



The Man Who Would Change Microsoft: Ray Ozzie's Vision for Connected Software

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Ray Ozzie has a long and storied history of technological innovation, with accomplishments that include creating Lotus Notes and founding Groove Networks. But Ozzie may now be facing the most daunting challenge of his career: coordinating the work of Microsoft's various product groups to keep the world's largest software company agile enough to address the challenge of the next generation of Internet-enabled software.

It would have been difficult to predict the events that led Ozzie to this point. Growing up in and around Chicago, the middle of three children, Ozzie liked to build things, and was more interested in constructing model train layouts and assembling cool electronic contraptions than he was in schoolwork. He was, of course, a member of the audio-visual squad in his Park Ridge, Ill., high school. It was during his freshman year there that Ozzie stumbled upon his first computer -- an encounter that would set him on the path to his future career.

But the moment that transformed Ozzie's view of the power of technology came somewhat later, when he was studying for his bachelor's degree in computer science at the University of Illinois at Urbana-Champaign. It was there that Ozzie discovered the PLATO project, an early experiment to harness the power of networked computing for rich communication and group collaboration. By the mid-1970s, PLATO's many features included email and an instant messaging feature dubbed "Talk-O-Matic." Ozzie wrangled a job working on the project, and, while doing so, communicated online with a collaborator who worked remotely from off-campus. Ozzie was impressed by the eloquence and intelligence of his offsite workmate and the two quickly bonded. Ozzie's only complaint was that when they sent instant messages to each other, his offsite colleague was a frustratingly slow typist.

After their joint project was completed, Ozzie met his remote partner in person for the first time during a party at the partner's house in 1975. Only then did Ozzie discover that his colleague was a quadriplegic, bound to a wheelchair, whose slow typing was a result of having to interact with the keyboard using a stick held in his mouth.

The incident had a profound effect on Ozzie. He was struck by how the technology allowed them to connect so closely, despite physical constraints and without preconceived judgments. The two had met in a shared mental space that was uniquely enabled by networked technology.

Much of Ozzie's work since that day has centered on exploring how technology can allow people to connect and collaborate online. He created what would become Lotus Notes, one of the first commercially successful "groupware" applications. Following the acquisition of Lotus by IBM, Ozzie left to found Groove Networks where he developed a new generation of desktop collaboration software. When Groove Networks was acquired by Microsoft in April 2005, Ozzie joined Microsoft as a chief technical officer. On June 15, 2006, Ozzie was given the title formerly held by Microsoft founder Bill



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Gates of chief software architect. Gates remains Microsoft's chairman.

At Microsoft, Ozzie has led the company's "Live" initiative, focused on supplementing Microsoft's traditional desktop applications with web-based software and services. But his mission is much broader: to make sure the company's various product groups coordinate their efforts to take advantage of what he termed -- in a now famous memo sent to Microsoft's executive staff on October 28, 2005 -- the "Internet services disruption."

Accomplishing this feat won't be easy, in part because Microsoft is facing challenges on multiple fronts -- technical, business and cultural. New cross-platform technologies threaten to establish a new layer of abstraction that could reduce the importance of the operating system as a software development platform. Emerging business models -- such as open-source software and "free" advertising-supported applications -- threaten to undermine the economic basis for Microsoft's longstanding success. And while Microsoft's size provides it with enormous resources, some wonder whether this may make it difficult for the company to remain agile enough to break from its past successes and address these new challenges.

That's where Ozzie comes in. To keep Microsoft aligned with his vision of a connected future, he will have to work closely with the heads of Microsoft's various product groups, as well as with CEO Steve Ballmer. And the contrasts between Ballmer and Ozzie couldn't be more dramatic. Ballmer is animated and boisterous; Ozzie is quiet and thoughtful. Ballmer is, as he stated during a recent presentation at Wharton, "a salesman at heart"; Ozzie characterizes himself as "a technologist." Ever the geek, Ozzie has a black T-shirt displayed above this desk with bold lettering that reads: "Hack is not a four-letter word."

But Ozzie's soft-spoken Midwestern gentility and nuanced view of the world may be just what is needed to work across Microsoft's various product groups. Without direct management authority for many of these units, he will have to lead indirectly, by communicating his vision of the future of networked computing. He will have to do what he's been focusing on for most of his career -- using technology to connect with others.

Knowledge@Wharton recently met with Ozzie in his office on Microsoft's Redmond, Wash., campus to talk about the challenges facing Microsoft and his vision of how the Internet will connect the software products and hardware devices of the future. An edited version of the conversation follows.

Knowledge@Wharton: You've been a Microsoft employee now for roughly two years. What has surprised you most about the company?

Ozzie: I can't say that anything has surprised me. I knew what the company was like because I had been doing business in one way, shape, or form with it since the early 1980s.

What is breathtaking to me, once inside, is the scope and the number of initiatives that are being undertaken in parallel by all of [Microsoft's product] groups. It's a much more nuanced business than I had appreciated. You can know something intellectually, but when you actually see it and get a chance to interact with the groups, it's [quite] interesting.

Knowledge@Wharton: About a year ago you were made chief software architect, the title Bill Gates formerly held. What do you do in that role?

Ozzie: It's a fascinating role, which Bill created after he stepped down as CEO some years back. It serves a unique function that's necessitated by the breadth of the company. The first task is to bridge the different groups [within Microsoft]. I might see something going on within one group that another group might be able to take advantage of that [might not be visible] from their vantage point within a division. So, in essence, it's an architect one level up.

The same thing pertains to market strategy and business strategy. I may be able to see these different products and how they could come together to solve an opportunity in the market that [the individual product groups] might not otherwise recognize. It's a role that sits at the juncture of technology and market and business strategy -- all put together.

Knowledge@Wharton: You mentioned how big and diverse Microsoft is. One issue with a company of this size is focus. What are the two or three things that Microsoft has to stay focused on for the next few years?

Ozzie: In any successful enterprise you have to "keep the trains running on time," as your primary obligation to shareholders and to the market. The biggest, most significant businesses that Microsoft has are the Windows business and the Office business, although the server and tools business is growing fairly rapidly. Those businesses need to continue to innovate, but I'll say innovate with a "small i."

It's essential that [Microsoft] continue to understand its customer requirements and to advance those products in a way that isn't just at the margin. For example, the Office business [is really] the "productivity" business. So, they have an obligation to continue innovating around what people do in managing documents, meetings, projects and so on.

There's tremendous opportunity because of the changing nature of work -- the fact that organizations are increasingly distributed, the fact that we work at home so much now. There are lots of opportunities for innovation in that realm.

And then on the Windows side, there is continued opportunity because of how hardware is changing. Disks continue to get bigger, there are [features] like flash memory that might fundamentally impact the performance of laptops and PCs, bandwidth continues to increase, screens continue to be reshaped, natural input such as cameras and voice continue to be important. Everyone finds battery life to be a challenge, particularly when you fly five or six hours and you're trying to work. There's a lot of innovation that can happen within the OS, working cooperatively with the hardware and driver vendors, to extend battery life.

These are just innovations within the core of what those products are intended to do. Then you step back and say, "Environmentally, what is changing that might fundamentally reshape these things?" And that's why I separated the "small i" from the "big I" of innovation. As long as I've been in this industry, every five, six, or seven years there has been some fundamental change in the environment that gives one the opportunity to step back and say, "Could we serve those needs in a dramatically different way?" Today that really is all around services.

Knowledge@Wharton: What are the "big I" innovations you see? What are the areas where you see fundamental change that will have a significant impact on Microsoft's products?

Ozzie: [It comes back to] some of things I talked about earlier: Computation is improving dramatically; we now have multi-core processors and soon we're going to have many-core processors. Storage improvements continue unabated. Broadband is becoming increasingly pervasive -- I want to say that respectfully to people in rural areas and others who don't necessarily enjoy the benefits of high bandwidth. But the fact that so many people have high bandwidth [lets] us figure out how to balance what part of an application should be in a data center -- somewhere "in the cloud" -- and what piece of that solution should be on a desktop or on a mobile device. The right balance varies based on the application.

But that balance is far different moving forward than it has been in the past. When you have a very thin straw to a service, you tend to balance things differently than when it's a higher bandwidth pipe.

So each group within Microsoft -- and in our industry -- is at a point where we should be saying, "If we're aspiring to deliver productivity to a customer, how should we best weave that into services that are deployed through a browser? What aspects do you want mobile? What kind of synchronization should automatically be built in? Should I use the camera in that mobile device to snap a picture of the white board and have it automatically go up to the service and integrate it with the other documents related to this meeting that I'm working on?"

In each solution within our business, the people who are running those businesses should look at their customers and say, "Given these new tools at my customers' disposal, how should we reshape this?" And I think that is potentially disruptive innovation in a positive way.

Knowledge@Wharton: You've mentioned services several times. That's a term we hear a lot in the industry, but it means different things to different people. The common industry term is "software *as a service*," where people are talking about delivering applications over the web as opposed to traditional desktop-installed applications. When Microsoft people speak, we usually hear them say "software *and services*." How do you see services? Do you embrace the Salesforce.com "no software" model or do you see it differently?

Ozzie: When we, as an industry, communicate the meaning of an architectural shift to customers, sometimes it's great to take an extreme position because it helps people to understand the benefit of this new era. In first generation "software as a service," people tried to push the browser as far as it could go.

But the most important mission of vendors is to figure out what value they are delivering, not how they are delivering it. If you look at people like Salesforce.com, they may talk "software as a service" being [exclusively] through a browser, but they have an offline edition.

People need to work in a mobile manner. It might be sales force automation or some other aspect of CRM [customer relationship management]. [People] might use Outlook when they're driving around; they might want to open up their laptop and type something in. They might use a mobile device and have spotty coverage and want to be able to use [the application] offline.

What we as an industry need to deliver are seamless experiences -- however those things are accomplished -- to do the appropriate thing in the browser and the appropriate thing on a laptop or on a device to solve that problem.

So the way I view it is, first generation "software as a service" really just meant browser. Second generation means weave together hardware, software and services to accomplish a specific solution.

The iPod is a great example of that. You have hardware, the embedded software on the device and an associated [online] service. The BlackBerry is another great example [of the combination of] hardware, software and service. The Xbox is a terrific example -- you've got amazing software in the games, hardware to support it and Xbox Live as a service.

Does that mean all solutions have to involve hardware and software services? No. There are going to be many things that are perfectly good to deliver in a browser. There are also going to be many software [applications] that are standalone, which will have only a little piece up on the service. But I think it benefits the customer to think of it holistically.

Knowledge@Wharton: Isn't the dividing line between what happens in the browser versus what happens on the desktop changing? Google has launched Apps for Your Domain with its Docs and Spreadsheets product. A story [was recently published] that Adobe is planning to do a version of Photoshop online. Aren't things changing quickly? What impact will this have on your products?

Ozzie: Absolutely, things are changing.

As I said before, it gives us the opportunity to revisit what belongs on the service and what doesn't. If you go through many different scenarios, you find out what trade-offs you make by putting it one way or another.

Let me back up to something a little bit different and then come back.

In the realm of media, [for example,] there are some cases where it's very clear that a centralized architecture is the best way to go in the future, where professionally produced movies and videos might have their "master" up on the service. And [the service] either displays them through a browser or delivers them to a locally cached device, whether it's a handheld media player like a Zune or iPod, a media center or cable box, or a TiVo-like DVR. That architecture is more or less treating the center as the master and the edge as the cache.

For personal media -- home videos or pictures you take with your digital camera -- the inverse [architecture] might be right. We have immense storage on our local devices, and we're very comfortable

with them. [The right approach] may be copying those videos or pictures among your home machines and only delivering up into the cloud what you want to share with other family members. You might not upload your whole photo album -- all your terabytes of local media -- to the service. [The service] might be the sharing point. It's almost the inverse of that other model.

I don't believe a single model is going to solve all problems. Computers within an enterprise, for example, are very tethered. In the enterprise model, it might be that running applications off a service with a high bandwidth connection to that desktop is the perfect thing. Some professionals are highly mobile and the best architecture for them is to have things delivered to a mobile device and replicated up to the service.

In the docs and spreadsheets realm, I believe there are certain uses of spreadsheets in particular, where the sharing model [enabled by] using it up on a service could be really useful. I think that there are other scenarios where you want it on your laptop. As a company, Microsoft views this as an opportunity -- to deliver the aggregate productivity value in all places.

Adobe is a great example. Flash is a rich client; it's rich code delivered to the edge. It's not a centralized model; it's a decentralized model. It just happens to be tethered to the service.

If anybody has a software and services model, it's Adobe, because of that rich [Flash Player] applet that they extend the browser with. The more they enhance that, as you can see in their Flex and Apollo plans, the more it becomes this unified software and service vision, which is basically the same as Microsoft's vision.

We've been talking about it mostly from a technology perspective and what that can do for an end user. One of the other big things that [a] services [architecture] does for traditional software companies is change the way that we touch our customers.

The origin of Microsoft was in computer stores, a pure retail environment with shrink-wrapped software. Nowadays, you can go buy some AdWords and drive some traffic to a site. [On that web] page, you [can say to customers,] "Learn what this thing is all about, try it, and buy it." On the web, you can up-sell people based on a very specific value proposition. You can have a very close, interactive customer relationship. You can get them to register, make them more offers and help teach them what value there might be in other products that relate to what they're doing.

This is a *huge* opportunity for Microsoft. We have a tremendous number of users of our products. We have a tremendous number of users who haven't paid for those products and there are a tremendous number of people who have yet to touch our products that might find them to be of value.

The Internet increasingly touches everyone in some way, shape or form. Some people view these technology transitions as a threat, [but] I view them as a market expansion opportunity.

Knowledge@Wharton: Isn't the transformation difficult?

Ozzie: Well, any transformation is difficult. Any transformation in the industry has some risk associated with it, and some opportunity.

When you look at the transformation from mainframes to minis, minis to PCs, PCs to LANs, LANs to the web, the web to where we're going -- which is services -- there were some companies that recognized the threat/opportunity and managed that transition. Some changed their business model and thrived.

Knowledge@Wharton: In the examples you gave of hybrid [web-based and desktop] technologies, you talked about the importance of offline access. Right now, that typically means desktop-installed software. But isn't that changing, too? Tools like Adobe's forthcoming Apollo are built around a web architecture, but with the ability to run locally. So, again, isn't the bar changing? What's Microsoft doing in that space?

Ozzie: Well let me just start by saying that, in my view, we only have one shared future as a software industry. And that is centrally deployed code that has a different lifetime associated with it on the device

it's deployed to.

So, what is HTML or DHTML? Most web pages have JavaScript in them. That's code that is delivered to the client and it has the lifetime of the browser instance you're using. Flash -- what is that? Well, it involves enhancing the browser runtime by downloading code. But it tethers those enhancements to the service and the lifetime of those things is still within the browser. With Apollo, maybe you can make the lifetime that of the user on that device. They have increased the lifetime from the browser instance to the PC.

All apps -- whether Win32 code, Flash code, managed WPF [Windows Presentation Foundation] code -- are going to have those lifetime choices and will all be centrally deployed, whether that central deployment is from an enterprise or from a service provider on the web. The concept of CD-based installs, floppy-based installs or USB stick installs are artifacts of a time when we were not fully connected.

So I don't see radical differences in the approaches that Adobe might be taking, that we're taking, or that the web industry in general is taking. The languages and run-times may be different. And we come at it from a history of the desktop coming up to the web. They are coming from a history of being on the web and going down to the desktop, but the endpoint is the same.

Knowledge@Wharton: In this space, how important is being cross-platform? To what extent will Microsoft be focusing on the Windows environment versus delivering products run on Windows, on Mac, on Linux?

Ozzie: The guidance that we are giving the development community -- and the guidance that we use in-house -- is to look at applications through the following lens: When the business model behind that app means that you have to get it everywhere, we call that the "universal web application pattern." When the most important thing is the *experience* that the user has with that application and you might be willing to trade off the breadth of the web for the richness of that experience, we call that an "experience first pattern."

There's no hard line between the two, but there is some guidance there. It's clear that the ad-based model is a "universal web pattern." The whole business model says, "Pick a technology for building that solution that gets to every eyeball on earth." At the opposite extreme are Windows games and, I believe, the Office Desktop components, which are "experience first." You want to make the experiences as rich as you can and you code to the [Windows] platform in order to do that.

But these are not absolutes. For example, Office is an "experience first" thing, but we do a Mac version and a PC version. The "ubiquitous web" is very important for many of our businesses and we use that also.

Knowledge@Wharton: Microsoft has been fairly aggressive in the area of advertising sponsored products, like search, for some time now, but seems to be having difficulty getting traction. Is this just not in the DNA of the company? Is this a case of the "innovator's dilemma" where the successes Microsoft has had in operating system and productivity software make it difficult to transition to these new business models?

Ozzie: The DNA of the company is software. Let's start there. The mission, as communicated internally for as long as there has been a Microsoft, is that this is increasingly a software-driven world. And the more it's a software-driven world, the more it is consistent with the opportunity that's in the DNA of the company.

We have navigated the waters in different transformations within the industry. Everybody takes for granted now that we're an enterprise server company. [Years ago] there was no presence in enterprise at all. Xbox is fairly successful now. How we transformed game consoles into *connected* game consoles [with the] surrounding online service was truly innovative. Even though [the Sony] PlayStation and [Nintendo] Wii both have net connections, if you look at what people can do with their friends using Xbox online, it's dramatically innovative. And now we're transforming that to include the PC, so PC

people can play against Xbox people. And because the Xbox is connected to your TV, we're using it to deliver HD video.

I believe fundamentally that where there is software opportunity, it *is* consistent with Microsoft's DNA.

Now back to the innovator's dilemma. Whenever someone has a very successful business, there is absolutely a risk of innovator's dilemma. I believe it's too soon to tell whether there is a significant risk of that kind of disruption in [Microsoft's] core businesses -- simply because we're in the early days of understanding the role of web-based productivity versus PC-based productivity.

I am not one to believe that suddenly you snap fingers and everything that you do on the PC is doable on the web. You shouldn't just take things [you do on the PC] and put them [on the web]. You should figure out what they're good for [on the web] and what they are good for [on the PC] and weave them together. Based on my experience, I believe that this represents more opportunity than risk.

I am not saying that change management is easy. It's not. We have a big company. It is a very successful company. People tend to see things from the perspective of what has worked for them in the past. But I think [Microsoft has] a culture of always being a little bit paranoid, always looking out there and adapting. The success of the ad model is something that the company didn't see. It saw search but I don't think it appreciated the power of that ad economic engine writ large.

Is it difficult to compete with somebody who has executed as well in search as Google? Absolutely. We've spent the last few years putting some amazing people on it and the core relevance of search has increased progressively.

But I think you will find that Microsoft will take a different approach toward search than simply trying to copy Google's success. History has shown that any time you have a fairly significant market leader, the best way of competing is not to just simply take the same approach. You have to find your own unique approach. And Microsoft has a number of different ways that we could do that because of the different touch points we have with the market and how people use our products.

Knowledge@Wharton: Does this issue of change get us back to your role? Is it fair to say that part of your function is to be a change agent across the organization?

Ozzie: Yes. I am certainly not the exclusive change agent, but that is a key part of my role, absolutely.

The reason I say it's not just [my role] is anybody in the company who has experience with what we're trying to change plays a key role as a change agent. So, for example, back on services, I expect everyone in the company who has experience in services to help those within the company who have less experience with services understand what it's all about.

In the past, success for a software product was shipping, releasing to manufacturing. Today I refer to that as the "grand opening." It's not when things end, it's when they begin.

It's incumbent upon people within the organization who deal with mobile phones to communicate to others within the company that there are cultures that haven't embraced the PC to the degree that the U.S., Western and developed markets have. If you look at India and China, the phone is the primary access device. How we deliver value to our customers in those markets may be different and those groups need to touch others within the organization in that way.

The entertainment folks [at Microsoft] have great experience in these integrated scenarios. They should be telling stories to help that change management.

Knowledge@Wharton: What seems challenging is this: I assume the people who run those groups have their own P&L [profit and loss] responsibilities...

Ozzie: Absolutely. Yes.

Knowledge@Wharton: ... and when you come in and say, "Well, I have some architectural ideas that in the long run will be a lot better..." Aren't they going to say, "Get out of here, I have to ship my product

and do it quickly and cheaply." How do you balance that architectural vision with the day-to-day responsibilities to get a product out the door on time and at the right price?

Ozzie: There's no single pattern that matches every sub-culture within the company.

The first thing I have to embrace to be successful is to go where people are and help them understand how to reshape themselves for the future on their terms. The Office group has a different culture than the Windows group, [which has a] different culture than the Xbox group. They do development differently; they do planning differently. So that's number one.

Number two is that it's highly social. We have to use a combination of center and edge in order to affect things. I may talk to the leaders of a group and ask them what their plans are. I use storyboarding, so I might map out a storyboard for how I would see things panning out moving forward.

At the same time, the people on my staff work directly with the people within the organization [who work for those] leaders so they can get the message in a less threatening way than having this guy at the top come in.

Things always occur through both leadership and grassroots mechanisms.

Knowledge@Wharton: You mentioned the Xbox. There has been a lot of praise for the fact that the team that developed the Xbox worked somewhat autonomously. The Xbox is not a Windows-based device. If you try to integrate everything, doesn't it create compromises with what is best for specific products? How do you make those judgments?

Ozzie: Well, I'll tell you how I frame it -- which may be differently than some people. I've spent my whole career building software and organizations with one thing in mind -- reducing coordination cost.

The purpose of collaborative software and, in my view, leadership, is to try to figure out the right way of structuring to reduce coordination costs. As systems get bigger, unless you intentionally reduce coordination costs, things explode.

With respect to Xbox, incubation is one way to initially reduce coordination costs. You say, "We're going to do it off to the side." That gives the rest of the organization permission to ignore it, so that's good. It manifests itself in many ways. Some people say, "Wow, what are those guys doing over there? It's really cool." And some people get cynical and go, "Ah, those guys -- there they go again, off doing their own thing." But it reduces coordination costs.

Later, as [the project] becomes more real, people can begin to factor it in and understand the right touch points. But that gives them the freedom to innovate and work without high degrees of coordination.

What tends to be more difficult are centrally mandated [commands] -- "Everyone shall depend on this new thing." There are lots of coordination costs in that.

If you declare that everyone [should] use something that's already fully debugged and out there like a standard -- HTML [for example] -- that actually reduces coordination costs. Everyone can rally around something that works. But if it's telling everybody to rally around something that's still in the process of being defined, that causes combinatorial explosion in coordination costs.

So there is no simple answer, but what you'll find throughout the company are many different mechanisms for these things. MSR [Microsoft Research] is an example of a big chunk of innovation that can happen without causing coordination costs in the rest of the company. They innovate and then they have things like TechFest to make their innovations visible to other points in the company. And then at the next release, those people will incorporate those changes.

Then we have another group that does applied research -- Live Labs. It's a group that reports to me. They're still researchers, but they're trying to weave [their work] into products that have more applicability from the start.

Then, there are incubation groups within the business units. And those are *very* close to the product

groups and the marketing groups within those organizations.

Knowledge@Wharton: Now that you have Bill Gates' former title, chief software architect, will you continue his tradition of having "think weeks" when you collect information to go off and ponder the future to gain new insights?

Ozzie: "Think week" has been transitioning from a single "Bill thing" to something where a broader audience gets the chance to comment on submitted papers. The tradition of think week is incredibly strong. It says to the whole company, "Submit your best ideas." But whereas that [previously meant] submit them to Bill and get Bill's feedback, what we've realized is that there are some interesting models, Digg-like models, where people can look at things, comment on them and see what emerges in terms of actually making things more concrete.

So, yes, we will continue "think weeks," but I will not be taking it on as, "Okay, now everybody can submit [your ideas] to Ray." I'll be a visible participant, but a participant, nonetheless.

Knowledge@Wharton: You've come under some criticism for not being more out in front, stating a clear and concrete vision of where Microsoft is going. Why haven't we heard more details from you about [Microsoft's strategic] roadmap?

Ozzie: Very good question. There are always trade-offs. This is a style thing -- I tend to like to back up things that I talk about with concrete deliverables. Otherwise, you state things and if they are too far out, it just doesn't resonate well. It's perceived as trying to over-hype something that you aren't delivering.

I have been trying to work internally on some fairly interesting things and we will talk about them as they become more real. We're out there talking about what the most important things are to deliver for the company today, which are Office and Vista. Those are the primary things we are talking about right now.

Are we ready right now to talk about how to change the game in search or how Microsoft might weave services into our various offerings? No, we're not. But we will.

Knowledge@Wharton: If you could roll the clock back five or so years and change anything you wanted to, what would you alter that would position Microsoft better today?

Ozzie: Well, I mean, [that's an exercise in] revisionist history, you know.

Oh, had we recognized the power of the ad model sooner -- that's probably the single thing.

There were many in the company who understood the power of search, going all the way back. But, like many [others], we thought of it more as a feature. You know -- "You can search this, you can search that" -- as opposed to the ad-based auction, and how that would change the game for online marketing. That would probably be the one thing.

Knowledge@Wharton: What's the biggest competitive threat facing Microsoft right now?

Ozzie: Microsoft has many competitors.

Knowledge@Wharton: Which ones worry you the most?

Ozzie: I'm paid to be worried, and so I worry about many things.

I worry about Linux and making sure that we're really good in that market. I'm worried about the future of media and the devices we consume that media on -- things like iPod and what Apple is doing. I worry about making sure that we continue to lead in email and that we're delivering email on mobile devices and in the enterprise and to consumers. There is a different set of competitors in that realm.

I want to make sure that we deliver business solutions and development platforms for business solutions to customers. There is a different set of competitors there. And then, of course, I want to deliver online services to consumers and small businesses and big businesses. There's a set [of competitors] there.

I think it would be a big mistake to focus on one specific competitor that we all must rally behind. Any given day, there's one that I'm really very passionate about. And some occupy more of my time than others over the course of a quarter. But I have to pay attention to all of them. It's a broad business.

Knowledge@Wharton: This gets us back to the issue of focus. If some threats require deep, sustained competition, doesn't that become difficult if you're looking at such a broad spectrum of competitors?

Ozzie: I'll state something, but it's kind of at a very high level. Size and momentum can be a disadvantage in some cases. And in some cases the breadth that is associated with size can be an advantage. It's my job to make sure that we are tactically executing quickly enough to be highly relevant where we need to be, and to use the breadth where we can to continue to be successful.

There are analogies in terms of the asymmetric threats that we [face] as a society -- not "we" Microsoft, but we as this country -- in terms of figuring out ways to deal with random threats coming from left and right.

[Is it better to be] big and have a lot of momentum, yet have a lot of capabilities, or would you rather be the small guy [attacking]? There really is no right answer.

It's our job to do the best we can to cope with asymmetric threats and to use our size and scale as an opportunity. We have such a great manufacturing base, such great technologies and a great education system. But there will always be threats to that environment. You can't take a central stratified approach. You have to figure out the right way to mix decentralized structures and centralized structures and leadership to accommodate what you need to do.

In every one of the threats that the company has had over its history, what's most fascinating is not just how the company reacted to that threat, but the tangential benefits and the cultural change that happened within the organization. When all was said and done, [these threats] ended up making the company more resilient.

[For example,] in the PS2 competitive realm with Sony, our whole entertainment division came out of that one battle. In terms of a Linux compete, we could be very focused on that, but I think the company has a much more mature viewpoint of what customers need now in terms of interoperability, which led to a lot of the success in the server and tools division because of a fairly nuanced understanding. That probably wouldn't have occurred had we not had that one focused threat.

And the same thing is true, wherever you go. The real question in our competition with Google is not just, "What product will you produce to compete?" but how did the company transform from figuring out which of its many offerings should be ad-supported and which ones shouldn't? Which ones should be subscription-supported and which ones shouldn't? What go-to-market opportunities do we have as an organization, that we never even would have considered, had we not built that infrastructural foundation for that competitive challenge, that could now be taken advantage of by the various offerings?

Knowledge@Wharton: You have been around the industry for quite a while. Of all the things you've done, what are you most proud of?

Ozzie: The teams. Let me extend that -- the people and organizations surrounding the software systems that I built. Just step back and look at [Lotus] Notes as one case in point. Forget the technology for a moment. There were some amazingly passionate developers who stuck with that project for a long time, and I got to know them. I love that.

There were thousands of small businesses and organizations where opportunity was created in the ecosystem surrounding that product. That's incredibly gratifying.

And then there are customers whose businesses were changed. I'm a technologist, so, frankly, I assume we can build just about anything that we set our minds to. What really impacts me are the people and organizational benefits that are downstream from those technologies.

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