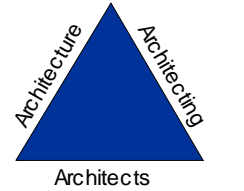


ARCHITECTURE RESOURCES

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The Role of the Architect

A simplistic view of the role is that architects create architectures, and their responsibilities encompass all that is involved in doing so. This would include articulating the architectural vision, conceptualizing and experimenting with alternative architectural approaches, creating models and component and interface specification documents, and validating the architecture against requirements and assumptions. However, any experienced architect knows that the role involves not just these technical activities, but others that are more political and strategic in nature on the one hand, and more like those of a consultant, on the other.

These activities drive the competencies that the architect needs to be successful. We present a competency framework that helps architects assess areas for their own personal development, and managers in identifying who is a good fit for the architect role.

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Introduction

We often find it useful to look at building architecture and see if lessons learned there apply in our domain. Though there have been building architects for as long as we have built structures, the regulated profession of building architecture is less than 150 years old. Ancient, traditional cultures and languages used the same word for both builder and architect. Construction was an integrated craft. The master mason or carpenter knew how to design structures, estimate costs, assemble labor and materials, and manage the construction process from foundation to roof. With the industrial revolution came new materials, machines, techniques, regulations, etc. And along with all this came a proliferation of highly specialized subcontractors, who handled each specialized problem. This redefined the role of the general contractor, whose labor force built less and less of the building. The specialized details of construction became matters for experts while the role of the architect became more clearly focused on providing overall conception of structures, and managing the relationship between the client and the builder/contractor (Lewis, 1998).

It is really easy to see the parallels in software and enterprise architecture. It wasn't that long ago that an individual or very small group might conceive of and develop an operating system or an entire application. Increasing product complexity, project size, distributed teams, high levels of integration within and even between different product lines, and product lines sharing a common code base, have changed the processes and roles associated with software development. In particular, over the past few years the role of architect has been created in many organizations to ensure the overall integrity and critical characteristics of systems and development processes.

Although the history of the enterprise and software architecture discipline is short in comparison with its analogous counterpart in the building domain, we have been able to establish several success factors for the role of the software architect. In this paper, we concentrate on the competencies the architect must have to be successful in the role.

An Architect's Domains of Competency

When we created an architecture workshop for Hewlett-Packard internal use some eleven years ago, we studied many architecture projects in HP and in the industry, as well as the literature on software architecture and systems architecture (e.g., Reichtin, 1991), and even looked into some of the work on building architecture. Since then, we have worked with thousands of architects across a broad spectrum of industries, and held technical exchanges with other industry leaders such as the architecture team at the SEI who have published a number of books related to software architecture.

Based on this understanding, and looking at the architect in the context of the architecting process, we have identified several critical areas of activity, or domains of competency, that figure prominently in the architect role. These are technology, business strategy, organizational politics, consulting and leadership. Below, we take a look at the knowledge and experience, activities and personal characteristics it takes to be successful in each of these aspects of the architect role.

Technology

As an architect, you need a thorough knowledge of your organization's products, relevant technologies and development processes. But even in the technical area, your key activities are different than those of developers. Activities include articulating the architecture vision, conceptualizing and experimenting with alternative architectural approaches, creating models and component and interface specification documents, validating the architecture against requirements and assumptions, preparing documents and explaining the architecture to sponsors and stakeholders.

One of the architects we worked with emphasized the TEC in the word architect. We enthusiastically agree with the emphasis! That is the necessary foundation, and the ongoing touchstone, for our success as architects in the computing/systems/solutions space. We have to be able to make technical decisions that

are respected in the developer community. If we are too removed from our technical roots, we will have a hard time facilitating, guiding and making decisions that stand up under developer scrutiny.

If we are a product or application architect, this may mean we still write code. But the architect does not have to write *just any* code to show that he or she is still getting exposure to the technology and staying current with the moving frontier of "hard problems" that must be solved to make this system fly. Either the architect has to have very good relationships with designer/developers who do work on this frontier—relationships that translate through active discussions and open sharing into real insight—or the architect has to work there herself.

Ideally, the architect is seen as useful by developers, not just as a political shield, but as a technical problem solver. The architect role is working well when developers call upon the architect to enter into problem solving with them, especially when the issue they are grappling with touches multiple pieces of the system, or, even if localized in it's impact, it is significant to the success of the system. But if the architect is developing code full-time, who is keeping the architecture up-to-date? This takes bandwidth. Ideally, the architect is involved in addressing, at a conceptual level, the tough challenges that may mean the architecture needs to be revised and updated, and then the architect updates, or better explains and defends, the architecture.

So the architect has technical roots, and technical acuity so that she is able to quickly grasp technical issues and lead the collaboration that brings them to resolution. But the architect is also the person (or team) with the whole-system purview, so we emphasise the ARCH in the word architect, not just the TEC. The architect deals with over-arching concerns. What are the really big things we have to get right, or we fail? What are the concerns that cut across the pieces of the system? If we want the system to have particular properties, we need to intentionally design the architectural elements and their collaborations to achieve these properties. If we do not, the properties are emergent so that system acceptance is a matter of some combination of luck, developer heroics, and user compromise.

The personal characteristics really essential to success in this domain are a high tolerance for ambiguity because the problems are less well-defined, often with unclear or conflicting objectives, and as the architect you play a significant role in clarifying what the objectives are. You also are skillful at working at an abstract level, and a good system thinker.

What you KNOW	What You DO	What You ARE
In-depth understanding of the domain and pertinent technologies	Identify and address architectural challenges	Creative
Understand what technical issues are key to success	Create models and assess alternative approaches	Investigative
Development methods and modeling techniques	Prototype/experiment/simulate	Practical/pragmatic
	Prepare architectural documents and presentations	Insightful
	Technology trend analysis	Tolerant of ambiguity, willing to backtrack, seek multiple solutions
	Take a system viewpoint	Good at working at an abstract level

Table 1. Technology Competency Summary

Often this is the extent of how people see the architect role, and this, along with technical consulting, is in fact the primary role of a junior architect. But as a senior architect you also need to be an effective strategist.

If the junior architect is primarily a technologist, the senior architect is primarily a strategist, contributing to the business strategy and having primary responsibility for defining the technical strategy.

Business Strategy

To succeed in this aspect of the architect role, you need a solid understanding of your organization’s business strategy and the rationale behind it, as well as your company or division’s business practices, planning cycles, and decision making processes. You have a good understanding of the business context of your organization. You understand your competitors, their products, strategies and product generation processes. You are familiar with the key factors in the business environment that affect your organization’s success, and you are able to distill all these business factors into architectural requirements and architectural choices. But the overriding characteristic that fuels your success in this domain is that of an entrepreneurial visionary who can translate well between the business and technical domains.

What you KNOW	What You DO	What You ARE
Your organization’s business strategy and rationale	Influence business strategy	Visionary
Your competition (products, strategies and processes)	Translate business strategy into technical vision and strategy	Entrepreneurial
Your company’s business practices	Understand customer and market trends	
	Capture customer, organizational and business requirements on the architecture	

Table 2. Strategy Competency Summary

As a skilled technologist you create good architecture. As a skilled strategist, you create the right architecture for your organization. The next three domains of competency are more about getting the architecture realized. The first is about gaining support for the architecture among the management community. Rob Seliger, the principal architect for the Concert Architecture (Seliger, 1997) for medical information systems said, the single thing architects most need to learn is how to sell, sell, sell.

Organizational Politics

Our view of organizational politics, just like the politics of nations and states, is too often sullied by manipulative, power-grubbing behavior of a few individuals. The best of politics is, however, about working to achieve consensus, to effectively align people through integration of interests, and persuasion and influence rather than authority or dominance. It is about decision making by representatives, with bottom-up delegation from the many to a trusted few. It is about caring passionately enough about an outcome to work at overcoming objections and resistance—not by any means at all, but with personal integrity and insight into the hopes, values, and concerns, that all play a role in making or obstructing progress.

For the architect, this often means defending the technical integrity of a system, while acknowledging the organizational factors that have a necessary bearing on the nature of the solution. Architectures have many and diverse stakeholders. Often they are used across organizational boundaries, by other projects, divisions, and even other companies. To gain and maintain the sponsorship of management and the enthusiastic support of other key influencers, you will need to do a good deal of influencing yourself.

You really need to understand both the business and personal objectives of key players, and get them personally committed to the success of the architecture. This means listening, networking, articulating and selling a vision, and doing all this continuously over the life of the project.

The people doing this well are extremely articulate and confident. They are resilient and driven, and they are sensitive to where the real power is and how it flows. They look for and see the organization behind the organization, and they use this insight to build and maintain support for their projects.

What you KNOW	What You DO	What You ARE
Who the key players are in the organization	Communicate, communicate, communicate!	Able to see from and sell to multiple viewpoints
What they want, both business and personal	Listen, network, influence Sell the vision, keep the vision alive Take and retake the pulse of all critical influencers of the architecture project	Confident and articulate Ambitious and driven Patient and not Resilient Sensitive to where the power is and how it flows in your organization

Table 3. Organizational Politics Competency Summary

This domain of competency generates the organizational support to get the architecture created. The next one supports getting it deployed into use.

Consulting

The actual users of architecture are development teams creating products or components, and their goal is not to make your architecture successful, but rather to satisfy their specific functionality, schedule and quality requirements. While using the architecture may be the best overall approach for the organization, this is often not apparent to product teams. Consequently, your task as an architect includes recognizing first that developers are a primary customer, and that the architecture must provide value to them in generating good products. Second, you need to enable product teams to quickly understand and effectively use the architecture. You are functioning here more as a mentor and teacher, preparing and making presentations, consulting to individuals and teams, and also mentoring junior architects.

What really contributes to your success here is to be truly committed to others' success and to have a good understanding of change management and how groups adopt new processes.

What you KNOW	What You DO	What You ARE
Elicitation techniques	Build "trusted advisor" relationships	Committed to others' success
Consulting frameworks	Understand what the developers want and need from the architecture	Empathetic, approachable
	Help developers see the value of the architecture and understand how to use it successfully	An effective change agent, process savvy
	Mentor junior architects	A good mentor, teacher

Table 4. Consulting Competency Summary

So now we have a good architecture. It is the right architecture for the organization. It has got sufficient organizational support to actually get created. And it has been effectively deployed to the developer community. It's a wrap! Well, not quite!

Leadership

The domain of competency which organizes all the others and gives them dynamic force, is leadership. An architecture team without leadership goes nowhere. It thrashes and diverges. We've seen this too many times. A leader is required to infuse the team with a common vision, and to motivate the core team and associated teams to do their best work.

This requires dedication and passion, and a strong belief that you can lead the effort. You must see yourself, and others must see you, as a credible leader.

What you KNOW	What You DO	What You ARE
Yourself	Set team context (vision)	You and others see you as a leader
	Make decision (stick)	Charismatic and credible
	Build teams	You believe it can and should be done, and that you can lead the effort
	Motivate	You are committed, dedicated, passionate
		You see the entire effort in a broader business and personal context

Table 5. Leadership Competency Summary

The diagram below shows that while technology and business strategy skills form a foundation for you as an architect, the real challenges (and ones that are not always acknowledged) as those in organizational

politics, consulting and leadership. Also, as you become more senior in this role, it is less about what you know and more and more about who you are--your personal characteristics.

	What you KNOW	What you ARE
Leadership		
Consulting		
Organizational Politics		
Business Strategy		
Technology		

Conclusion

As we have seen, the architect role is very challenging. A lot of what this role is about is not technical, so if this is what you enjoy doing—great! If not, you may not want the role of senior architect.

Before choosing the role, you should also be aware that there are other risks that you should consider. You will have more responsibility without corresponding authority and control, you will encounter a lot of resistance and disappointments—we have seen many an architecture project canceled along the way. And from every angle you will encounter others that believe they have a better idea.

However, if the challenges inherent in architecting are the kind that appeal to you, then the role has great rewards. These include a focus on interesting and complex problems, the opportunity to advance very high in the organization with a continued focus on technical rather than personnel and fiscal issues, and the opportunity to make an enormous difference to the company.

Success in the architect role depends on skills and characteristics not typically emphasized in university curricula or the on-the-job training. To help you delve further into the various facets of the software architecture discipline, we host the *Resources for Software Architects* web site (<http://www.bredmeyer.com>). The site collects together a variety of resources for software architects. We also encourage you to participate in the *Action Guides for the Software Architect Workshop* at the OOPSLA 2000 conference (see <http://www.bredmeyer.com/RoleWorkshop.htm>) that we are facilitating with Bill Branson of Frank-Russell Company. You may also be interested in our Role of the Architect workshop (http://www.bredmeyer.com/role_of_architect_workshop_overview.htm).

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Visual Architecting Process Training for Architects

Software Architecture Workshop. This class focuses on the Visual Architecting Process (VAP). It is organized around the process. As the workshop progresses, small teams of participants take their project

from vision to architecture. This format, punctuating lectures with exercises that build on one another, gives participants the opportunity to learn and practice techniques used in each of the process steps.

Open Enrollment Class: Chicago, IL on **September 19-22, 2006**

See http://www.bredemeyer.com/architecture_workshop_overview.htm

Enterprise Architecture Workshop. This class focuses on the Visual Architecting Process for the *Enterprise* (VAP-Enterprise). Following a couple of context-setting modules, the core sections of the course are organized around the process. It follows a workshop format, with lecture modules followed by team exercises to practice techniques and solidify concepts and models. The Visual Architecting Process for the Enterprise starts with Business Strategy, identifies and refines the Business Capabilities Architecture, and uses this to drive the Information (data), Application Solution, and Technology (Infrastructure) Architectures at the enterprise level of scope.

Open Enrollment Class: Chicago, IL on **September 12-15, 2006**

See http://www.bredemeyer.com/Enterprise_Architecture/Enterprise_Architecture_Workshop.htm

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Resources for Architects

The *Resources for Software Architects* web site (<http://www.bredemeyer.com>) organizes a variety of resources that will help you in your role as an architect or architecture project manager. A number of Bredemeyer Consulting's *Action Guides* and *Architecting Process Action Guides* are on the papers and Downloads page (<http://www.bredemeyer.com/papers.htm>). You will also find books and papers listed under "How: The Architecting Process" in our Bibliography, and on the Architecture Books List (<http://www.bredemeyer.com/Books/recommendedBooks.htm>). You may also be interested in our *Software Architecture Workshop*, as well as our *Architecture Vision Workshop*. For more information, please see <http://www.bredemeyer.com/training.htm>.

About Bredemeyer Consulting

Bredemeyer Consulting provides a range of consulting and training services focused on Enterprise, System and Software Architecture. We provide training and mentoring for architects, and typically work with architecture teams, helping to accelerate their creation or migration of an architecture. We also work with strategic management, providing consulting focused on developing architectural strategy and organizational competency in architecture.