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Employee Update

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Strassmann on the future of IT

At April Meetings Week, Paul Strassmann's talk was supposed to be about his work in helping kickstart an extraordinary IT transformation at NASA and his lessons learned. It was much more, in part because Strassmann brings an unusually broad and deep perspective of the entire IT industry. • Fresh from his assignment as Acting Chief Information Officer (CIO) for the agency, Strassmann explained the government's ambitious plan to have NASA and other agencies not only catch up with private industry in terms of IT, but, in some cases, to leapfrog it.

He offered an insider's look at how the President's Management Agenda (PMA) is driving change throughout the federal government. He also shared why he thinks system integration services are heading toward a kind of "Wal-Mart" model and what it takes to create competitive advantage in this kind of environment. (In this model, the CIO is the "store manager" and Wal-Mart is the "systems integrator," Strassmann said. "And the customer can then come in on a portal and buy when and how, what they choose, what they need, without the need for scheduled integration.")

What Strassmann found at NASA

After Sean O'Keefe was named Administrator of NASA in early 2002, he recruited Strassmann to help the agency upgrade its low PMA ratings. As a former chief financial officer at the Department of Defense, O'Keefe was well acquainted with Strassmann, who was an advisor to the DoD deputy secretary and later, director of Defense information. (Strassmann also served "tours of duty" as CIO at Xerox Corp., Kraft Foods, and General Foods Corp.)

After Strassmann took over as acting CIO at NASA, he faced 32 "clearly marked PMA targets to shoot at" and 105 violations in IT management. The principal issue that warranted his attention: reducing costs. NASA was in the midst of a serious controversy over how the agency spent its money. Strassmann quickly realized that NASA IT spending was out of line with comparable benchmarks.

The agency's IT spending accounted for 14% of its total spending, a shockingly high number compared to other agencies and private industry. In comparison, the percentage of revenues spent on IT at Lockheed Martin, which is NASA's top IT outsourcing contractor and is, in many respects, a "look-alike organization," was more than two-thirds less.

Another surprising metric: Nearly one-fourth of NASA personnel (civil service and contractor staff) were designated as IT staff.

("I cannot emphasize sufficiently the importance for SAIC consultants to understand the fundamental economics of agency IT, starting with cost benchmarking," he told the audience in an aside. "To assist an agency CIO, an SAIC consultant must first understand whether an agency is information poor or information rich, whether an agency is information inefficient or information efficient.")

Why were the costs and headcount so high? Thousands of localized solutions, according to Strassmann. The contract-by-contract, application-by-application approach had created an IT infrastructure that he characterized as "costly chaos." Almost everywhere he looked, Strassmann saw a perpetuity of support contracts and steadily mounting costs just to "glue" together ill-fitting and ill-designed systems and keep those systems running. In addition, too much IT funding seemed to be directed to administrative functions instead of the scientific and mission support that O'Keefe wanted to emphasize.

Clearly, this was a cost structure NASA could no longer afford, said Strassmann. Neither can the rest of the federal government or, for that matter, private industry, he added. Strassmann is convinced that the Office of Management and Budget (OMB) "is correct in pursuing a vigorous effort to impose (standardized) enterprise architectures on the federal government. That is the only way in which various agencies can become interoperable with Homeland Security and how e-Government will ultimately succeed."

In addition, "if the future calls for interoperability and integration of billions of dissimilar devices, the only way in which I see that accomplished is through many-to-many network services," Strassmann said.

He believes that only when the computer industry shifts to selling network services instead of technologies – bringing about a corresponding shift of integration costs and risks from the customer to the vendor – will government agencies and commercial firms be able to achieve the standardization, interoperability, increased security, and new services they are demanding while, at the same time, reducing costs.

"If I am correct in my assessment, then the implications for SAIC are far reaching. Much of the SAIC business that is, at present, admirably well tuned to the current contracting model, will be confronting customers who will wish to be serviced according to different rules."

As a result, the economically most likely scenario is that huge integration and support contracts will disappear over the next 15-20 years (except for special purpose and mission specific applications), according to Strassmann.

What SAIC's future could look like

"The future of SAIC is in the delivery of networked services," he insists. In the new environment, he believes SAIC will have to offer transaction-priced services rather than billable hours for custom-made systems. On the other hand, Strassmann sees networked services as a more attractive financial model than billable hours. The latter is a tough model, he says, because accumulated knowledge capital is included in the billing rate, not as an asset that should earn superior returns. With networked services, if you gain volume the marginal costs of each transaction declines close to zero and the gross profit margins can be large indeed, he says. In his views, this is a better way in which to collect returns on knowledge capital.

"When such a shift (to networked services) will happen is anybody's guess," said Strassmann. But "SAIC's largest customer, DoD, has speeded up the clock when it wishes to have transformation systems – that is, joint and interoperable systems – in place. There is no way of achieving such objectives by retrofitting existing systems."

You need high-performance network connectivity so that new interfaces let you access new services that are "pumped" from redundant, scalable, and secure large-scale host services sites.

Shifting NASA to the Networked Services Model

At NASA, the centerpiece of Strassmann's vision – and the key to optimally managing this network services architecture – were two network "mission control" centers, modeled after NASA's Mission Control Center in Houston. By leveraging off an idea that was culturally familiar to NASA staff – centralized "mission control" of a few objects in space – Strassmann won support for an idea that was culturally unfamiliar – consolidating control of more than a quarter million computer objects on Earth. His model also marked a departure for the computer industry, which typically operates network, information security, and computer and network support as separate functions.

The first network center began operations at the Marshall Space Flight Center in Huntsville, Ala., in fall 2002. The rapid deployment and success of this center created a change in thinking and increased acceptance for a new IT architecture at NASA, said Strassmann. It also confirmed his belief that to implement a new architecture, "rapid executions or working demonstrations of real systems are worth a thousand times more than any fancy presentation."

Delivering performance at NASA

Although the network control center was an important achievement, the real focus for Strassmann – and for OMB – was e-government. Into this area, OMB had bundled everything it wished to monitor at government agencies, he said. This included compliance with federal acts for information security, paperwork reduction, and records reduction, as well as with OMB guidelines for IT architecture, inter-agency sharing of IT project costs, and development of business cases.

At NASA, e-government had resulted in the rapid proliferation of servers and Web pages (created independently by different NASA organizations). Strassmann could see how a different and more consolidated approach could generate significant cost savings.

Others had tried and failed to achieve a consolidated OneNASA Web presence. One problem according to Strassmann: The technology was changing every six months while a typical procurement cycle at NASA takes 28 months.

Following Strassmann's advice, the agency tried a different approach. NASA invited vendors to compete in an "art competition" and invent what they thought would be the best world-class solution for NASA. As an added benefit, the entries allowed NASA management to see what they were buying.

By the end of December, O'Keefe gave his endorsement to proceed. There was a catch: The OneNASA Web concept seemed so exciting and so likely to score well at the next round of OMB evaluations that O'Keefe insisted on getting the entire project implemented by February 3.

That meant consolidating more than 3,000 Web sites with 4 million pages of information into a new format, with a new taxonomy, using advanced content management technologies, in only four weeks.

Again Strassmann helped find the solution. Within days, NASA had a new contract to have AT&T convert the Web pages and host the Web site (thanks to the GSA Federal Technology Services schedule). By 3 a.m. on February 1, the OneNASA Web environment was fully operational, five months after the idea was proposed, and two days ahead of schedule.

Within hours, the Space Shuttle Columbia would be lost as it re-entered Earth atmosphere and the world's attention would focus on the OneNASA Web site. The site would become the agency's primary means of communicating disaster news to the world.

AT&T had contracted to handle a peak rate of only 20,000 transactions per hour or less than half a million transactions in a 24-hour period. The Web site surpassed that in the first hour and a half, clocking 1.5 million transactions. By the end of three days, the site exceeded 375 million transactions. In Strassmann's view, the ability of the OneNASA Web site to operate under extreme stress was important evidence pointing to the viability of the network-based architecture solution.

Summary. "Organizations are getting ready for the advent of an era of information competition… not only in a military sense, but also in its commercial forms," he said. When Strassmann views the liquidation of long established firms, he sees the results of information-based competition.

"If you want to wage information warfare, you have to do it from the standpoint of how the entire enterprise functions," he said. Enterprise architecture must be flexible to allow the rapid integration of new acquisitions and technologies or the capacity to peel off units and technologies that are no longer useful.

"One of the rules in the IT business is that profits will migrate to where integration takes place," noted Strassmann. Wherever integration takes place in the future, "the profits will go to those who can integrate services from many diverse sources to many diverse users with a great variety of devices," he concluded.