

What does an enterprise architect do?

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First, what is enterprise architecture?

■ IBM

- On Enterprise IT architecture: It is not about enterprise applications, it's about doing IT architecture work at the enterprise level. The enterprise IT architect considers the business and technical architecture of the enterprise, creates a strategic vision, and carries out that vision through implementation. This work is not limited to software, but extends to complete systems thinking in the enterprise..

■ Spewak (Enterprise Architecture Planning):

- On enterprise architecture: It is the process of defining architectures for the use of information in support of the business and the plan for implementing those architectures

■ GERAM

- On Enterprise engineering: It is the collection of those tools and methods which one can use to design and continually maintain an integrated state of the enterprise.

■ Boar:

- On IT Architecture: It is a series of principles, guidelines, drawings, standards and rules that guide an organization through acquiring, building, modifying and the interfacing of IT resources throughout the enterprise.

Enterprise architecture scope

Information is the life blood of a business. Information management is the essence of business management. EAP can refer to a business or to IT. Can you model IT architecture separate from business architecture? Where does one begin and the other end?

Scope for EA can be:

- A virtual enterprise
- The enterprise
- A business unit (or collection of business units)
- IT only

Can the scope for EAP be a cluster of enterprises?

What is in enterprise architecture?

- EA does not define one architecture, but multiple architectures
- There is not one perspective for EA, but many
 - Planner, owner, designer, builder, subcontractor¹
 - Each level is not just more detail, but with essential differences²
- There is not one tool for EA, but many
 - Many modeling languages
 - Several modeling methodologies/frameworks
 - Several software packages

¹Sowa, J.F. & Zachman, J.A. "Extending and formalizing the framework for information systems architecture." IBM Systems Journal, Vol. 31, No. 3, 1992.

²Zachman, J.A. "A framework for information systems architecture" IBM Systems Journal, Vol. 26, No. 3, 1987.

Why this push towards EA?

- Increased dynamic complexity of businesses and systems
 - Does business complexity cause IT complexity or IT complexity cause business complexity?
 - Core competency rationalization, rapid changes in core competencies
- First push in the 1980s
 - Enabled by improved computing capabilities, pushed by the corporate reengineering phase. Strong emphasis on business processes and IT automation
 - Early Internet period of the mid to late 1990s put architecture well behind speed and innovation
- The next wave is here
 - Enabled by the IP protocol, web services and other protocols
 - Cloud computing, SaaS, mobile devices, Google, Apple and others
 - Fueled by churn in the global economy which fosters many different types of virtual enterprises
- EA tries to manage dynamism
 - Enable future agility, support innovation, reduce costs, improve productivity

Let's remember strategy for a moment

- What is strategy?
 - “A pattern in a stream of decisions.”
 - Behind every successful company lies a successful strategy
- It is an interdisciplinary field involving economics, management, organizational theory, law, (cognitive sciences)
- Many different schools of strategy
- Strategy is pragmatic. Strategies exist to give organizations (businesses) advantage in their ecosystems (markets). Profit motive
- The role of IT in strategy has had much debate both recently and historically, with high and low points. Currently we are entering a “high point”

Different schools

Design	Senior management formulates clear, simple and unique strategies in a deliberate process of conscious thought
Planning	Formal, decomposable into discrete steps, checklists, techniques.
Positioning	Positions selected through formalized analysis of industry situations. Porter's five forces, PIMS, Boston Consulting Group.
Entrepreneurial	Focus on the CEO, intuition, metaphor. Forceful leader. Start-up, niche. Leader maintains close control on his or her formulated vision
Cognitive	Strategies originate in people's minds as frames, models, maps, concepts, schemas. Cognitive biases, heuristics, naturalistic decision making. Creativity.
Learning	Disjointed incrementalism, logical incrementalism, muddling-through, emergent strategies, the learning organization.
Power	Development of strategy is political, a process involving bargaining, persuasion and confrontation among actors who divide power.
Cultural	Focus on common interest and integration, strategy formation is a social process rooted in culture. The threat of Japan in the 1980s spurred this.
Environmental	How organizations use degrees of freedom to maneuver through environments. Limits to strategic choice due to environmental conditions.
Configuration	Configure an approach to strategy by adopting one or more schools. Shift from one mode to another depending on the life-cycle of the firm.

From "Reflecting on the strategy process," Mintzberg, Henry. Sloan Management Review. Vol. 40 No. 3. Spring 1999. 7

Capabilities and competencies

■ Capability

- A firm's ability to execute business processes and activities to produce a required product through deployment of a firm's resources

■ Core competence

- Capabilities which directly contribute to and improve the value of the firm as perceived by the market and customers
 - Printing a payroll check is probably NOT a core competency
 - Quickly designing new networking technologies most likely is
- Core competencies create core products

■ An enterprise architect's job is to *help* match IT investments to strategic capabilities which then leads to strategic advantage

- Many decisions, both big and small, conspire to create, planned or emergent, an IT strategy

Knowledge, IT and strategy are intertwined

1. Capabilities are a key component to competitive advantage
2. Knowledge is a significant ingredient within capabilities
3. Therefore, knowledge is important

Two views on knowledge

■ Dominant view of knowledge management

- Tacit knowledge; conversion to explicit; storage, retrieval and diffusion of explicit knowledge
- Focus on the production versus consumption of knowledge
- How is knowledge produced? (innovation)
- Knowledge can be managed

■ Some reactions to the dominant view

- Knowledge grows via a series of unplanned, indeterminate interactions between people
- Knowledge is acted upon in tacit form without full awareness or validity
- Learning is fraught with difficulties
 - Cognitive biases, organizational and individual defensiveness
- Knowledge can't be managed

A conventional technologists view of knowledge

■ Catalog

- Identify data, documents, build a taxonomy (by hand or driven from the data)
- Collect documents and maintain a collection scheme
- Convert documents, add metadata

■ Store and search

- Data warehousing, data movement (ETL, MOM)
- Knowledge bases (Verity, Autonomy, etc.) with advanced searching algorithms
- Index services for simpler searching
- Search engine aggregation (Copernic.com)

■ Disseminate

- Create an intranet site or a portal and personalize it
- Sit back and wait

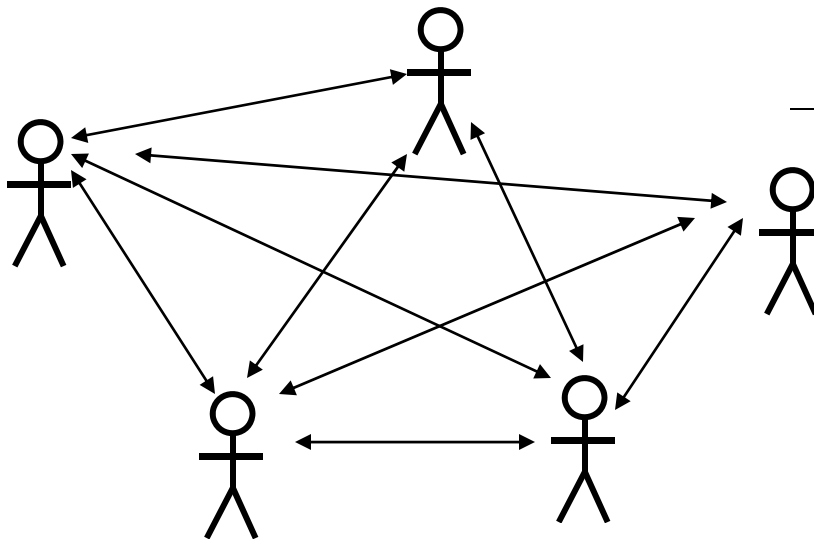
Two sides to knowledge in action

1. Production
 1. Collecting, merging, distilling, distributing, searching
 2. Consumption
 1. Getting knowledge displayed in behavior in individuals, teams and organizations
- Which is the harder problem?

Knowledge chain or knowledge network?



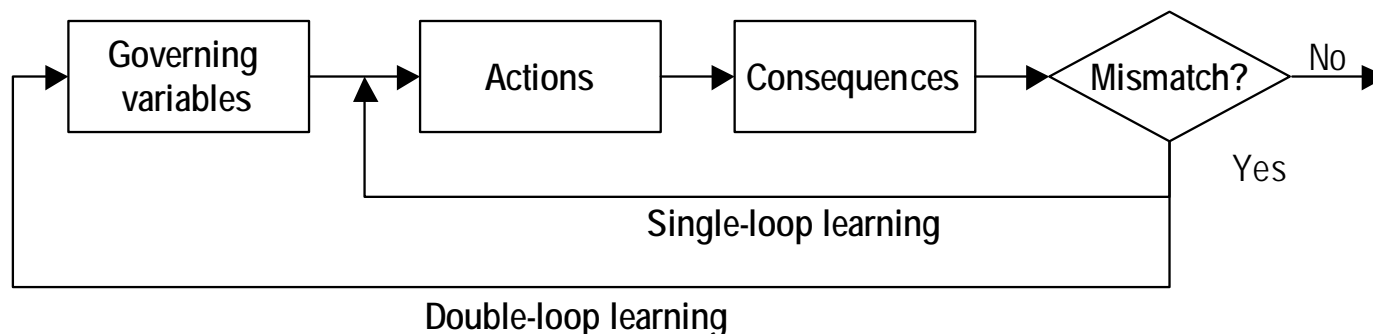
- OR -



What is the precise sequence of interactions that produces the knowledge needed by the organization? What comprises the interactions? Can you repeat the sequence each time? What rules govern the sequence?

Deterministic, probabilistic reasoning

- Management relies too much on deterministic causality
- In an environment of uncertainty and change, probabilistic reasoning is needed.
 - Probabilistic causality implies seeking of disconfirming evidence, which is hard for people to do, hence the attachment to deterministic reasoning, which needs no disconfirming evidence (because the deterministic reasoning says there is none!).
- Discovering error is the first step toward learning



OK. Where the heck are we?

- Enterprises need to manage knowledge so that they can make and act on decisions within time frames dictated by the competitive environment. *Knowledge is intertwined with action.* Strategy creation/strategy execution are a never ending cycle. Knowledge gets created in the cycle. IT accelerates the cycle. Human frailty disrupts the cycle
- Knowledge management is clearly getting a handle on how to catalog, store, search and distribute information. This is *production* of knowledge
- Knowledge management has had plenty problems with getting knowledge turned into action. This is *consumption* of knowledge.
- Consumption of knowledge is the scarce capability, not production
- Therefore, knowledge management needs to focus hard on the social and human issues of *knowledge consumption*
- To be successful, enterprise architects need to be mindful of the fallibility of human beings and social organizations and how technology influences culture
 - While getting the tech to work is hard, getting the whole system to work is harder

What do enterprise architects do?

- Technology life-cycle management
 - Identify emerging technologies, defining standards, retiring technologies
- Technology procurement
 - Purchasing, managing the vendor relationship
- Methodologies
 - Gartner is referring to design methodologies
- Life cycle process and standards
 - Project management, reuse, metrics and testing
- Skills planning
 - Architecture's perspective helps plan future skill development
- Data architecture
 - Identify common standards to ensure interoperability
- Interfaces and modularization
 - City planning: how do parts relate to each other?

Where do the architects “sit”?

- Architecture is not monolithic. Planning may be carried out by groups other than the core team
 - Software architecture
 - Business architecture and functional rationalization
 - Establish repositories of knowledge management and best practice
 - Shared software component development

- Activities in architecture
 - Identify potential architecture investments and cost-justify them
 - Communicate the architecture and maintenance process to users, stakeholders
 - Road map management
 - Conflict resolution and exception handling
 - Deploying the architecture
 - Monitoring the effectiveness of the architecture

Problems with defining the role of the architect

- The universal law of inevitable scope creep
 - All systems (human, technical) will tend to increase their scope. All systems will begin to fragment when the resources required to unify the system are too great. All systems repeat this unification/fragmentation process ad nauseam

- What is changing?
 - IT is enabling greater scale, greater system unification potential with less resources than before (scale without mass),
 - see Brynjolfsson, MacAfee, et. al (2008)
 - IT is now nearly everywhere, in all thought, all action and is likely to get to everywhere shortly

- Even the role of the enterprise architect is subject to the universal law of inevitable scope creep

EA and PMO

- There is a curious relationship between the enterprise and a project. Are they converging?
 - Project Managers Rule! Project managers running cross-functional projects, controlling purse strings, running evaluations, controlling *everything*. – from *Re-Imagine*, by Tom Peters
- If system and human architectures are intertwined, architects may need to design both, simultaneously
- If enterprises produce projects (a.k.a. products/services), then project managers + architects are an important pair
- Get your EA and PM buddies and prepare to jump!

My killer EA team

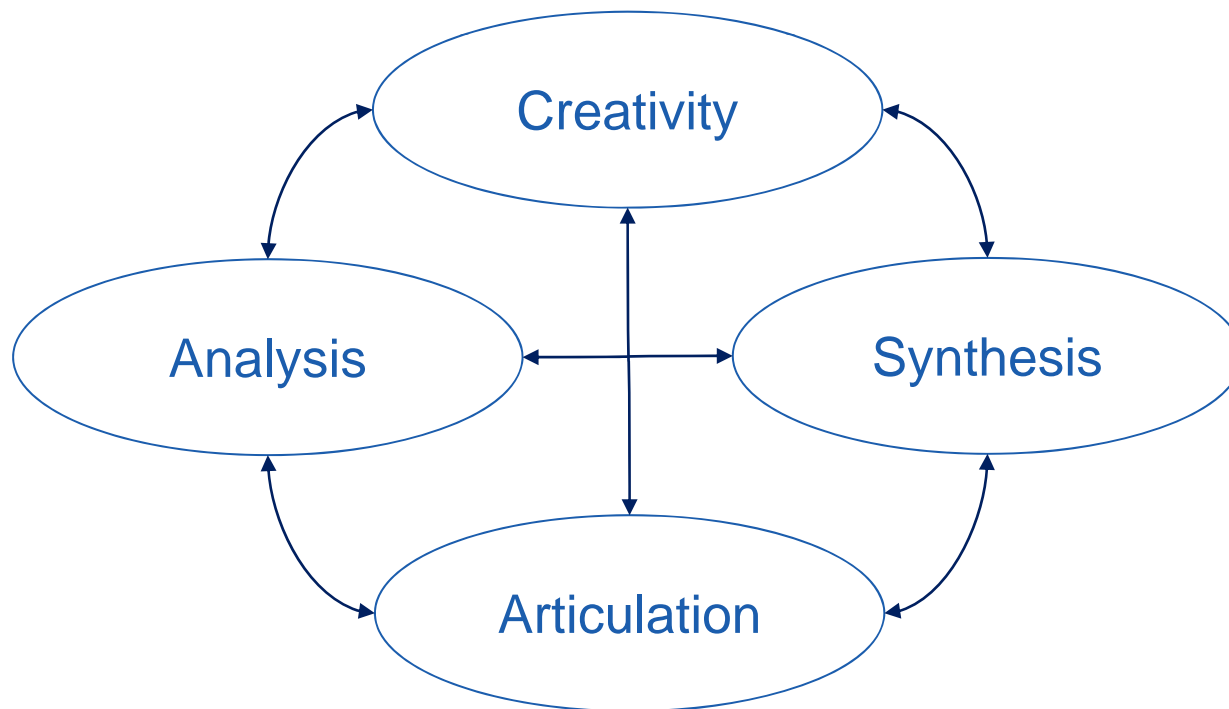
- **A data architect** who understands the nuances of all forms of data, including relational data, XML data and all things in between. Knowledge of data warehouse schemas is a must.
- **A software architect.** He or she should understand all things that code can do and how code should be best designed for maximum reuse and minimal complexity. Knowledge of business application architectures would be needed.
- **An integration architect.** This person should know the ins and outs of various middleware including web services, identity management, distributed system architectures, ETL tools, message-oriented middleware and all the things that keep distributed systems in sync.
- **A network architect** who can reason about network protocols, network security, routers, switches, the cable plant, wireless infrastructure, phone and data networks, converged networks and private and public network architectures.
- **A business process architect.** This person should know the ins and outs of how business process work (and don't), how business processes are best changed and how business processes and the technology can be altered for optimal architecture price and performance. The ability to communicate well with business leaders is key.
- **An organization architect.** This person should be trained and skilled in organizational development and organizational design. Deep knowledge about what makes humans tick is required. This person should be able to contribute to developing and evolving the corporate culture so that it can make maximum use of IT investments. Experience in psychology or social services may prove helpful.
- **Human experience architect.** This person should be a master of human-computer interface issues and help the architecture team conceive of elegant and highly usable IT tools with a significant “wow” factor where needed. Having worked for Apple’s industrial design team is a plus.
- **Business strategy architect.** This person should be deeply knowledgeable about the linkages between business strategy and IT. Knowledge of the various schools of business strategy is required and the ability to converse well with the best of business and academic researchers on these difficult and critical issues is needed.

Mike Rosen, Cutter Consortium on EA

- **Inquire** -- Architects are asked to solve specific problems. Getting to the core of the problem and soliciting requirements is the first step in addressing any given set of requirements.
- **Integrate** -- One of the major benefits that an architect brings to the enterprise is in integrating the solution for the particular project with the business domain, enterprise concerns, industry standards, established patterns, and best practices.
- **Analyze** -- Next, an architect has to analyze the information that he or she has collected. The analysis consists of answering three architectural questions: 1) What are the key elements of the problem or solution? 2) What are the relationships between them? 3) How do they combine to provide value higher up?
- **Conceptualize** -- Once the overall, integrated solution is framed, the architect needs to create a conceptual vision of the solution.
- **Abstract** -- The architect also has to communicate the key details to other specific audiences. This can be accomplished with architectural viewpoints, such as business, information, application, and technology perspectives. Abstraction can be defined as the suppression of irrelevant detail.
- **Visualize** -- They say a picture is worth a thousand words. It is also an excellent way to represent the architectural drawings and models at each level of abstraction. So, another key skill and function of the architect is to create visual renditions of the different abstractions and viewpoints.
- **Formalize** -- An architectural "specification" is the usual approach to formalization. However, the specification does not necessarily have to be a document. A formal visualization in the form of a complete and precise model, expressed in industry standard notation, may often be preferred .
- **Communicate** -- This is probably the single most important aspect of an architect's job. Fundamentally, architects are in the role of communicator. After they establish and formalize a solution, they need to communicate that solution as well as its importance and value throughout the organization.
- **Enable** -- A key to achieving architecture's goal of influencing IT projects and systems depends on the extent to which architects enable the target audience to easily use the architecture.
- **Assist** -- One of the primary enablers for architecture is to actively assist projects in using it. This is the single most important activity an architect can do to make the architecture real. Virtually all successful architecture programs include some aspect of consulting to projects.

The critical EA skill set

- These are separate and integrated skills
- Experience matters, but 'raw horsepower' for this manifests early



What do we want an enterprise architect to do?

- Do you see uncomfortable scope creep in the prior slides?
 - Isn't everyone an architect?
 - What can an architect reasonably do given scarce time?

- Key things to consider
 - What decisions today (big or small) have long-term implications?
 - What knowledge do we need to get that has long-term implications?
 - Who do we need to communicate and collaborate with now to affect the future?

- How do you advance EA?
 - Top-down?
 - Bottom-up?
 - Inside-out?
 - Outside-in?

Conclusion

- While I have my own assessments, opinions and decisions to form or make (all in collaboration with you!), I leave the question of “What does an enterprise architect do” to you to answer, individually and communally...

“Talk is dangerous. Sometimes it makes things happen, it makes it real.”

From Body Heat, Lawrence Kasdan

“Thinking is free. Action is expensive.”

Wisdom, vigilance and discipline prevent bad talk from becoming bad action!