

Committee on Veterans' Affairs
Subcommittee on Oversight and Investigations
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Introduction

Mr. Chairman and esteemed Members of the House Subcommittee on Oversight and Investigations of the Committee on Veterans' Affairs, thank you for this opportunity to testify about the progress I have seen over the past 10 months in how the Department of Veterans' Affairs manages information and information technologies (IT) in support of its mission.

During May, June, and July of last year I had the honor of facilitating the efforts of over 20 of VA's senior IT and business leaders, from all Administrations and Department staff offices, in forming what came to be known as VA's Enterprise Architecture Innovation Team. Over the course of 15 days and five very long weekends, with plenty of individual time in between studying, writing, and working in small groups, they created and unanimously endorsed the document that was approved by Secretary Principi in September 2001 and that you know as VA's "Enterprise Architecture: Strategy, Governance, & Implementation." Since then I conducted an analysis and review of VA's project management practices and also had the privilege of facilitating, in October and again just a few weeks ago, two working conferences attended by more than 200 of VA's senior and technical IT managers.

The short story is that in these past 10 months I have seen a profoundly positive transformation in how VA manages IT. I remember how at first many of the members of the Enterprise Architecture Innovation Team believed that it was undesirable and impossible for VA to have a single integrated enterprise architecture. That belief was replaced by the revelation that it is not only possible but also highly desirable to have a single integrated enterprise architecture in order to manage IT to achieve the noble vision of "One-VA." And they put their new beliefs into action by laying the foundations of good IT planning and governance in their "Enterprise Architecture: Strategy, Governance, & Implementation" document. But the vision and planning of 20-some people, no matter how senior, does not suddenly transform an enterprise with over 220 thousand personnel, a budget larger than most of the world's countries, and historical roots in distinct and separate enterprises.

The next steps are well underway, as evidenced by what I experienced first hand at the two VA CIO conferences that I facilitated over the past five months. But they are steps on a long, and in

some ways never-ending journey; and so, I am here today to suggest to you, the Congressional leaders who are in essence the “Board of Directors” of VA, and the elected representative of their “stockholders,” the people of the United States, that your cooperation, and support may also be called for if success is to be maximized.

VA’s Enterprise Architecture Innovation Team did not take the easier, softer road in creating their vision for a One-VA Enterprise Architecture. They created a new IT governance structure that is beyond the reality of VA’s current organizational structure, they selected the most comprehensive and complete framework for organizing their work, they incorporated performance measurement, project management, and continuous quality improvement into their plan, and they acknowledged that a profound change in the attitudes and culture of VA would be necessary for their fundamental success. John Zachman may have said it best in the cover letter he wrote to Secretary Principi to accompany the “Enterprise Architecture: Strategy, Governance, & Implementation” document:

I would like to take a moment now to talk about the road that lies ahead. The role of the Information Technology community in an Enterprise is not simply to build and run systems. This is what results in disintegration, “stovepipes.” Rather the mission of the information folks in any Enterprise is to engineer and manufacture the Enterprise such that it is aligned with the intent of General Management and is flexible, adaptable, interoperable, integrated, lean, etc. and responsive to the Enterprise’s “customer” (as well as to other Enterprise “stakeholders”). ... This is a new way of life. There is no quick fix. This is not a project. It is a “process.” It is different from the Industrial Age past. It is the Information Age present! With that understanding, I would like to impart on you some advice that may help as you continue down your road to institutionalize the Department of Veterans Affairs Enterprise Architecture:

- Do not underestimate the difficulty and complexity of engineering and manufacturing the most complex object yet conceived by humankind – the Enterprise. This will take time and determination.
- This is a new way of life, a revolution in thinking, a discipline, an engineering process. Change of this magnitude takes time and perseverance. Do not get discouraged. ...
- Make executive education and technical training a continuous process. Don't assume anything. It is easy to forget long-term issues in the short-term stress of daily life.
- And remember, the state of the art is only fifty years old or so and the "playing field" still pretty level -- there is still much to learn and discover, and many opportunities to create advantage and value. (John A. Zachman, July 20, 2001 letter to Secretary Principi, appended in its entirety at the end of this written testimony.)

Background and Perspective

It may be a “small world,” but it is also a very complex one. And human beings have done a good job of succeeding in it. Anthropologists credit much of that success to our bigger brains, and how we’ve used them to develop languages, tools, and technologies. One especially useful mental technique we’ve developed is to seek simplifying explanations for what are often complicated realities. We find comfort, value, and usefulness in the various theories, hypotheses, models, frameworks, taxonomies, and paradigms that help us better understand and manage our world, our organizations, our technologies, and our lives. In fact, such partial truths underpin almost all of our scientific and technical progress, as we improve our understanding of reality, the “truth” if you please or what Einstein called “God’s thoughts.” Our simplifying mental models have their downside, however, depending on the importance of the things they leave out.

Consider this: In the “science” of 1850s’ medicine, microorganisms and disease were not related and thus the death rates from infection averaged around 50% in European hospitals and contagious diseases spread easily. It’s not that bacteria weren’t killing people, it’s just that our view of the world did not recognize what was actually occurring, until Semmelweis, Pastuer, and Lister came along. But many years passed before this new paradigm and their discoveries were adopted as new behaviors and practices, and yet even as the 20th century began surgeons still worked in their street clothes.

IT is an enabler. IT alone doesn’t make organizations more efficient, effective, or better places to work. In fact, the exact same off-the-shelf software application can be part of great success in one organization and total failure in another. It’s not the technology, but how we use it. And we are still in the early stages of learning how to really use IT to enable the success of people and the organizations, societies, and economies they create. In short, we haven’t really figured out yet how to get much bang for our IT bucks.

If you question that conclusion, consider the research of Paul Strassmann (former top IT executive at the Department of Defense, Xerox, and General Mills) which indicates that only about one in five businesses gets a reasonable rate of return from IT spending and that two in five actually get a negative value added from IT investments. Or if you read the IT press, I wonder if you’ve ever seen a list of CIO key issues that didn’t have some version of “IT alignment with organization goals” in its top 5? Me either. But why, after 30 years on the top of our concerns, haven’t we figured out how to do alignment? The sad fact is that we don’t even have decent metrics to measure alignment. Therefore, given total quality management creator W. Edwards Deming’s admonition that we cannot manage what we do not measure, it’s no wonder we are still not managing alignment very well.

Consider this: The profound change in the world that we call the “industrial revolution” had its beginnings in the second half of 18th century England and came to America in 1790 when Sam Slater built the first steam-powered cotton-processing machine. In 1797 Eli Whitney pioneered standardized parts and division of labor in the manufacture of muskets. Ninety-five years later the Duryea brothers built the first gasoline-powered automobile. Still, 20 years more would pass

before Henry Ford combined the moving assembly line technique with division of labor and interchangeable parts in a way that began the transformation of manufacturing as we knew it, lowering the price of the Model A from \$850 in 1908 to \$310 in 1926 (with some help from Frederick Taylor's 1911 publication of "Principles of Scientific Management"), and thereby transforming our socio-economic milieu.

The information age began in 1945 with the "invention" of the computer as a result of a war effort that required massive amounts of mathematical calculations, a U.S. Federal government with the vision and resources to fund the work, and the creativity of Eckert, Brainerd, and Mauchly. Information technology has made astonishing progresses over the past six decades, and many good things have come of it. But the hard evidence is scarce that all that hardware and software has actually contributed much to making organizations more profitable or better places in which to work.

Organizations are perhaps the most complex things ever created by humans, and invariably they are built and evolve in a haphazard manner. Thus, the ongoing saga of one management paradigm after another purporting to solve all of our problems. Likewise, the ongoing parade of IT silver bullets. Sure we endure, even succeed, but the waste is enormous. And IT's continuous cycles of buy, rework, and scrap, combined with absurd complexity and wretched quality, are a major component of all that squander. Consider that perhaps such inefficiency and carelessness are not altogether necessary in the information age.

What if we could engineer our systems and the organizations they serve the same way we engineer airplanes and buildings? Ever wonder why is it that 45-year old B-52s are still the backbone of the USA's strategic bomber force, or that 65-year old DC3s and 30-year old 747s still fly the world over, or that we can remodel and renovate buildings so that they provide service decade after decade, even century after century?

The answer is "architecture" – the design, engineering, and documentation of a complex artifact so that it fulfills its purpose and facilitates the coordinated activity of the various specialists required to create, maintain, and operate it. Applied to organizations, doing "architecture" is described by John Zachman, the creator of the state of the art organizing framework for enterprise architecture, a "semantic model" or "language" if you please, as the engineering and manufacturing of an enterprise that is aligned with the requirements of management, and is flexible, adaptable, interoperable, integrated, lean, and responsive to customers and other enterprise stakeholders.

I'm not 100% sure today just what "engineering and manufacturing an organization" totally means, any more than Eli Whitney in 1797 understood the full potential of standardized parts and division of labor in manufacturing, but I do know that it implies a profound a change in our thinking about organizations and the technologies IT professionals provide and manage for them. I also know that some of the best managed enterprises in the world are making the investment of time and resources to figure it out, and that the U.S. Federal government is funding the most concentrated effort in the creation of the ideas, techniques, and tools needed to make the promise of enterprise architecture and the information age enterprise a reality. Just like the Federal

government provided the dollars for the research and development that led to the creation of the computer some 60 years ago.

The effort to invoke these disciplines was initiated by the U.S. Congress in 1996 through the passage of the Clinger-Cohen Act that requires, among other things, every Federal agency to have a CIO and to align IT with the business through enterprise architecture. A brilliant and forward thinking policy initiative, with commendable ongoing guidance for its implementation provided by OMB and GAO, but Clinger-Cohen was short-sighted in that it does not even consider the possibility or desirability of a government-wide enterprise architecture. The necessity of at least a basic Federal government-wide data architecture is becoming painfully clear to those charged with dealing with the world of today that requires the ever greater integration of information across Federal agencies for initiatives like e-government and homeland security (and sometimes data integration across levels of federal, state, local, and even foreign governments and the private sector). The lesson is simply that we cannot know all the details today for what tomorrow holds and there is an ever-increasing need for us all to be able to intelligently and proactively correct our course as we get new information and learn from our mistakes.

Conclusions

VA is massive in size, enormously complex, and highly decentralized. VA also has significant workforce development concerns, a long history of independent parts, and an organizational culture and structure that are not conducive to those parts working well together. VA has set the bar high for itself and by doing so can serve as the “poster child” and proving ground for the information age Federal government agency. But VA needs some things from Congress too, and I humbly offer you the following suggestions:

- Hold them accountable, but understand and honor their long-term vision: The long-term future is built upon short-term accomplishments. Please don't make the mistake of demanding short-term IT accomplishment without long-term relevance, because the result will be rework, scrap and replace. There is a need for incremental progress, but with balance. The long-term goals of One-VA and a One-VA enterprise architecture that they have set for themselves should not be sacrificed for short-term gain; although, sometimes a well planned and executed short-term compromise may be appropriate.
- Provide policy guidance and assistance: VA is entering new ground as they strive toward One-VA. The current organizational structure and budget authority of VA are not conducive to One-VA or enterprise architecture. Historically VA has optimized the parts and sub-optimized the whole. You are asking them through Clinger-Cohen, and they are asking themselves through One-VA, to shift the balance toward optimizing the whole through massive integration. They will need your patience, help, and guidance.

- Provide funding for this change: Resources are needed especially for the things that have never been done before in VA. I'm not talking about IT projects – They will stand or fall on their own merits. But there is a real need for additional funding for the VA central office IT organization and for the Office of the Chief Enterprise Architect, as well as for the establishment of a VA-wide Project Management Office. But VA is a socio-technical enterprise, made up of people and technologies, thus all of this will be for naught if there is not funding and acknowledgement of the significant effort in education, training, and organizational culture development that is required in order to realize One-VA. These are not IT issues, these are VA issues and they will require the active involvement of VA's business and IT personnel, as well as the assistance of change management professionals.

The two CIO conferences that were held since last October are indicative of the kind of change that is going on in VA. For the first time ever, the more than 200 professionals who are responsible for the various pieces of the VA IT pie came together to create a shared vision for a One-VA enterprise architecture and plans for achieving it. For the first time ever, they worked together face-to-face. For the first time ever, the parts all talked with each other and with the central office. For the first time ever, they listened to each other, and responded accordingly. And it's not just about plans for enterprise architecture, but also about cyber security, project management, network infrastructure, workforce development, performance measurement, and fulfilling VA's support to homeland security. It's not about business as usual either, but rather a profound change in the culture from one of dis-integration and fear, to one of collaboration, trust, and accountability. But even the vision and planning of 200 IT managers, no matter how senior, does not suddenly transform an enterprise with over 4,000 IT professionals, several hundred thousand other personnel, and tens of millions of customers. This is not a project. There is no silver bullet. This is a new way of life for VA, the change will happen incrementally, and we are all part of it. The question each must answer is "What part will I play in the creation of One-VA?"

If I can answer any of your questions or provide you with any additional information, I am always at your service.

Attachment: John Zachman's cover letter to Secretary Principi accompanying version 10.01 of VA's "Enterprise Architecture: Strategy, Governance, & Implementation":

Zachman International
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July 20, 2001

The Honorable Anthony J. Principi
Secretary, Department of Veterans Affairs
810 Vermont Avenue NW
Washington, D.C. 20420

Dear Secretary Principi:

I had the privilege of being present for the final two weekend working sessions that produced this historic milestone document, the Department of Veteran's Affairs (VA) Enterprise Architecture Strategy. I was impressed by your vision for the Department and your sense of urgency for addressing this vital issue. The Strategy has all of the attributes of a successful undertaking: Enterprise vision, business and information technology collaboration, and top management support. I was also impressed by the Department's realization that Enterprise Architecture is actually a business issue, not a technical issue. And I was extremely pleased that the 20 VA delegates to this Enterprise Architecture Innovation Team represented equal numbers of business executives and information technology executives.

The evidence of this complete business-technology collaboration was manifest in the Team's presentation to you during the final session ... with Laura Miller, *Assistant Deputy Under Secretary for Health* defining Enterprise Architecture and why it is so important, Guy McMichael, *Acting Assistant Secretary for Information Technology* discussing the long term political and business ramifications, and Ventris Gibson, *Deputy Assistant Secretary for Human Resources Management* describing the framework. I never thought I'd see the day!!

This document is insightful, coherent, comprehensive, and innovative --- a tribute to the clarity of vision and understanding that only can result from intense communication. I must also mention the gifted facilitation by a group of dedicated folks led by Professor Leon Kappelman that truly demonstrated the determination and perseverance of mountaineers on expedition. Finally, I was impressed with the stamina and commitment of the entire VA Enterprise Architecture Innovation Team. There was an intensity of participation. None were reticent to contribute. All were accepted and respected. From 7 AM in the morning 'till 12 Midnight, Thursday through Saturday weekend after weekend, the team remained focused on the "summit" of the Strategy.

I would like to take a moment now to talk about the road that lies ahead. The role of the Information Technology community in an Enterprise is not simply to build and run systems. This is what results in disintegration, "stovepipes." Rather the mission of the information folks in any Enterprise is *to engineer and manufacture the Enterprise such that it is aligned with the intent of General Management and is flexible, adaptable, interoperable, integrated, lean, etc. and responsive to the Enterprise's "customer" (as well as to other Enterprise "stakeholders")*. I, in fact, suggest the name of "Information Systems" or "Information Technology" be changed to "Enterprise Engineering and Manufacturing" to set the correct perspective.

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The role of "Enterprise Engineering and Manufacturing" is to engineer and manufacture the Enterprise, and Enterprise Architecture is the essential engineering of the Enterprise before manufacturing it in order to deliver something coherent that Management needs, to minimize "scrap and rework" and to avoid "legacies." I believe that the *Long Term* Objectives of "Enterprise Engineering and Manufacturing" is to make every cell ("primitive model") of the Framework for Enterprise Architecture explicit, enterprise-wide, horizontally integrated across each row, vertically integrated down each column, at an excruciating level of detail in order to: constitute an inventory of reusable components from which the Enterprise can be "assembled-to-order," serve as a baseline for

managing change (to the Enterprise), and provide the knowledge base for the Enterprise to which the external environment can be related and evaluated and from which management can derive their strategic advantage.

This is a new way of life. There is no quick fix. This is not a project. It is a "process." It is different from the Industrial Age past. It is the Information Age *present!* With that understanding, I would like to impart on you some advice that may help as you continue down your road to institutionalize the Department of Veterans Affairs Enterprise Architecture:

1. Do not underestimate the difficulty and complexity of engineering and manufacturing the most complex object yet conceived by humankind – the Enterprise. This will take time and determination.
2. This is a new way of life, a revolution in thinking, a discipline, an engineering process. Change of this magnitude takes time and perseverance. Do not get discouraged.
3. Things will have to be implemented periodically so you have to accept some risk of "scrap and rework," but build that risk and cost into the *short term* strategy. Set realistic expectations.
4. Make executive education and technical training a continuous process. Don't assume anything. It is easy to forget long-term issues in the short-term stress of daily life.
5. And remember, the state of the art is only fifty years old or so and the "playing field" still pretty level -- there is still much to learn and discover, and many opportunities to create advantage and value.

Finally, I would like to extend my congratulations to you and your blue ribbon Enterprise Architecture Innovation Team for having the vision, courage and commitment to begin this process to move this most valuable federal department, into a position to better serve our Nation's veterans and their families in the 21st century.

Thank you for inviting me to take part in this historic and notable undertaking. I wish you all the very, very best!!

John A. Zachman