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GENERAL MOTORS' TONY SCOTT

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AMERICA'S THIRD-LARGEST COMPANY IS RELYING ON TONY SCOTT TO LEAD IT INTO THE DIGITAL FUTURE.

That's no mean feat in an industry that has been notoriously slow to use the Internet and other information technologies in decades past. Even if General Motors had rushed headlong into the digital age, it would have been pressed by the sheer size and complexity of far-flung operations that span no fewer than 30 countries.

But embracing the Net--specifically, with new trends such as Web services and wireless networking--is precisely what Scott has in mind for the third-ranked Fortune 100 company. As chief technology officer, he is in charge of the carmaker's global computing and telecommunications architecture. Although the company still struggles with com-

TECHNOLOGY AS AN ENGINE FOR CHANGE

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GENERAL MOTORS CTO TONY SCOTT

plications arising from new systems, he is determined to use Web technologies to untangle GM's sprawling infrastructure.

Scott has never shied away from challenge, having jumped from his job in the pharmaceutical industry at Bristol-Myers Squibb to the very different world of automobiles in 1999. And if the bottom line is any indication, he must be doing something right: After years of stagnant sales, GM, the world's largest automaker, is again gaining market share. It recorded sales of more than $177 billion last year.

To keep abreast of technology trends, Scott participates in organizations that work on issues that appear galaxies away from the smokestacks of Detroit, the company's headquarters. For instance, he represents GM on the management board of the Liberty Alliance Project, a seemingly esoteric but important initiative backed by Sun Microsystems to create a single sign-on technology for Web transactions.

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Scott recently told CNET News.com what it's like to drive information technology for a company steeped in traditions that date back a century and whose power was once compared with that of the U.S. government.

Q: How does GM make technology-buying decisions?

A: Occasionally we get surprised and discover a new space, kind of like discovering a new star--you don't do that too often. But essentially there is an incumbent technology in place, and somebody who wants to come in and dislodge the incumbent has a fairly high hurdle. On those occasions when it does occur, we construct a technical review and try to understand what the technology advantages are, and we understand the economics of the decision, the replacement costs and the strategies, if there are any. We try to develop a 360-degree view of the decision we are about to make, which would include a strong technology evaluation...And we also spend a lot of time with that company trying to understand its technology road map.

It has certainly been true that a leader today is not necessarily the leader tomorrow, and it's part of the reason I spend time on emerging technologies, trying to figure out who is headed in the right direction and who is barking up a tree.

Do you find yourself leaning more on the larger, established technology companies and less on the unknowns, despite what they may offer?

I think one of the roles we play is that in a number of cases we introduce smaller firms to larger firms and suggest to them that partnership might be good. Again, this may be unique to GM, but when we adopt a technology, we need it supported worldwide in all of our environments. That's really hard for a small, 100-person firm or anything less than one of the big guys to really do that effectively. So we tend to try to encourage those kinds of partnerships, and where they have done that, it has generally worked pretty well.

How much do you plan to spend on IT in 2002, and is that more or less than last year?

GM spent approximately $3 billion on IT in 2001 and expects to be around that number in 2002 as well.

How large is GM's R&D budget?

It's hard to break out because it's spread across a lot of different organizations, so I'm not sure I can give you a good figure on that. Some R&D we do through outsourced vendors, and some we do internally. Even if I could give you a figure, it would be hard to put a close number on it.

What are the main areas you're excited about and will invest in over the next year?

One is customer relationship management (CRM) in general, and that includes dealer support and dealer systems, as well as systems in other areas of our business, like at GMAC (General Motors Acceptance Corp., a group of financial services companies). Clearly that is an area where a lot of companies are investing these days. Especially as you move to the Web and digitize the business, it becomes more important.

We'll be investing more in wireless, as well as in core business improvement projects such as supply-chain

optimization. We'll also continue to add features and functionality to our employee portal.

What will CRM give you that you don't have now?

A more intimate relationship with customers and the ability to provide exactly what they want when they want it. That's the ultimate manifestation. And that's if it is done well; if it is done badly, it's where people get inundated with e-mail and junk mail and other things they don't want. If it's done well, it can simplify our customers' lives and make GM easier to use as a company.

Is this something you'll implement to help on the consumer end as well as with your partners?

Certainly. There's a lot of work to be done in the dealer-relationship area. Dealers have to do things like order parts and cars, schedule maintenance, and all kinds of other activities that they interact with GM on. In the past, we may not have made that as easy to do as one would like.

How large is this project?

It's a multiyear project. When you're talking about hundreds and hundreds of dealers, and the scale of GM, it's a multiyear project.

One of the complicating factors is that GM has technology made by many different companies.

Yeah, we're trying to move away from that. We probably have, somewhere in the world, one of everything. We say nothing is bigger than GM's IT organization except the Internet itself.

What software maker or makers are you focusing on?

Siebel is our primary focus at this point; we have declared that the standard in GM. Surrounding (the Siebel technology) there are a whole bunch of dealer-management systems. No one thing stands out there--a bunch of pretty specialized software for the auto industry that would surround our implementation of Siebel.

How important is the debate over Windows vs. Unix vs. Linux?

It is important to the development people to a certain degree. I think economics is going to probably end up dictating that. If you look at every dollar we spend in IT, somewhere between 60 and 80 cents of that dollar is spent on maintenance of software and operations. Twenty to 40 percent--if you're lucky--is spent on new development. The real economic question is going to be, what is easier to support and maintain? And where do you get leverage? I think the jury is still out on that.

What other tech areas are you involved in now?

We continue our thrust in wireless that we started last year. We have a number of projects under way in the manufacturing environment, in

GMAC and so on. While last year we solidified the strategy, this year it's a lot about implementation and roll-out, and building up the infrastructure to support wireless.

What types of applications are you targeting?
Probably the biggest things are material management in the factory. If you think about how big some of these factories are, and the number of trips a forklift driver makes during the day, all of that can be optimized using wireless technology. In GMAC, they are doing things like property appraisals using wireless technology...They have found that saves a lot of time and double-entry costs and so on.

The other big thing is on the infrastructure side. In light of security concerns, we're taking a new look at how our networks are laid out and the various levels of security we have. We're adding more caching capability in the networks as well as taking a new look at how our networks are set up.

Security must be a mammoth task to make sure all of GM's many systems are secure. Is there one person responsible, or is that part of your duty?
We have a chief information security czar, if you will, James Christensian. We just hired him from Visa. James has been a great help to us in terms of taking a fresh look at our wide-area network design and local campus design. And not just the network--it's about end-to-end security: What are your policies and procedures, what are your practices, how do you deploy technology?

As far as security goes, is it more of a technology or a policy issue?
I think it's a combination, but it is largely driven by policy. It's also having good risk assessment, understanding what the threats are and taking appropriate measures to address those. With good risk-assessment, you can craft the appropriate policies and deploy technology appropriately as well.

What's your biggest tech nightmare?
My biggest tech nightmare right now is security. Security infrastructure is based on decades-old thinking and technology and doesn't scale to today's demand. Effective security today requires too many login IDs, passwords and devices.

Open source--is that something that is viable for GM?
It has not been a big factor yet. We are keeping our eye on it, but so far it's not a big factor. I think it's a good trend in some senses, as long as it doesn't destroy the ability of companies to create and value intellectual property at some level. As willing as people are to contribute stuff for free, at some point they're going to (want to) be rewarded for it. We'll have to watch that one.

Enterprise architecture must be a pretty large part of what you do.
It's beginning to be, especially as we globalize and (standardize) systems. The pieces get bigger and bigger.

Has the standards picture improved in the past few years?

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The hardware space has gotten pretty standardized. You can hook anything to almost anything else these days, and we just don't see a lot of failures...The biggest challenge has been software. It's starting to come together, but it lags behind the hardware industry by decades, probably.

Because of vendor politics or complexity?

I think politics is a part of it. Part of it is customers have not forced the software industry to standardize up until now...When you get to the scale of a company like GM, and your objectives are to do globally common kinds of systems, you need a lot more interoperability than has been afforded by the software industry up until now. We're starting to be very vocal in terms of standardization and forcing software vendors into more standard sorts of practices.

I think the whole software industry is immature if you look at another area, like quality, for example. That goes hand in hand with standardization in some respects. What is the measure of quality in software? The concept of defects per million is just mostly lost on the software industry.

Why is that?

It's just a maturity issue...One of the things that allows standardization to take place is relative stability in terms of the underlying technology that you build things out of. Standardization in the car industry has come about because we basically build cars the same way for decades in a row. There are good economic incentives for us to do that. That hasn't occurred in the software industry. I think it will. And I think you are starting to see some efforts now.

Why do you think that is coming now, after all of these years?

A couple of factors. It's a lot harder to start a software firm and get someone to pour lots of money into it and hope you'll have something in two, three, four or five years. Secondly, if you look at the R&D spent in the software industry between Microsoft, IBM, Oracle and Sun, you probably have 80 percent of it right there. So it's concentrated in a relatively small number of big players at this point, and they are going to drive standards.

Do the big software makers set the agenda and drive the standards initiatives through the standards bodies like the World Wide Web Consortium and the Internet Engineering Task Force?

My experience is that it has been kind of mixed. Microsoft or Sun or IBM deciding to go a certain direction certainly has an influence. But I have seen plenty of independent activity in standards bodies as well, people with points of view who in the end prevail because of good

argument and good, solid technical reasoning.

We had done a story that essentially said software makers don't think the W3C is moving quickly enough on Web services. At the time, I thought that if you asked technology buyers the same question, they might have the opposite point of view.
I take that comment from the software makers sort of tongue-in-cheek. What they are saying is, "We didn't win." They didn't get what they wanted and had to sit down and talk to other people about it and justify where they wanted to go, and a lot of the software vendors don't want to do that. But at the end of the day, that's where the real value comes in the standards bodies. It's a forum; it's a place where people can come expose their ideas, and the best one, hopefully, wins.

What about organizations like the Web Services Interoperability Organization? Is that something you're following pretty closely?
Oh, yes. It is a good thing, and I hope it gets legs. It got off to a bit of a rough start and was announced before, I think, they were ready to announce it. I think it will come together, and I look forward to it becoming the predominant standards organization in that area. I think you have great players in there. It needs more industry influence. It's another one of these deals where I think the voice of business needs to be heard other than just the technology companies.

In the Web services area, you had said you have not made a choice between Microsoft's .Net approach and Java. You use both today. Anything new in that area?
No, we continue on with our work. Nothing new to report.

We write these stories about Web services, then get e-mail from readers saying: "You know, this stuff isn't real. People aren't using it yet, so why are you hyping it?" What do you think about Web services?
These things go through a cycle. First of all, it's the new, new thing. Everybody gets excited; it gets overhyped. Then reality sets in and so on. But I don't think Web services can be ignored.

I remember two years ago, when I came to GM, that I was talking about XML and people would say, "What? What is that?" Then it went through this hype, and Microsoft started building it into its products in a big way, and lots of R&D went into it. It's not the panacea for everything, but it is pretty darn useful. And even people in organizations that were spending a lot of money a couple of years ago just didn't understand what it was or why it was important.

What do you think is most useful about Web services? What's the big deal?
Rather than assuming that you need a huge, extremely centralized data warehouse to provide information, and that everything is going to go through this huge facility, it's in one sense creating scalable information utilities in your organization. And I think that is big.

The other one that is probably even bigger is...you'll be able to connect in ad hoc ways that are a lot more useful for companies, consumers, and so on, and attach to those utilities where and when you want to. I think that's very useful.

Before electricity was predominant, we knew a lot about electricity. But

GENERAL MOTORS
AUTOMOBILE MANUFACTURER

FOUNDED
1908

HEADQUARTERS
DETROIT

NUMBER OF EMPLOYEES
362,000

ANNUAL REVENUE FOR 2001
$177.3 BILLION

ANNUAL EARNINGS FOR 2001
$1.5 BILLION

TICKER
GM

to make it useful, someone had to invent the outlet. Now you can just go plug an electric appliance in the wall, and there's a standardized plug, and the darn thing just runs. I think Web services is the beginning of creating a series of plugs that will make computing more utilitarian instead of requiring a degree in computer science to construct systems.

Is the proprietary aspect still there, even though a lot of Web services are becoming standardized?

Just like the electric utility model, I don't know whether my electricity is being generated by a nuclear plant or a gas turbine plant or wind power or solar power or what. In some ways, I don't really care. I just want to plug in, and I want it to work. I think the same is going to be true in the data utility space.

What's been your biggest disappointment with Web-based technologies?

The overall complexity of a completed solution has led to a lot of headaches. We've taken complexity out of the client side--although we still have various plug-ins, etc.--but added complexity to the infrastructure with such things as caching, firewalls, app servers, Web servers, database servers and other network components. The result is a tuning and performance challenge.

What are some of the technologies you think will be important in the coming years?

I think one of the sleeper ones coming is tablet PCs. You are just starting to hear more about them, and there have been lots of failed experiments in the past. Based on what I see in the current generation of them, I think it could take hold this time. If it does, it will drive a big revolution in the way we think about computing and how we use computers. It will particularly drive the wireless stuff...Combined with wireless, you get a whole different kind of capability that I think is going to be very big.

In software, I'm hearing about some good things starting to happen in the software quality area, where organizations are starting to drill into this as an issue and as a cost. I'm seeing some good work coming out of universities and some R&D organizations, both in terms of the measurement side and then also in the engineering side--much better tools in terms of code analysis and design to prevent things from occurring in the first place. Even Microsoft has gotten the message big-time that customers just won't tolerate the legacy levels of bugs.

How do you measure success and failure as a CTO?

These probably are best measured by peers in the IT organization--did the CTO provide the right guidance in terms of technology over time?--and by business metrics such as time-to-market in key areas like products and services, as well as efficiency of internal processes. ■