

# Enterprise Architecture: Engaging and Empowering People while Creating Opportunity for Change

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## Summary: How to Realize the True Value of Enterprise Architecture

- **Provide users' perspective to EA:** Cater to the needs of people on the ground who use EA and benefit from it
- **Recognize the importance of learning before using:** Remember that users need to get the overall picture before making use of EA. Make background information available, not just architecture standards
- **Present users with justifications for decisions:** Explain why and how standards are defined to build trust and confidence in users
- **Show examples:** Present how EA has been used and can be used to make it real for users
- **Support and encourage sharing of experience:** Enhance EA content as well as the community by involving users to share their experiences

Read on to find out more about who the users of EA are and what they expect. Learn from NIH's example to identify specific opportunities to empower users in order to realize the true value of EA.

## Context of Enterprise Architecture

### Creating It, Then Using It

Enterprise architecture (EA) is a critical part of IT strategy in any organization. However, just defining enterprise architecture doesn't bring its true value of efficiency to the organization nor support for the organization's strategic objectives.

In the EA Assessment Framework 2.0 published by the Office of Management and Budget (OMB) in December 2005, three capability areas, Completion, Use and Results, are defined as primary objectives of every government agency's EA program. It is clear that EA is not just an assignment for CIOs to document architecture standards for an agency – for the future value to be realized, it must be used to achieve results.

### Context at NIH

At the National Institutes of Health (NIH), the Office of the Chief IT Architect (OCITA) is responsible for establishing an enterprise architecture that enables efficient business processes and information access for all NIH Institutes and Centers. OCITA developed a website as one of the communication channels used to inform the NIH community about EA, facilitate the design process of IT applications, and guide the implementation of IT applications and infrastructure.

Despite the availability of all existing architecture standards on the website and efforts by the Chief IT Architect to reach out to the NIH community, adoption of the EA and the website was still one of the biggest challenges for NIH. All technical details were accessible to anyone, from business decision makers to IT project managers, developers and contractors. Why weren't they using EA and achieving results by using it?

## What is User Research?

It is a qualitative research of human behavior and needs to understand users' experience around products, services or strategies. It is not about asking users what they want. It is about understanding their behavior and needs, and deriving what they need from the understanding.

Researchers collect data through interviews, observations and/or analysis of existing research data, and identify themes of user behavior. Usually, types of users, not in terms of their demographics, but of their behavioral tendencies are identified through analysis. Behavior models, which address what users do and how experience is organized for the user, are also developed using a graphical model.

Based on the analysis, specific opportunities are presented as a conclusion of the research. In the past, this research technique has been used to help commercial and government organizations identify optimal solutions to serve true needs of their customers or users in relation to commercial products and services, internal IT systems, websites as well as organizational strategies.

## Approach for NIH Research

The total of 15 users, including NIH full-time employees and contractors who were likely to have direct interaction with EA, were interviewed in person, in their work environment. Most of the interview sessions were videotaped when users granted permission for later analysis.

Each interview was conducted following a pre-defined protocol. Researchers who conducted interviews analyzed findings from interviews to identify types of users and their behaviors in relation to their current and potential interaction with EA at the NIH.

The entire research process was completed in five weeks.

## Approach to Understand Use and Results

NIH recognized its lack of understanding about users of EA. At first, they thought they knew what users needed – technical details. However, they questioned if they really knew who consumers of EA at NIH were. What do these consumers expect in EA and really need in order to realize its benefits? How can NIH reach out to the community to inform them about EA using the website and other communication channels? To answer these questions, NIH partnered with Sapient to conduct in-depth research and further define users of EA at NIH.

The research was designed to understand how people at the NIH behave and work in order to identify opportunities to foster adoption of EA at the NIH. NIH and Sapient identified users representing various IT functions within the NIH across multiple Institutes and Centers, including NIH full-time employees and contractors, including both project managers and technical personnel. These users were interviewed in person, in their work environment. Interview findings were analyzed to identify types of users and their behaviors in relation to their current and potential interaction with EA at the NIH.

This white paper shares findings from this research at NIH to inspire people involved in the development and maintenance of EA in government and commercial organizations to create opportunity for change in their organization through EA. To enable change and realize the value of EA in any organization, it is critical to engage and empower people in the process. For this process to be effective, NIH realized that understanding users' perspective on EA was the first step. The remainder of the document presents this perspective by explaining users' attitudes and behavior in regards to EA, and share opportunities derived from that understanding.

## Users' Attitudes Towards EA

So, who are the users, or consumers, of EA at NIH? Instead of identifying profiles of these users by their demographic and organizational profiles such as job titles or tenure at NIH, we created profiles of users based on their views of EA. This approach helped us:

- Focus on what users do and why, without being influenced by what their job title may imply
- Identify similarities across different job functions and organizations
- Define segments that may be applied to a single user differently depending on particular situation the user is in

## User Segments

Based on the analysis of the interview findings, the following three user segments were identified and defined in relation to users' interaction with enterprise architecture at the NIH:

- Trend Finders
- Fit Seekers
- Fixer-Doers

The following table summarizes each segment:

User Segment	Trend Finders	Fit Seekers	Fixer-Doers
Key Question	"Where are we going?"	"Does it fit my project?"	"How do I make it work?"
EA for me is ...	... a future indicator	... a potential value	... a tool set
Attributes	<p>Are interested in understanding the current and future IT landscape to see if it will influence their work in the future.</p> <ul style="list-style-type: none"> <li>• Want to know if there might be an impact to the shape of their work.</li> <li>• May sit on the information; use it to compare against their work; or use it as future indicators that may eventually impact their decisions.</li> <li>• Require high-level information without lots of details behind why or how something became part of enterprise architecture.</li> <li>• May not understand how enterprise architecture can help them and therefore may need to be encouraged and reminded that enterprise architecture is out there.</li> </ul>	<p>Try to find a solution for their particular project, aware that it might involve components of enterprise architecture.</p> <ul style="list-style-type: none"> <li>• Try to understand the NIH IT landscape and take it one step further by evaluating and making decisions on whether or not to incorporate components of enterprise architecture into their work.</li> <li>• Need background details to justify the decision, both to themselves and to others, to use an enterprise architecture component or to make future decisions.</li> <li>• Require details about why one solution is better than another.</li> <li>• May be driven to use enterprise architecture for organizational consistency.</li> </ul>	<p>Focus on getting something to work by building, maintaining, and supporting the project.</p> <ul style="list-style-type: none"> <li>• Need detailed, tactical and technical information on how to get something to work (knowing how systems work together, guidelines and code).</li> <li>• Want information from other Fixer-Doers on how to get something to work or get it fixed.</li> </ul>

Table 1: User Segments

These three user segments represent current and potential users of EA at the NIH. Different motivations, derived from the differing scope and context of their work, defines their characteristics. It is clear that users in different segments are looking for different types of information to satisfy their unique needs.

### What NIH Realized from the Segmentation

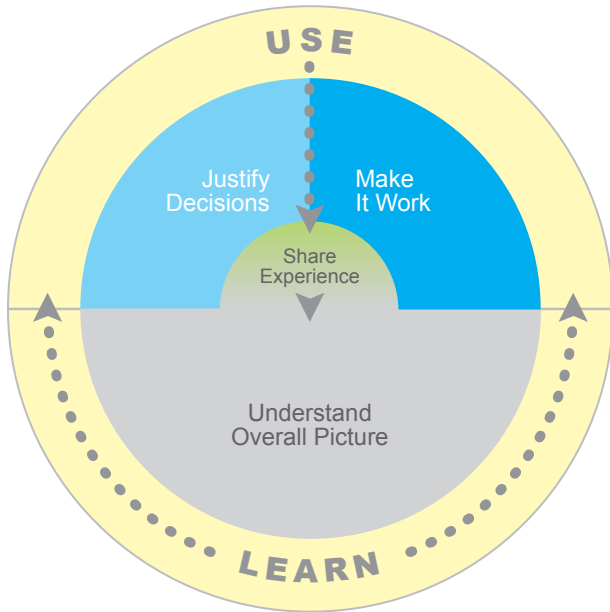
Before this research, NIH was assuming that EA users were mostly Fixer-Doers or some Fit Seekers who looked for specific technical information. However, the research revealed that users consider EA not just as a technical tool set, but also as an indicator of future trends. As one Trend Finder mentioned, "[An enterprise application] is moving to J2EE. Probably down the road, we have to move there." Such a realization based on what EA indicates has tremendous implication on staffing, training and investment. Compared to Trend Finders, Fit Seekers are looking for something more specific for their particular project at hand. One user testified: "We were evaluating workflow products, thinking about using new technology. We went to see [the Chief Architect's] group and got guidance on resources. We got what we wanted. It helped cut time off our research. It gave us head start." Fit Seekers look for compelling reasons to use components or resources from EA in their projects. They need to see the results.

It is important to understand that the user segments are mutually exclusive. However, in many ways, the segments represent a potential evolution of users — a person could start out as a Trend Finder and then evolve into a Fit Seeker, or start out as a Fit Seeker and evolve into a Fixer-Doer. In addition, a person could be in two different user segments at the same time depending on their role on different projects. For instance, while on multiple projects, they could be a Trend Finder on one project and a Fixer-Doer on another.

This segmentation, based on users' views and needs, brought NIH new insights into how users relate to EA and what kind of information they need for their particular situation.

## User Experience of EA

While their characteristics and attitudes toward enterprise architecture vary, users' fundamental behavior in relation to enterprise architecture can be generalized into one model for all segments of users. So, how do they interact with EA?



### EA User Behavior Model

Among three different segments of users we observed that their fundamental behavior is consistent although emphasis on elements of the behavior can be different. Overall, users need to learn about enterprise architecture in order to use it. Only after learning does use of enterprise architecture become possible. The outer circle in the Figure 1 shows this fundamental flow of the user behavior.

The overall flow of experience includes four elements: **Understand Overall Picture, Justify Decisions, Make It Work, and Share Experience.**

The behavior model shows different elements of user interaction with enterprise architecture at the NIH. Every user's experience is built upon their understanding of the overall picture. They move on to use enterprise architecture to justify their decisions and make their technical solutions work. Sharing experience is an important aspect of the behavior in growing overall understanding of enterprise architecture.

Figure 1: EA User Behavior Model

Behavior Element		Critical Factor	Description
LEARN	Understand Overall Picture	Users have to build this understanding of overall picture to move on to actually use and incorporate EA in their work.	Every user's experience is built upon their understanding of the overall picture in relation to enterprise architecture at the NIH. Scope of the "overall picture" varies in its detail depending on users and their problems at hand.
USE	Justify Decisions	Knowing the 'why' behind things is important, and it increases their overall understanding of EA.	Building upon the understanding of the appropriate overall picture, users then need clear justification for making decisions based on what's presented in the EA. When users are "Understanding Overall Picture," they are still learning about enterprise architecture but not really using it yet. Now they start using what they learned in their decision-making.
	Make it Work	After justifying the decision, users need technical details to execute their solutions.	Another element of the user behavior while "using" EA is about technical execution. They want examples from existing solutions that they can use and then tweak as necessary to make it work in their context.
	Share Experience	While users are using EA, they have opportunities to share what they experienced, both positive and negative.	Sharing covers information on what's out there, why something worked or didn't, and how something was implemented. As the downward arrow in the model indicates, sharing contributes to learning by building the understanding of the overall picture for an individual as well as the entire community.

Table 2: Elements of User Behavior

## What the Behavior Model Indicates

The behavior model indicates that sustaining a high level of understanding at an individual as well as at an overall community level means increased trust in EA and the NIH as a whole. Related to trust, the model also indicates the importance of active and continuous local level involvement by showing that:

- Users need clear evidence that enterprise architecture makes sense in their local context
- They need to make their local solution work and look for support to make it possible
- Continuous involvement can be derived from sharing experience and building understanding for the overall community

## Opportunities to Empower Users

How did this new understanding of user segments and behavior in relation to EA help NIH identify specific ideas to empower and involve users for better adoption of EA? By combining the elements of the behavior model and user segments, we identified where and how NIH should focus attention in order to support behavioral tendencies across the user segments.

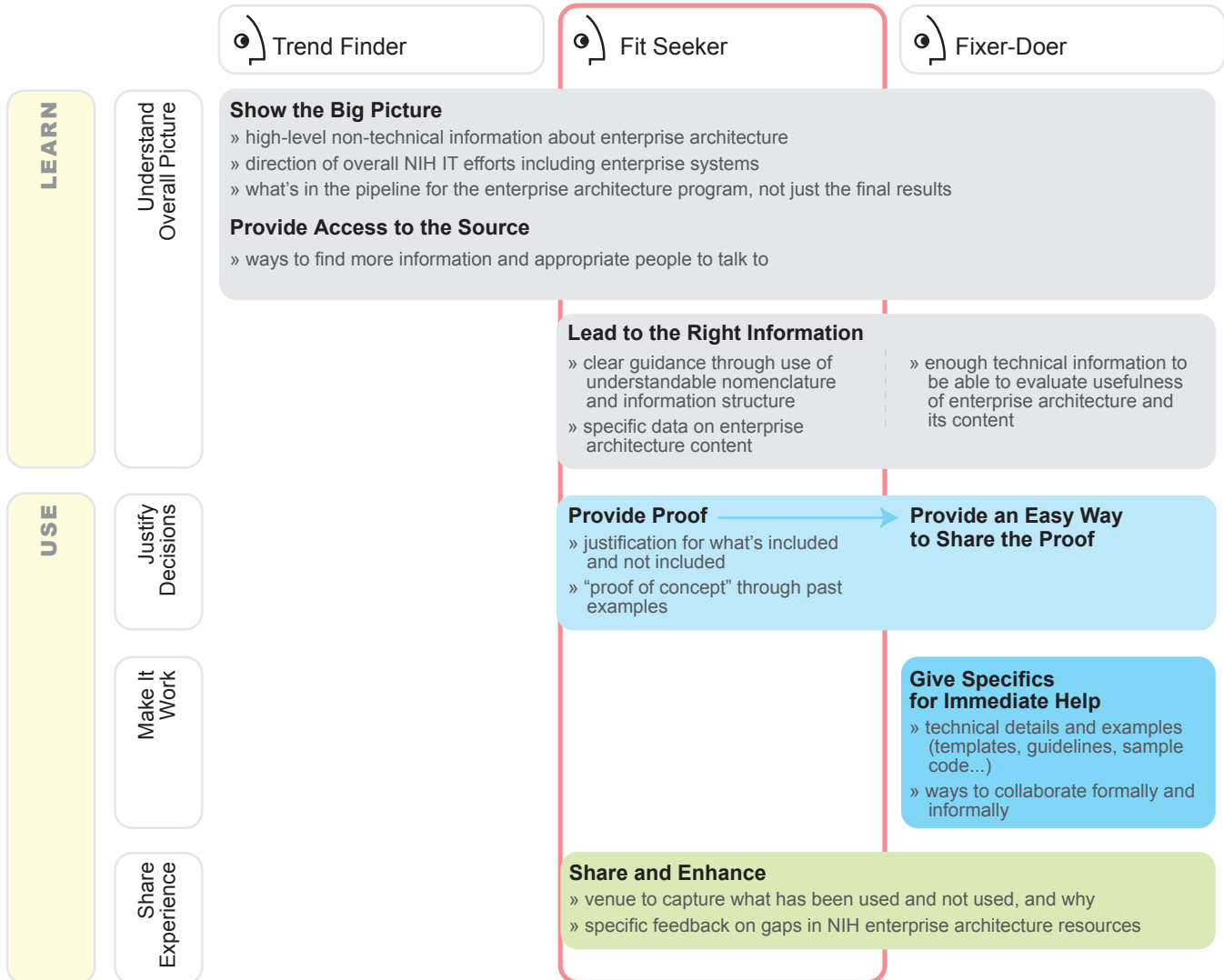


Figure 2: Opportunity Map

## Opportunity Map

The opportunity map (Figure 2) shows specific opportunities for NIH to support users of EA to meet their needs. Although many opportunities are identified for all segments of users, it is important to note that “Fit Seekers” are the key to successful adoption of enterprise architecture at the NIH. They are the decision-makers, and they prompt Fixer-Doers to adopt enterprise architecture, too. Fixer-Doers’ behavior depends on direction from Fit Seekers. In addition, supporting Fit Seekers well will provide good coverage for Trend Finders as well.

To maintain and grow EA within the NIH, it is critical to support and encourage sharing of experiences. EA should be used to achieve results, not just documented — and sharing enhances its content as well as its community.

## Taking Action

Based on the understanding of these opportunities, NIH took specific actions to update its communication about EA and its approach to EA adoption at NIH. The most visible change was realized with a complete overhaul of the NIH EA Website ([enterprisearchitecture.nih.gov](http://enterprisearchitecture.nih.gov)) which is used as the primary communication channel for EA at NIH. Examples of the actions already taken include:

- **EA Program Planning:** The new awareness of the need to explain, justify and teach has been incorporated in to the program planning.
- **NIH EA Website Updates:** The site was updated to reflect the behavior of the users better with prominent positioning of “Overall Picture” (About section) and focus on what users can do (Your Part section) in addition to the architecture standards. Additional content and functionality to promote sharing (Case Studies, Email Updates, Email Pages) are incorporated into the site.
- **Communication Planning:** Based on the opportunity map, NIH refined its communication plan to define details of communication strategy. For each key stakeholder group, NIH identified what, when and how to reach out to them and desired results from the interaction with them.
- **Lecture Series:** Lunch time lecture series presented by the Chief IT Architect informs the NIH community on variety of topics on EA. Presentation materials are shared on the website.
- **Consistent Messaging:** NIH has developed consistent message based on the research findings with focus on why EA matters at NIH, and uses it in various channels of communication including the website, presentations, brochures and posters. Along with uniform color scheme and a logo, consistency is enforcing the message.

Overall, NIH saw this research as an opportunity to revisit its strategy especially in regards to Use and Results aspects of its EA program. Findings from the research drive decisions on standards development process, communication and education for the program. Most importantly, a variety of users from across NIH are kept involved in the program through standards development groups, validation of new website features, lecture series, and informal open communication to establish and maintain trust with EA in the NIH community.

## Seeing Results

As a result of these specific actions, many initiatives within NIH are realizing the value of EA and sharing their experiences with others. Some examples of case studies are posted on the website in the context of understanding why EA matters at NIH. (For more information see: <http://enterprisearchitecture.nih.gov/About/Why/HowUsed.htm>)

Case Study	Benefits	Description
System for Enterprise Records and Correspondence Handling (SERCH)	<ul style="list-style-type: none"> <li>Streamlined procurement lifecycle</li> <li>Reduced system design timeline</li> </ul>	NIH's Technology Architecture provided technical research on products that support workflow and document management. The Chief IT Architect's group also provided information about the NIH technical environment to ensure successful implementation and integration of SERCH.
Web Conferencing for Online Training	<ul style="list-style-type: none"> <li>Minimized training and operation cost by using existing solutions</li> </ul>	A Human Resources Specialist was able to use and apply the resources already available in NIH Enterprise Architecture in order to reduce the travel and administrative costs associated with preparing and delivering training in remote locations.
Workflow and Document Management	<ul style="list-style-type: none"> <li>Reduced time and cost associated with research of potential solutions</li> <li>Increased knowledge of the team</li> </ul>	Office of Human Resources could research and understand the technical concepts associated with document management and workflow tools without having to spend extra time and effort. In the end the team was able to save time and money associated with the research into a solution and reuse existing patterns from another part of NIH, rather than recreating a design from scratch.
NIH EA Website Design	<ul style="list-style-type: none"> <li>Compliance with current and future web browser standards</li> <li>Reduced time to define browser benchmark</li> </ul>	The development team was able to save time in arriving at its browser benchmark, because the information was already documented in the Technology Architecture. There was no need to conduct large scale, time consuming user surveys or to interview IT operations staff to determine the correct benchmark.

Table 3: NIH EA Case Studies

## Conclusion

Through user research, NIH gained new insights into different segments of EA users and their needs. By understanding user behavior with regards to their interaction with EA, NIH realized that learning supports using, and sharing of experience is key to increasing the overall understanding of EA.

In addition to providing new insights, the research radically changed the understanding of what is needed to get results from the use of EA. It takes much more than documentation of the architecture. Supporting learning of overall picture and creating environment for sharing are critical in overcoming users' distrust and get buy-in from them.

While adoption of EA is an on-going, evolving process, NIH has already seen some positive results of meeting the needs of EA users on the ground by keeping them involved and sharing the results with the community.

Each organization is unique in its people and the culture that influence the way EA is introduced and adopted. However, the findings presented in this paper can be adopted by government as well as commercial organizations to make EA living and breathing in the organization by:

- Providing users' perspective to EA
- Recognizing the importance of learning before using
- Presenting users with justifications for decisions
- Showing examples of how EA has been used and can be used
- Supporting and encouraging sharing of experience related to EA to enhance EA content as well as the community

This paper provides another way for NIH to encourage the sharing of experience in the extended EA community. We would like to make this a starting point of the dialogue in the community of CIOs and architects to connect the reality of EA compliance with needs on the ground by engaging and empowering people, and to develop EA that creates opportunity for change in the organization.