

Architecture

Open Architecture and

FOSS tools



OPEN ARCHITECTURE

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Author : Maikel Mardjan (@maikelmardjan)



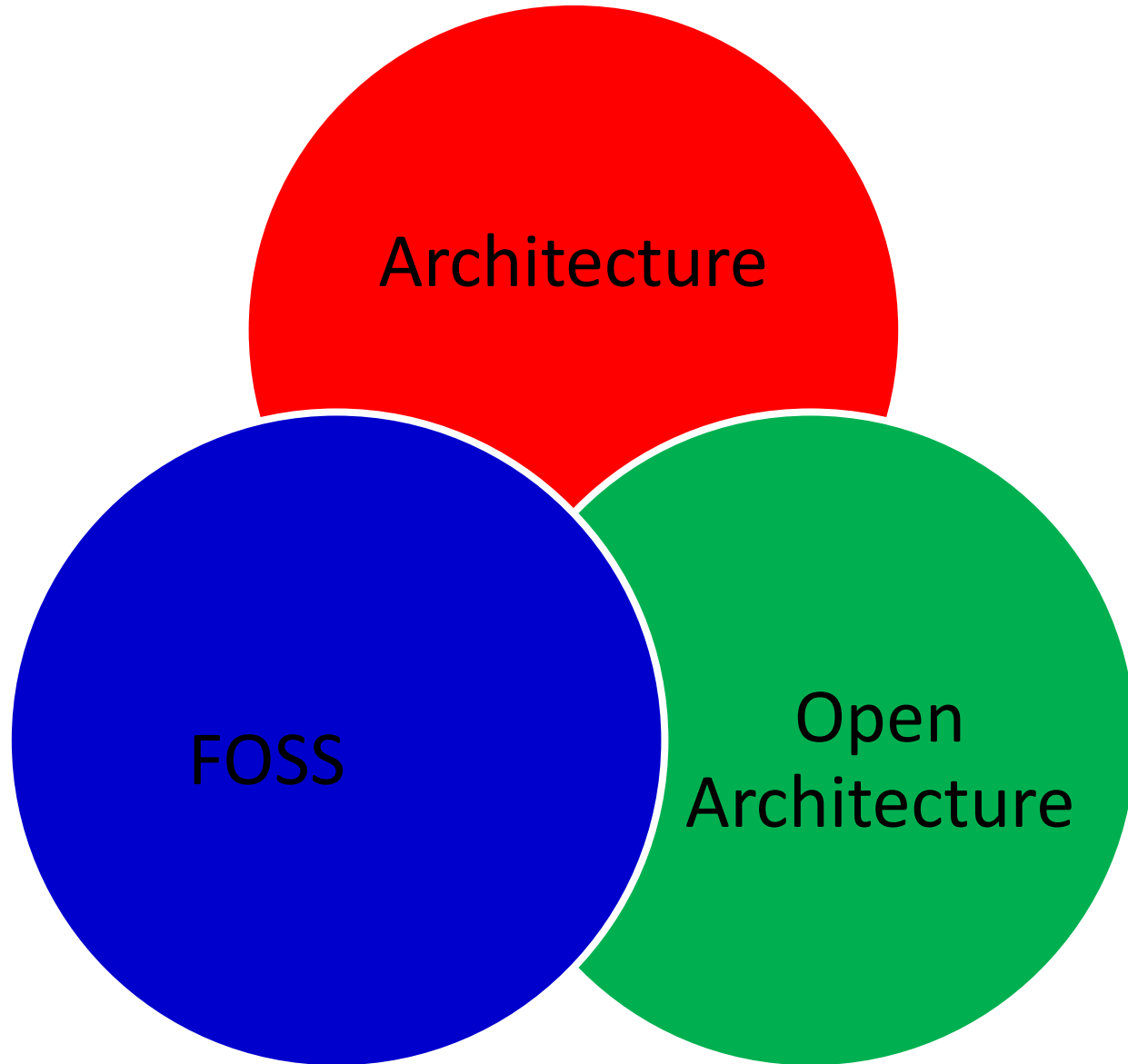
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Growth
No Complexity



SCOPE



WHOAMI



Name : Maikel Mardjan (Dutch)

- Architecture & Design
- 20+ years working within IT Industry
- Master (MSc) Business Studies of University of Groningen
- Master degree (MSc) Electrical Engineering, of Delft University of Technology
- ...and still likes to do real hands-on programming (Golang, Python, PHP,JS etc) to make and break things

I love solving IT challenges and creating good architectures and designs for complex systems



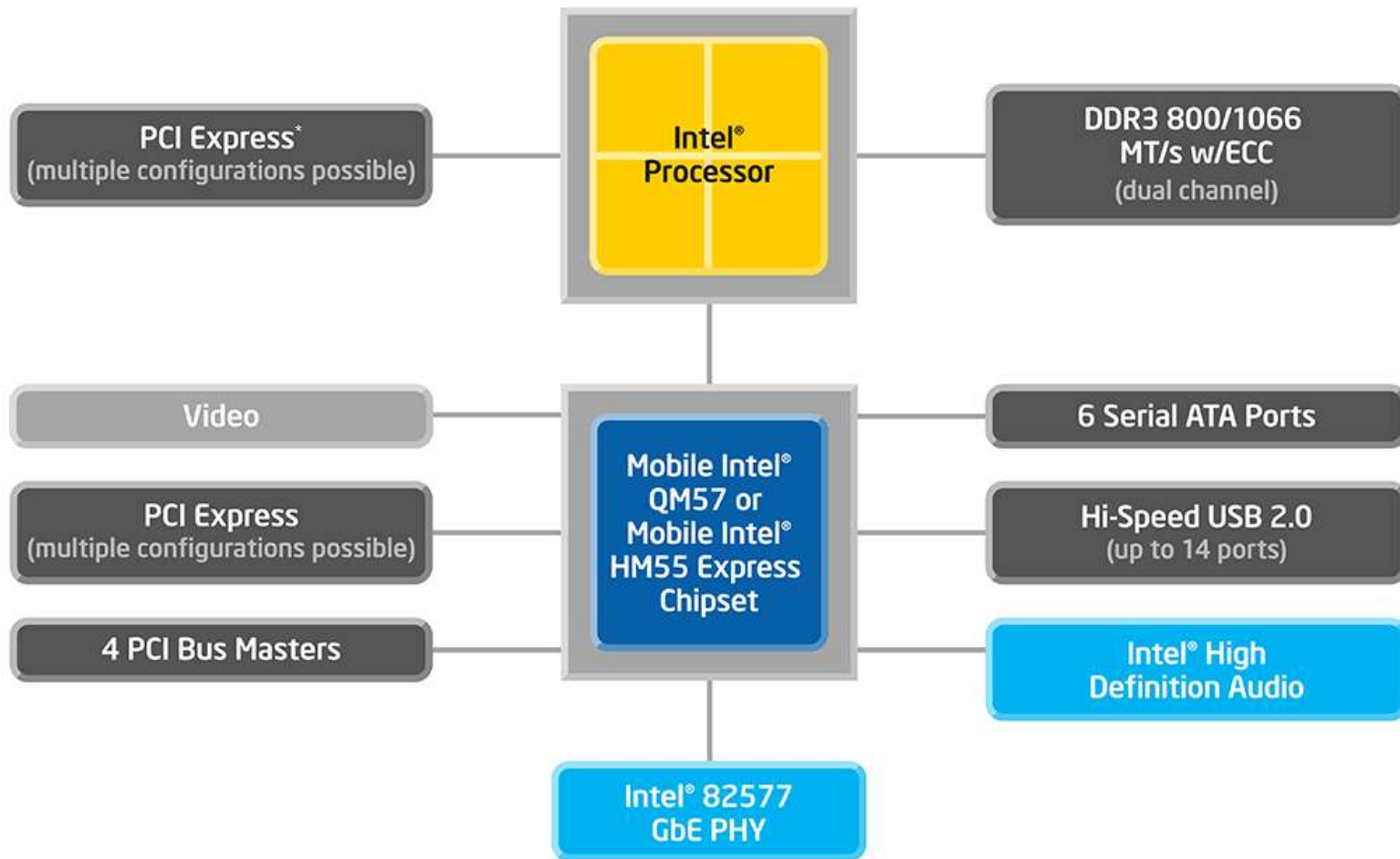
AGENDA

- What is IT architecture
- Architecture methods and frameworks
- The need for open architectures
- FOSS tools for creating your (open) architecture
- What is wrong with TOGAF™ and Archimate™?
- Problems and challenges for Open Architectures

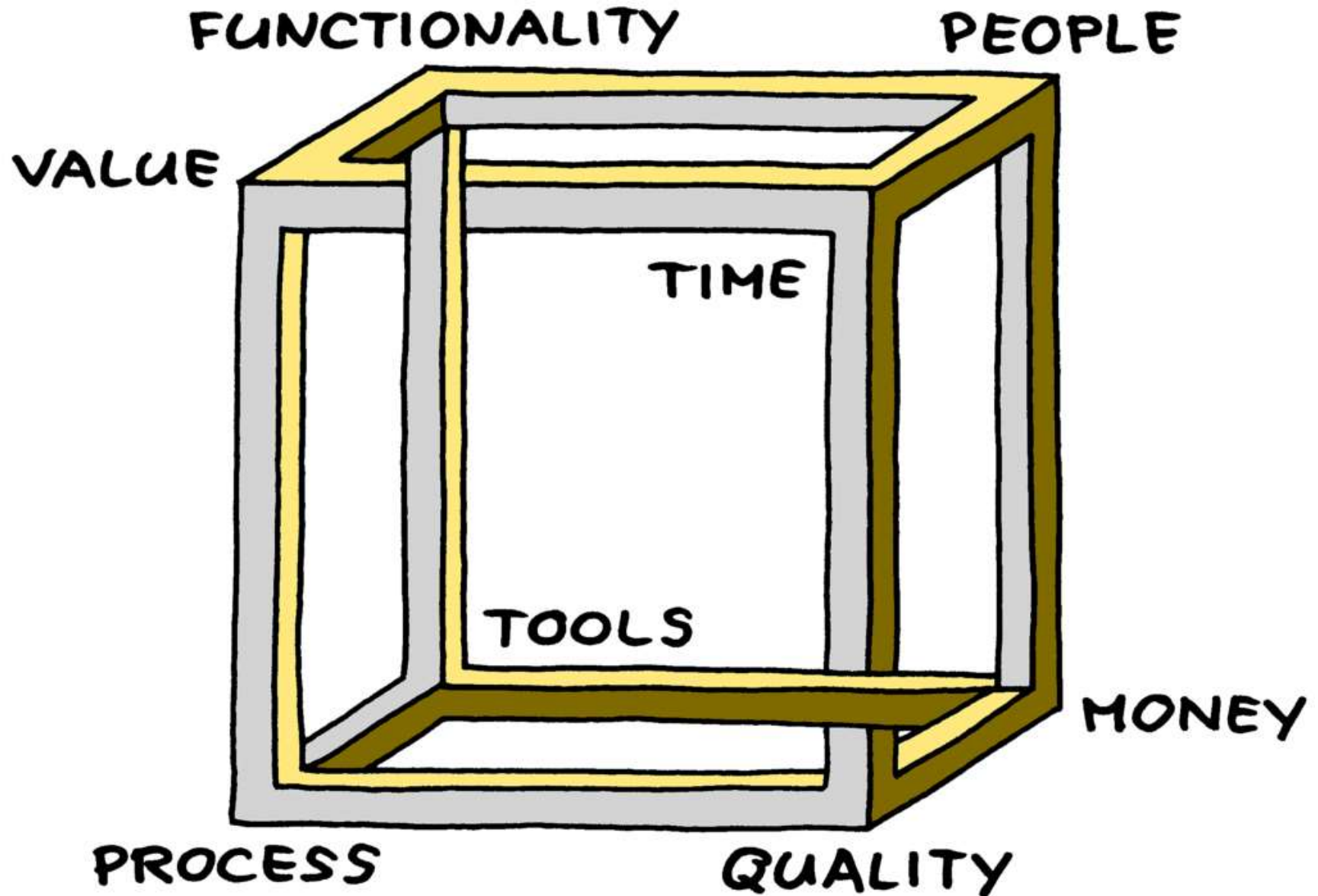
WHAT IS IT ARCHITECTURE?



WHAT IS IT ARCHITECTURE?



WHAT IS IT ARCHITECTURE?



ARCHITECTURE?!

(Too) Many many definitions!

Asking the question means you:

- Receive a (very) opinionated answer
- Get lost within 10 seconds
- Can be sucked into a field of software engineering you never were aware of

ARCHITECTURE: SOME DEFINITIONS

- “The structure of components, their inter-relationships, and the principles and guidelines governing their design and evolution over time.” (source: Togaf9)
- “(system) fundamental concepts or properties of a system in its environment embodied in its elements, relationships, and in the principles of its design and evolution” (source: IEEE)
- “The complex or carefully designed structure of something.” (Oxford dictionary)
- “The conceptual structure and logical organization of a computer or computer-based system.” (Oxford dictionary)
- “A structured set of descriptive representations relevant for describing an object and being employed such that an instance of the object can be created and such that the descriptive representations serve as the baseline for changing an object instance.” (John Zachman)

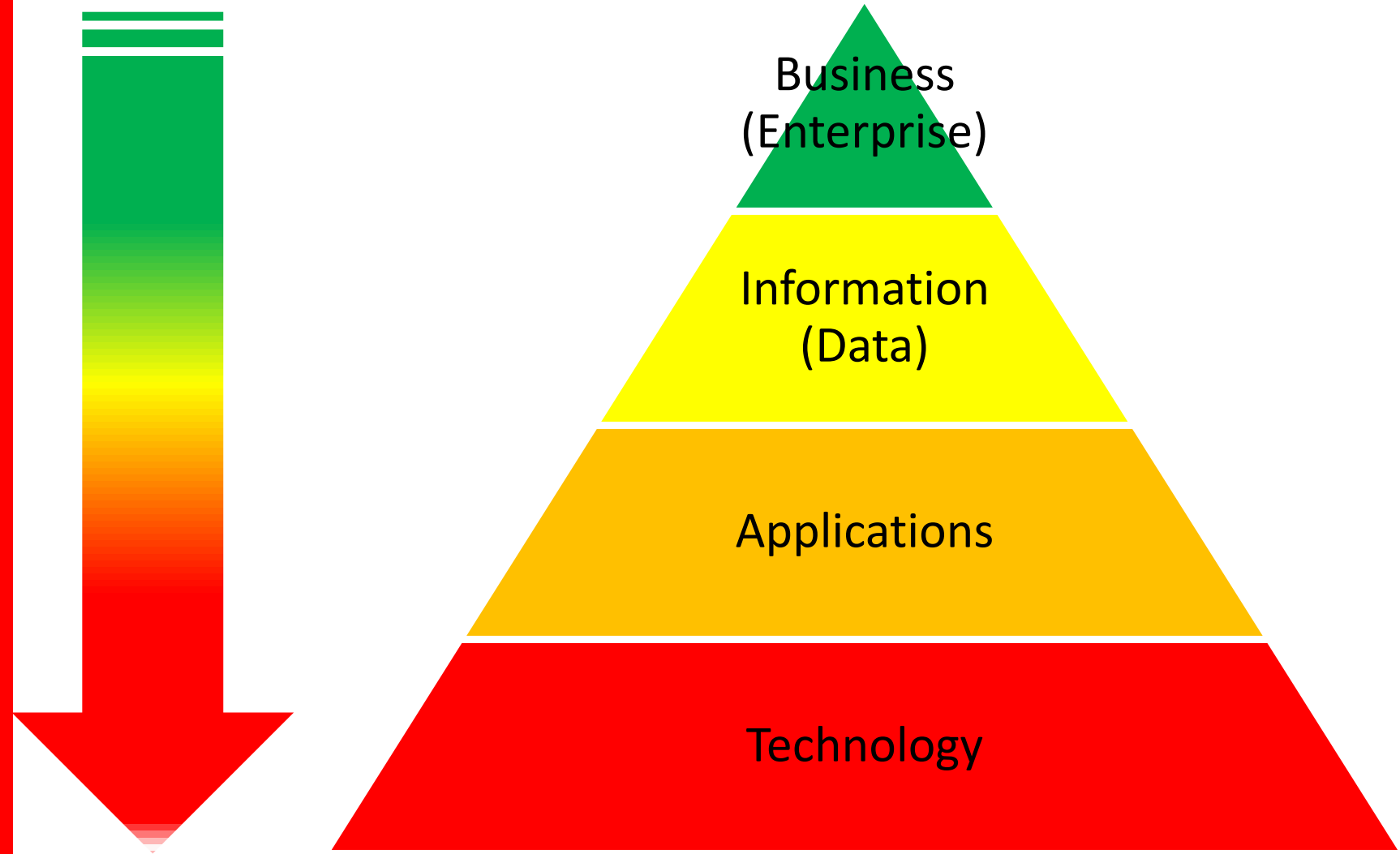
ARCHITECTURE

Some guidelines:

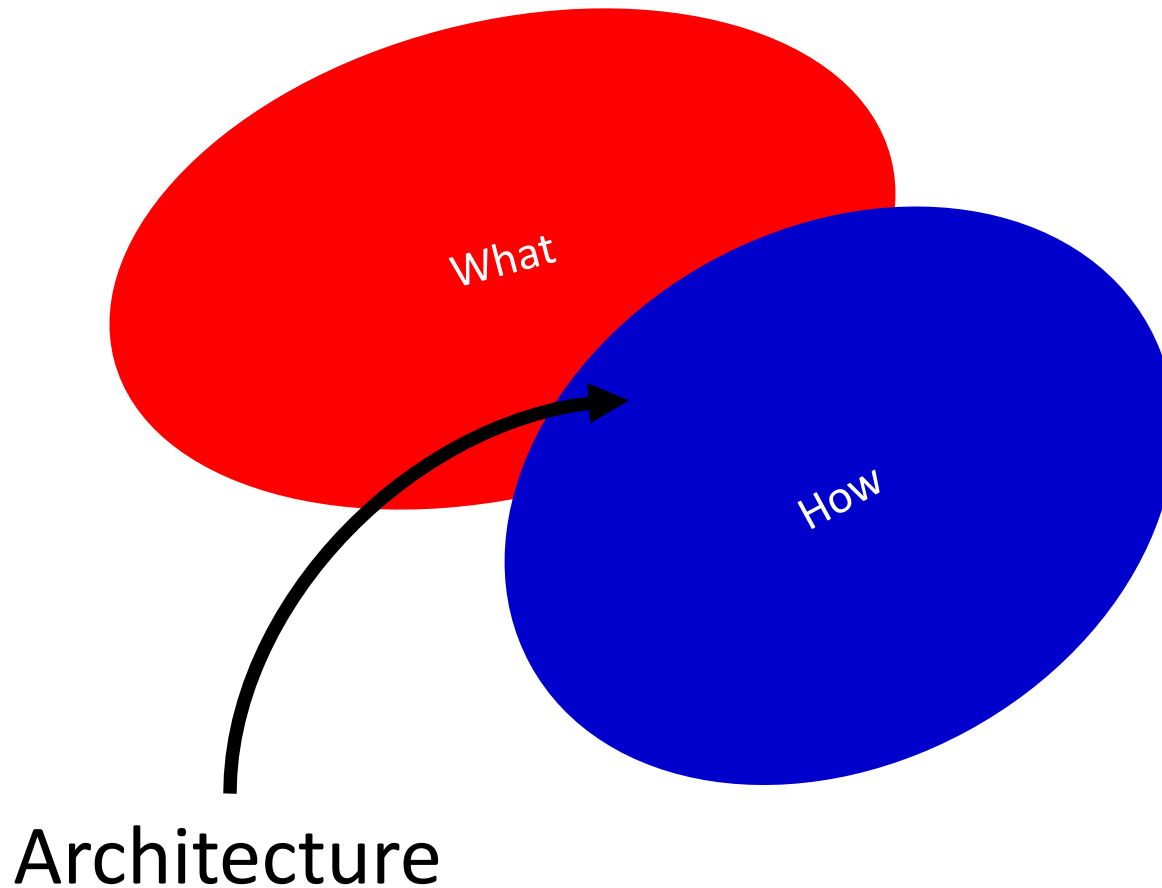
- An architecture is what is **fundamental** to a system (so not *everything* about a system), but the essentials.
- IT Architecture is not by definition high level. Relevant details can be of the utmost importance.
- Is more than software and engineering (it is also about the 'fuzzy vague things')
- Architecture **must** have a purpose!

ARCHITECTURE?!

Architecture (mind the colours -)



ARCHITECTURE: JUST ENOUGH!



Try to keep away from the 'why'...

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ARCHITECTURE METHODS & FRAMEWORKS

Architects love methods, frameworks and selfies



Monkey Selfie

ARCHITECTURE METHODS AND FRAMEWORKS

If you know one you know them all?



COMMON USED ARCHITECTURE METHODOLOGIES

There are frameworks and methodologies

Methodology:

- An explicit way of structuring one's thinking and actions.

Framework:

- Meta-level (a higher level of abstraction) through which a range of concepts, models, techniques, methodologies can either be clarified and/or integrated.

For IT Architecture: (Most) Frameworks are used as methodology.

WHAT IS IT ALL ABOUT?

Why?
Contextual

Security

Governance

What?
Conceptual

How?
Logical

With What?
Physical

WHAT IS IT ALL ABOUT?

Why?
Contextual

Security

Governance

What?
Conceptual

How?
Logical

With What?
Physical

Business

Information

Information
Systems

Technology
Infrastructure

WHAT IS IT ALL ABOUT? BUT I DO ...

Why?
Contextual

What?
Conceptual

How?
Logical

With What?
Physical

Security Architecture

Governance

Business
Architecture

Information
Architecture

Data
architecture

Big Data
Architecture

Application
architecture

Software
Architecture

Technology
Infrastructure
Network
architecture

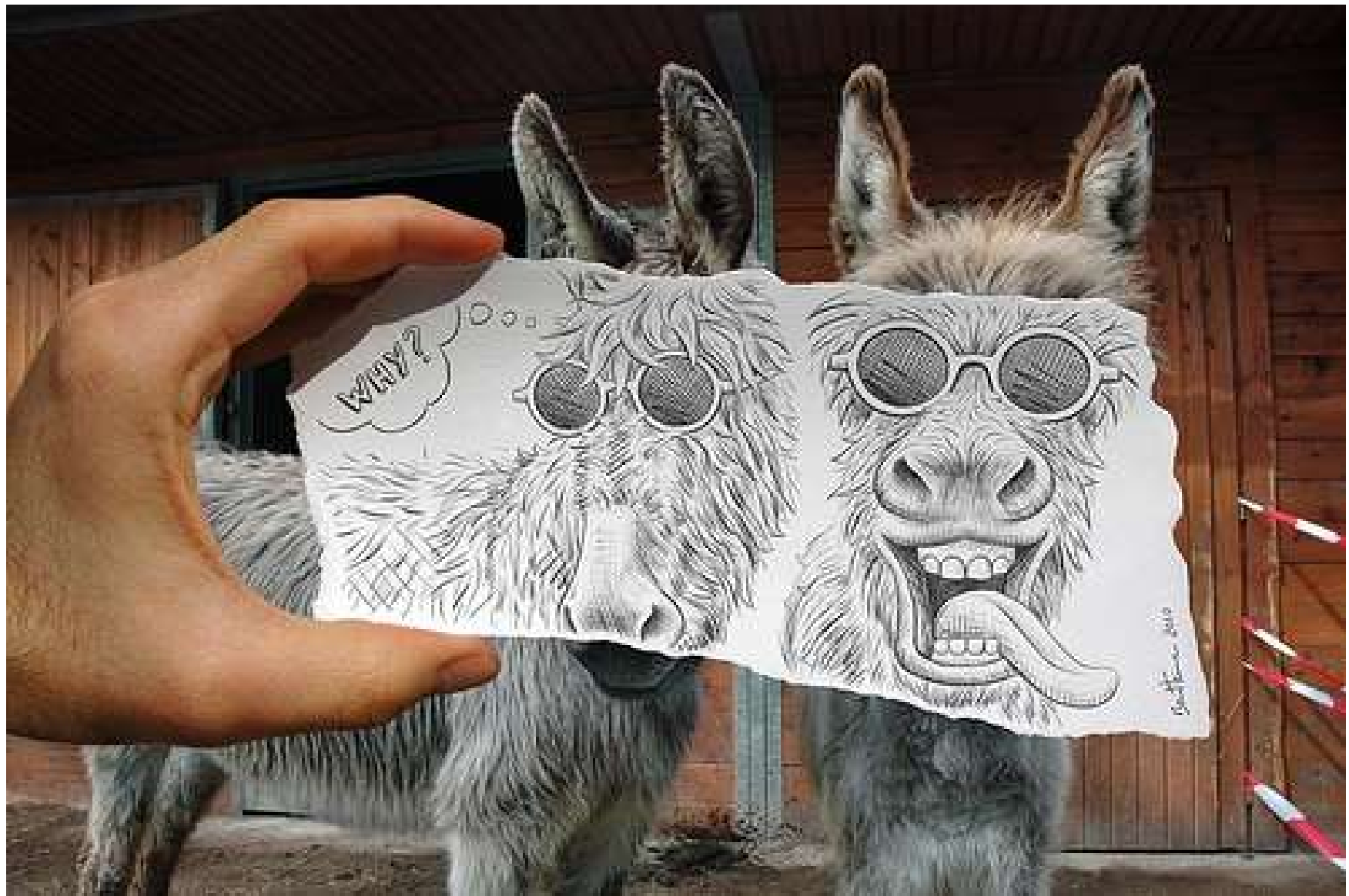
System
architecture

**Architecture*

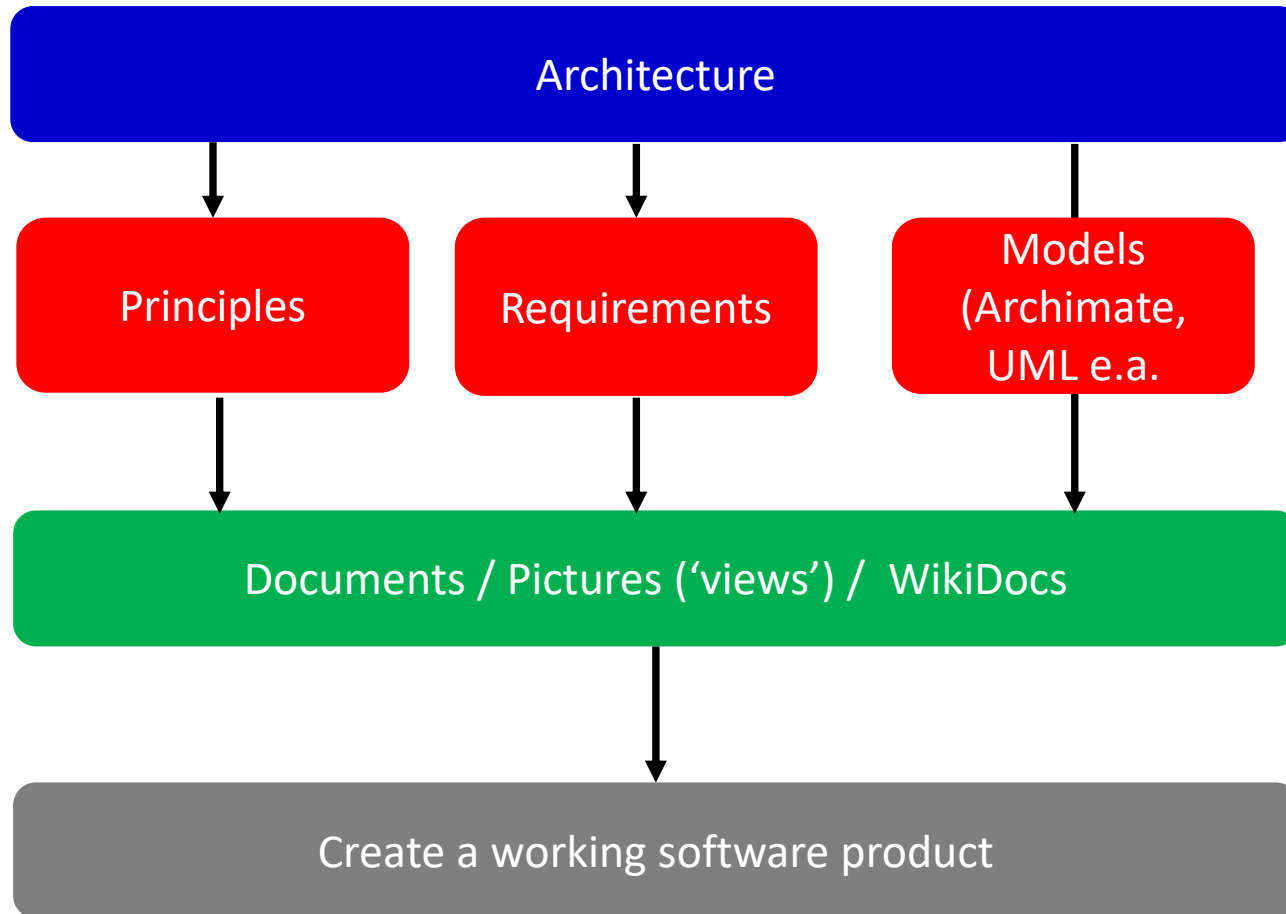
COMMON USED ARCHITECTURE METHODOLOGIES AND FRAMEWORKS

- DoDAF (US Department of Defense Architecture Framework)
- FEAF (US Federal Enterprise Architecture Framework)
- IAF (Index/Integrated Architecture Framework) (Capgemini)
- Zachman Framework
- GEA (General Enterprise Architecting) (Ordina)
- DYA (Dynamic Architecture) (Sogeti)
- TOGAF (The Open Group Architecture Framework)

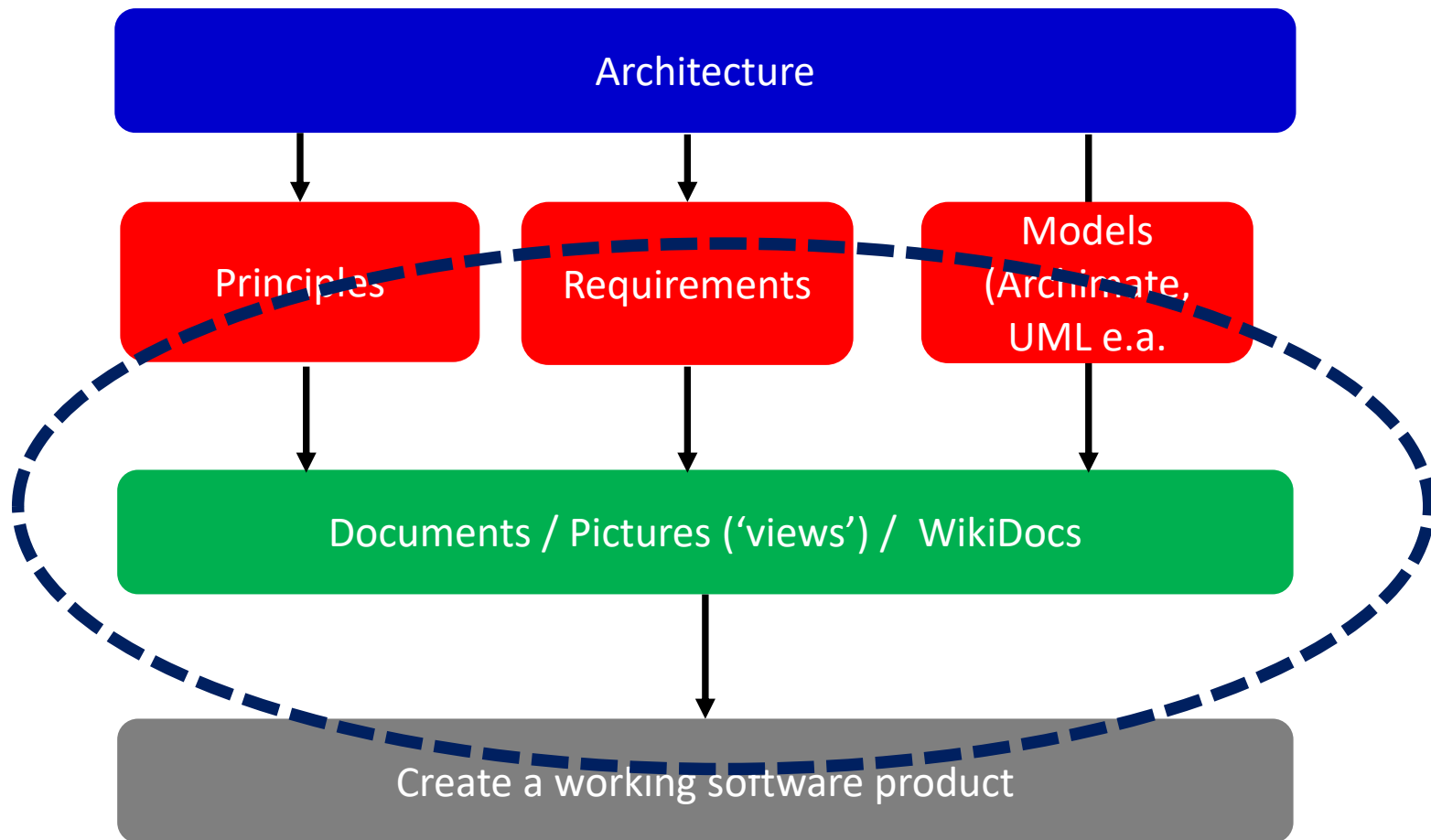
WHAT IS THE PRODUCT OF ARCHITECTURE?



THE PRODUCTS OF ARCHITECTURE



THE PRODUCTS OF ARCHITECTURE



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WHY DO WE NEED OPEN FOR ARCHITECTURE?

Are you
insane?!
The **why**
question!

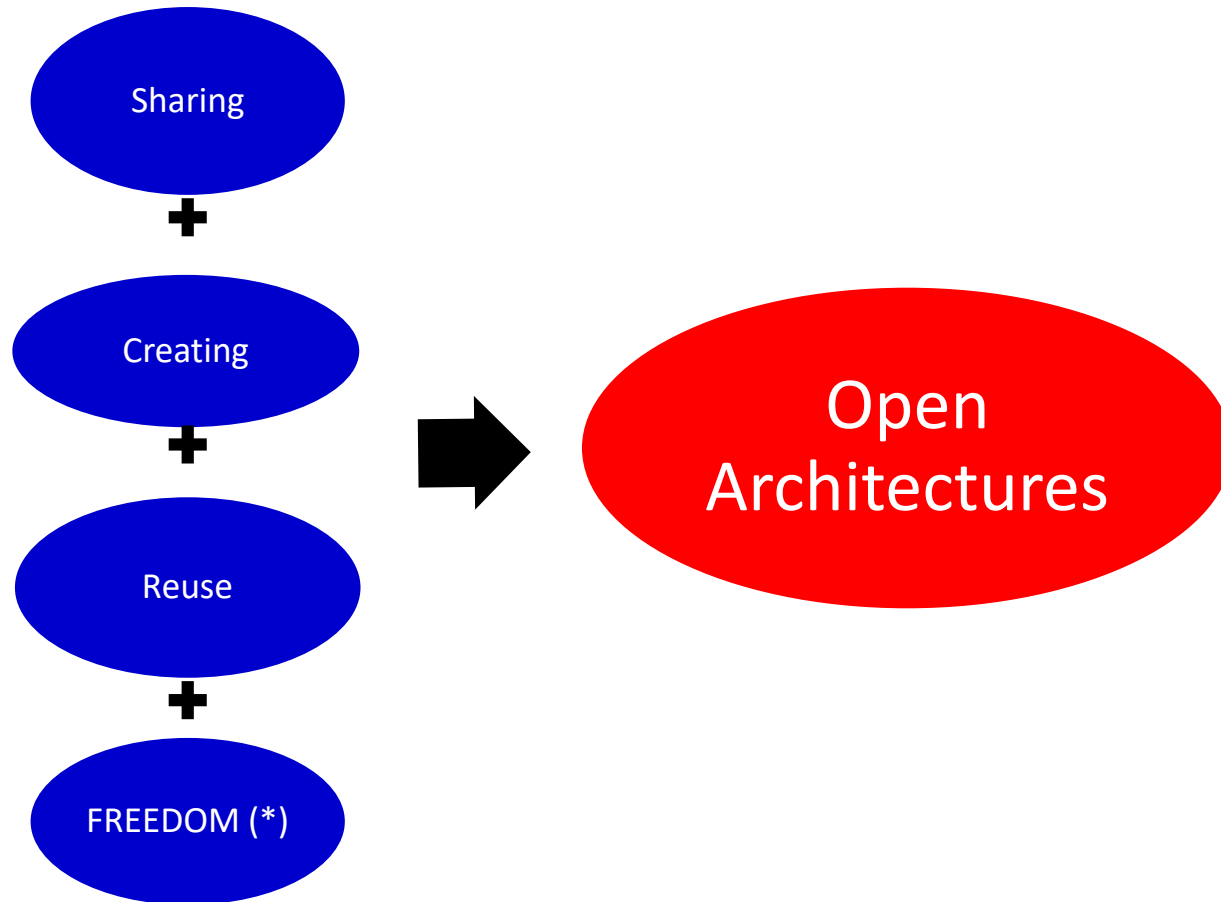


WHY DO WE NEED OPEN FOR ARCHITECTURE?

Never ask the why question...



OPEN ARCHITECTURES?



(*) Freedom as meant by Free Software Foundation (FSF)

THE (TOO) OPEN ARCHITECTURE

As with architecture (too) many definitions of what an open architecture exist.

When talking about open architectures the main perception is:

- Based on open standards
- Easy to adjust
- Flexible
- (micro)Services based
- Has components ('building blocks') that can easily be replaced
- Easy to extend (e.g. base system with plugins/add-ons/etc)

OPEN ARCHITECTURE (MAIN PERCEPTION)



OPEN ARCHITECTURE (REALITY)



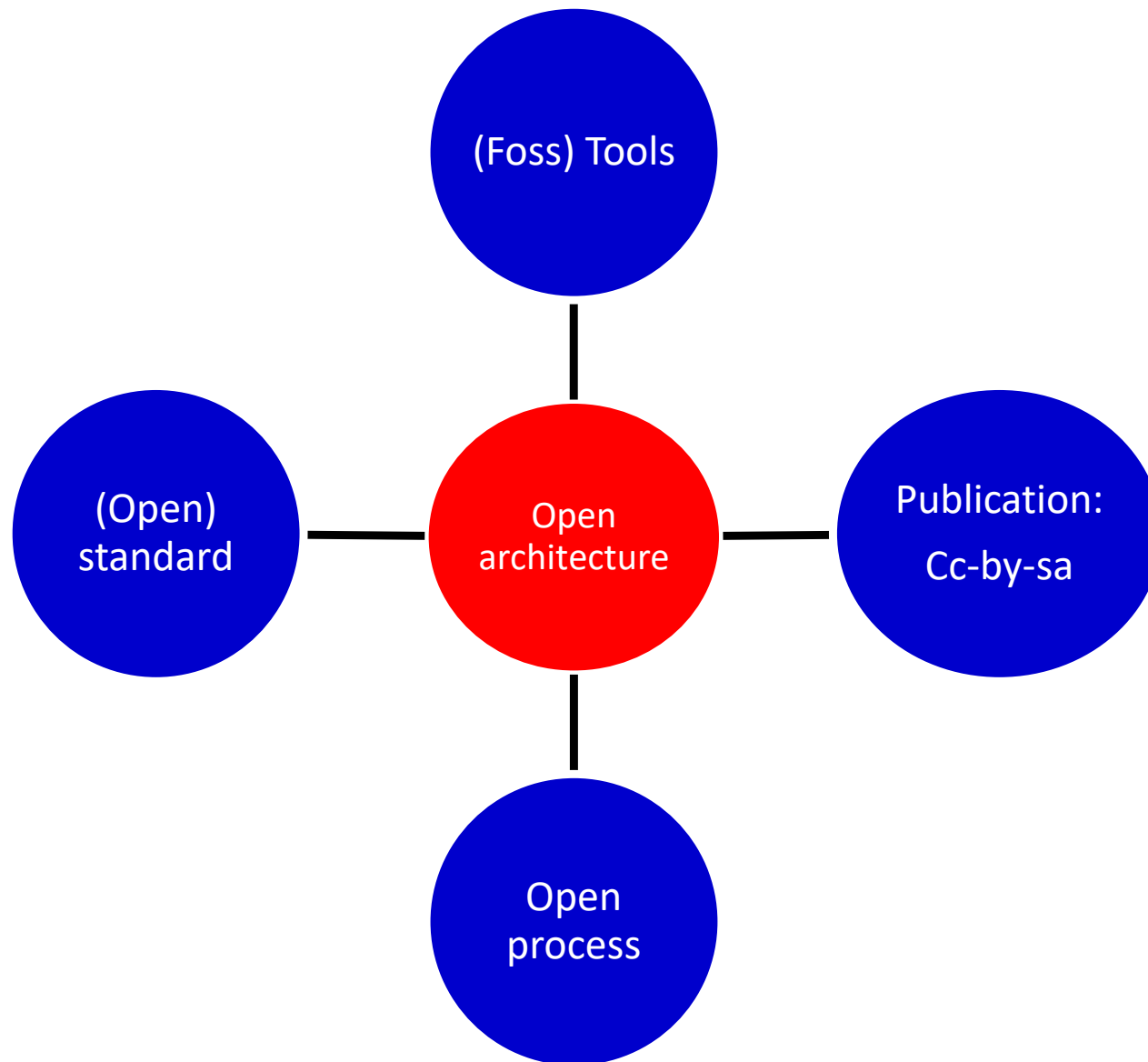
THE (TOO) OPEN ARCHITECTURE

As with architecture (too) many definitions of what an open architecture exist.

So when talking about open architectures the main perception is:

- **WRONG!!**

A FOSS VIEW ON OPEN ARCHITECTURE



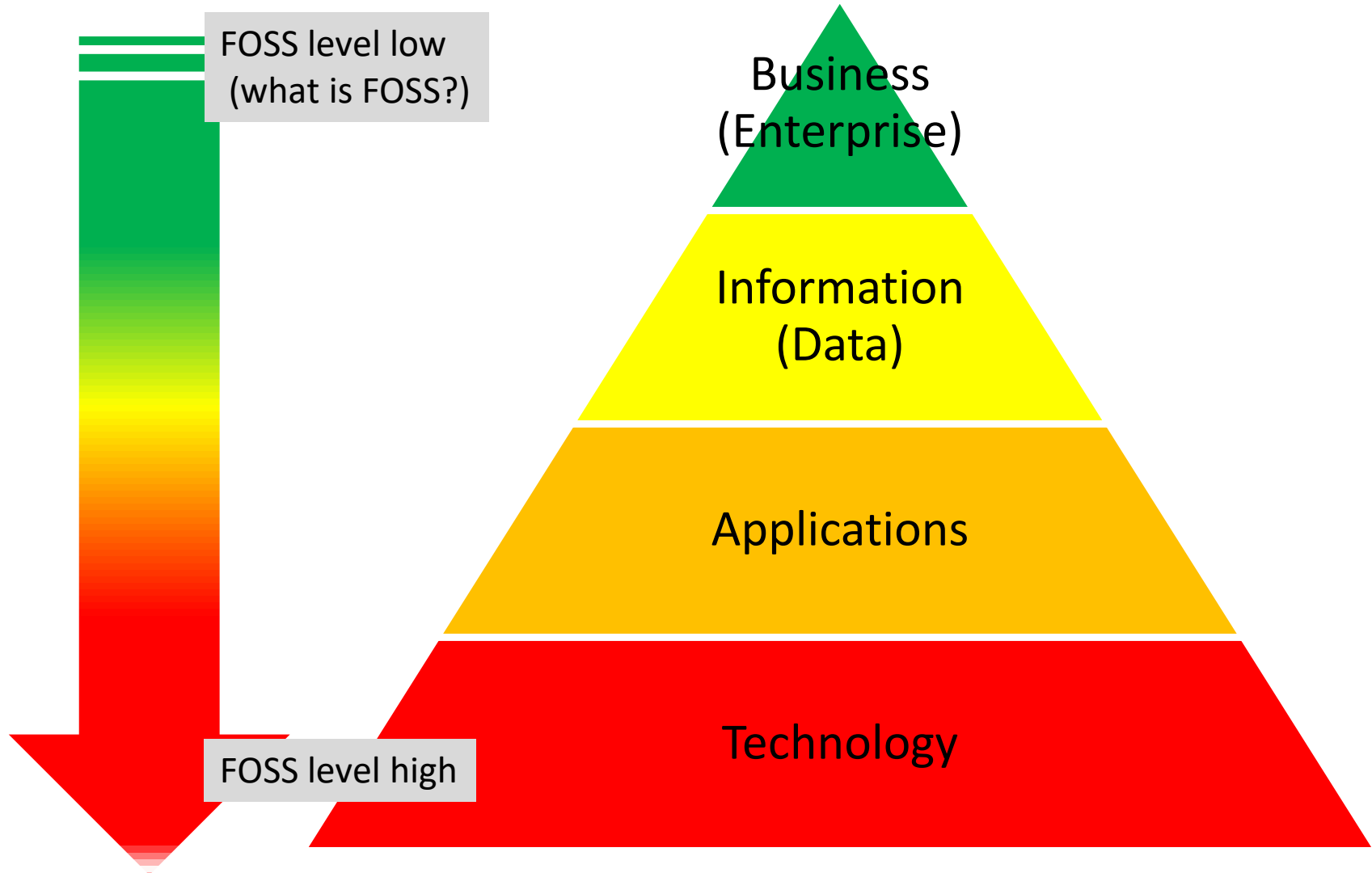
STATUS OF OPEN ARCHITECTURES

- FOSS projects
- Some Software Companies (mostly FOSS oriented companies)
- More and more governments (UK Government, Dutch government, US) are taking some steps

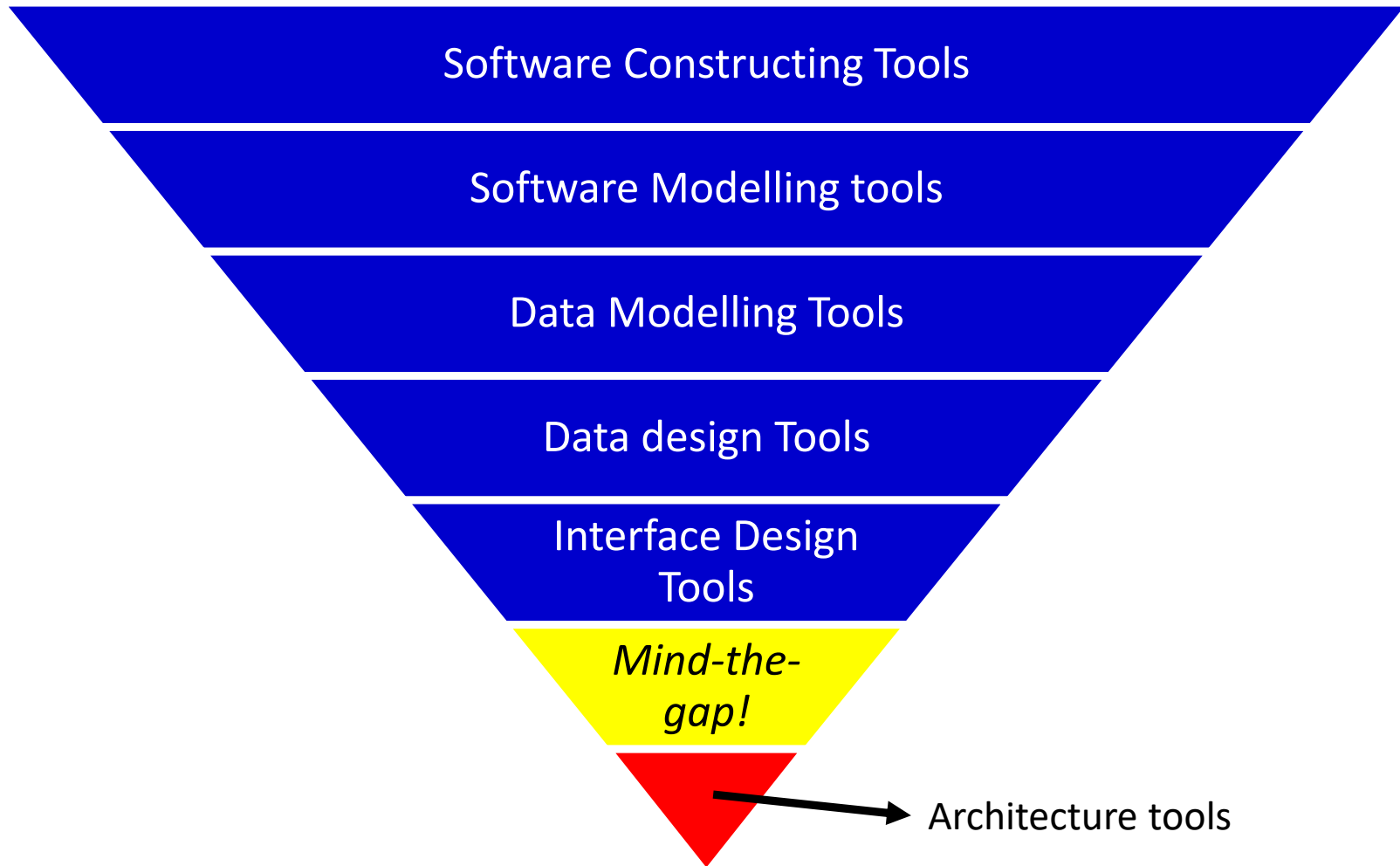
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ARCHITECTURE AND FOSS TOOLS



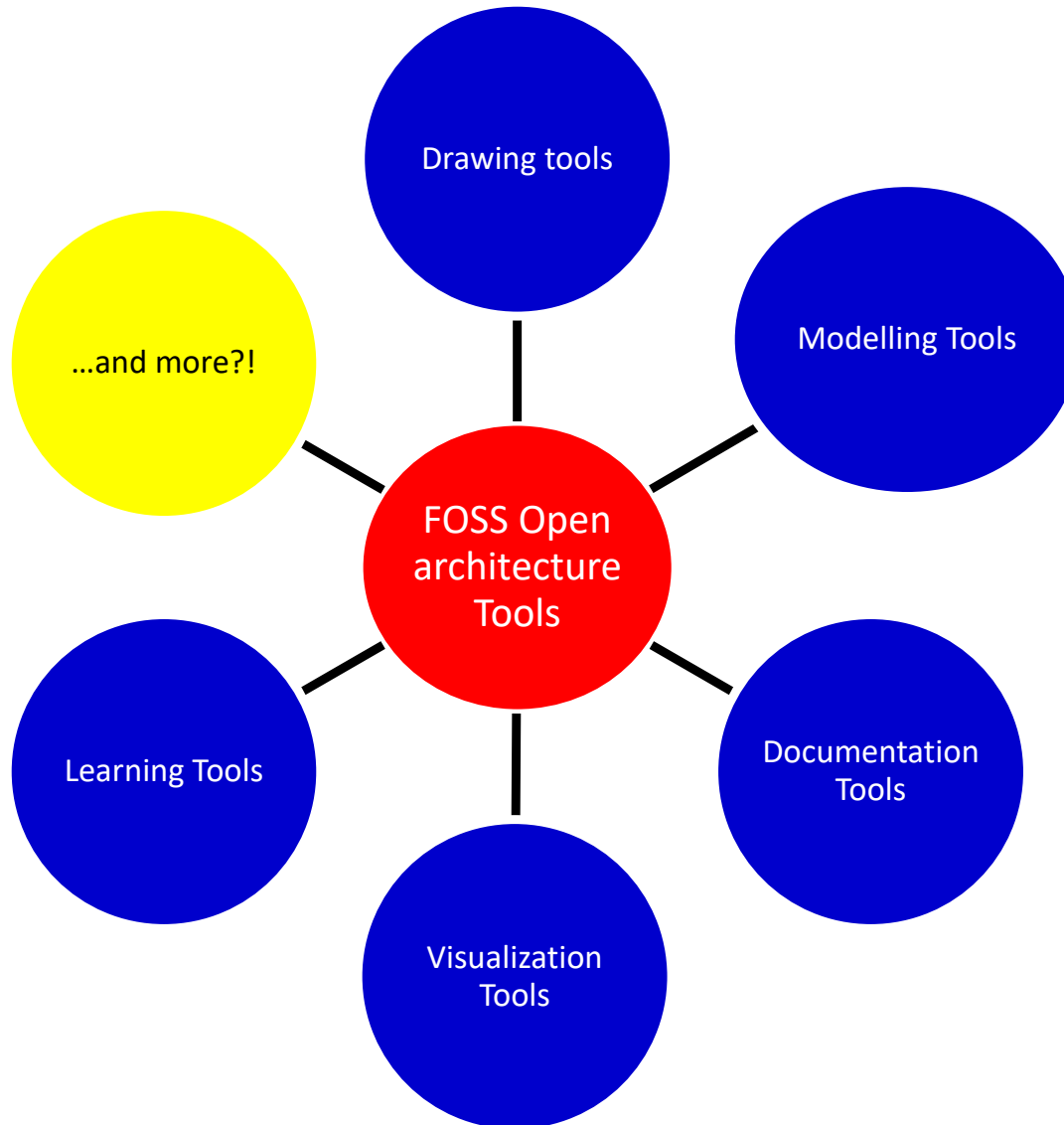
FOSS TOOLS FOR CREATING YOUR (OPEN) ARCHITECTURE



Most architecture tools are 'MDA' driven or are commercial ('malware') packages based on popular frameworks/methodologies (e.g. Togaf, Archimate)...

FOSS TOOLS FOR CREATING YOUR (OPEN) ARCHITECTURE

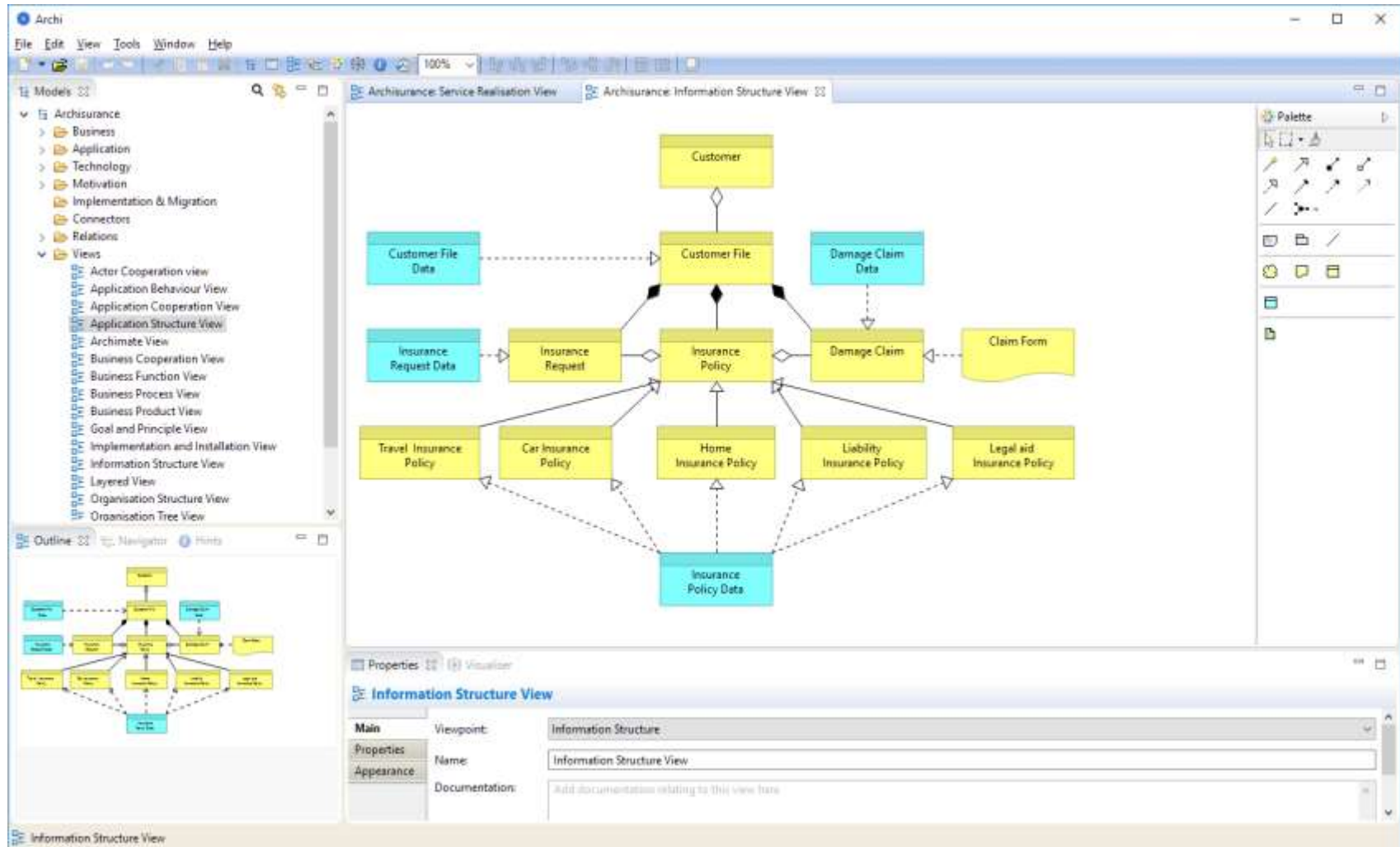
So what kind of FOSS architecture tools *should* you need:



FOSS TOOLS FOR CREATING YOUR (OPEN) ARCHITECTURE

Think of:

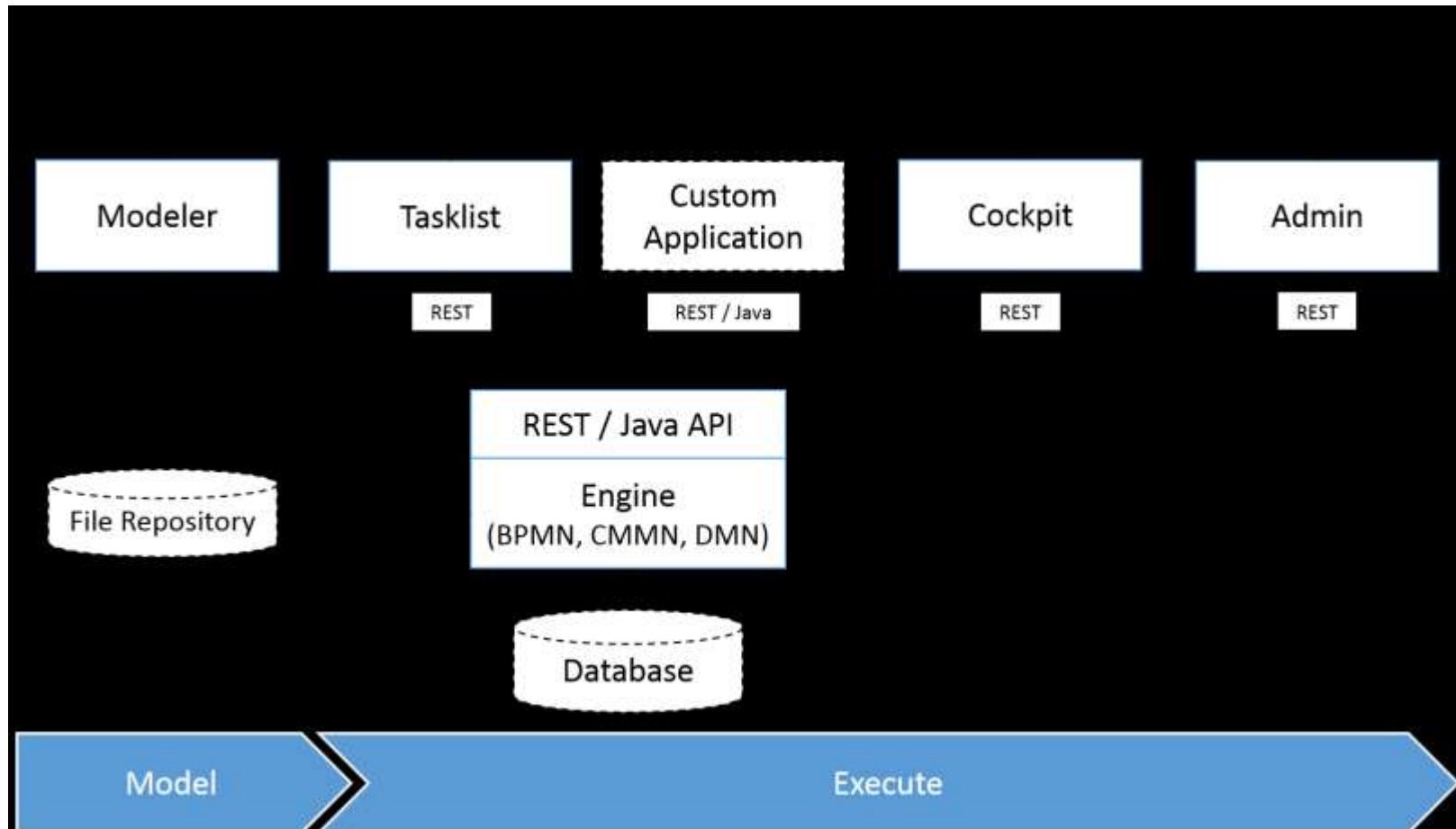
- Archi (www.archimatetool.com) Free ArchiMate Modelling Tool



FOSS TOOLS FOR CREATING YOUR (OPEN) ARCHITECTURE

Think of:

- Camunda Modeler (camunda.org) BPMN diagramming



FOSS TOOLS FOR CREATING YOUR (OPEN) ARCHITECTURE

Think of:

- Protégé (protege.stanford.edu/) ontology editor and framework

WebProtégé - Chromium

webprotege.stanford.edu/#Edit?projectId=987d9f04-f085-4534-be1f-8619aa5f0c4d

protégé

WebProtégé Aero

Classes Properties Individuals Notes and Discussions Changes By Entity Project Dashboard

Add content to this tab Add tab

Classes

Create Delete Watch Branch Search: Type se

- owl:Thing
 - Aircraft Manufacturer
 - Airliner Role
 - Narrow Body Airliner Role
 - Wide Body Airliner Role
 - Vehicle
 - Aircraft
 - Airbus Aircraft
 - A300
 - A310
 - A320 Family Aircraft
 - A330
 - A340
 - A350
 - A380
 - Boeing Aircraft
 - B707
 - B717
 - B727
 - B737
 - B747
 - B757
 - B767
 - B777
 - B787
 - Lockheed Aircraft
 - L1011

Change history for Boeing Aircraft

Description	Author	Timestamp
Created Boeing Aircraft as a subclass of Aircraft Details: Added: Class: 'Boeing Aircraft' Added: 'Boeing Aircraft' SubClassOf Aircraft Added: rdfs.label "Boeing Aircraft"	M Horridge	Thu Oct 17 2013 15:37:05 GMT-0700 (PDT)
Edited class Details: Added: 'Boeing Aircraft' SubClassOf hasPrimaryManufacturer some 'Airbus Aircraft'	M Horridge	Sun Oct 20 2013 15:50:06 GMT-0700 (PDT)
Edited class Details: Removed: 'Boeing Aircraft' SubClassOf hasPrimaryManufacturer some 'Airbus Aircraft' Added: 'Boeing Aircraft' SubClassOf hasPrimaryManufacturer value 'Boeing Airplane Company'	M Horridge	Sun Oct 20 2013 15:50:16 GMT-0700 (PDT)

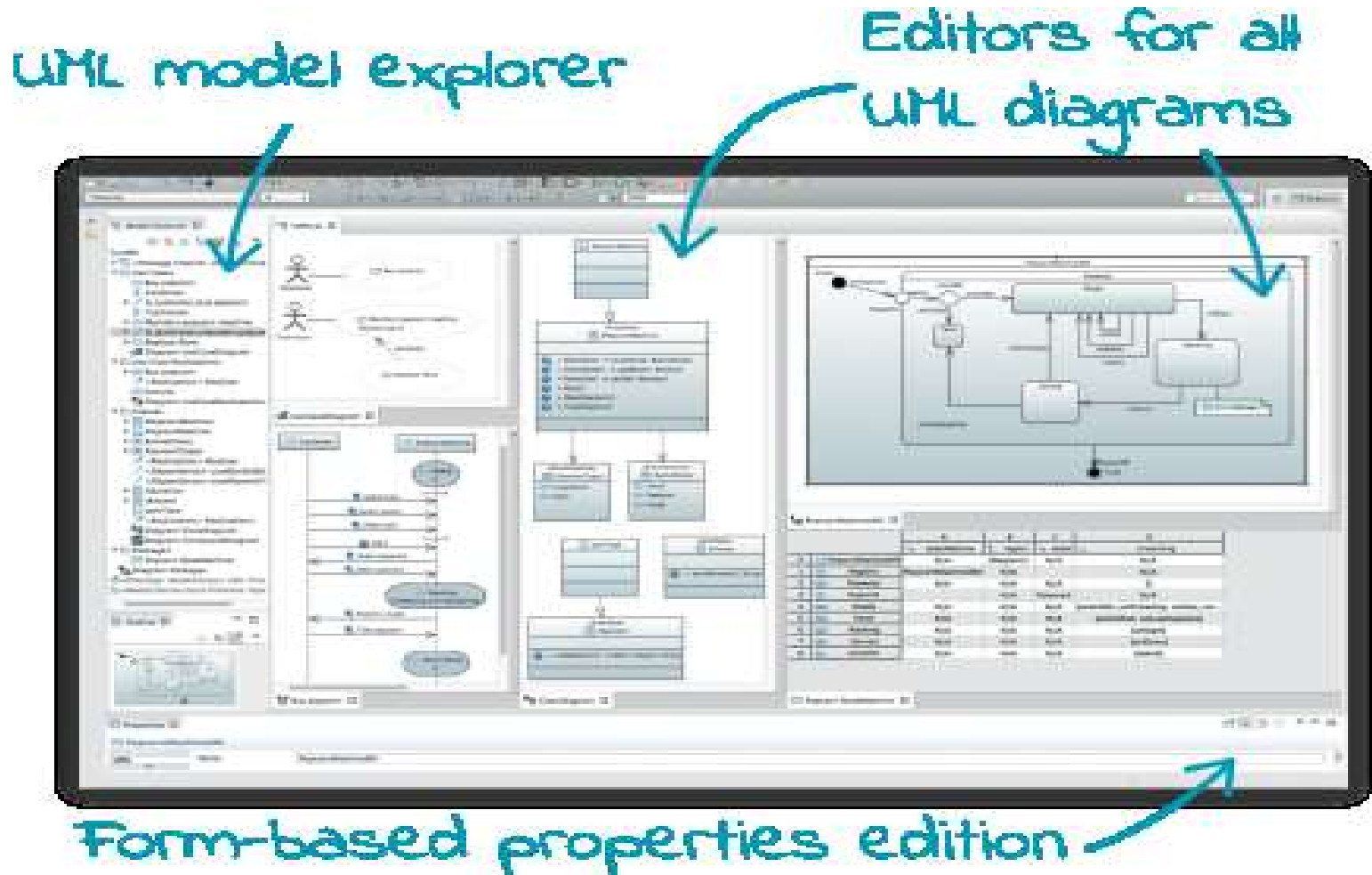
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FOSS TOOLS FOR CREATING YOUR (OPEN) ARCHITECTURE

Think of:

- Papyrus (eclipse.org/papyrus/) Model-Based Engineering tool



FOSS TOOLS FOR CREATING YOUR (OPEN) ARCHITECTURE

And more! :

- Archi (www.archimatetool.com) Free ArchiMate Modelling Tool
- Camunda Modeler (camunda.org) BPMN diagramming
- Protégé (protege.stanford.edu/) ontology editor and framework
- Papyrus (eclipse.org/papyrus/) Model-Based Engineering tool
- Open ModelSphere (www.modelsphere.com/org/) data, process and UML modeling
- RAML tools (raml.org) RESTful API Modeling
- And yes do not forget Open Source Software Engineering Tools from Tigris.org (analyse, requirements, management, issue trackers)

See more links on:

<https://github.com/nocomplexity/ArchitecturePlaybook>

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WHAT IS WRONG WITH TOGAF™ AND ARCHIMATE™?

It is
Malware
created by
thieves!



WHAT IS WRONG WITH TOGAF™ AND ARCHIMATE™?

TOGAF and Archimate (archimate is an architecture modelling language) are:

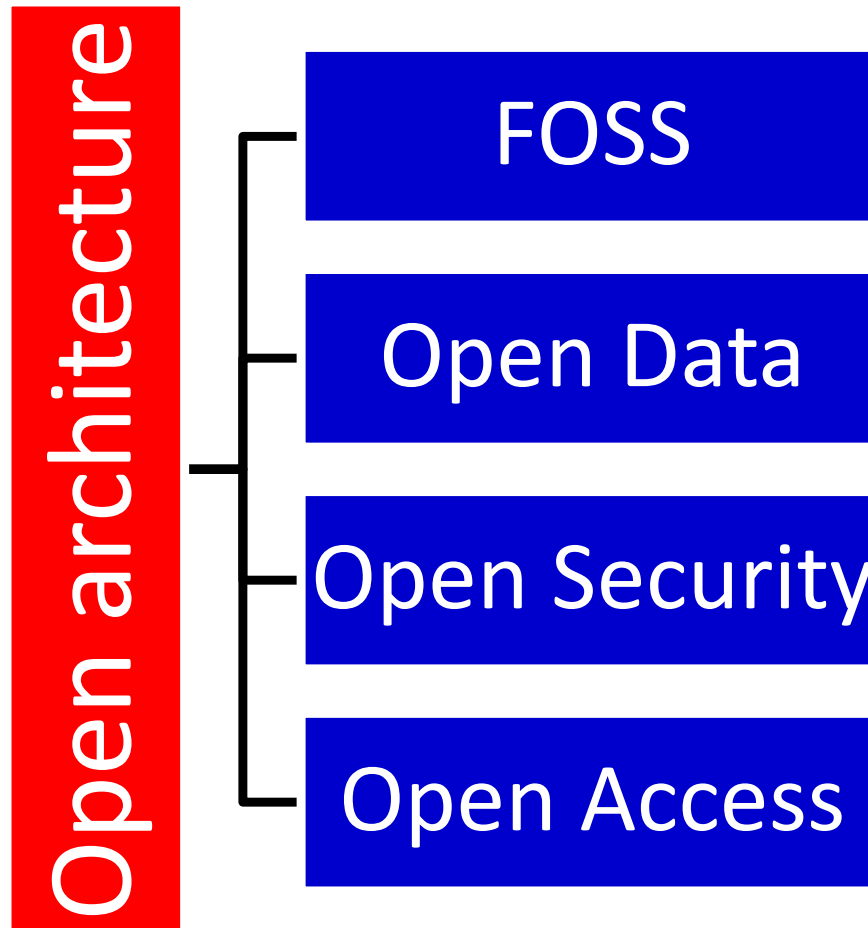
NOT OPEN so:

- Licensed work
- Creating tools only possible after...
- Togaf is too academic, misses real alignment with software and engineering world
- Many organizations misapply TOGAF (creating overhead instead of value)
- Views created with archimate tend to be overcomplex and only architects can understand (after years of practice)
- Archimate is YAML (Yet Another Modelling Language) and is weak on the real engineering / physical level
- Not FOSS

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THE PROBLEM WITH OPEN ARCHITECTURES



For open architecture you already win when architectures are published (*cc-licensed!*) in the open!

MAIN CHALLENGES FOR OPEN ARCHITECTURE

Same barriers as with FOSS, but also:

- Complex area
- The devil is in the details (sometimes) (Architecture != 0 | 1)
- Commercial Tools / Frameworks / Methods vs FOSS
- Transparency vs safety/security/privacy
- CC vs copyright && NDA-documents
- Creating architecture documentation is hard (and often makes no sense)
- People (Architects!)



THANK YOU!



Support Open Architectures!

Contribute to “The Open Architecture Playbook”
<https://github.com/nocomplexity/ArchitecturePlaybook>

More information?

Call me : +31 [0] 6 22869536 of
Mail : info@organisatieontwerp.nl
Twitter : @maikelmardjan

(Also available for solving your *real nasty* complex IT problems!)