications related stuff, and had to have an ROI for it. IT paid for the infrastructure stuff, but this also had to have an ROI. Then the IT group was treated as any group was who wanted to request funding for IT projects. However, IT also then had to research and help develop some of the other proposed systems.

There was some discussion about whether ROI is possible to calculate for infrastructure. This speaker said that it is, others said that it is (at least) not easy. A distinction was made between quantitative and qualitative benefits. A difficult case was placing a value on saving five minutes a day for each employee through, for example, a single log-on. There seemed to be general agreement that valuing such savings is hard. Dr. Vijayaraman mentioned an article by Peter Keen that talks about placing a value on quantitative and qualitative IT benefits.¹

A distinction was made between technology for internal use and technology that has a direct line to customers (for example, for customer service reps and agents). In the latter case funding can be abundant. But for the back office there may be no need to upgrade. In one example, a firm took an especially long time to upgrade to the latest version of Lotus Notes.

Another member of the group said that a very successful model was when users had to fund new developments. IT would help them put together the case and would be present with them (seated behind them) at the budget meeting before the capital committee, which happened monthly. They would create a “checkbook” at the beginning of the year for all the IT developments, but only through this allocation process would money from the checkbook actually be spent. The key to making the process work was that six months after the system was up and running top management would revisit the business case and ask the business side to justify to what extent it had realized the benefits that were included in the case. Knowing that this was going to happen was a powerful incentive for doing a good job on putting together business cases.

Another firm has a similar process, except that the “capital committee” meets only once per year. IT helps the users create the business cases in this firm as well. It helps when it is possible to see the cross-departmental impact of all of these requests on the IT budget. That’s a time when some requests will be “whacked.”

It is important to understand the ongoing costs that the technology would generate. One firm would do estimates of this for five years out. It is not enough to understand what the technology costs today. Vendors do not do a very good job of helping you to estimate ongoing costs. In fact, it may be in their interests to conceal from you what those costs may be. So you should find the earliest adopters of the technology and ask them what their costs have been. In some cases it is possible to get briefings from firms about their technological directions if you are willing to sign non-disclosure agreements. This can give you a six-month edge on the competition.

Along these lines you have to ask when the technology may break even. For example, let’s say you are considering putting in blade servers. But it turns out that in order to achieve a cost savings, you would have to purchase a large number of them (this participant cited the threshold of 40). So you can’t be putting in new technology just because it is a new toy, just because you want to be able to brag that you have it.

An example of a company that lets new ideas co-exist with ROI is Citi.

¹ See Peter Keen, “The Search For IT Value. Forget About ROI: Think About Business Process Cycle Time,” January, 2003, http://www.peterkeen.com/recent/articles/z_bpm_roi.htm.

Institutionalizing discovery and exploitation of ETs

In a firm with a larger number of IT personnel, good ideas get “R&D’ed.” ROI is not on the business units in this case. They “have a bucket.” But the R&D work is not done by an isolated group. Sooner or later such people tend to drift away from understanding real business needs. So they are rotated. A developer might do a three month R&D project but then be shifted back into development. The goal is “insightful innovation” that will fit reasonably well into what they already have. This leads to a culture of innovation in this firm that places a premium on knowing about new developments.

Another firm is now beginning to use the following scheme. They will take a developer, maybe one or two from the technical infrastructure, and a governance person, and this group will be charged with following specific technology areas. (This is like a community of practice, except for the fact that the members of the team are assigned.) This idea is about to be piloted at this firm. In the meantime they have had a council for the development of coding standards. This amounts to the lead developers in each of three functional areas regularly sharing with each other their best practices in coding and development. This firm has a relatively small IT staff (less than 100 IT personnel). This council was described as being a “marginal” success.

In a firm with a relatively small IT shop, standards play a large role. If the users want something that runs on a platform that is not currently supported, that would be an immediate red flag and would have to be looked at very carefully. If the end users are passionate enough about it, they will try to make the case for it. There are architectural standards that are published. Not everyone necessarily knows about them, but there are power users in the various groups that do. An example was that someone in the finance department wanted to get new software that would help with compliance. IT helped her to put together a business case that took into account all of the associated costs. When this was finished she experienced sticker shock, because the cost was much more than she had thought it would be.

Running Pilot Projects

You should be ready to pull the plug if a pilot is not working. One firm did a pilot run on Take-to-Me technology (click on an icon on the web site and start talking to a representative). They believed in the technology so much that they let the pilot run for a year. However, it just did not get much use by the end users. So they killed it. After 18 months, they started seeing it being used by other firms with more success, so they brought it back. It is now successful for them. Moral of the story: hit the market with the new technology at the right time. Ironically, the pilot they did may have spurred other firms to follow suit, and those firms launched just when this firm withdrew the technology. Also, make sure that if you do kill a project, you do not discard the documentation but keep it in a useable form in case it should be revived later.

A pilot at another firm of tablet PCs consisted of giving them to two salespeople and then doing in depth interviews with them to find out how valuable they really were.

One firm is working on a pilot project for Service Oriented Architecture (SOA). They will have one group building reusable services, and then will test out how much these are adopted by other

groups. This has to be done as a pilot because the eventual cost could be in the millions if they go to this model. They will spend \$50K on the pilot. They will use whatever open source software works in order to get the pilot running, even though they would not use this software in a production environment. The pilot will last for a 3-6 month time frame. This description led to a more extensive discussion of SOA.

Service Oriented Architecture (SOA)

There was such a great deal of interest in this topic, that we decided to make it the topic of the next IT Exchange meeting. There was a lot of discussion about what SOA really is. Is it about reuse of objects you develop yourself, or about using objects developed by outsiders? SAP and Oracle are moving towards SOA, so this is a trend that seems to have some inevitability attached to it.

Objects others create. One firm gave an example of what can be done with a web service and why they are necessary. This firm was reselling IBM equipment. They needed to be able to tell their customers the status of the systems they sold on the IBM manufacturing floor. So they used a web service to pull the data out of IBM's information system. To do this seemed to be pretty complex. On the other hand, it may be true that a lot of the components needed to do SOA are already present in industry standard software [WKM: I assume this was a reference to Microsoft software.]

A big challenge of SOA is who owns the objects. An economic model has to be created to make this work. Dr. McHenry spoke about Nicholas Carr, a former Harvard Business review associate editor. He is making the case that computing will be like a utility in the future.² IT shops within companies will disappear. Web services are the cornerstone of making this happen.

SOA will certainly stretch security. How to know that any given web service can be trusted?

Objects you create yourself. An example of this is the pilot that is described above. This is a firm with a fairly decentralized model. It was stated that SOA requires more centralized control. At least the management team has to make SOA the core principle. Only then will it be implemented. However, Schwab was cited as a company that was very decentralized. They had redundant maintenance going on all over the enterprise. Using SOA there proved to be particularly effective.

There was skepticism about the ability to get "hotshot" developers to use code written by other people.

² See Nicholas Carr, "Why IT Doesn't Matter," *Harvard Business Review*, Vol. 81, No. 5, May 2003; The End of Corporate Computing, *MIT Sloan Management Review*, Spring, 2005; *Does IT Matter? Information Technology and the Corrosion of Competitive Advantage*, 2004: Harvard Business School Press, and his blog at: <http://www.nicholasgarr.com>