Software Architecture Context

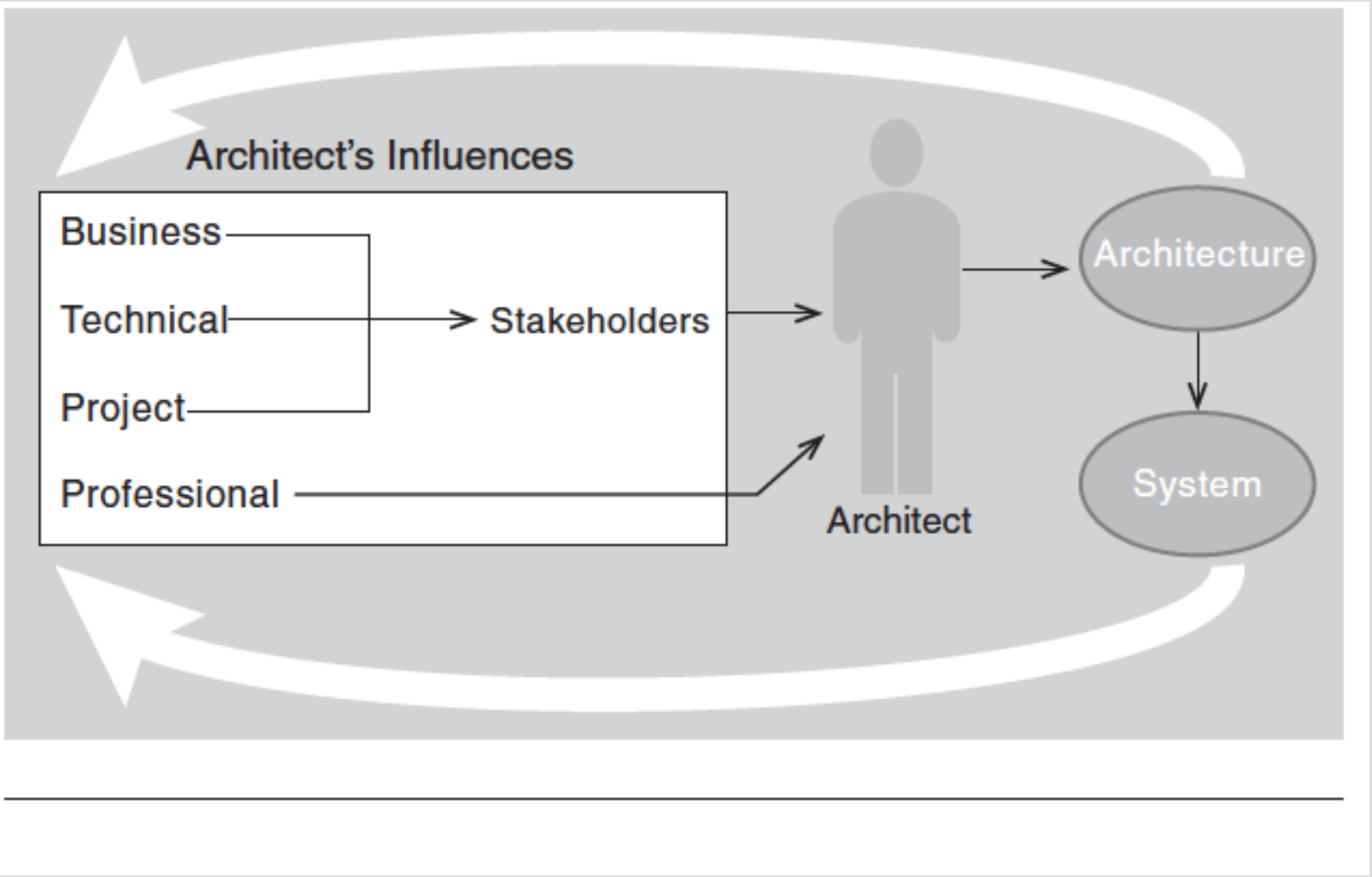
Topics

- Contexts of software architecture
- The architecture influence cycle
- What is the role of a software architect?

Contexts of Software Architecture

- **Technical** - technical role in the system or systems of which it's a part
- **Project life cycle** - relationship to the other phases of a software development life cycle
- **Business -** affect on an organization's business environment
- **Professional** - role of a software architect in an organization or development project

Architecture Influence Cycle

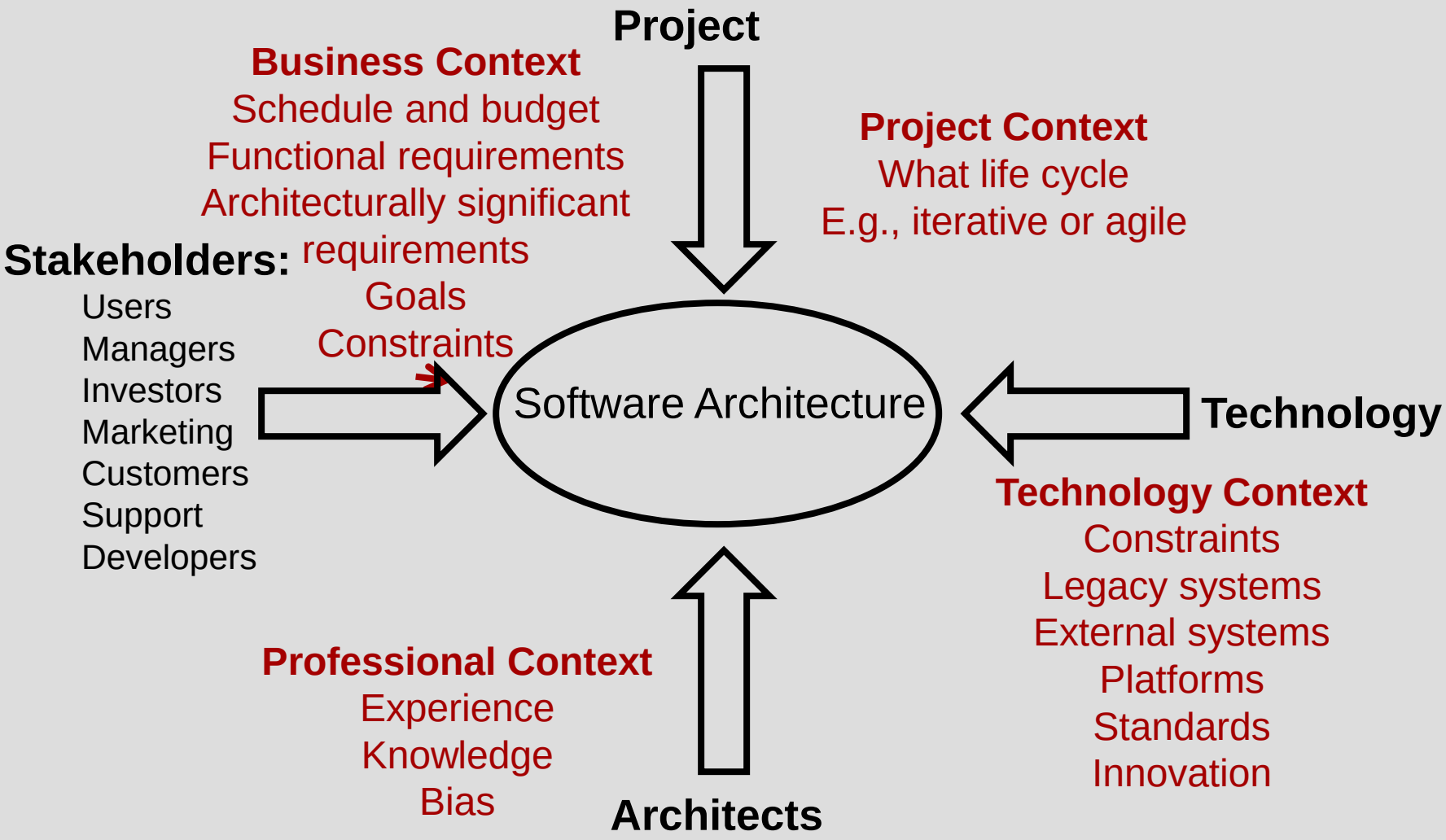


Intricate Interactive Waltz of Influence and Counterinfluence

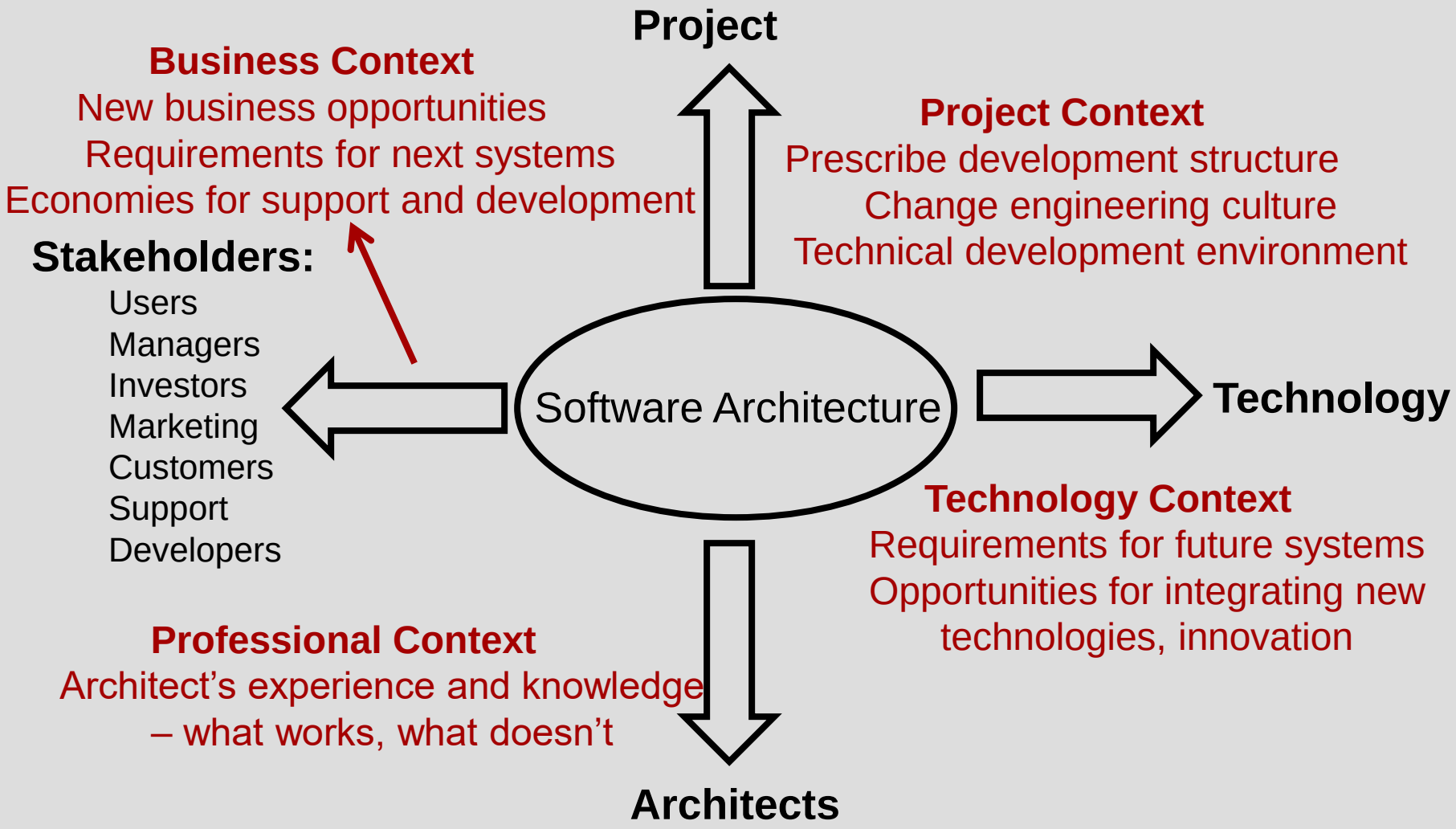
- Architects must identify and **actively engage the stakeholders** to solicit their needs and expectations
- A software architect must have considerable **communication, collaboration, and negotiating skills**
  - In addition to comprehensive **technical and domain knowledge**
  - Technically AND politically correct

"90% social sciences and diplomacy, 10% technology!"

The Architecture Milieu of Influences

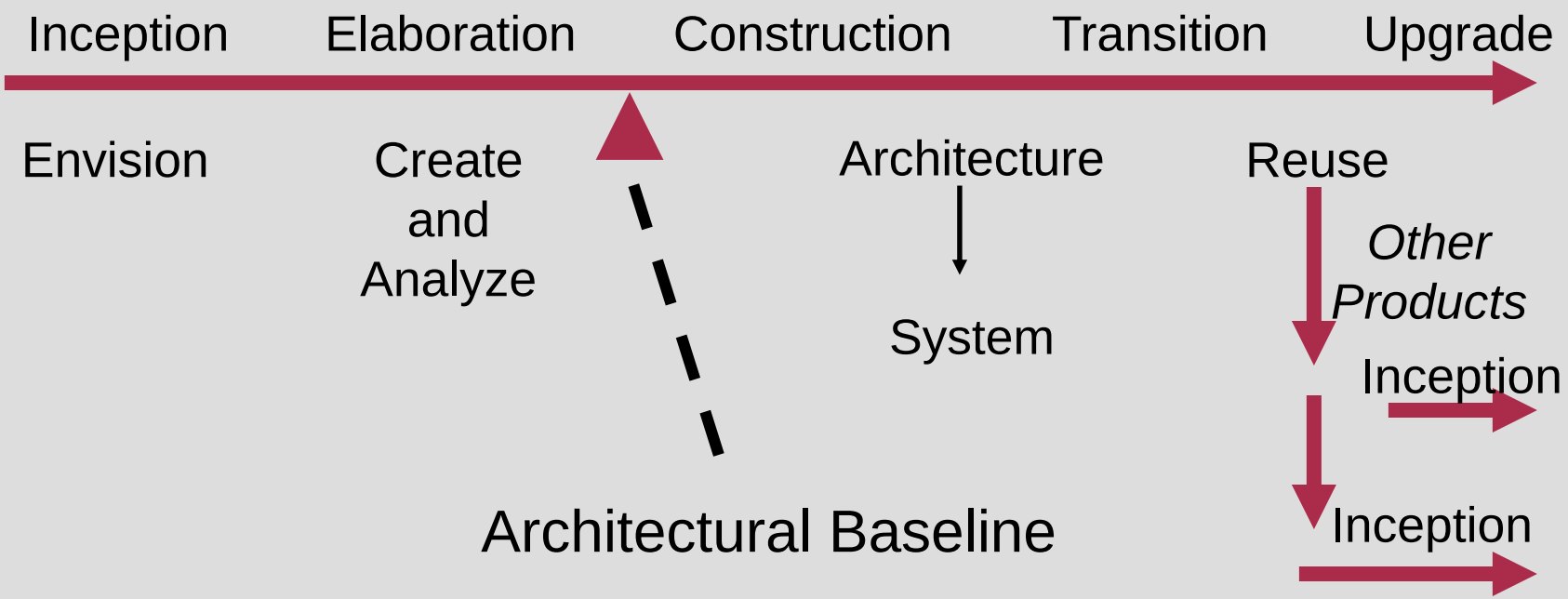


The Architecture Milieu of Influences

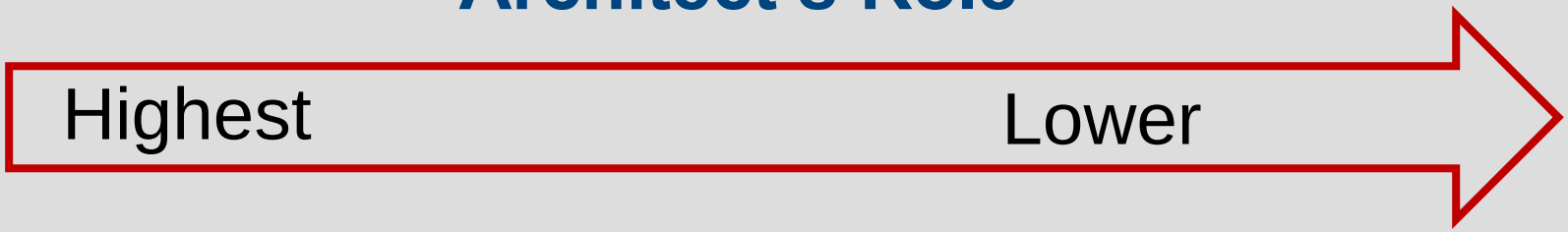


What is the Role of a Software Architect?

Architecture in the Product Life-Cycle



Architect's Role



Architect's Responsibilities

1. Contribute to the **business case** for the system
2. Understand the **architecturally significant requirements**
3. **Design or select the architecture**
4. **Document, communicate**, and **represent** the architecture
5. **Analyze** or **evaluate** the architecture
6. **Oversee/contribute** to system **construction** based on the architecture
7. Ensure the implementation conforms to the architecture - **validate**

Architecture Decision Scope and Impact

	Low Impact	High Impact *(high priority, important to business)*
Systemic *(broad scope)*	not architectural (*this could be a trap*)	**focus of architectural decisions**
Local	not architectural	not generally architectural *(though might set architecture guidelines and policies as needed)*

Software Architect Role Profile

- Architecture design but also …
- System software and hardware selection
- Build vs. buy decisions
- Architecturally significant requirements
- Development methodology, process, standards
- Technical and project leadership
- Coaching
- Hands on construction
- Leverage experience, track technology trends

Software Architect Role (Job Description)

(from Hofmeister *et al.*, *Applied Software Architecture*)

- The software architect **creates a vision**
  - Keeps up with innovations and technologies
  - Understands global requirements and constraints (business and technical)
  - Creates a vision (global view) of the system
  - Communicates the vision effectively
  - Provides requirements and inputs to the system architect (if separate role)
- The software architect is the **key technical consultant**
  - Organizes the development team around the architecture design
  - Manages dependencies
  - Reviews and negotiates requirements
  - Assesses technical capabilities of staff
  - Motivates the team
  - Recommends technology, training, tools
  - Tracks the quality of the design
  - Ensures architecture meets its design goals

Software Architect Role (continued)

- The software architect **makes decisions**
  - Leads the design team
  - Makes early design decisions (key global ones)
  - Knows when to end discussion and make a decision
  - Identifies and manages risk
- The software architect **coaches**
  - Establishes dialog with each team member
  - Teaches the team the architecture design and gets their buy-in
  - Listens to feedback
  - Knows when to yield to design changes
  - Knows when to let others take over detailed design
- The software architect **coordinates**
  - Coordinates activities of tasks that influence or are influenced by the architecture
  - Maintains integrity of the design
  - Ensures that the architecture is followed

Software Architect Role (continued)

- The software architect **implements**
  - Considers the design implications of introducing a new technology
  - May look at low-level details to validate initial concepts
  - May **prototype** to explore and evaluate design decisions
  - May implement a thin vertical slice to minimize implementation risk
  - May implement components as an implementation model for developers
- The software architect **advocates**
  - Advocates investment in software architecture
  - Works to incorporate software architecture into the software process
  - Continues to assess and advocate new software architecture technologies
  - Advocates architecture reuse

Career Path

(from Hofmeister *et al.*, *Applied Software Architecture*)

- Set your sights on becoming an **expert in software engineering**
  - gather broad experience
  - develop technical, leadership, communication and people skills
- **Apprentice** (hang out) with an experienced architect, or better get an **architect mentor**