



Metric-based Evaluation of Implemented Software Architectures

Eric Bouwers

Public

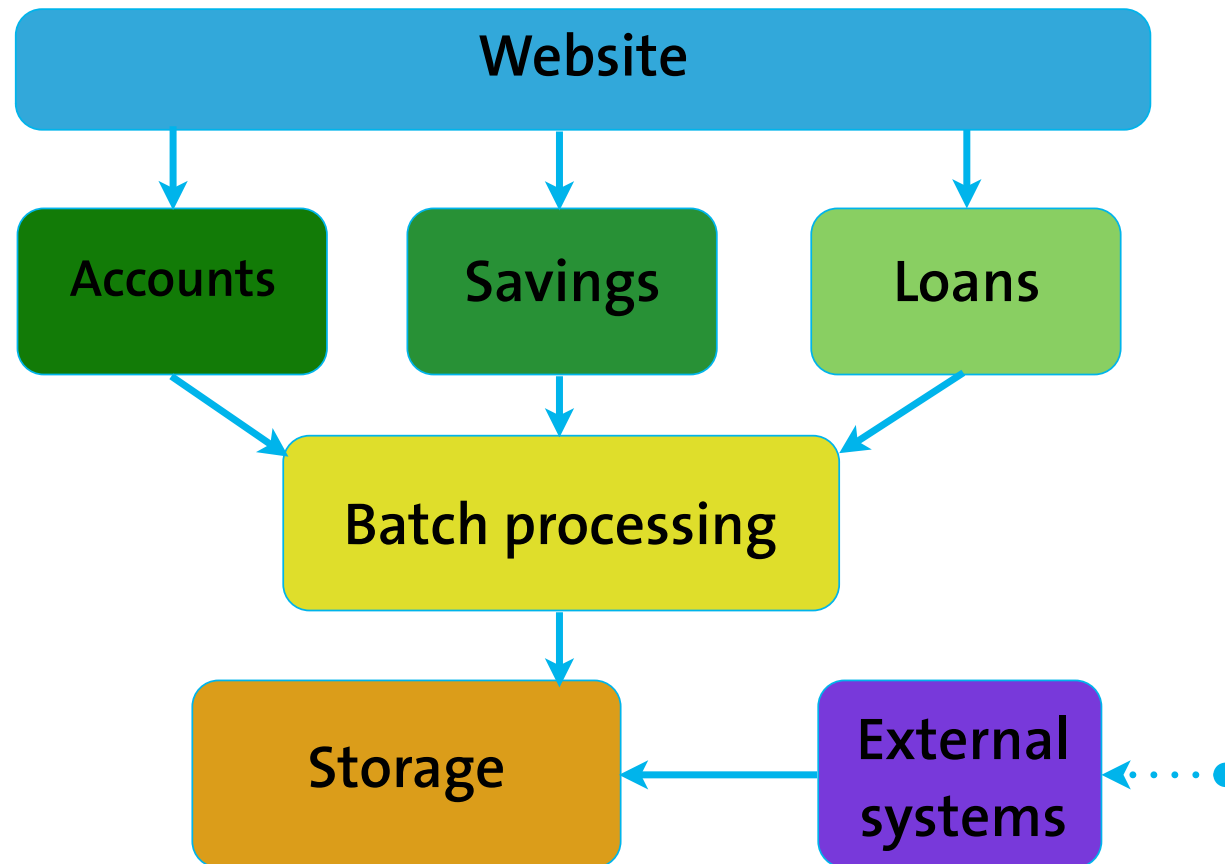
11/03/2013

T +31 20 314 0950
info@sig.eu
www.sig.eu

An example architecture



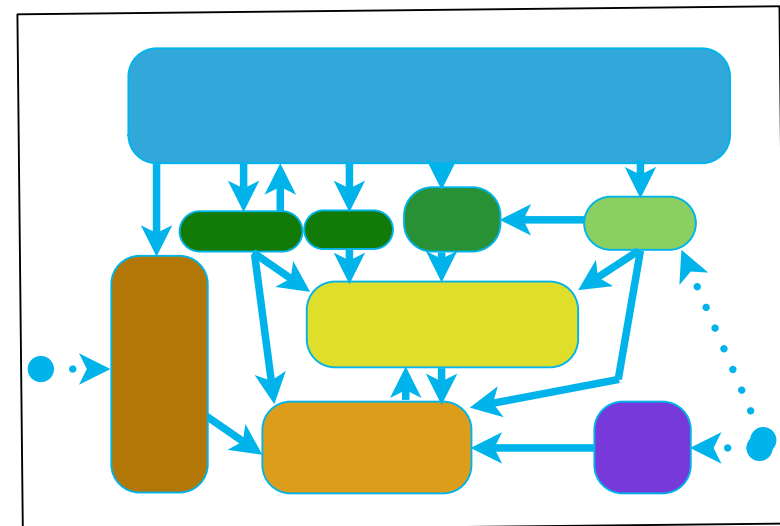
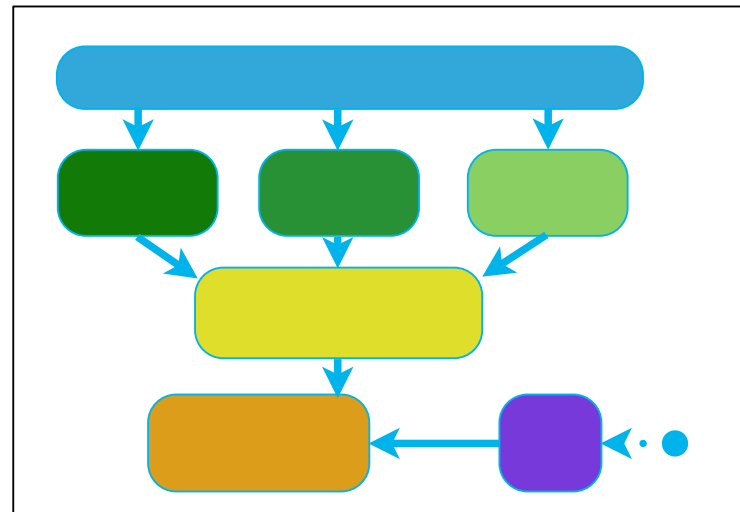
Software Improvement Group



Designed versus Implemented



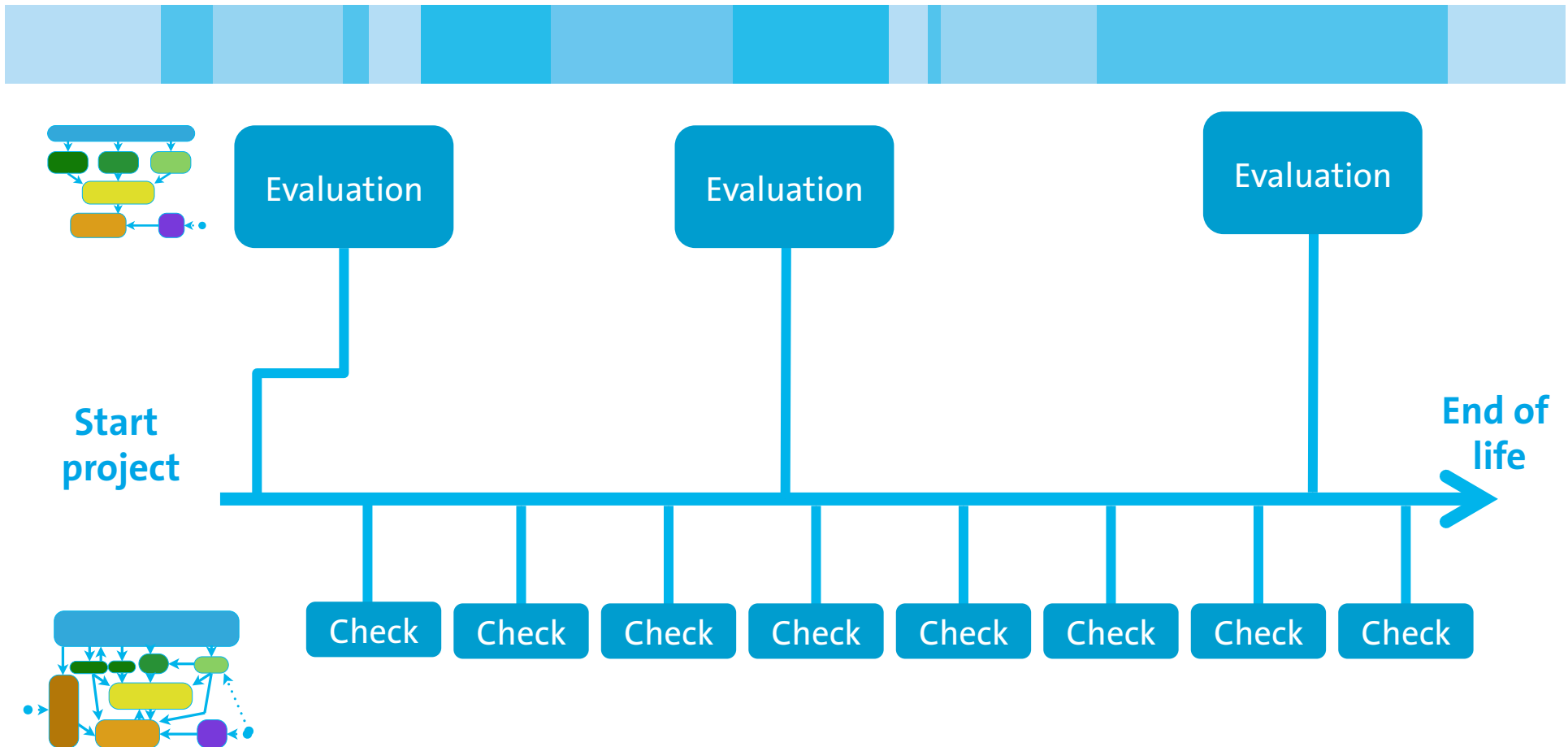
Software Improvement Group



Evaluation frequency per type



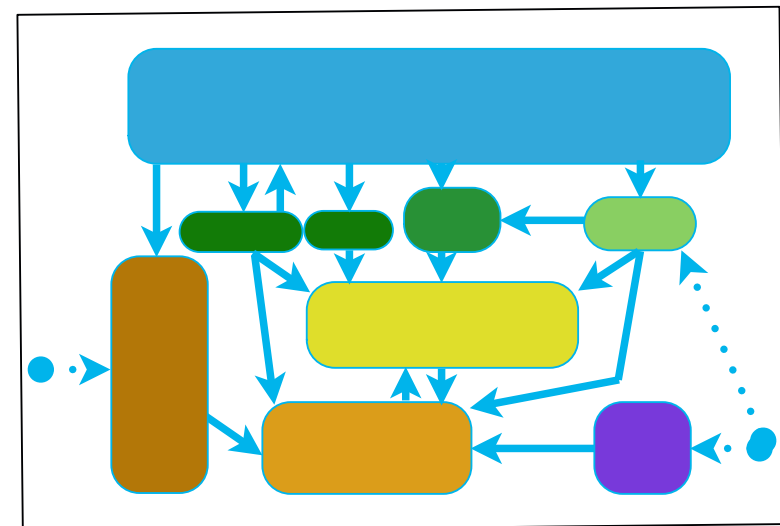
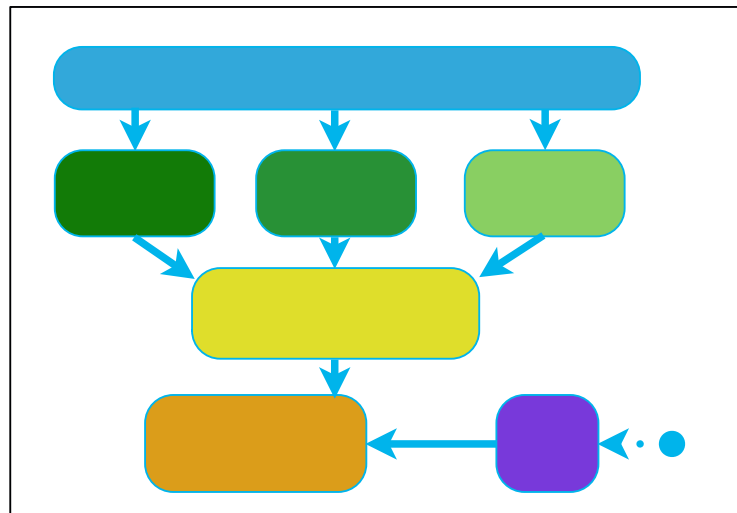
Software Improvement Group



Available evaluation methods



Software Improvement Group



ATAM, ARID, ALMA,
ALPSM, SAAM,
SAAMER, SAAMCS,
SBAR, ESAAMI, SAEM,
QASAR,



A first step ...



Software Improvement Group

- Abstraction
- Layering
- Logic in Database
- Module Inconsistency
- Module Size
- Source Grouping
- Technology Combination
- Textual Duplication
- Functional Duplication
- Libraries / Frameworks Usage
- Module Dependencies
- Module Functionality
- Relation Documentation and Implementation
- Technology Age
- Technology Usage



... towards a structure, repeatable check.



Software Improvement Group

<http://www.sig.eu/en/liscia>

28 questions

28 actions

5 topics

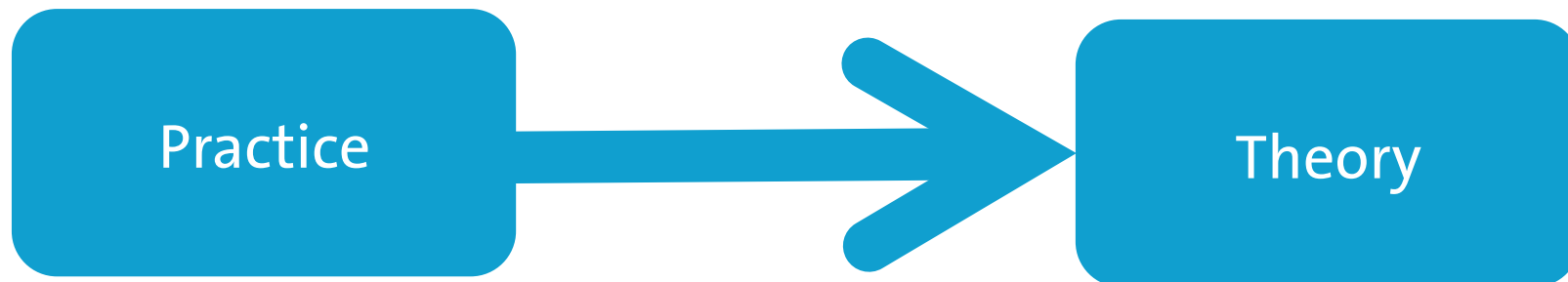


'A Lightweight Sanity Check for Implemented Architectures'
by E. Bouwers and A. van Deursen, IEEE Software July 2010

Crossing the border



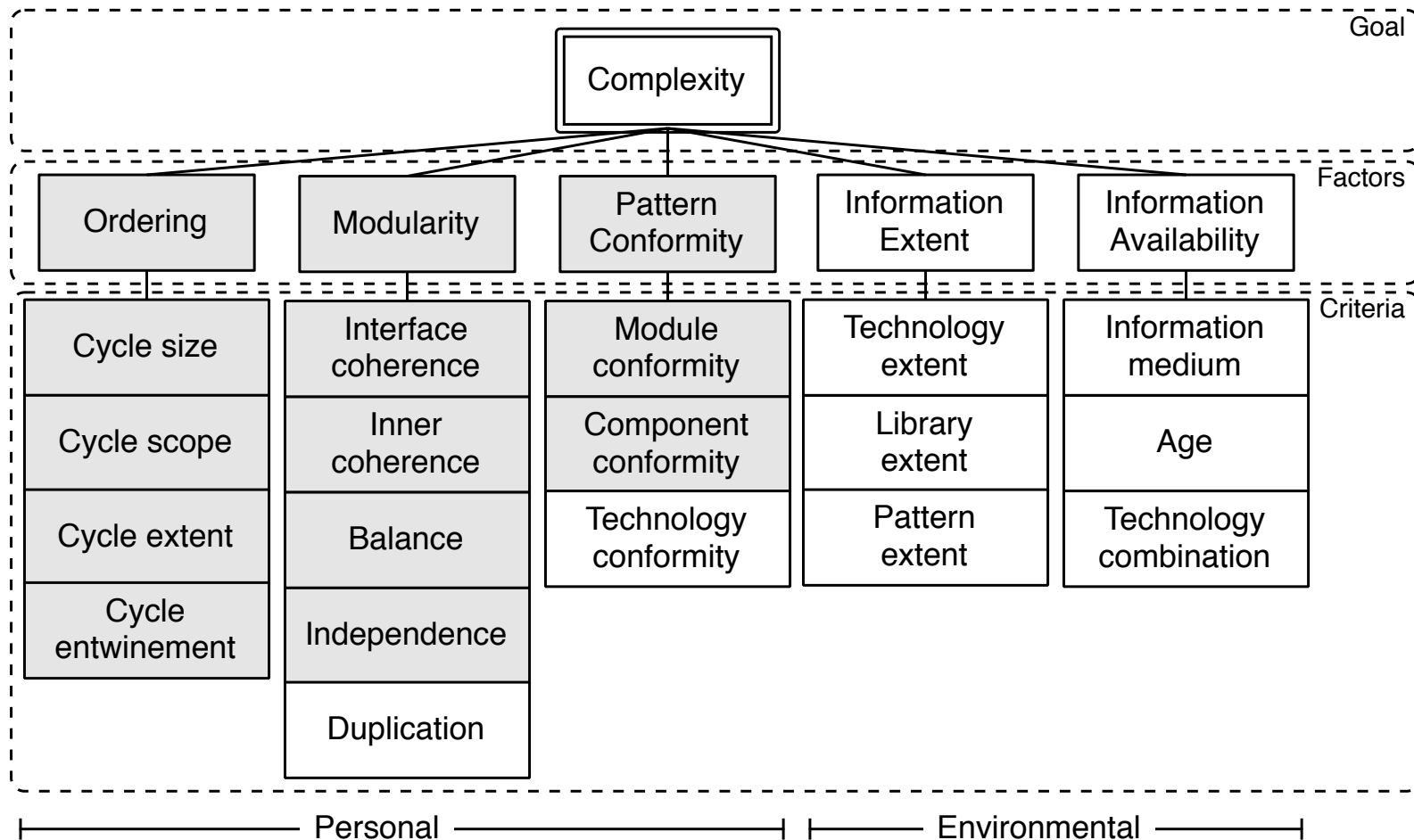
Software Improvement Group



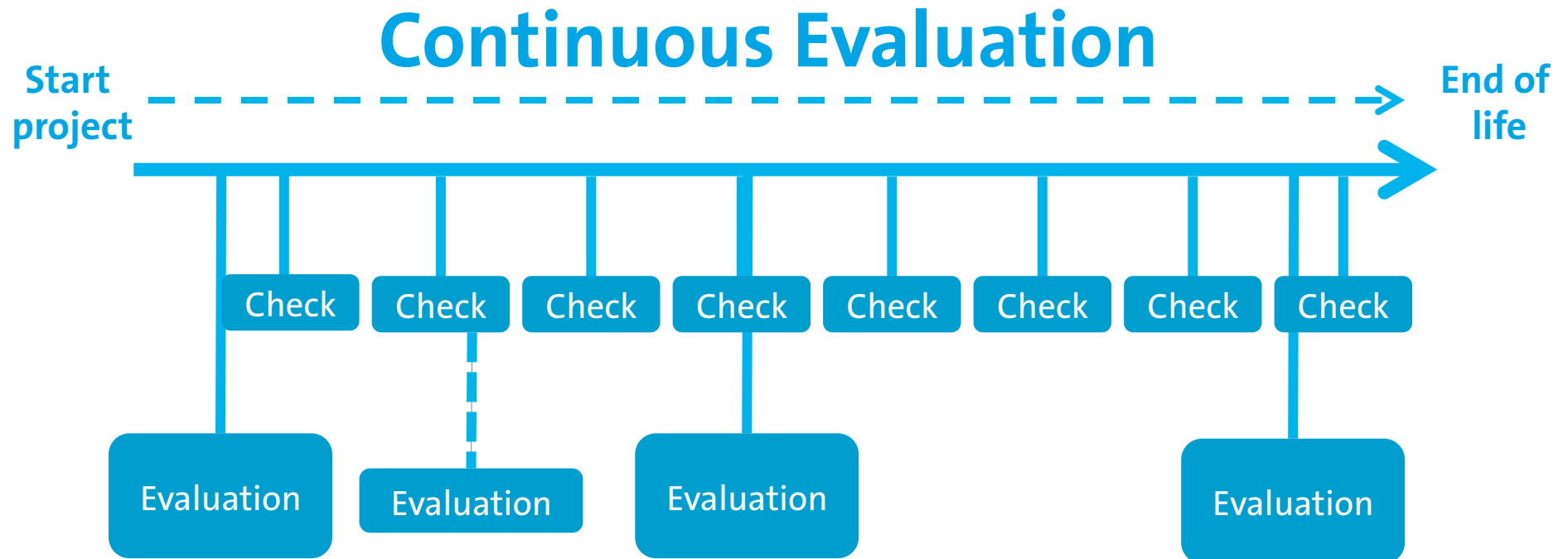
An architectural complexity model



Software Improvement Group



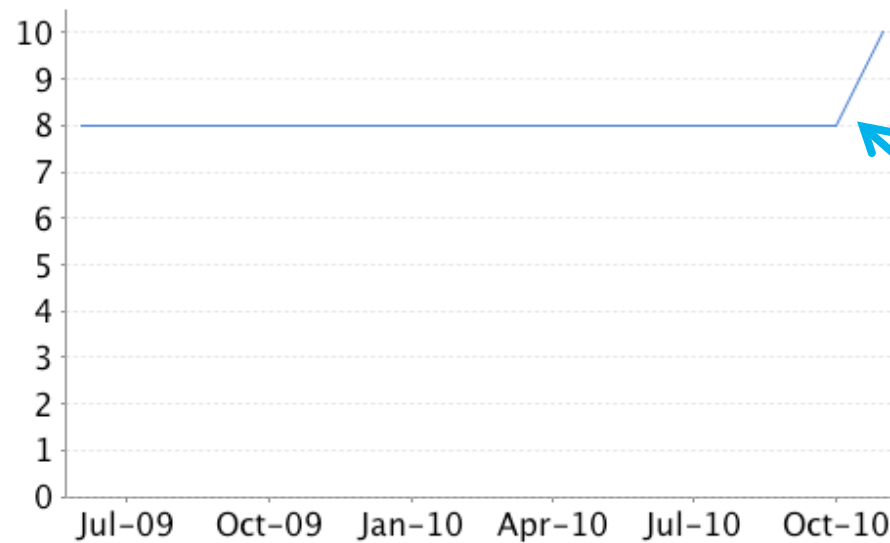
From regular to continuous evaluation



All steps combined



Software Improvement Group



[Check >> Evaluation](#)

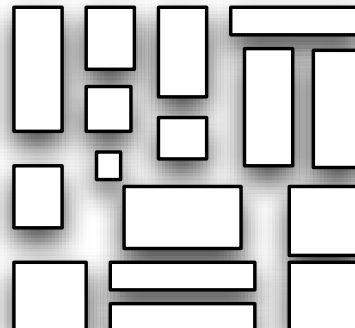
Component Balance



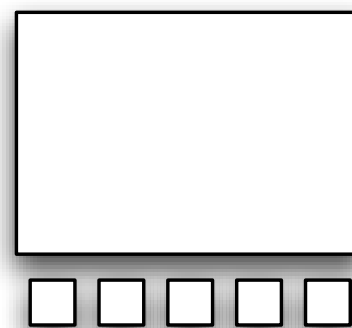
Software Improvement Group



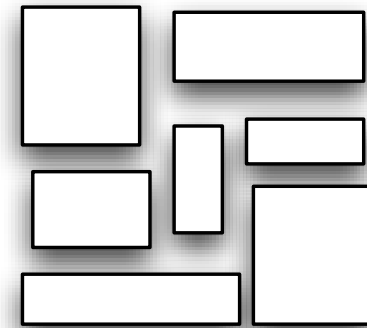
0



0.08



0.16

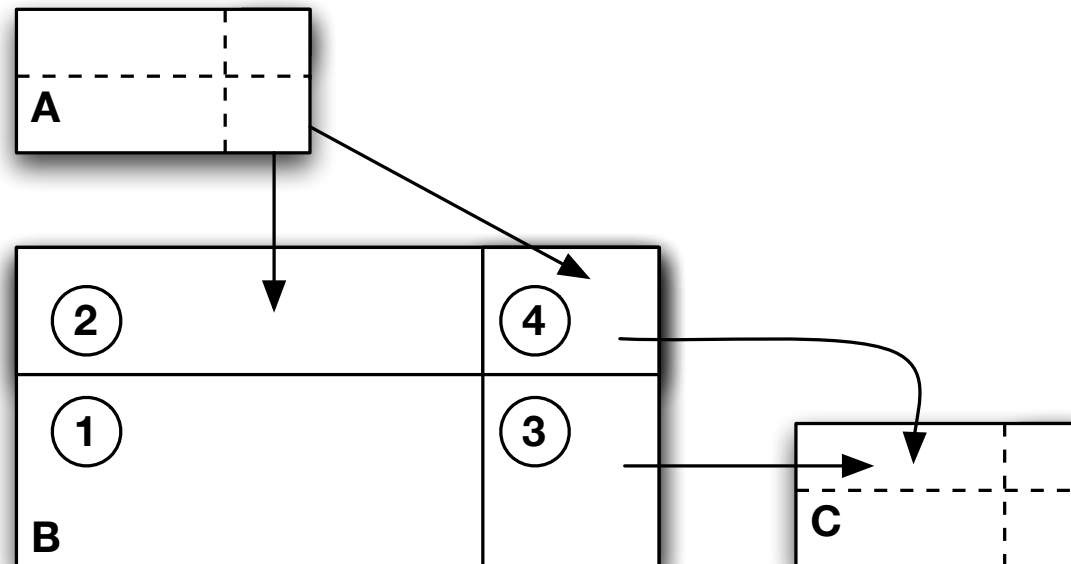


0.64

Component Independence



Software Improvement Group



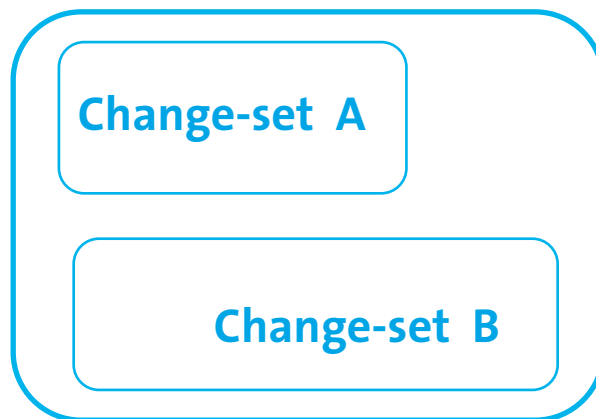
Local versus non-local change



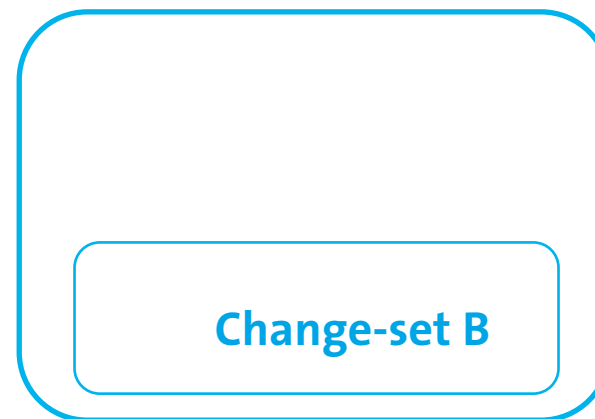
Software Improvement Group



Component 1



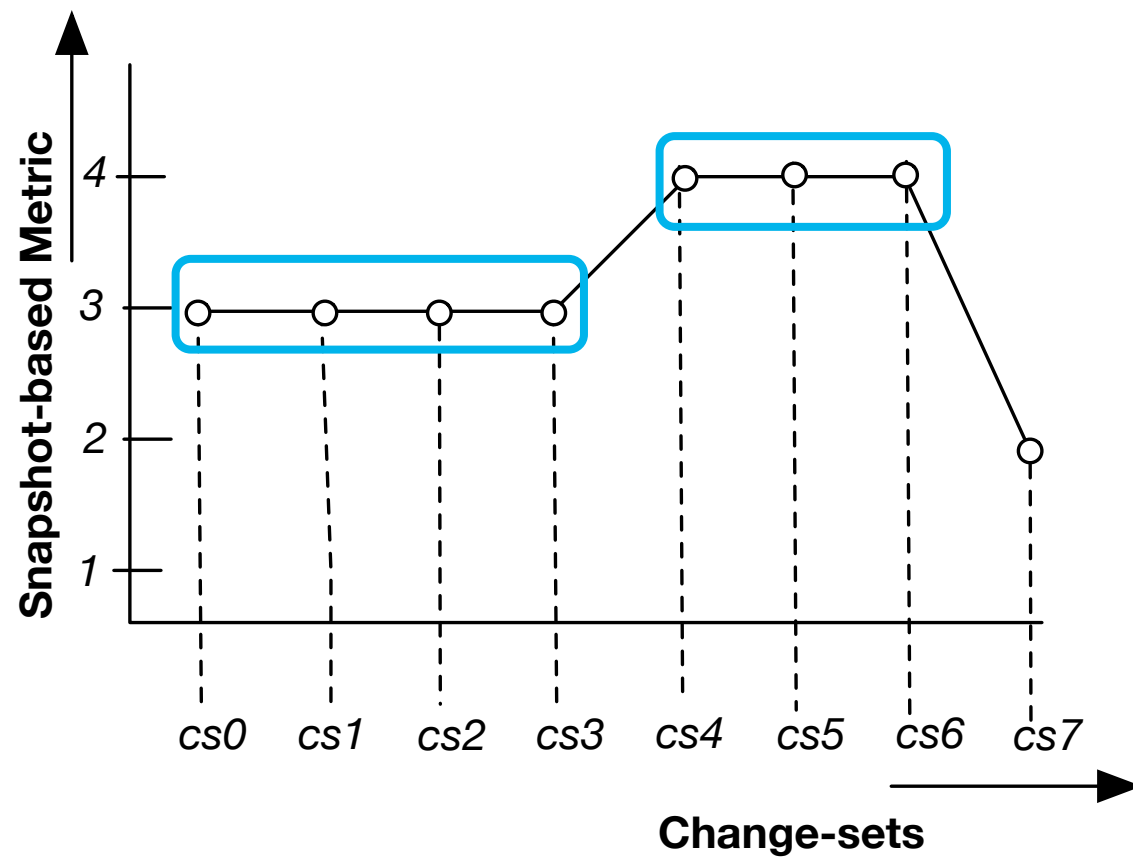
Component 2



Correlating static and dynamic metrics



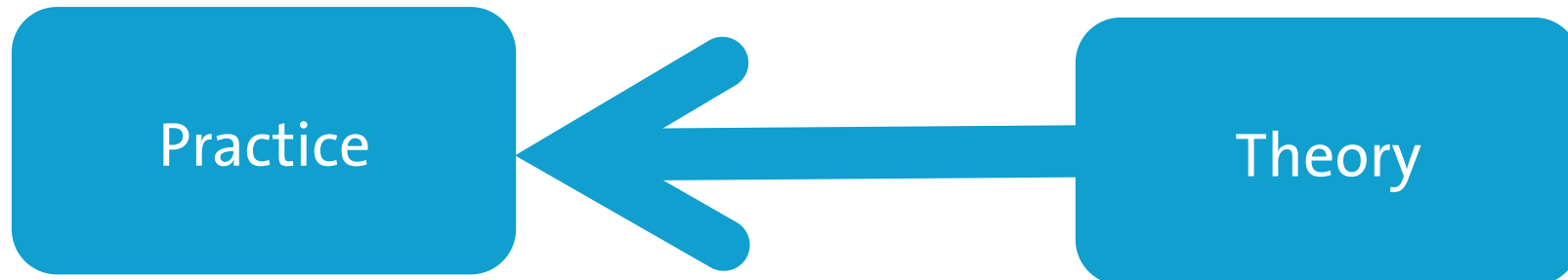
Software Improvement Group



Crossing the border again



Software Improvement Group



Measuring ISO 25010 maintainability



Software Improvement Group

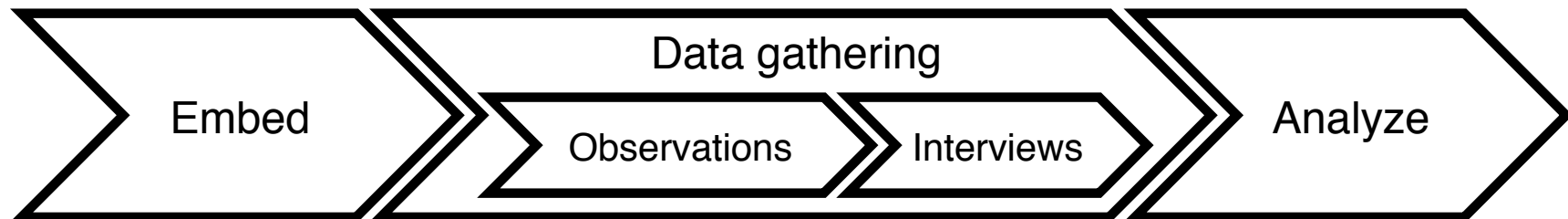


	Volume	Duplication	Unit size	Unit Complexity	Unit interfacing	Module coupling	Component balance	Component independence
Analysability		X	X	X				X
Modifiability			X		X		X	
Testability		X			X			X
Modularity							X	X
Reusability				X		X		

Evaluating metrics in practice



Software Improvement Group



Outlook



Software Improvement Group

A horizontal bar composed of several rectangular segments in various shades of blue, spanning the width of the slide.

Improve existing metrics

Define more metrics

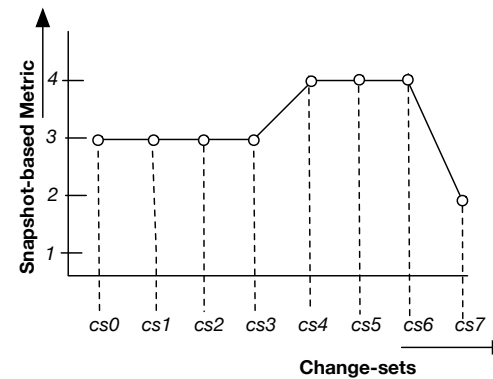
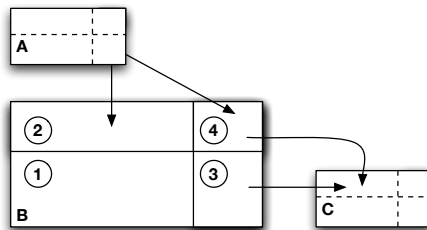
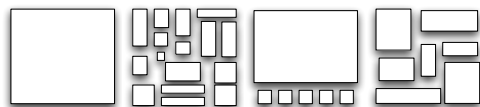
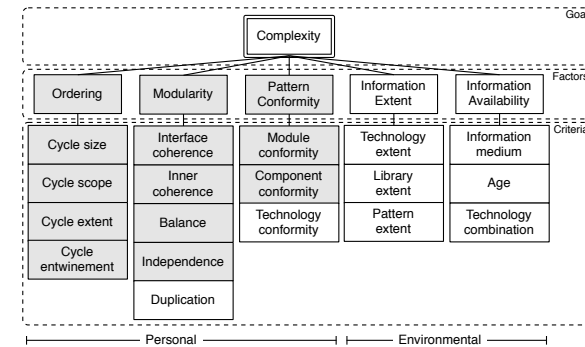
Continue evaluating metrics

Summary



Software Improvement Group

LiSCIA



@EricBouwers
eric@sig.eu