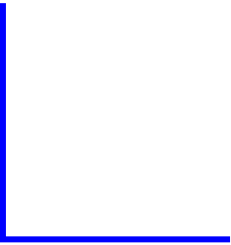


Software Engineering

Lecture 11

Architecture Modeling

Gregory S. DeLozier, Ph.D.
Kent State University
Mar 1, 2017



Architecture Modeling

- *What* is architecture?
- *Why* make models of it?
- *How* to make models of it?



What is Architecture?



Software Architecture

- **Software architecture** refers to

the fundamental structures of a software system,

the discipline of creating such structures,

and the documentation of these structures.

https://en.wikipedia.org/wiki/Software_architecture

Software Architecture #2

Architecture has become a very slippery word in the software business. It's hard to come up with any solid definition of what it means. I see it as a fundamentally subjective term - when people describe their software architecture they select the important parts of their systems, how these parts fit together, and the key decisions they made in designing their systems. Architecture is also seen as a technical issue, with the implication that the key decisions that need to be made are technical decisions.

- <https://www.martinfowler.com/books/hohmann.html>

Software Architecture #3

More from Martin Fowler...

What do we mean by a software architecture? To me the term architecture conveys a notion of the core elements of the system, the pieces that are difficult to change. A foundation on which the rest must be built.

<https://www.martinfowler.com/articles/designDead.html>

Software Architecture #4

- My working definition:

Those parts of a system design that are important to keep in mind while designing and implementing each component in detail.

- This includes interfaces, common resources, APIs, etc.
- This does not include things that are encapsulated
- This does not include things that are trivially changed



Reasons for Modeling



Models Facilitate Discussion

- Again from Martin Fowler...

A common use of diagrams is to explore a design before you start coding it. Often you get the impression that such activity is illegal in XP, but that's not true. Many people say that when you have a sticky task it's worth getting together to have a quick design session first. However when you do such sessions:

- keep them short
- don't try to address all the details (just the important ones)
- treat the resulting design as a sketch, not as a final design

Models Enhance Understanding

- Models allow participants to think about the problem
- Describe component structure
- Describe interactions between components
- Discover assumptions and disagreements

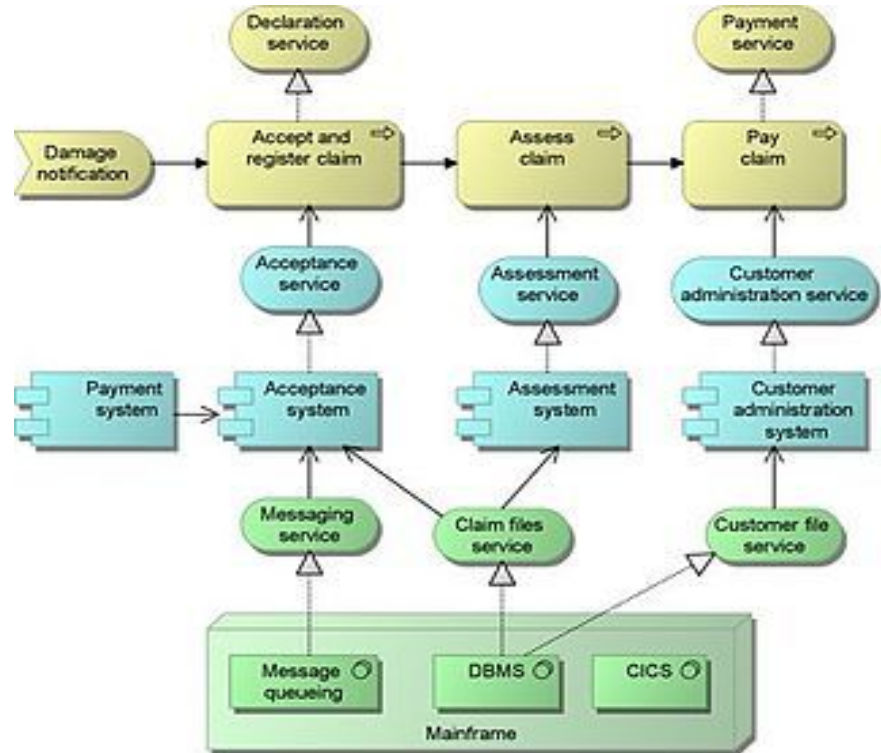
Models Communicate

- Team members (as we just mentioned)
- Stakeholders (check assumptions)
- Maintainers (future team members)
- Operations (easier to deploy with architectural info)

Modeling Tools

Archimate

- Archimate is a graphical modeling **language** for describing
 - Business systems
 - Applications
 - IT technology



<https://en.wikipedia.org/wiki/Archimate>

Archimate Layers

- Business Layer
- Application Layer
- Technology Layer

Passive structure	Behavior	Active structure	Motivation
	Business layer		
	Application layer		
	Technology layer		
Implementation & Migration			

Business Layer

The Business layer is about
business processes,
services,
functions and events of business units.

This layer "offers products and services to external customers, which are realized in the organization by business processes performed by business actors and roles".

Application Layer

The Application layer is about

software applications

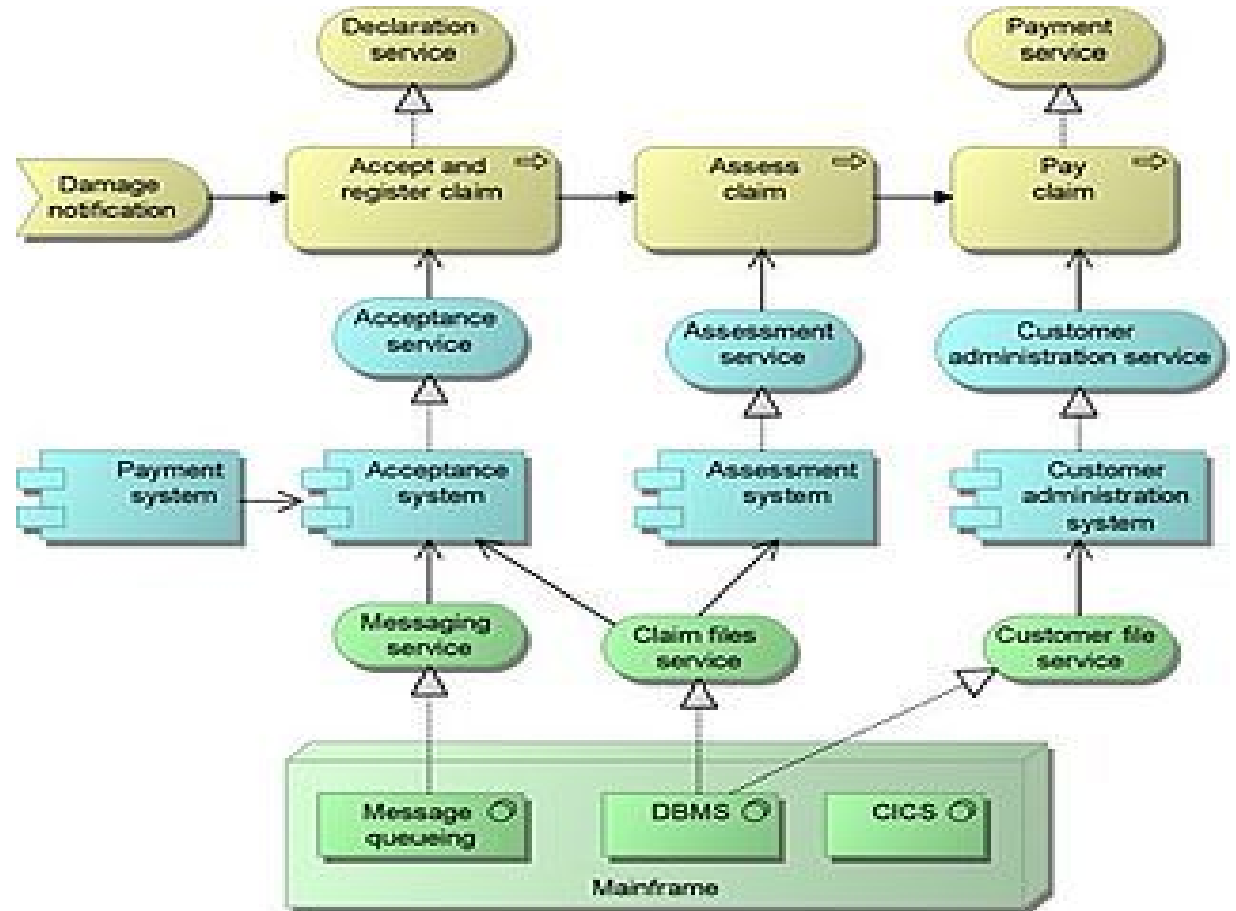
that "support the components in the business
with application services".

Technology Layer

The Technology layer...

- deals "with the hardware and communication infrastructure to support the Application Layer.
- This layer offers infrastructural services needed to run applications,
- Realized by computer and communication hardware and system software".

Archimate

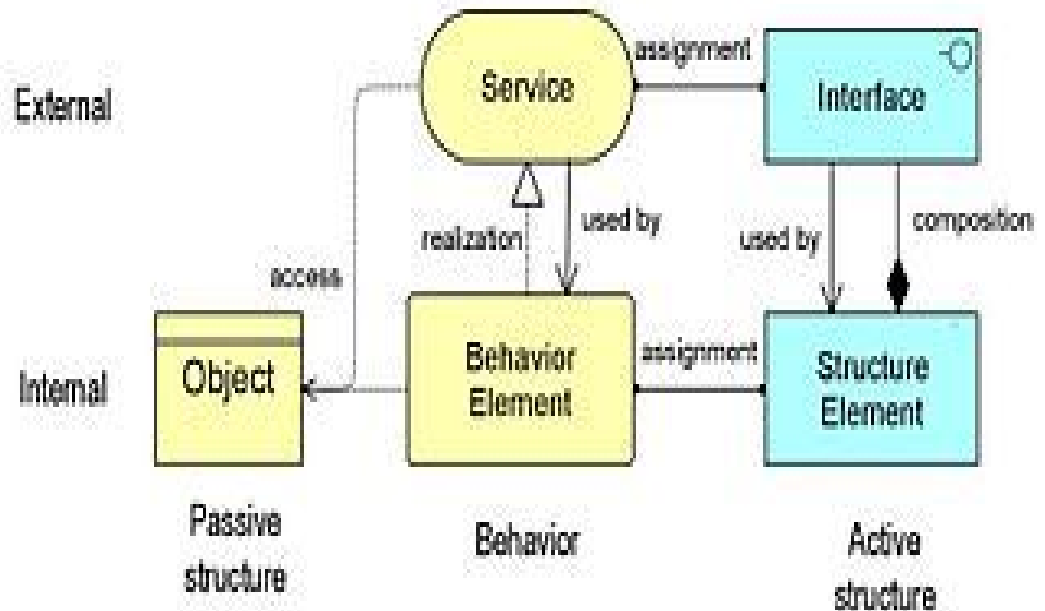


Archimate Language Elements

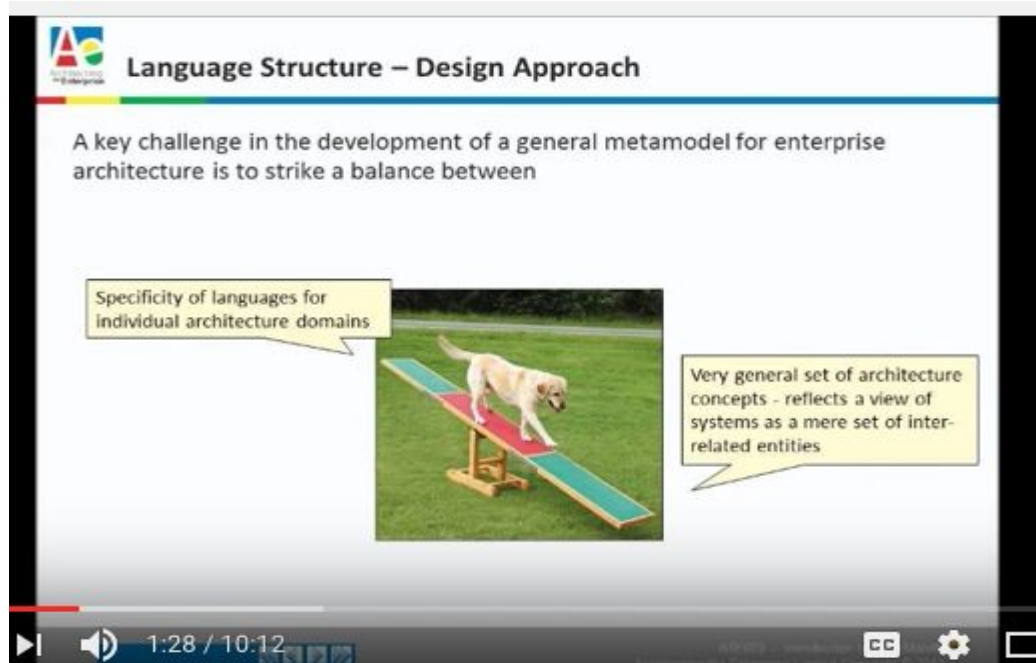
Symbols have
specific meanings...

Typically elements
can appear in
more than one
diagram. (Demo ahead)

These diagrams can
get quite large.
Try not to do that.



Archimate Video Intro



<https://www.youtube.com/watch?v=h-KY0q1UYVY>

Archimate Tools

- Archi is the most popular, though there are others
- Free (Archi) and commercial (Enterprise Architect)
- Demo time

<http://www.archimatetool.com/>

<https://www2.opengroup.org/ogsys/catalog/W168>

Reading

Links embedded in the slides today...

Specifically read the "Is Design Dead" (Fowler) article.

You are encouraged to explore the Archimate ecosystem.