Architecture Research

Responsibility, Business Value, Accountability, and Future State

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Thoughts on Architecture

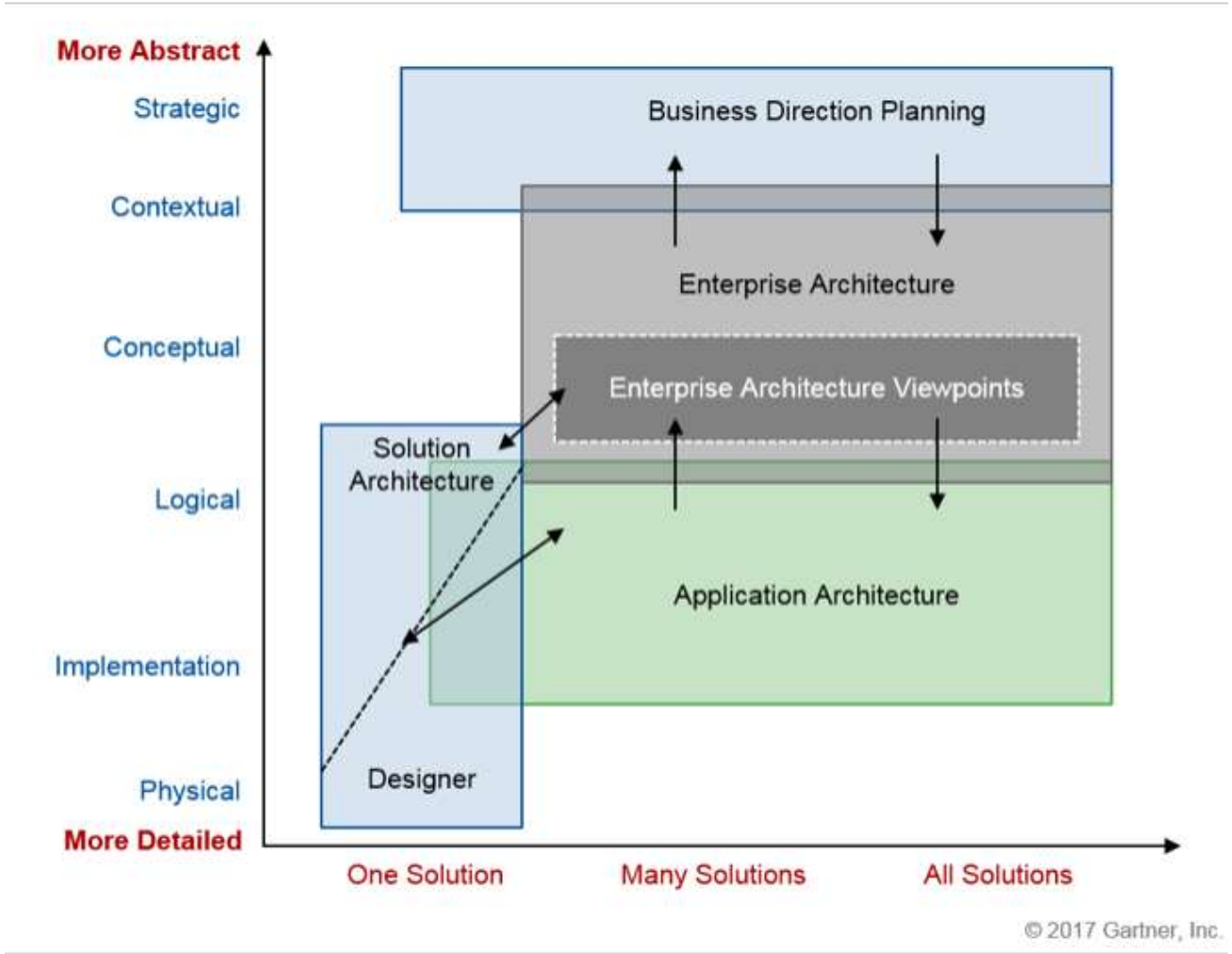
What we talk about when we talk about architecture

- Enterprise Architecture
- Application Architecture
- Data Architecture
- Security Architecture
- Software Architecture
- Solutions Architecture
- The list goes on…

What we talk about when we talk about Enterprise Architecture

- Top level view of architecture for an organization.
- Open group/TOGAF framework:
  - Business Architecture - business strategy, governance, organization, and key business processes
  - Data Architecture - structure of logical and physical data assets and data management resources
  - Application Architecture - blueprint for individual applications to be deployed, interactions, and relationships to core business processes
  - Technology Architecture - logical software and hardware capabilities supporting business, data, and application services: IT infrastructure, middleware, networks, communications, processing, standards, etc.
- According to Gartner:
  - Business architecture - guiding people, processes, and organizational change in response to disruptive forces towards business outcomes
  - Information Architecture - identifying the information needed to support the business model. Incorporating new sources of information for competitive advantage
  - Solution Architecture - creating deliverables that guide managing a portfolio of solutions to achieve targeted business outcomes
  - Technical Architecture - defines technologies used by the organization, how they fit together, standards/policies/etc.

One model for how these pieces fit together?



What do they focus on? What might they do?

	Enterprise Architecture	Application Architecture	Solution Architecture
Focus	Enterprise	Categories of applications	Single solution
Scope	Business, application, information, infrastructure	Application and information services	Business, information, application, infrastructure on a domain level
Detail	General/conceptual	Logical	Detailed/implementation
Primary Objective	Achieve business outcomes	Optimize application environment	Combine people, process, application and information to create a solution

Source: Gartner (June 2017)

Thoughts on Architects

The Software Architect’s Role in the Digital Age

- Role evolving from mostly technical to include business, social, and cultural aspects.
- Connect business and engineering to align company strategy and technology strategy ("ride the elevator from the penthouse to the engine room").
- Engaged in development, operations, and maintenance.
- Connect and coordinate. Manage complexity and spread knowledge.
- Contribute to quality attributes: business speed and value, cost and risk, technical debt management.

The Software Architect's Role in Practice

- Transforming from decision makers to advisors, coordinators, and knowledge managers.
- Emphasis on group decisions: developers make local decisions, groups form consensus global decisions with architects as consultants.
- Architects guide team members through standards/constraints.
- Identify important architectural decisions.
- Transferred knowledge to dev team.
- Explore technologies. Explore potential solutions.
- Document decisions (of value).
- Collect and disseminate patterns and guidelines.

Architect as shepherd:

- Architects must guide and harmonize the entire community of project stakeholders.
- They must bridge the gap between the development organization and the software architecture.
- Play a key role in change scenarios:
  - Adapt the organization and architecture to accommodate the changes.
  - Continuously change the architecture and organization to keep them aligned
  - Understand and mediate existing and new requirements, stakeholders, and concerns
- Architects must balance technical solutions with challenging social and organizational issues.
- Ultimately they must build relationships between people such that the goals of the development community are aligned with good-quality software architectures.

What about data architects?

- Design and maintains the architecture of data science applications
- Creates data models
- Creates data process workflows
- Designs shared information environments involving models or concepts
- Develops data models for optimal performance in databases
- Designs data structures for data interchange
- Develops data standards and converts data to controlled vocabularies
- Structures the technology that manages data models

What makes an architect successful? ("It depends.")

- Software architecture = "…the structures needed to reason about the system. Each structure comprises elements, the relations among them, and the properties of the elements and relations."
- Or the bridge between the system's business goals and its realization.
- Success is matching the architects skills to the role:

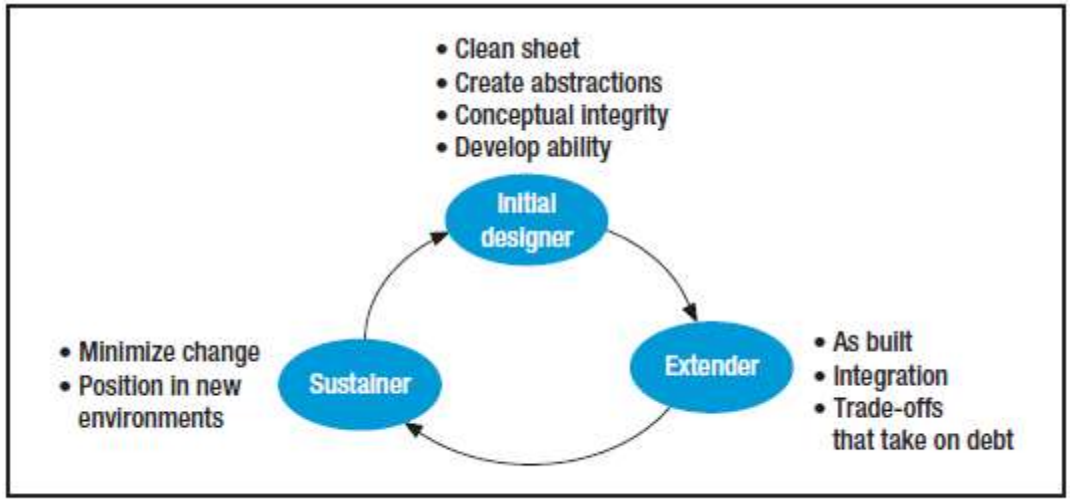


FIGURE 1. Software architects' three roles over a system's lifetime.

Initial designer	Extender	Sustainer
• Create and defend conceptual integrity	• Compromise conceptual integrity to accelerate value creation	• Assess and communicate conceptual integrity in new environment
• Understanding of all system structures and abstractions	• Understanding of as-built system, including undocumented side effects	• Understanding of system's environment and of competitive systems
• Proficiency with architecture design patterns	• Proficiency with architecture integration patterns	• Knowledge of how the system creates value for users or customers

FIGURE 2. Comparison of software architects' required skills across the three roles.

References

1. Waterman, Michael. "Agility, Risk, and Uncertainty, Part 1: Designing an Agile Architecture." *IEEE Software* 35.2 (2018): 99-101.
2. Klein, John. "What Makes an Architect Successful?." *IEEE Software* 33.1 (2016): 20-22.
3. Weinreich, Rainer, and Iris Groher. "The Architect's Role in Practice: From Decision Maker to Knowledge Manager?." *IEEE Software* 33.6 (2016): 63-69.
4. Hohpe, Gregor, et al. "The Software Architect's Role in the Digital Age." *IEEE Software* 33.6 (2016): 30-39.
5. Tamburri, Damian A., Rick Kazman, and Hamed Fahimi. "The Architect's Role in Community Shepherding." *IEEE Software* 33.6 (2016): 70-79.
6. da Silva Amorim, Simone, et al. "The Architect's Role in Software Ecosystems Health." *Proceedings of the 2nd Workshop on Social, Human, and Economic Aspects of Software*. ACM, 2017.
7. Slot, Raymond, Guido Dedene, and Rik Maes. "Business value of solution architecture." *Working Conference on Practice-Driven Research on Enterprise Transformation*. Springer, Berlin, Heidelberg, 2009.
8. Lavallée, Mathieu, and Pierre Robillard. "Are We Working Well with Others? How the Multi Team Systems Impact Software Quality." *e-Informatica Software Engineering Journal* 12.1 (2018): 117-132.
9. Gartner: Leadership Vision for 2019: Enterprise Architecture and Technology Innovation Leader, **Published:** 23 January 2018 **ID:** G00348586, *Analyst(s): Betsy Burton | Marcus Blosch | Brian Burke*
10. Gartner: Avoid the 13 Worst EA Practices and Ensure Your Success in the Digital Business Era, **Published:** 15 January 2018 **ID:** G00343827, *Analyst(s): Saul Brand | Betsy Burton | Marcus Blosch*
11. Gartner: Storytelling for Enterprise Architecture: How to Influence and Persuade Leaders of EA Value in Decision Making, **Published:** 29 January 2018 **ID:** G00350356, *Analyst(s): Philip Allega | Bruce Robertson | Ed Gabrys*
12. Gartner: Stage Planning a Business-Outcome-Driven Enterprise Architecture, **Published:** 16 March 2017 **ID:** G00321942, *Analyst(s): Brian Burke | Betsy Burton*
13. Saltz, Jeffrey S., and Nancy W. Grady. "The ambiguity of data science team roles and the need for a data science workforce framework." *Big Data (Big Data), 2017 IEEE International Conference on*. IEEE, 2017.