Architecture-aware Programming in Agile Environments

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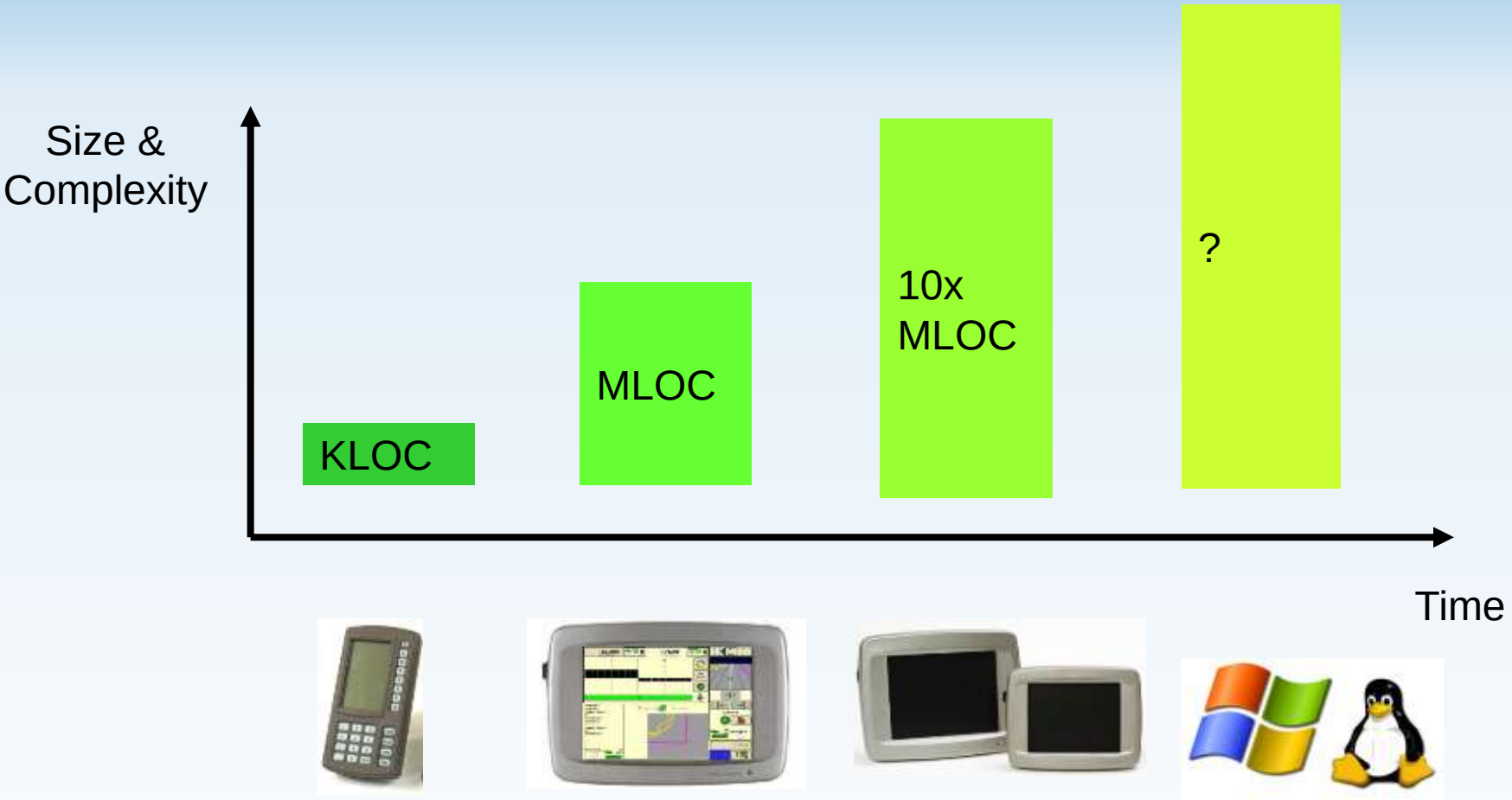
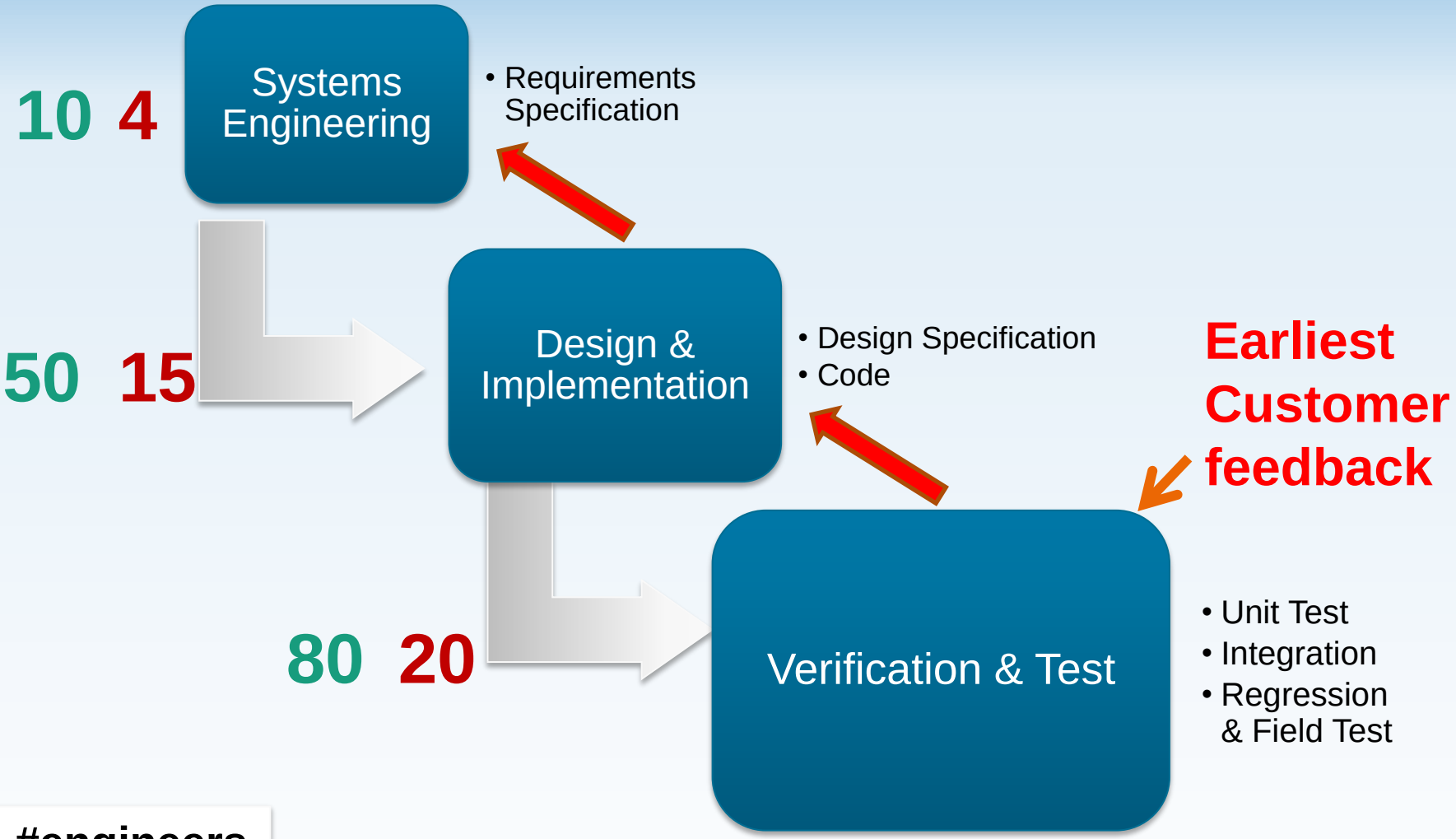
architecture.iese.fraunhofer.de

The Agile Environment

John Deere – Display Development



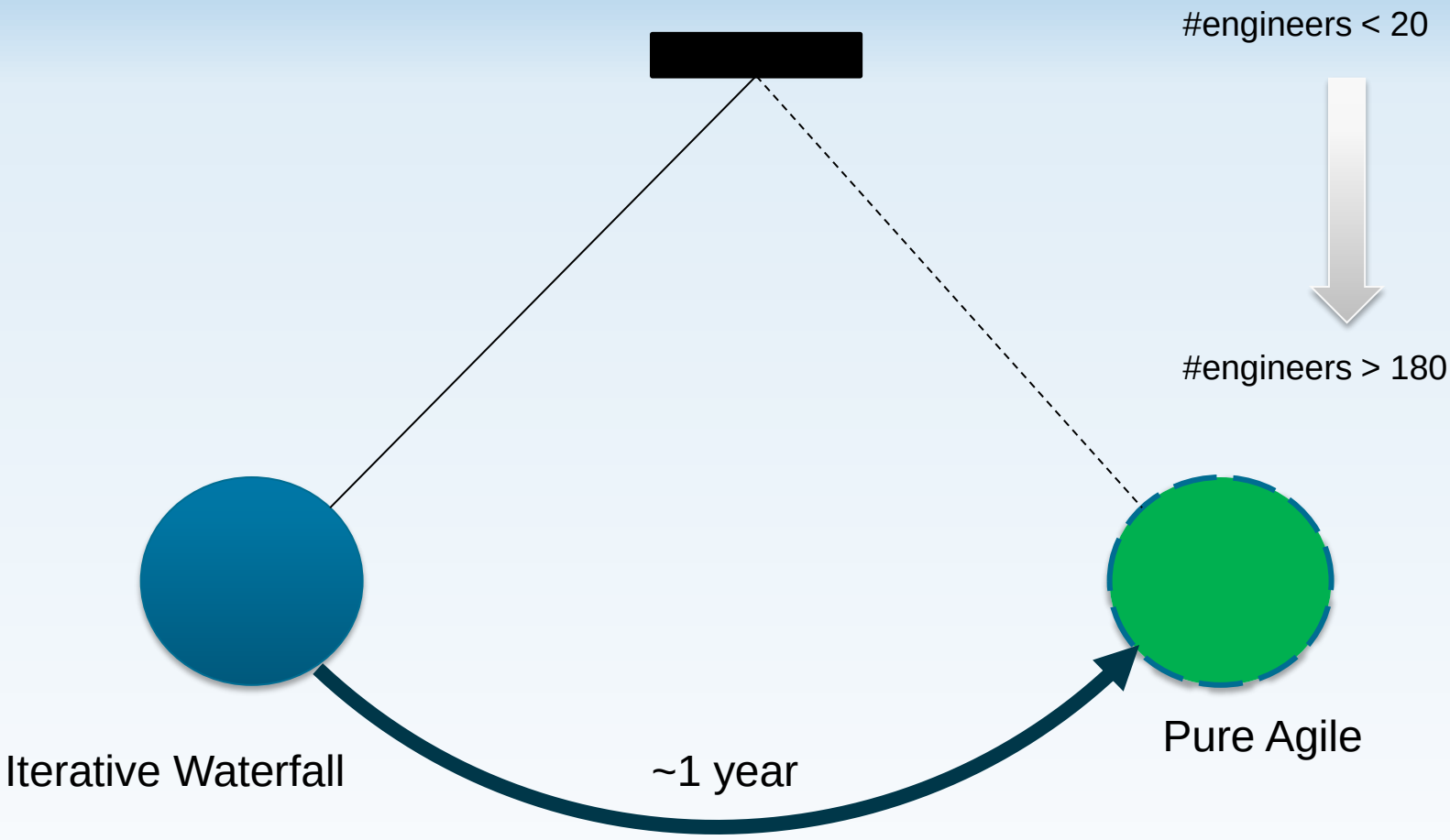
Starting Point



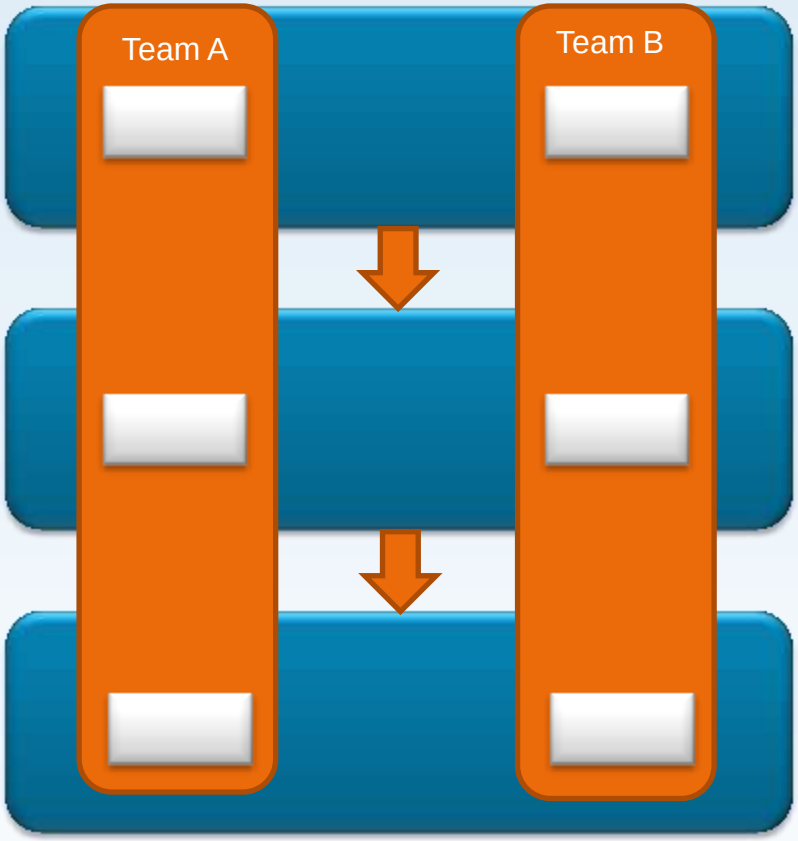
#engineers

US EU

Large-Scale Transition Towards Agile



Vertical Slices



Observations*

Clear phases are gone

Specs -> user stories

Rules & standards?

* „Agile doesn‘t scale … without architecture“ SATURN 2012
http://www.sei.cmu.edu/library/abstracts/presentations/keuler-saturn2012.cfm

Resulting Mind Sets …

… next PSI ?!

… we don’t document

„Do what you want“

… YAGNI

… Agile as an “excuse”

Root Cause: Philosophy Issues

$$Agile \supseteq \sum Agile\ Techniques$$

$$Agile != \{Programming\} \setminus \{Plan\}$$

Architecture Awareness

…

Haven‘t seen any

How did we know?

“Who is responsible for this component?”

“Who is impacted if I want to make a change, and who needs to review the change?”

“Oh … didn’t know we had that service implemented already”

…

The Challenges: How …

- “… do the developers know about architectural structures?”
- “… can developers to stay focused on writing code?”
- “… do we deal with the fact that developers are feature- and code-centric?”

What was our Approach?

...

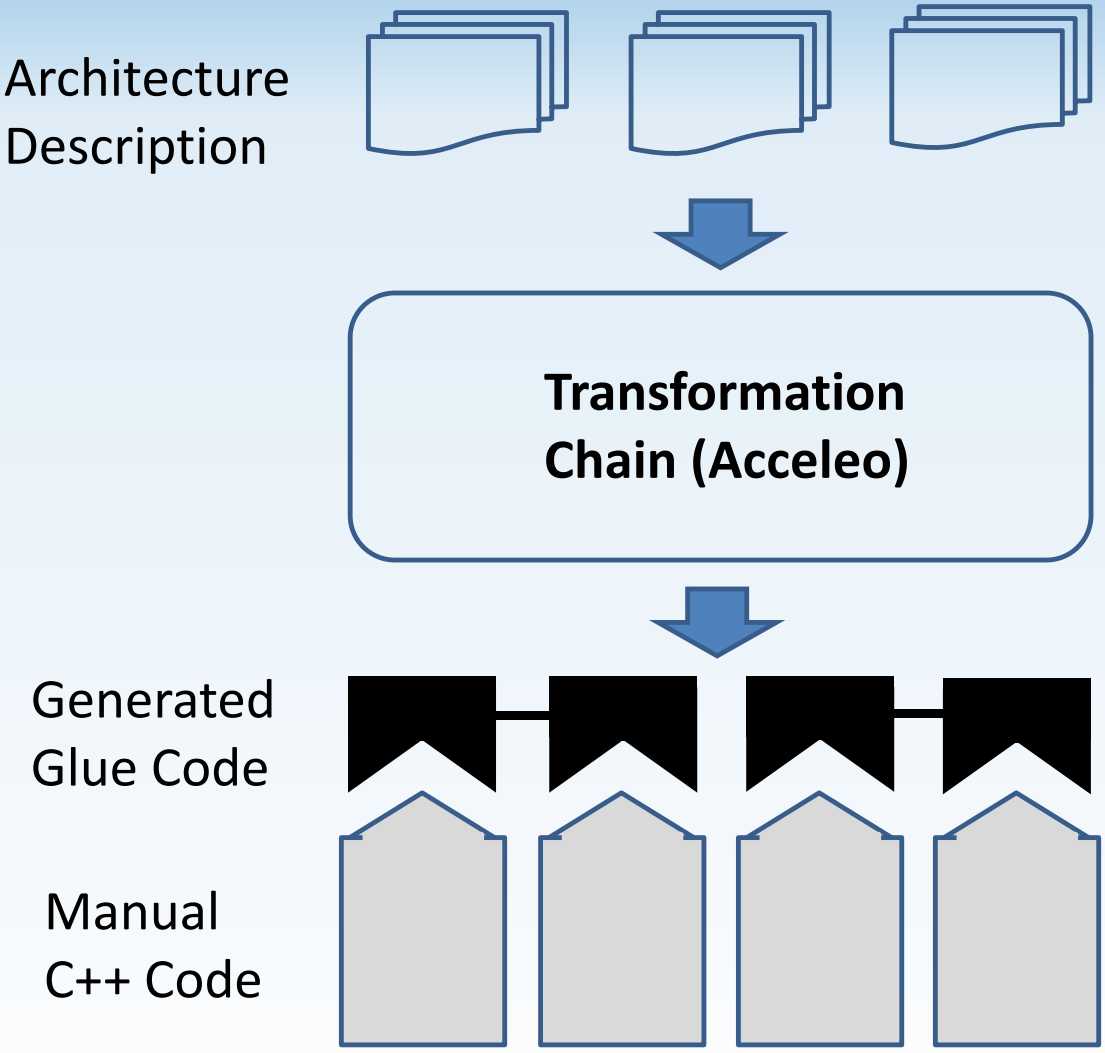
Connecting Architecture and Implementation

Code-centric Architecture

Unified Component Communication

Glue code generation

Common Technical Framework



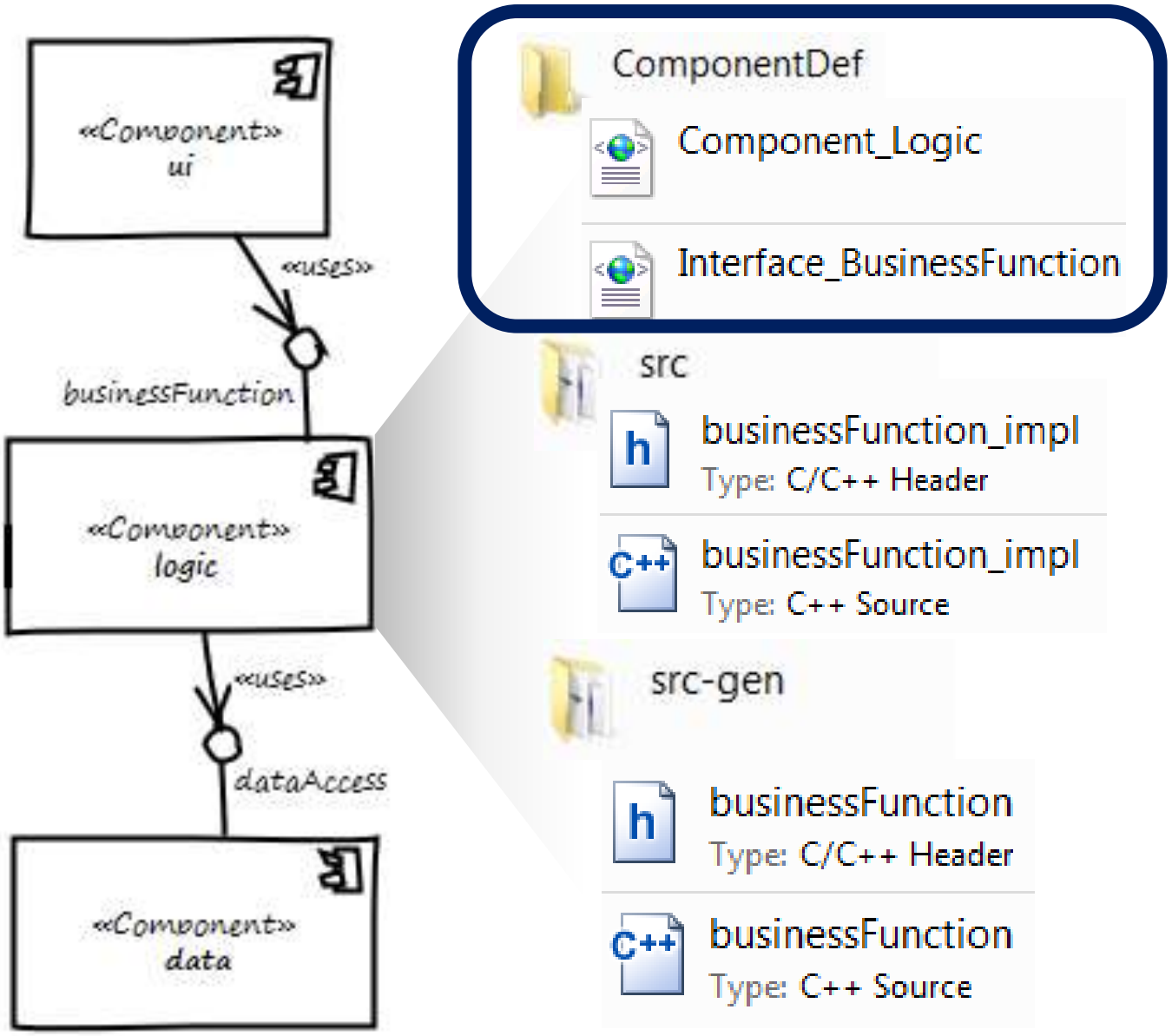
Architecture Description

```
<systemManifest name="mySystem"/>
        <component name="ui" typedef="ui.xml"/>
        <component name="logic" typedef="logic.xml"/>
        <component name="data" typedef="data.xml"/>
</systemManifest>

<componentType name="logic">
```

```
                <name="computeData"/>
        <reply>
                <parameter name="data"</parameter>
        </reply>
        </request>
        <state name="ready" type="bool"/>
        <event name="dataProcessed"/>
</interfaceManifest>
```

Co-Location of Architecture and Code



Experiences

Developers … → … need guidance

… embrace encapsulation of architectural decisions

Architecture … → … visible by co-location with implementation

Modeling tool not accepted → XML-based notation

“On-demand” generation of component structures → … convincing factor for Developers

Thank you for your attention!

… Questions?

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