coding {the} architecture

Master builder

The original generalising specialist?

Simon Brown

Jersey, Channel Islands

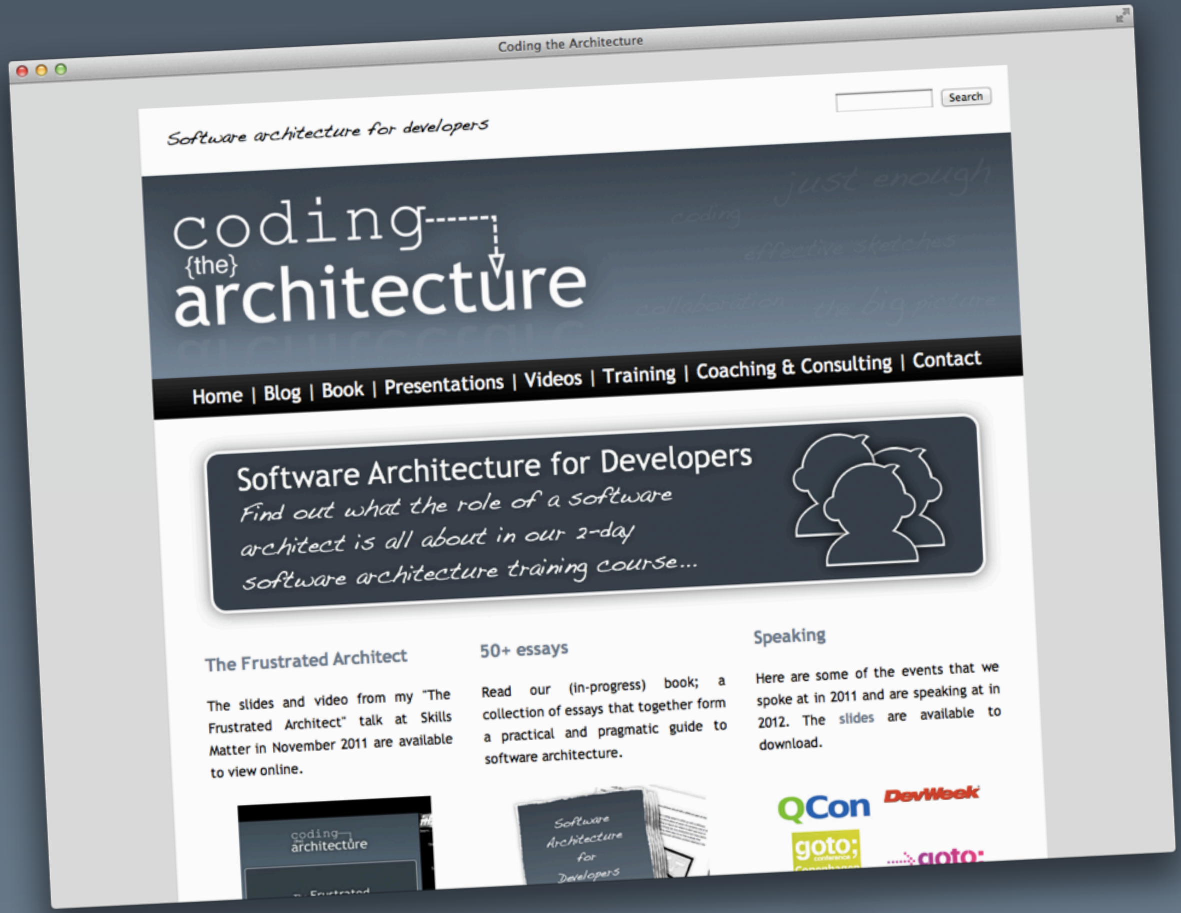
Jersey
Faroe Islands
Norway
Sweden
Finland
Tampere
Helsinki
St Peters
Bergen
Oslo
Stockholm
Tallinn
Estonia
Baltic Sea
Gothenburg
Riga
Latvia
North Sea
Glasgow
Denmark
Copenhagen
Lithuania
Moscow
Vilnius
United Kingdom
Isle of Man
Leeds
Dublin
Liverpool
Ireland
Birmingham
Bristol
London
Gdansk
Minsk
Belarus
Hamburg
Bremen
Berlin
Poland
Amsterdam
Poznan
Warsaw
Netherlands
Leipzig
Lodz
Wroclaw
Belgium
Cologne
Germany
Frankfurt
Prague
Krakow
L'viv
Luxembourg
Czech Republic
Ukraine
Paris
Slovakia
Chernivtsi
Dnipropetrovs'k
Donets'k
Munich
Vienna
Bratislava
Kryvyi Rih
Zaporozhye
Moldova
Austria
Budapest
Mykolaiv
Hungary
Switzerland
200 mi
200 km
Map data ©2012 GIS Innovatsia, GeoBasis-DE/BKG (©2009), Google, Tele Atlas

Locate Jersey

DIGITAL JERSEY

simon.brown@codingthearchitecture.com

@simonbrown on Twitter



Coding the Architecture

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Software architecture for developers

coding {the} architecture

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Software Architecture for Developers

Find out what the role of a software architect is all about in our 2-day software architecture training course...

The Frustrated Architect

The slides and video from my "The Frustrated Architect" talk at Skills Matter in November 2011 are available to view online.

50+ essays

Read our (in-progress) book; a collection of essays that together form a practical and pragmatic guide to software architecture.

Speaking

Here are some of the events that we spoke at in 2011 and are speaking at in 2012. The slides are available to download.

Writing

Training and consulting

coding {the} architecture

Software Architecture for Developers

A practical and pragmatic guide to software architecture

Technical leadership
Collaboration, consistency and preventing chaos

Communication
Effective sketches and lightweight documentation

Just enough
Structure, shared vision, risks and firm foundations

Simon Brown

Published incrementally

Variable pricing

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Leanpub

leanpub.com

Leprechaun warning!

Big up front design

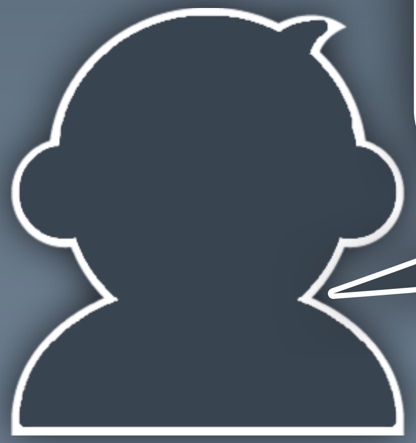
and analysis paralysis

Waterfall

UML

I'm a

software architect



Ivory Tower

PowerPoint Architect

Architecture Astronaut

Software development is like `${some.metaphor}`

Building, gardening, cooking, janitoring, ...

`${some.metaphor}`

is broken because...

:-p

“architect”

Latin: architectus

Greek: arkhitekton

“master builder, director of works”

arkhi- "chief"

+

tekton "builder, carpenter"

The Conclusion

Building architects were master builders,

therefore

software architects should code rather than sitting in ivory towers

The End

Back to the Middle Ages

Master builder = "master mason"

a stonemason

most major buildings were constructed of stone at the time

A master mason, is a
manipulator of stone,
an artist in stone and
a designer in stone.

Did master builders actually build?

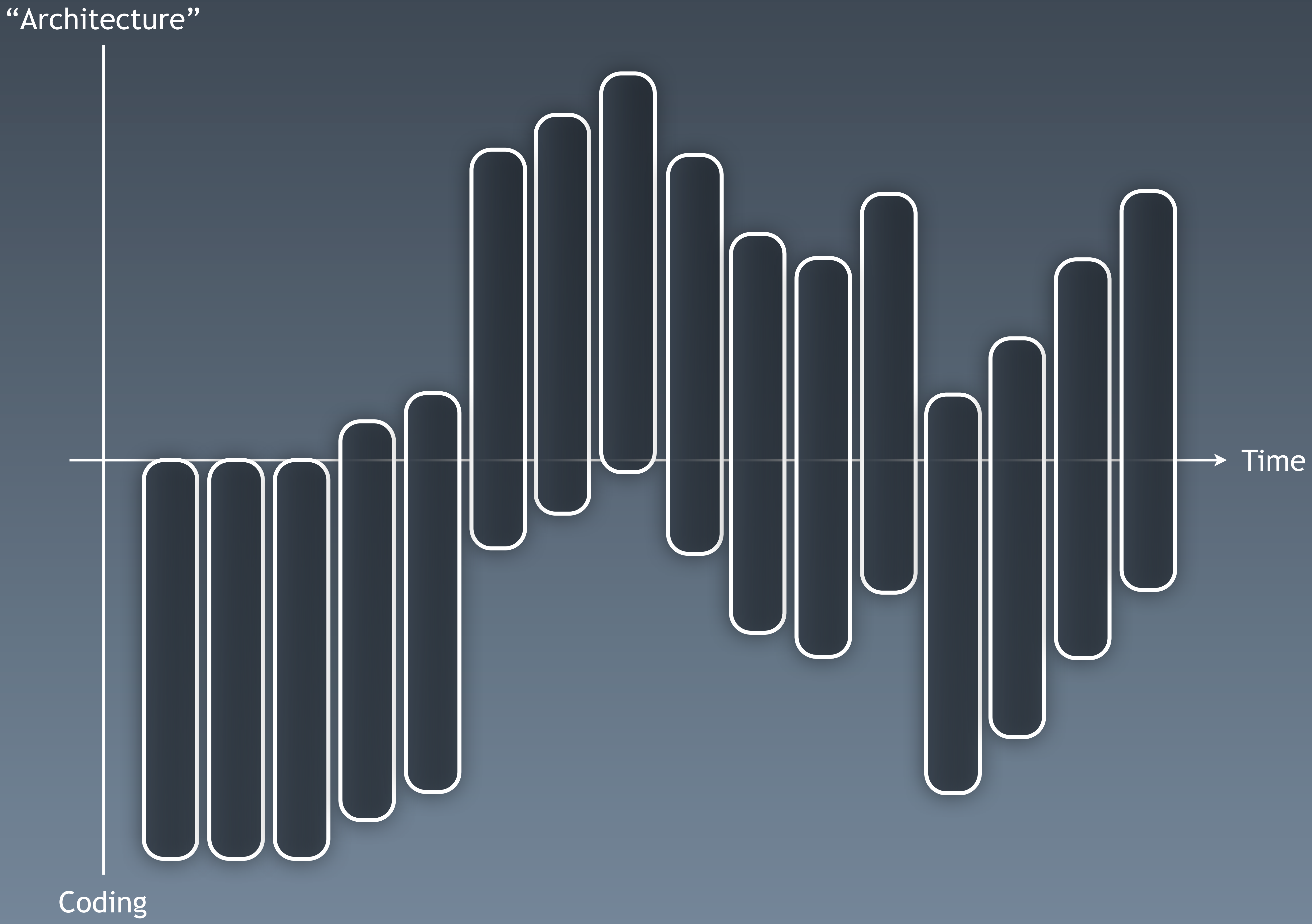
Although a master mason was a respected and usually wealthy individual, he first had to

prove his worth by going through the ranks as a stonemason

and then a supervisor, before being appointed to the highest position in his trade.

Throughout ancient and medieval history, most architectural design and construction was carried out by artisans, such as stone masons and carpenters,

rising to the role of master builder.


"Architecture"
Time
Coding

How much contact he actually had with this substance is, however, ***debatable*****.**

Ivory towers?

A mason who was at the top of his trade was a master mason. However, a Master Mason, by title, was the man who had overall charge of a building site and master masons would work under this person. A Master Mason also had charge over carpenters, glaziers etc. In fact,

everybody who worked on a building site was under the supervision of the Master Mason.

The master mason, then, designed the structural, aesthetic and symbolic features of what was to be built; organised the logistics that supported the works; and, moreover, prioritised and decided the order of the work.

…

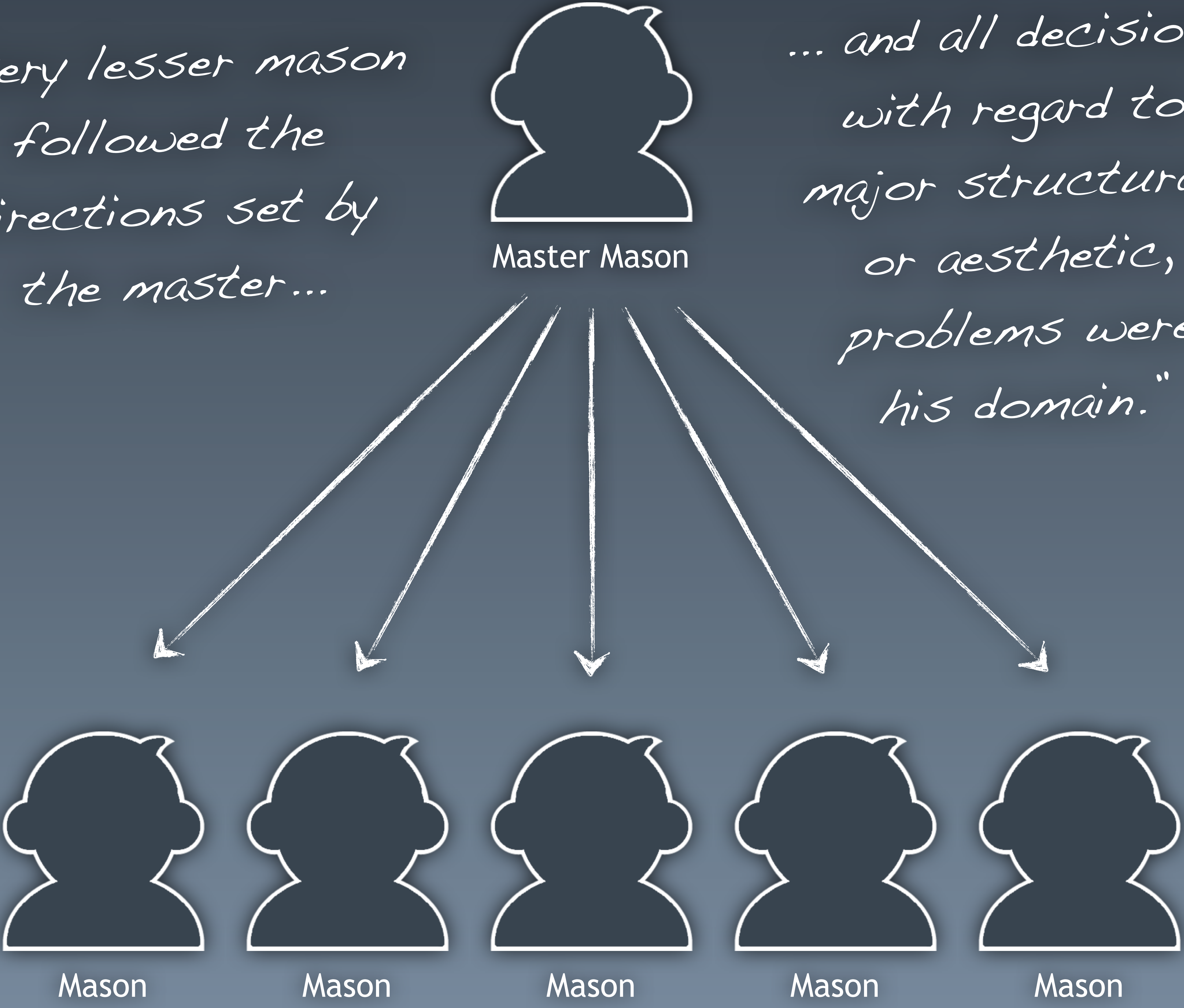
If, as seems likely, this multiplicity of tasks was normal it is

hardly surprising that master masons took little part in the physical work

(even had their status permitted it).

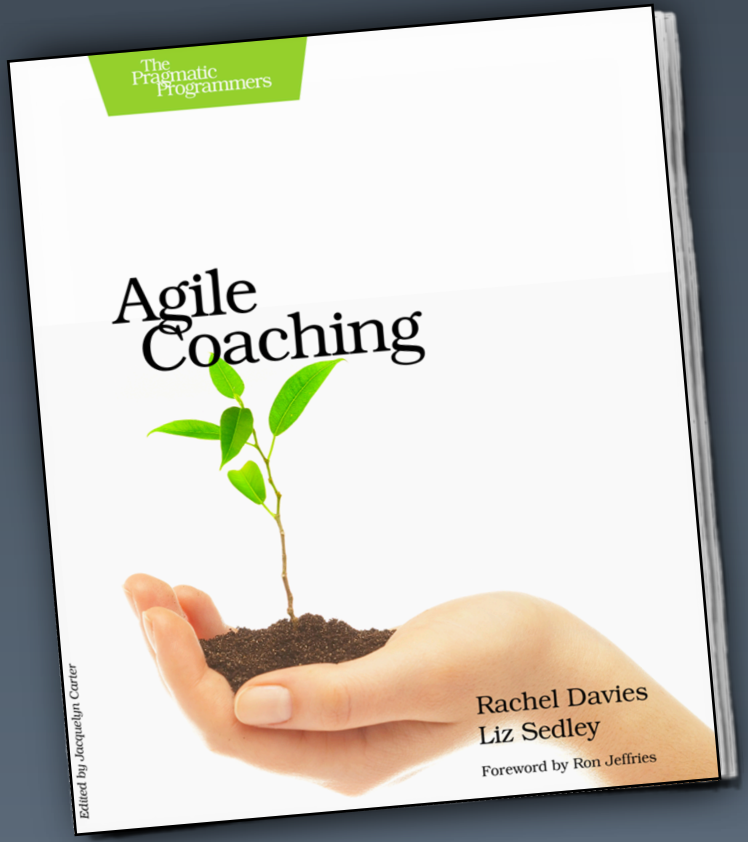
" Every lesser mason followed the directions set by the master...

... and all decisions with regard to major structural, or aesthetic, problems were his domain."



Testimony of this supposition is supplied by a sermon given in 1261 by Nicholas de Biard

railing against the apparent sloth of the master mason ‘who ordains by word alone’.



Agile Coaching

Rachel Davies & Liz Sedley

"If you know how to program, it's often tempting to make suggestions about how developers should write the code. Be careful, because you may be wasting your time—

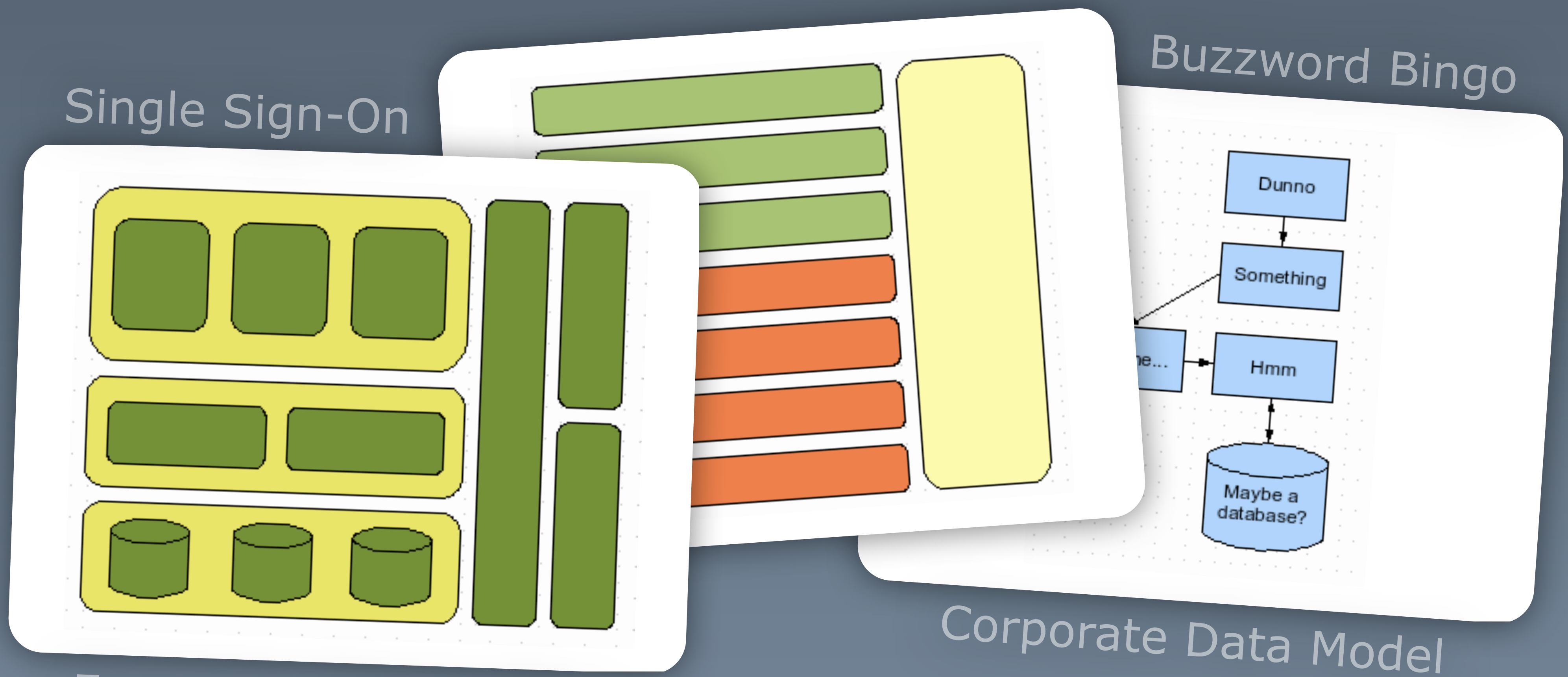
developers are likely to ignore your coding experience if you're not programming on the project.

They may also think that you're overstepping your role and interfering in how they do their job, so give such advice sparingly."

Why do you want to `code` on this project?

PowerPoint

Architecture



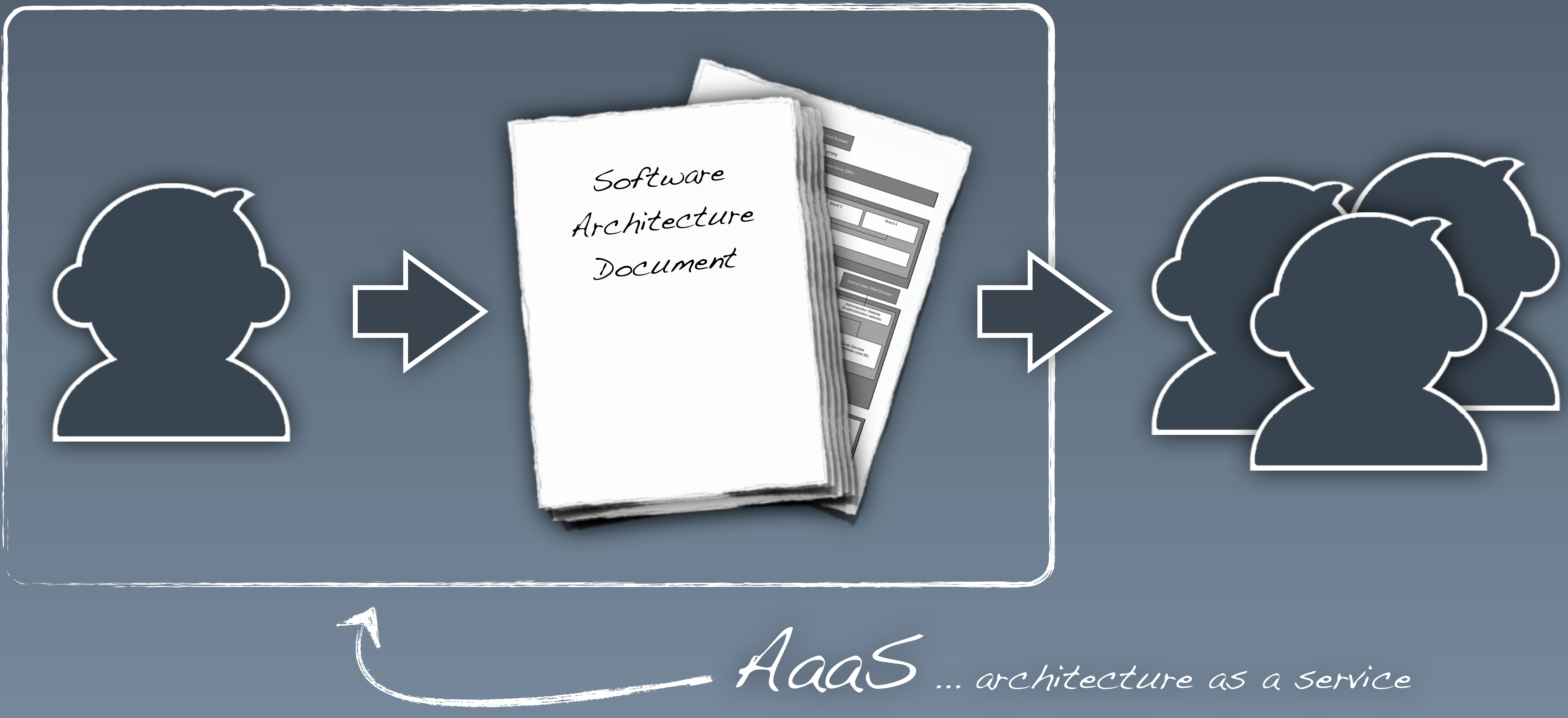
Single Sign-On

Buzzword Bingo

Enterprise Service Bus

Corporate Data Model

Software development is not a relay sport



AaaS ... architecture as a service

Successful software delivery

is **not** an

implementation

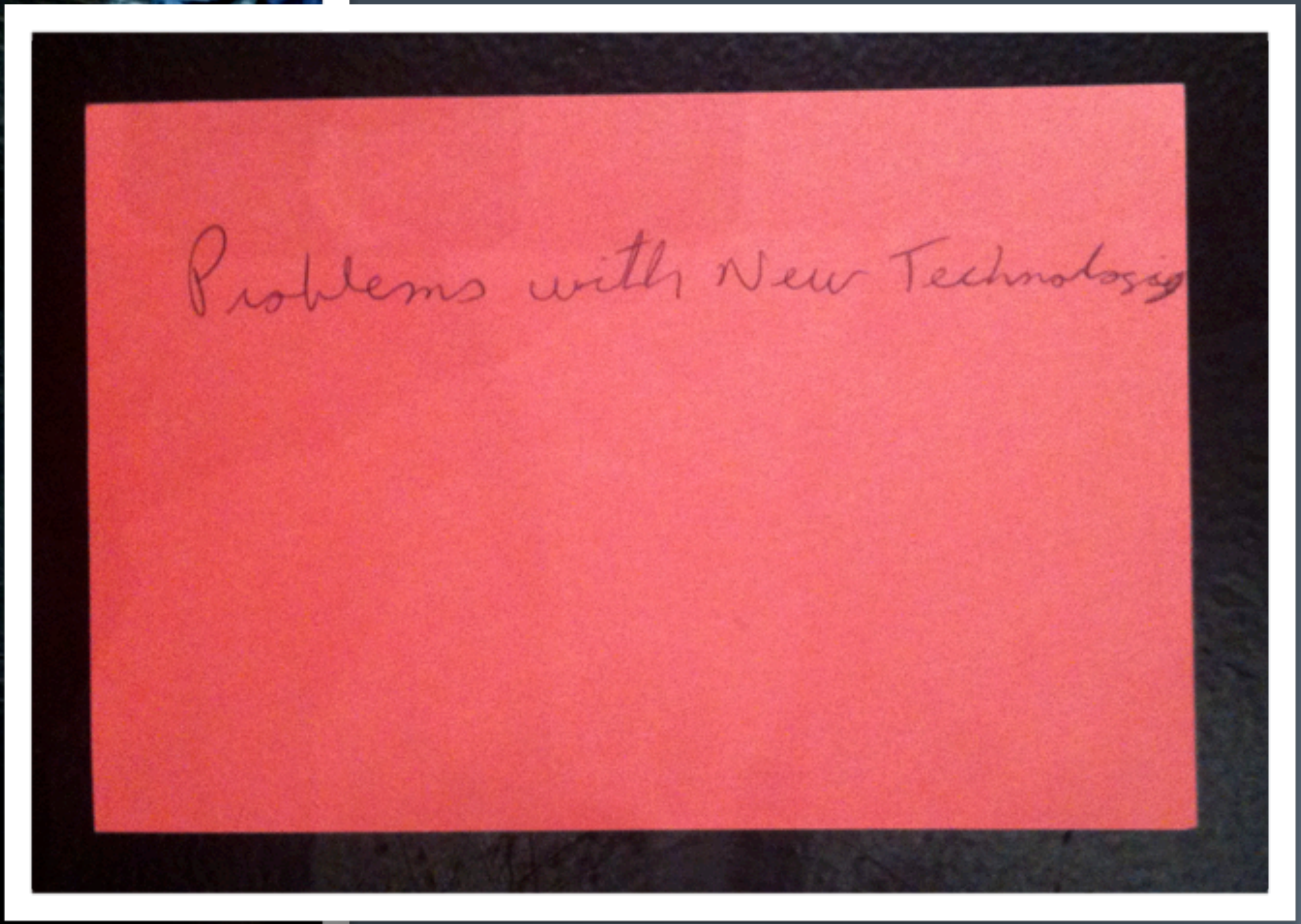
detail!

Why did you choose technology A?

A

B

C



An example timeline from
“Beyond Retrospectives”
by Linda Rising

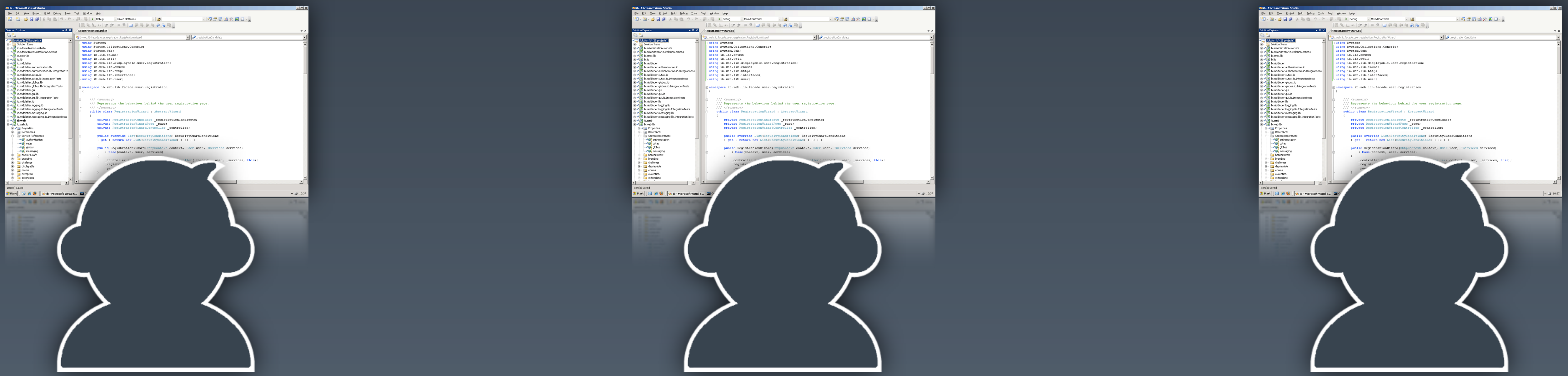
#gotocon Aarhus 2011

«interface» RuntimeContainerMBean
start ( )
stop ( )
isRunning ( )
getName ( )
shutdown ( )
getStartedDate ( )
getVersion ( )
getTotalMemory ( )
getFreeMemory ( )
getMaxMemory ( )
«interface» RuntimeComponentMBean
start ( )
stop ( )
getName ( )
getInstance ( )
isRunning ( )
RuntimeContainer
- runtimecontainer
- runtimeComponent
«interface» RuntimeComponent
getRuntimeContainer ( )
setRuntimeContainer ( )
setName ( )
setInstance ( )
getFullName ( )
From the JMX API
NotificationBroadcasterSupport
- messagepublisher
0..1
«interface» MessagePublisher
send ( )
publish ( )
AbstractRuntimeComponent
name
instance
4. Reset Results Notification
Early Termination Notification
Maturity Notification
5. Extend Window Request
3. Reset Results
2. Reset Request
1. Trade Event Schedule
LCM
Trade Event Schedule Message Handler
IRisk Results Message Handler
LCM Database
Event Batcher
FRO Observation Notification Message Handler
Batch Poller and Batch Handler
FRO Configuration Notification Message Handler
LCM Web Services
Problem Poller
LCM/ROT Management Console
MindAlign
12. Problem summary
14. Errors and warnings
Micromuse
LCM/ROT Support and Operations GUI
13. GUI requests/responses
ROT
ROT Database
ROT Web Services
Observation Dating Poller
ROT Replay Service
Reuters Datafeed Adapter
7. FRO Observation Notifications
8. FRO Configuration Notifications
11. Holiday information
Dating Server
6. Observations
Sophis
ACLM
Trade details
Static data
Risk Monitoring System (Java/Apache Tomcat)
Poller
Orchestrator
Counterparty File Processor
Limit File Processor
Link File Processor
Trade Details File Processor
Static Data Service
Trade Details Service
Calculation Service
Exception Service
Report Service
Risk Factor Service
User Interface
Maintenance requests/responses and Reports
Maintenance GUI and Reports (Web Browser)
Database (Sybase)
Cisco 3750
Easynet/LVL3 1Gbps Internet connections
Packet Shaper
Cisco CSS
FW By-pass
FW1
FW2
3750 Stackwise
F5 BIG-IP
Origin servers (Web, Application, Database, etc)
Blue Coat Proxy Appliances
Comms Infrastructure
Security
Content Delivery Infrastructure
Customers (Web Browser)
HTTPS
ISA Server (Microsoft Windows Server 2003)
Brand 1
Brand 2
Brand 3
Brand 4
Web Tier/Presentation Logic (ib.web.lib)
Internet Information Services (IIS)
Web Tier (Microsoft Windows Server 2003)
SOAP/HTTPS
Internal Users (Web Browser)
Middle-tier Services (ib.middletier)
Administration Website (ib.administration.website)
Authentication and Audit Services (ib.middletier.authentication.lib)
Secure Messaging Services (ib.middletier.messaging.lib)
Cutas Services (ib.middletier.cutas.lib)
Middle Tier (Microsoft Windows Server 2003)
Web User Data
Audit Logs
Secure Messages
Site Commentary
Funds Data (from Cutas)
Scheduled Services (e.g. letter generation) (ib.middletier.scheduler)
SQL Server 2005
Database Tier (Microsoft Windows Server 2003)
Funds Data
Cutas Server (AS400)

Foolishly hoping

for the best?

Leadership



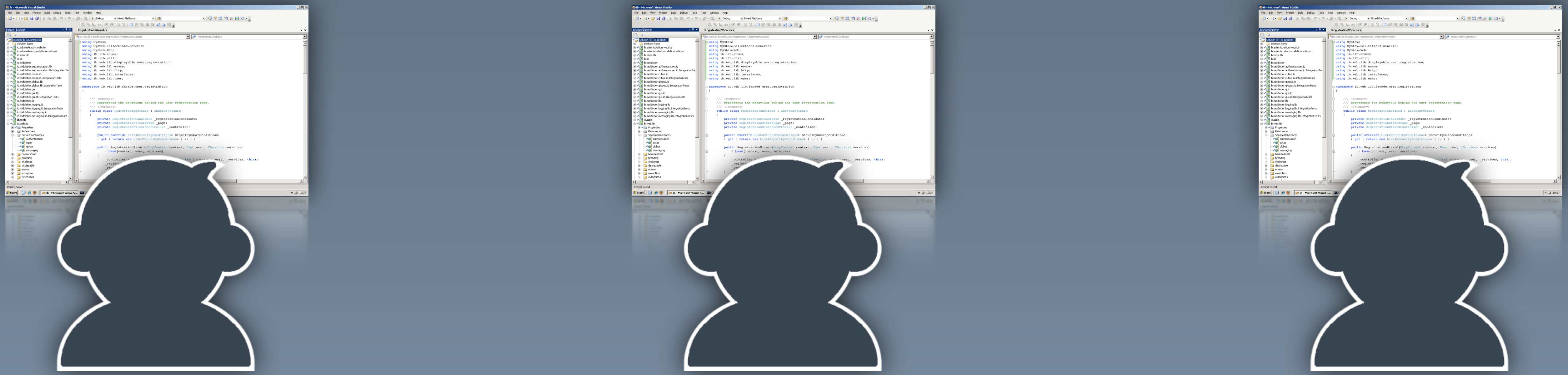
ib - Microsoft Visual Studio

RegistrationWizard.cs

```
using System;
using System.Collections.Generic;
using System.Web;
using ib.lib.enums;
using ib.lib.util;
using ib.web.lib.displayable.user.registration;
using ib.web.lib.enums;
using ib.web.lib.http;
using ib.web.lib.interfaces;
using ib.web.lib.user;

namespace ib.web.lib.facade.user.registration
{
    /// <summary>
    /// Represents the behaviour behind the user registration page.
    /// </summary>
    public class RegistrationWizard : AbstractWizard
    {
        private RegistrationCandidate _registrationCandidate;
        private RegistrationWizardPage _page;
        private RegistrationWizardController _controller;

        public override List<SecurityConditions> SecurityGuardConditions
        { get { return new List<SecurityConditions> ( ); } }

        public RegistrationWizard(HttpContext context, User user, IServices services)
            : base(context, user, services)
        {
```

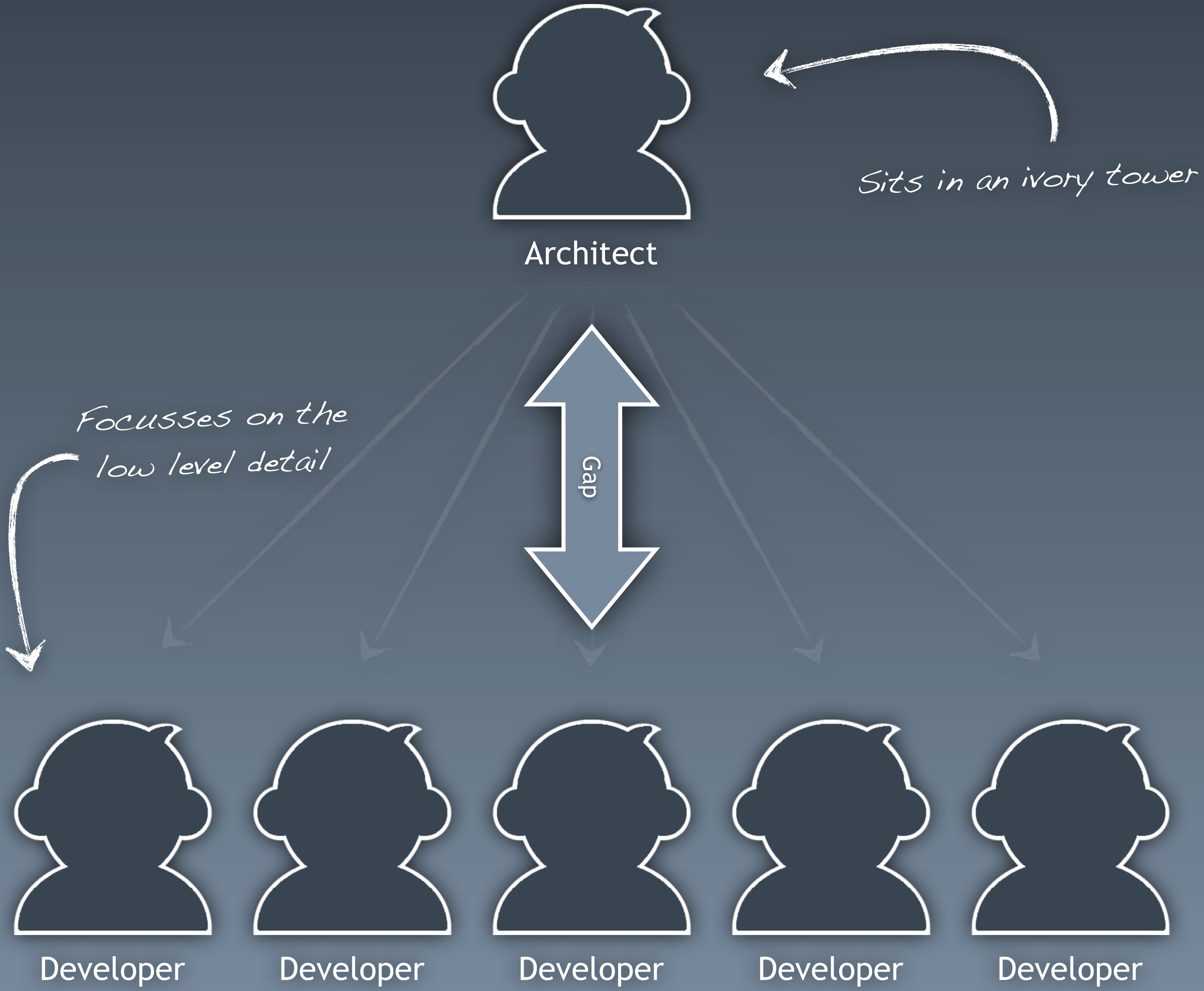
Chaos!

Does the team understand what they are building and how they are building it?



No defined structure,
inconsistent approaches,
big ball of mud,
spaghetti code, …

Slow, insecure, unstable, unmaintainable,
hard to deploy, hard to change,
over time, over budget, …



Sits in an ivory tower

Architect

Focusses on the low level detail

Gap

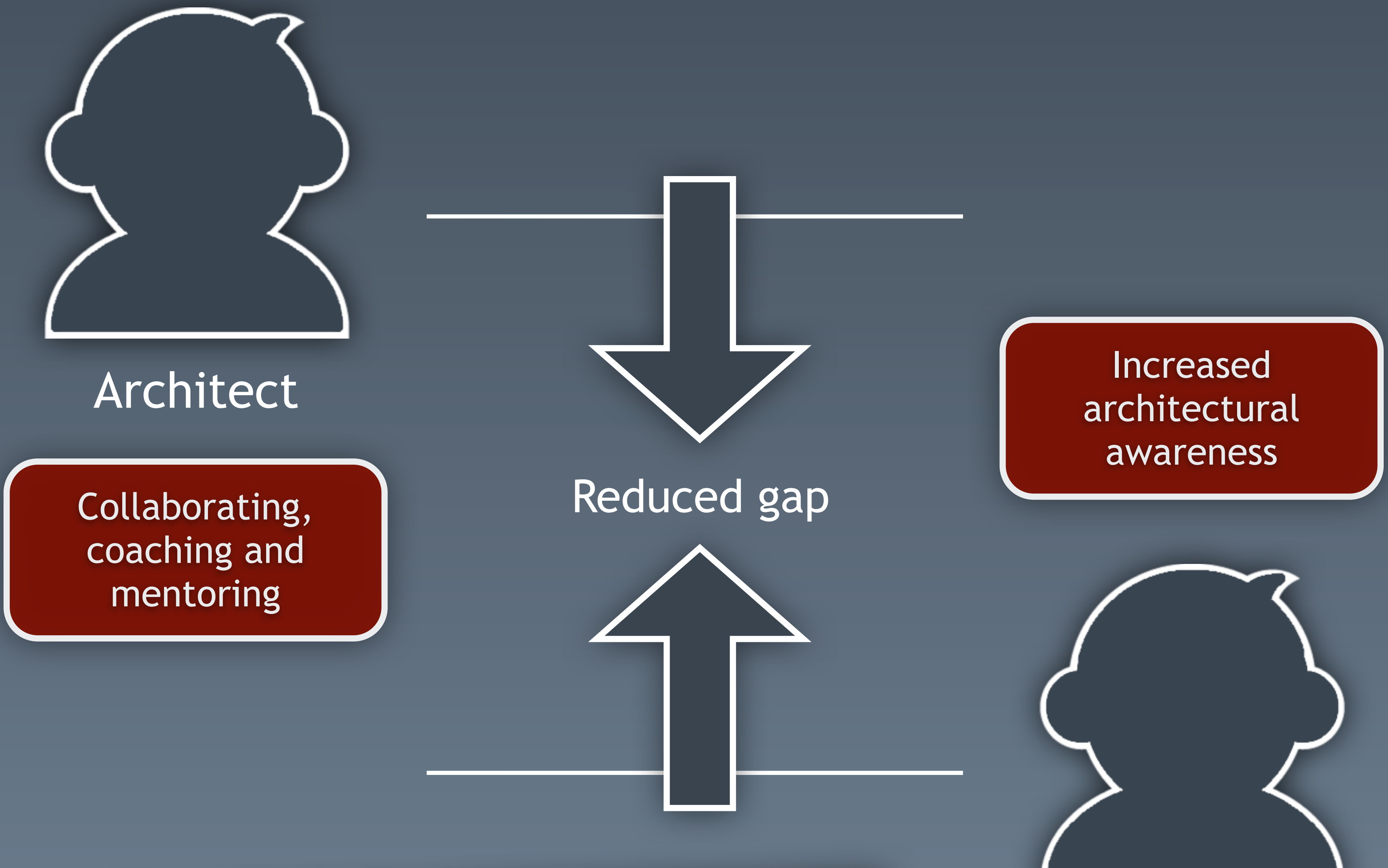
Developer

Developer

Developer

Developer

Developer



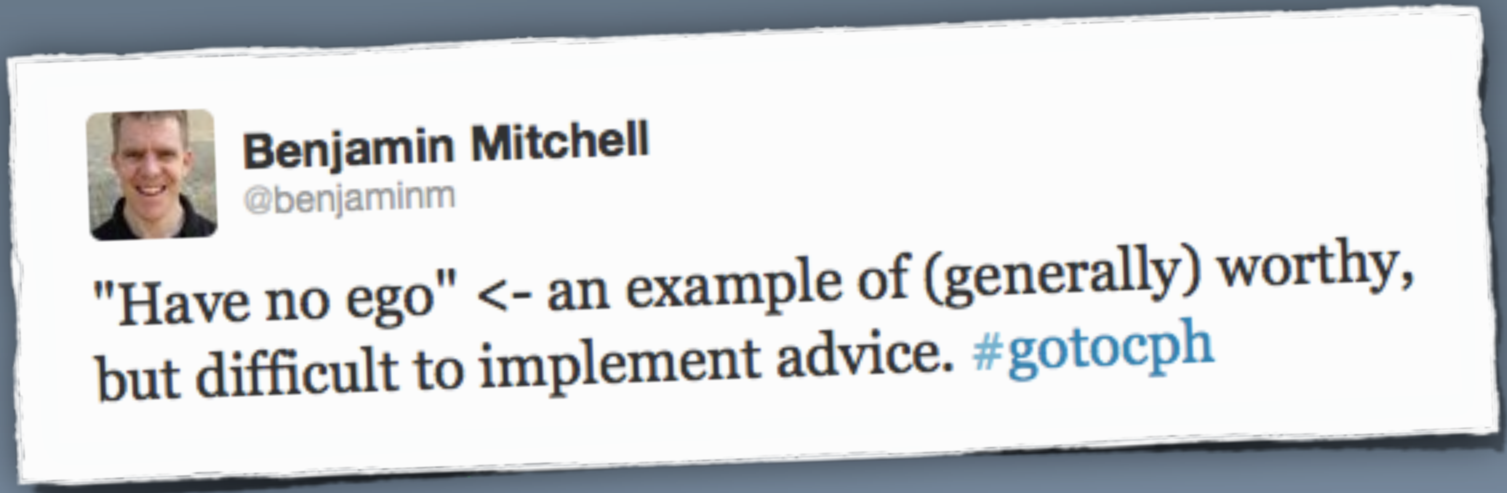
Architect

Collaborating, coaching and mentoring

Reduced gap

Increased architectural awareness

Developer

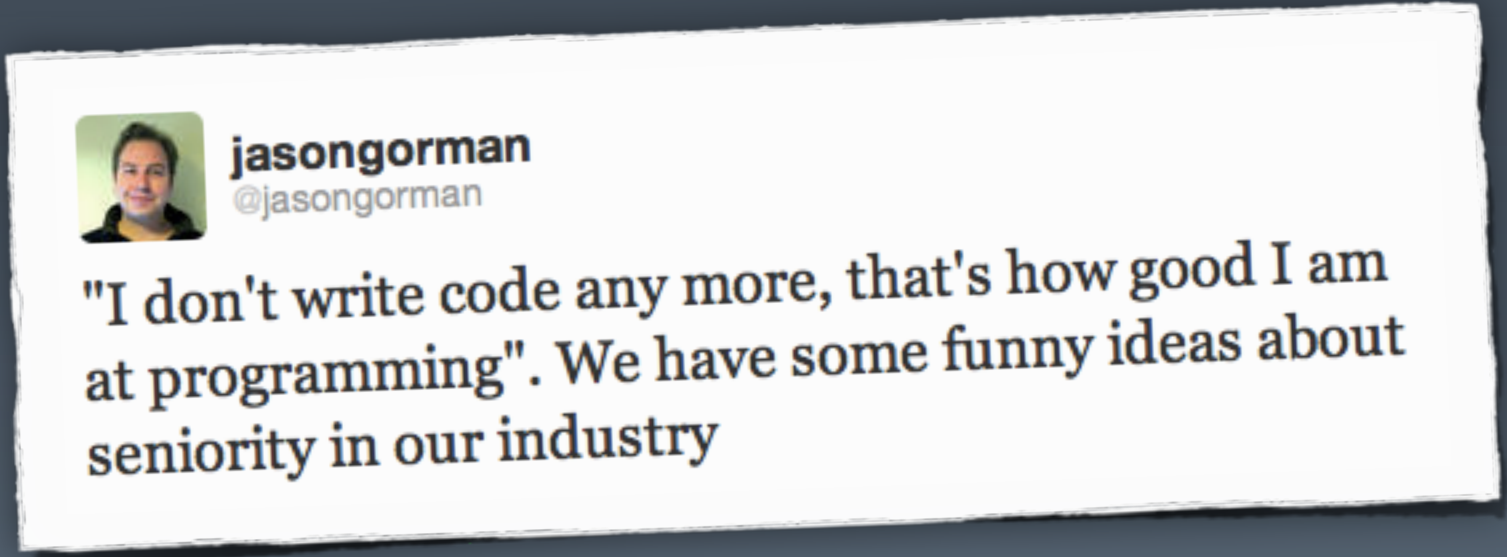


Benjamin Mitchell
@benjaminm

"Have no ego" <- an example of (generally) worthy, but difficult to implement advice. #gotocph

In order to avoid the sort of struggle late Renaissance artists had to be recognised as more than mere artisans it would seem that master masons perpetuated a myth (as I see it) of being the descendants of noblemen. Further to this, by shrouding their knowledge with secrecy

they created a mystique that separated them from other less 'arcane' or 'noble' professions.



jasongorman
@jasongorman

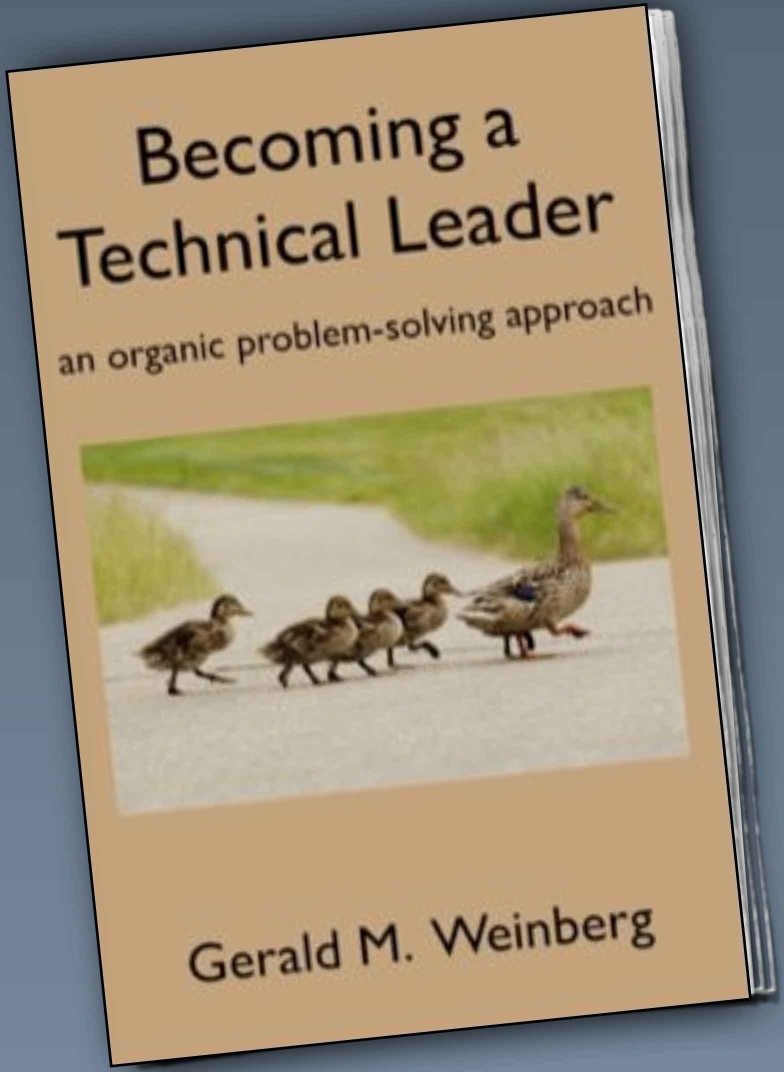
"I don't write code any more, that's how good I am at programming". We have some funny ideas about seniority in our industry

Would you **hire** a

software architect

that **wouldn't code**?

" Understanding the experiences of others expands our choices "



Becoming a Technical Leader

an organic problem-solving approach

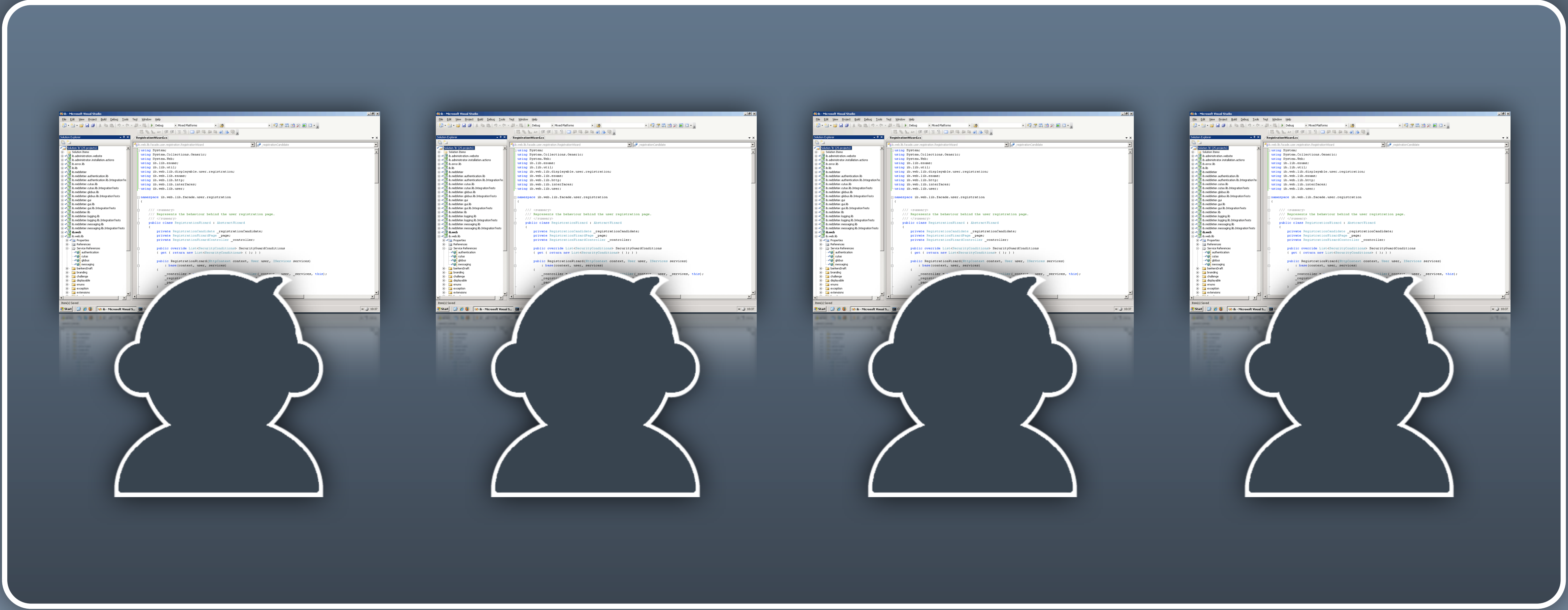
Gerald M. Weinberg

Becoming a Technical Leader

An organic problem-solving approach

Gerald M. Weinberg

Shared vision



```
using System;
using System.Collections.Generic;
using System.Web;
using ib.lib.enums;
using ib.lib.util;
using ib.web.lib.displayable.user.registration;
using ib.web.lib.enums;
using ib.web.lib.http;
using ib.web.lib.interfaces;
using ib.web.lib.user;

namespace ib.web.lib.facade.user.registration
{

    /// <summary>
    /// Represents the behaviour behind the user registration page.
    /// </summary>
    public class RegistrationWizard : AbstractWizard
    {
        private RegistrationCandidate _registrationCandidate;
        private RegistrationWizardPage _page;
        private RegistrationWizardController _controller;

        public override List<SecurityConditions> SecurityGuardConditions
        { get { return new List<SecurityConditions> { }; } }

        public RegistrationWizard(HttpContext context, User user, IServices services)
            : base(context, user, services)
        {
```

Pictures provide an excellent way to create a

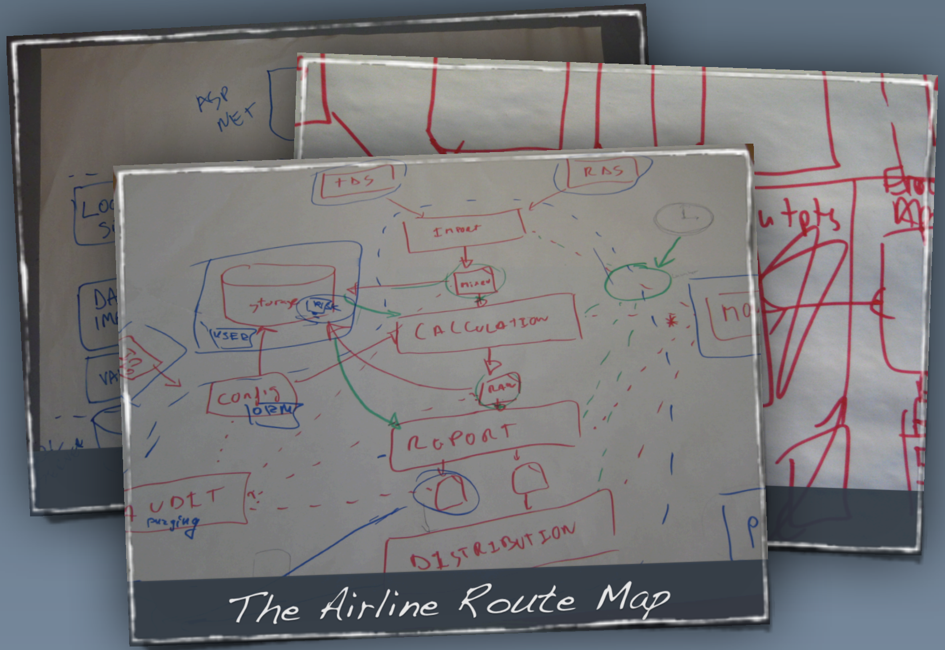
shared vision

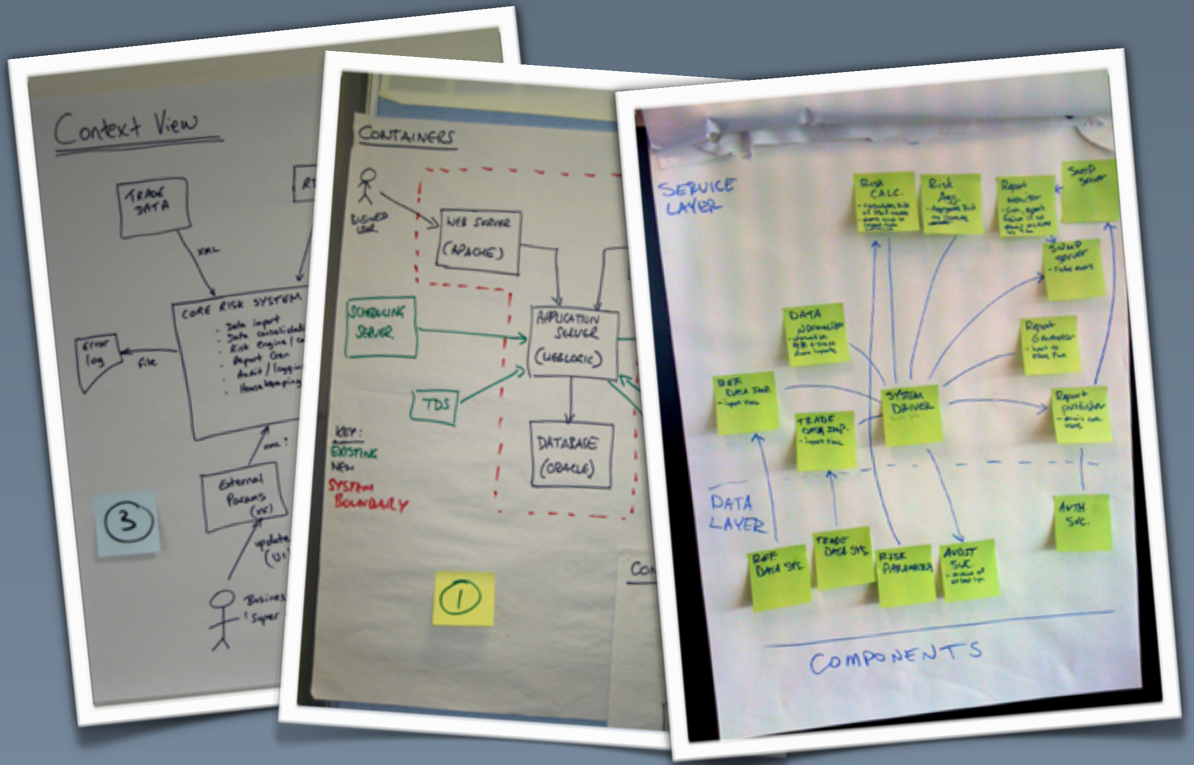
for the team

Making the implicit,

explicit

Moving fast requires good communication





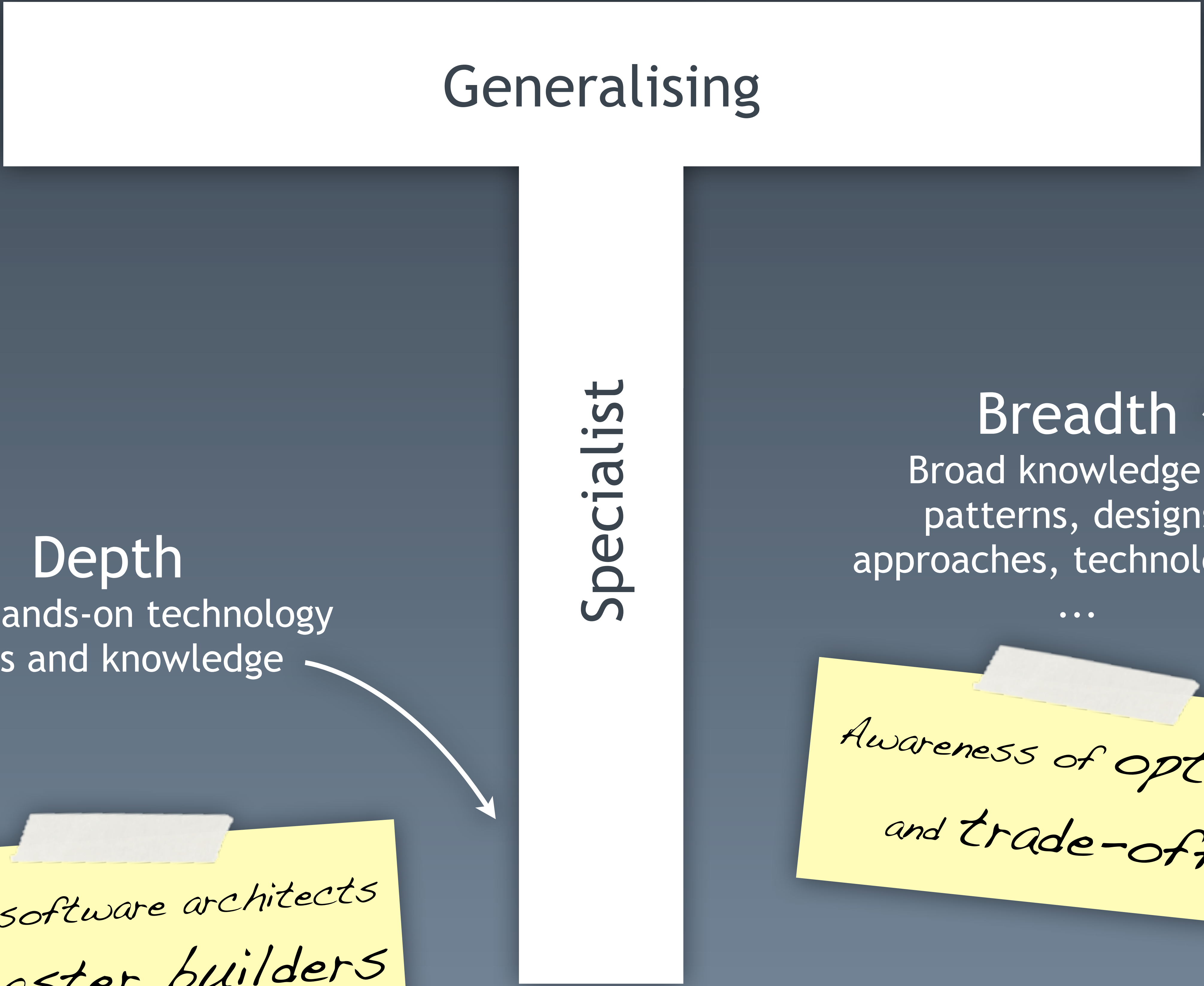
Should
software architects
write code?

Should software architects write

code

on software projects?

Ideally yes, but...



Generalising

Specialist

Depth

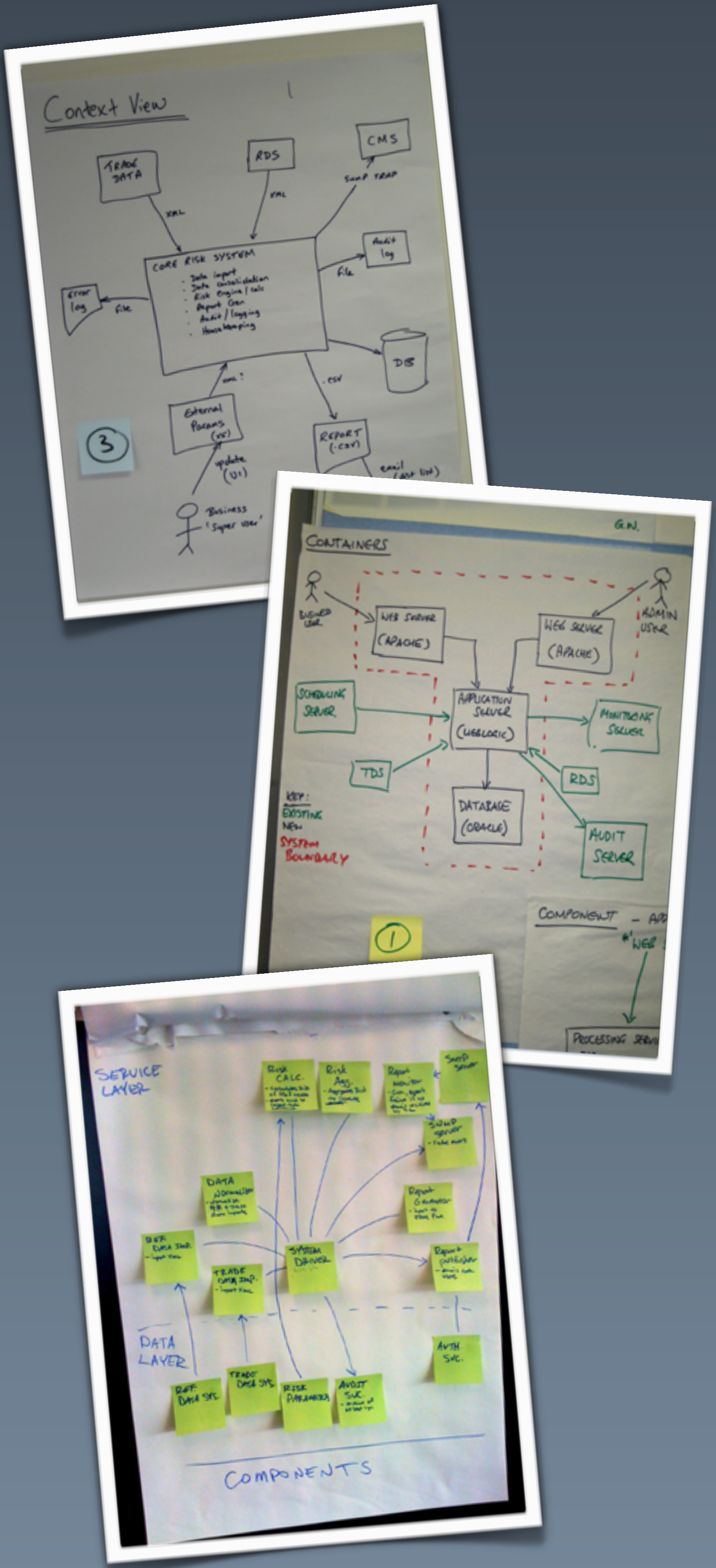
Deep hands-on technology skills and knowledge

Breadth

Broad knowledge of patterns, designs, approaches, technologies, …

Good software architects are master builders

Awareness of options and trade-offs



Would we code it that way?

This is why

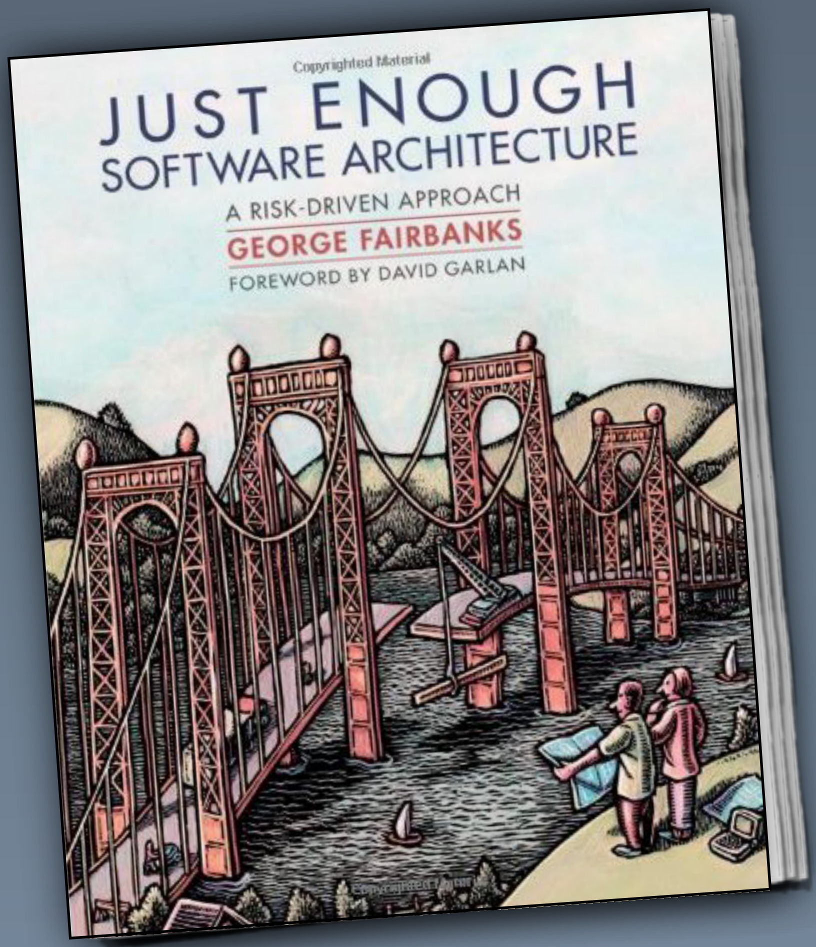
software architects must be able to code!

All decisions

involve a

trade-off

"architecture-indifferent design"



Just Enough Software Architecture

A Risk-Driven Approach

George Fairbanks

The Conclusion

Building architects were master builders,

therefore

software architects should code rather than sitting in ivory towers

The End?

Divergence of the master builder role

Throughout ancient and medieval history, most architectural design and construction was carried out by artisans, such as stone masons and carpenters,

rising to the role of master builder.

Until modern times there was no clear distinction between the architect and engineer.

In Europe, the titles "architect" and "engineer" were primarily geographical variations referring to the same person, often used interchangeably.

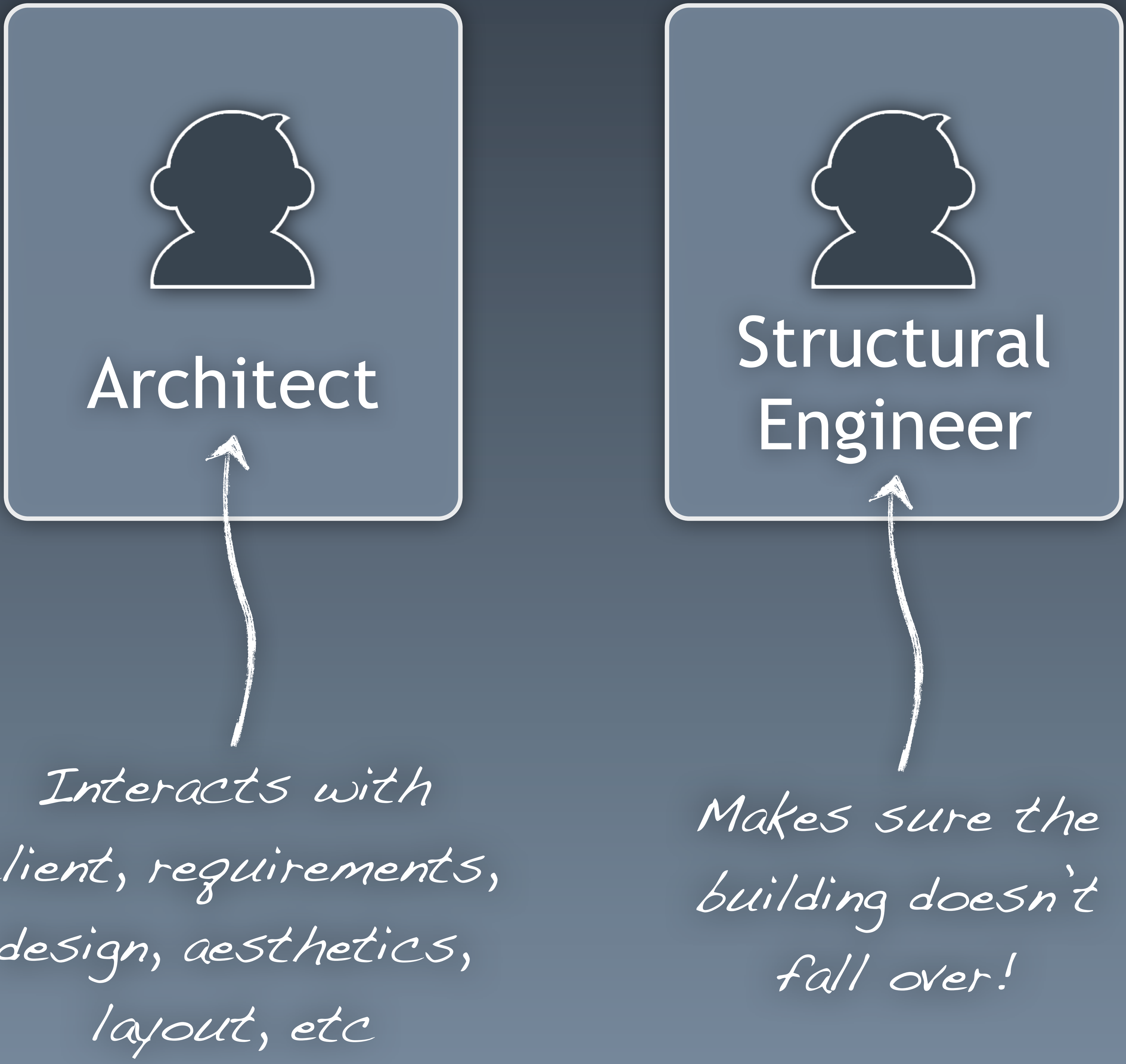
Structural engineering has existed since humans first started to construct their own structures. It became a more defined and formalised profession with the

emergence of the architecture profession as distinct from the engineering profession

during the industrial revolution in the late 19th century.

Until then, the architect and the structural engineer were usually one and the same - the master builder.

Only with the development of specialised knowledge of structural theories that emerged during the 19th and early 20th centuries did the professional structural engineer come into existence.

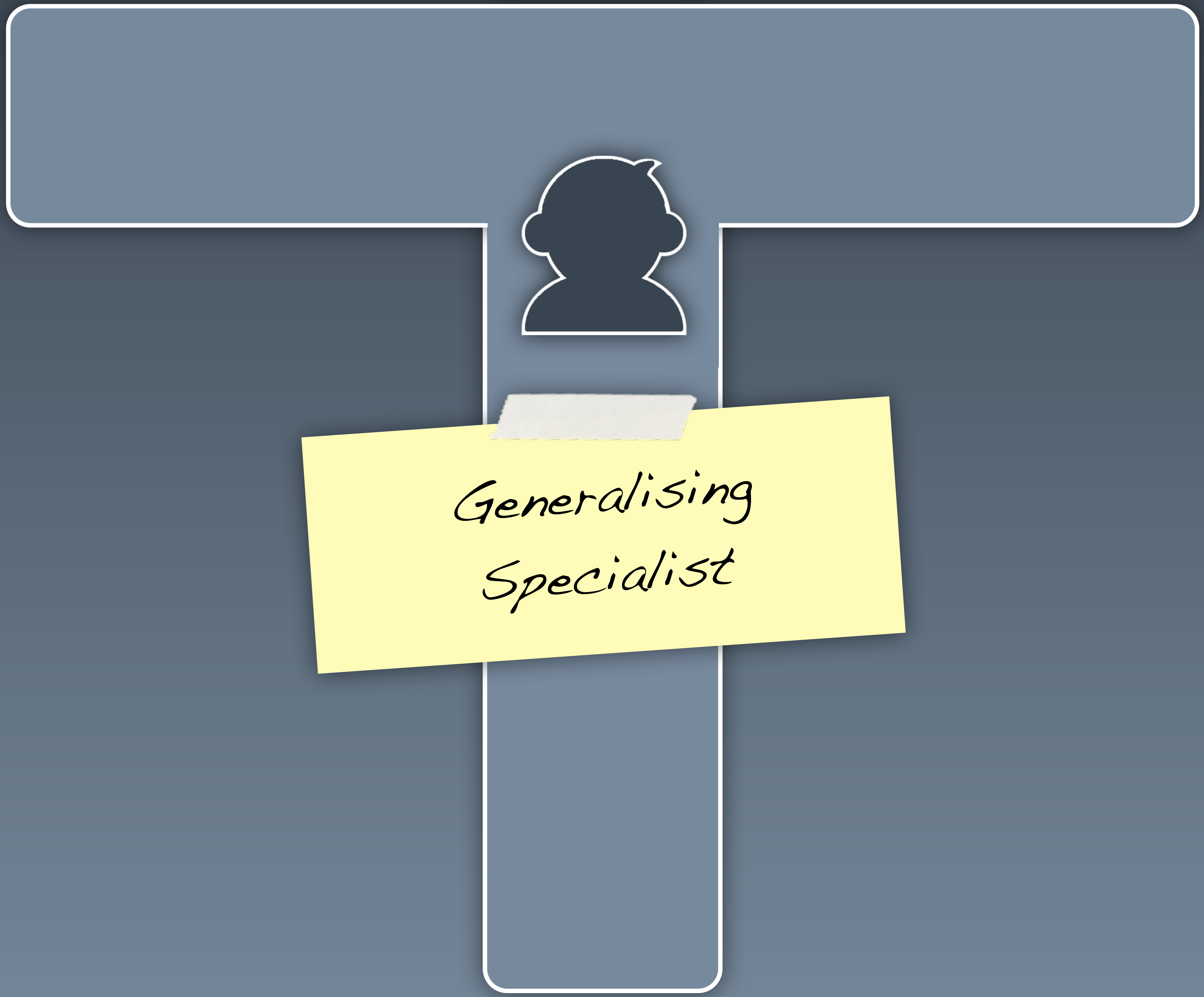


Architect

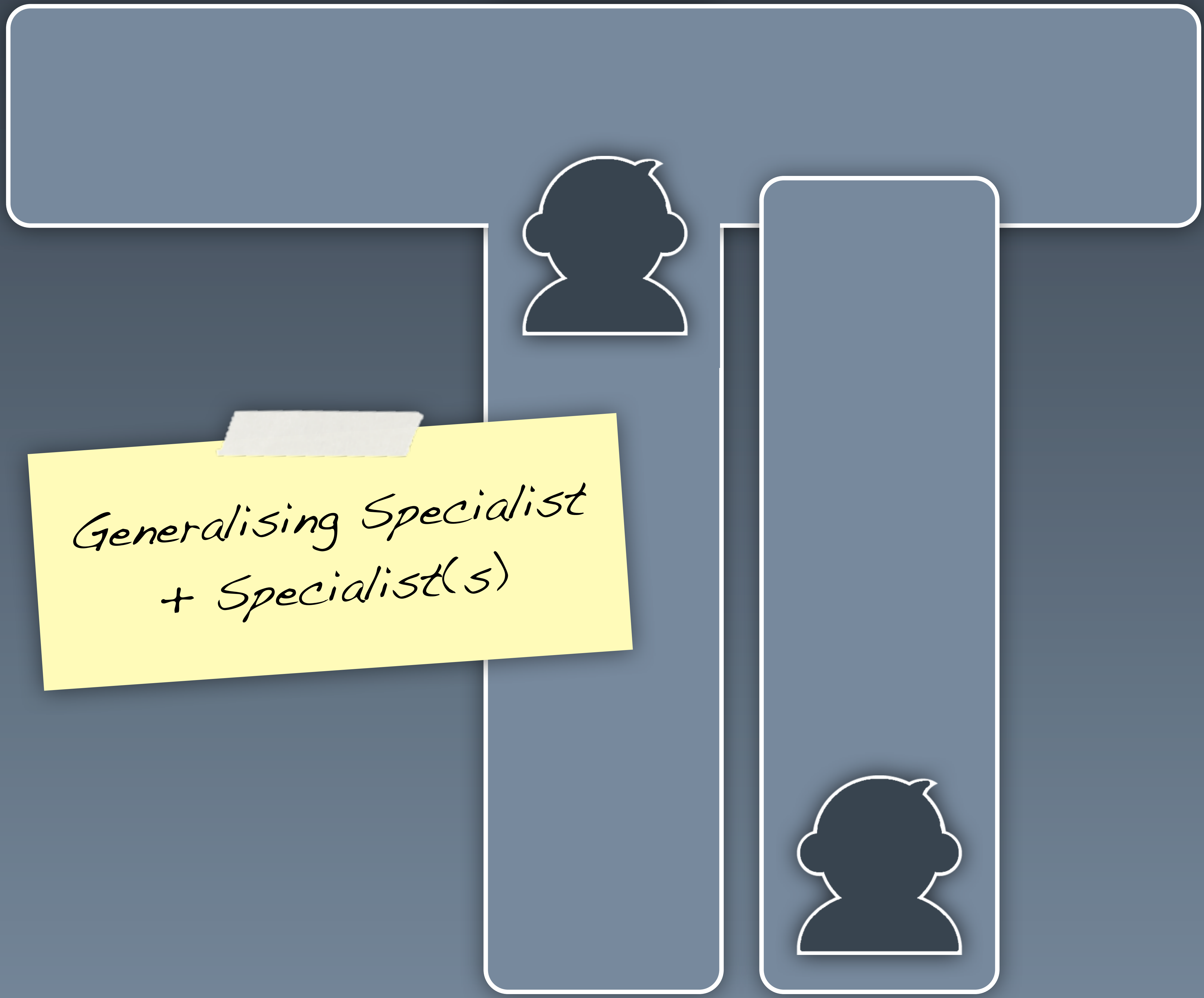
Structural Engineer

Interacts with client, requirements, design, aesthetics, layout, etc

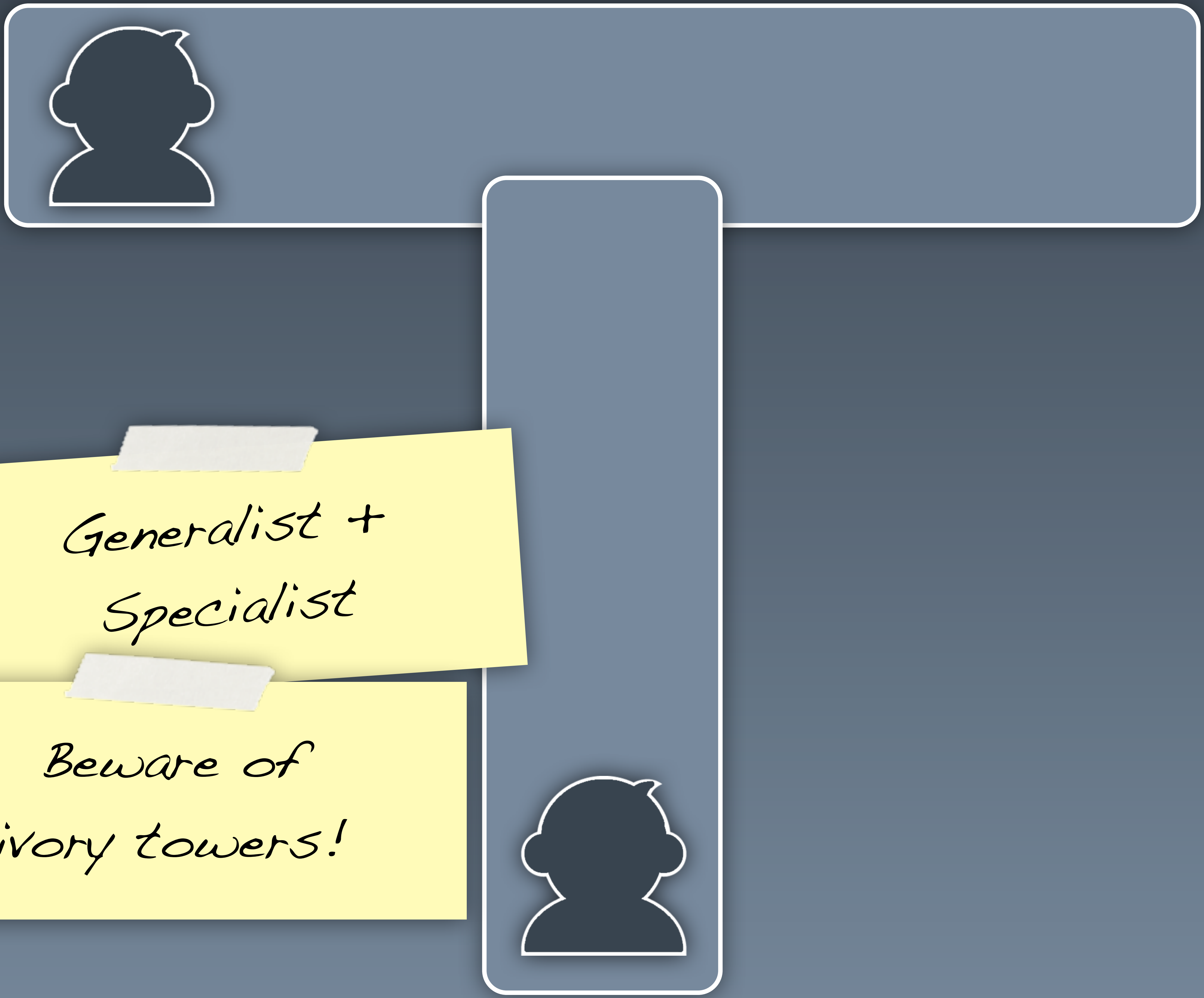
Makes sure the building doesn't fall over!



Generalising
Specialist

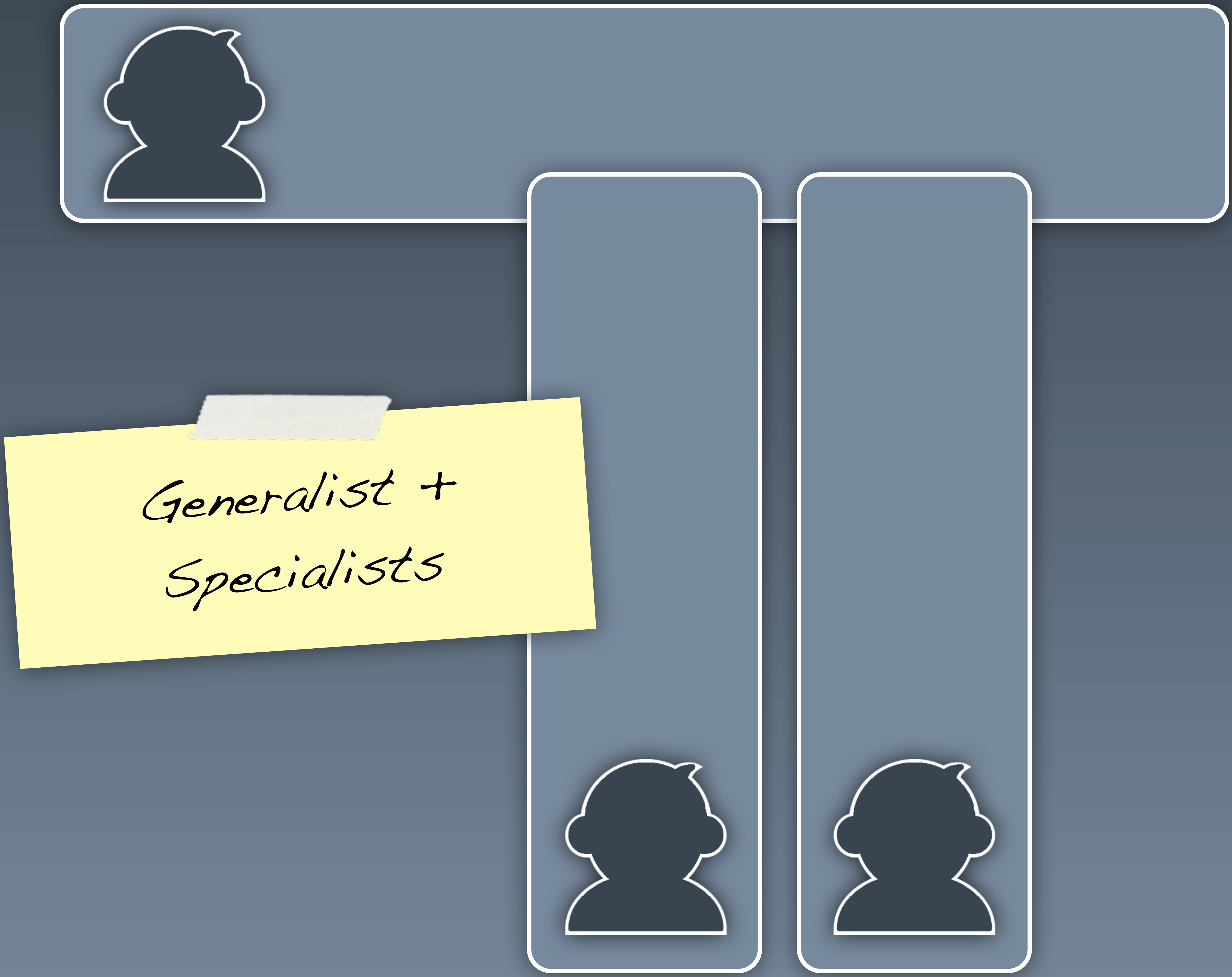


Generalising Specialist
+ Specialist(s)



Generalist + Specialist

Beware of ivory towers!



Generalist +
Specialists

How can I *possibly* be hands-on when I have

seven teams to look after?!

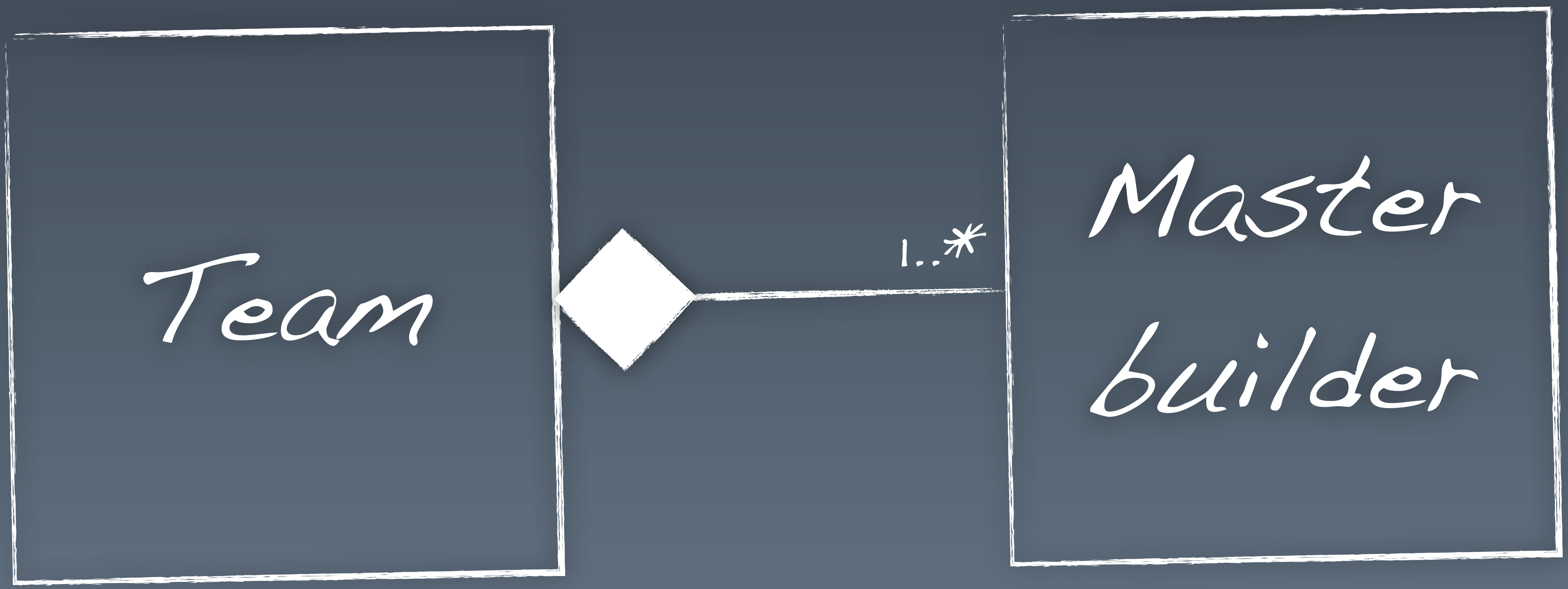
Software Architect

You can't ... but why are you looking after seven teams?

Enterprise Architecture Group

Although they may not have touched stone, master masons

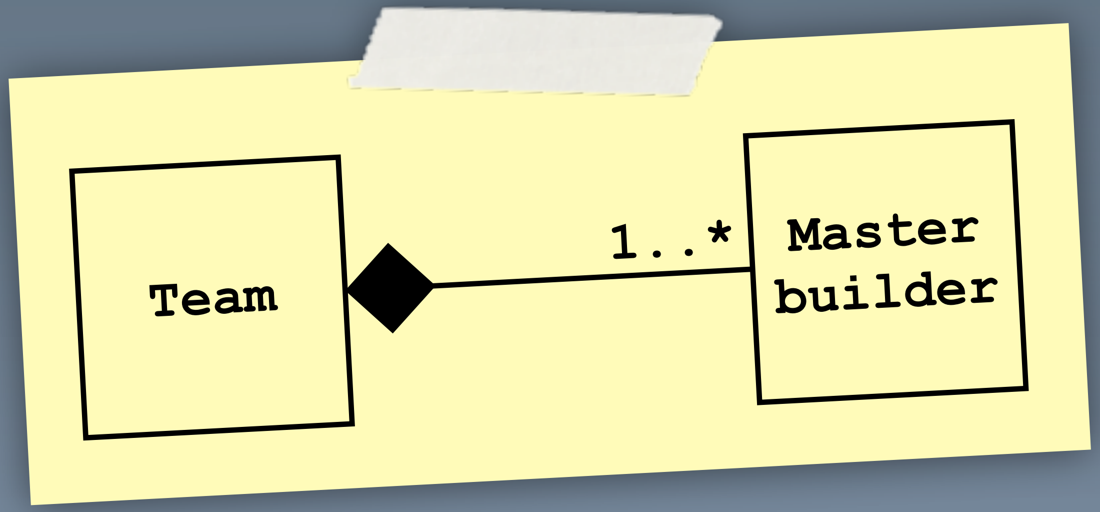
worked with the teams



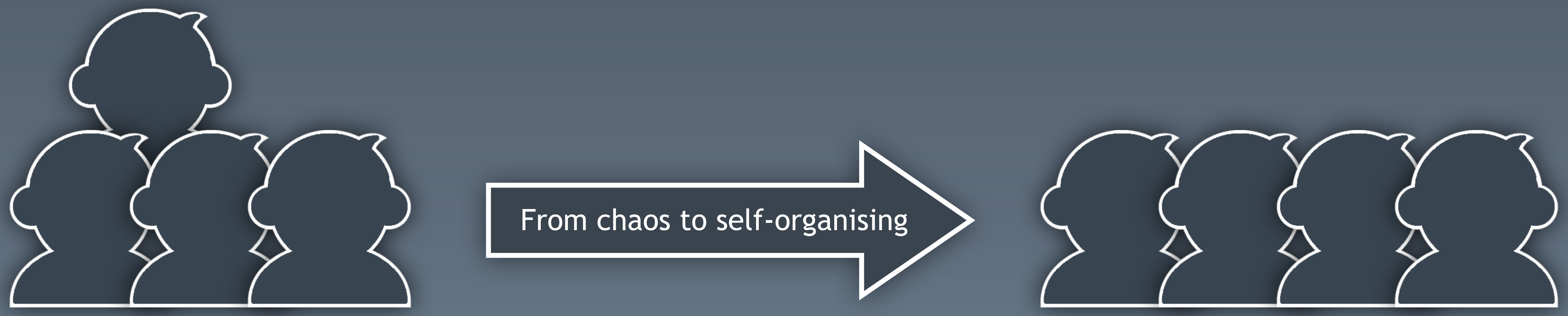
This diagram might work, but many (most?) people in our industry don't understand UML! :-/

Every software development team needs a master builder

1 or many



The software architecture role



Dedicated
software architect

Single point of responsibility for
the technical aspects of the
software project

Elastic Leadership (Roy Osherove)

Chaos (command and control),
learning (coaching),
self-organising (facilitation)

Everybody is a
software architect

Joint responsibility for the
technical aspects of the
software project

Corporate career ladders

Is coding a commodity?

The “corporate career ladder”

Non-technical

Technical

Our tech lead and mentor has been “promoted” …

help!

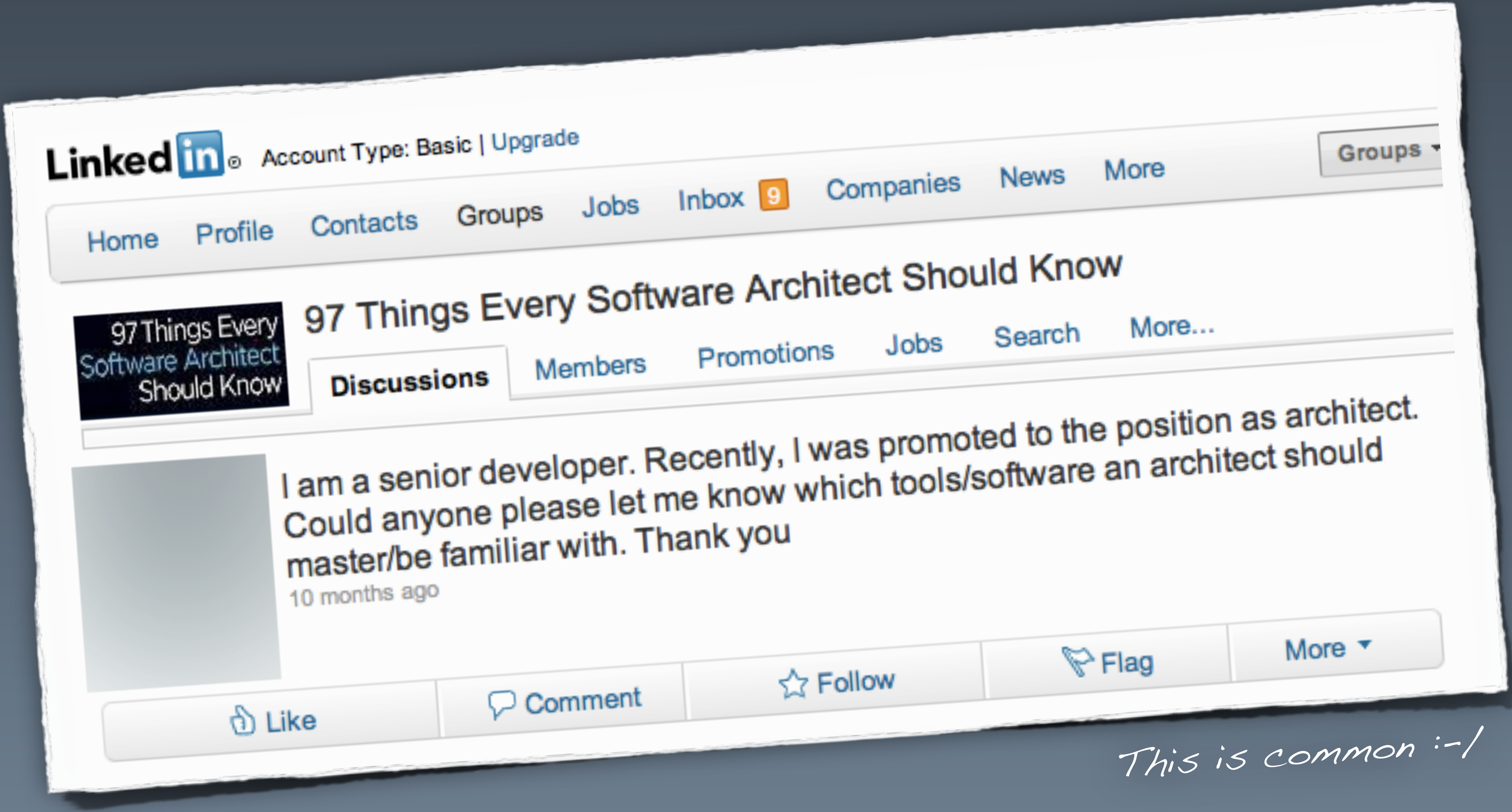
Medieval stonemasons' skills were in high demand, and members of the guild, gave rise to three classes of stonemasons:

apprentices,
journeymen,
and master masons.

Apprentices were indentured to their masters as the price for their training, journeymen had a higher level of skill and could go on journeys to assist their masters, and master masons were considered freemen who could travel as they wished to work on the projects of the patrons.

> *A mason would have an*
> ***apprentice***
> *working for him.*

Traditionally medieval stonemasons served a seven-year apprenticeship.


Linked in
Account Type: Basic | Upgrade
Groups
Home
Profile
Contacts
Groups
Jobs
Inbox 9
Companies
News
More
97 Things Every Software Architect Should Know

97 Things Every Software Architect Should Know

I am a senior developer. Recently, I was promoted to the position as architect. Could anyone please let me know which tools/software an architect should master/be familiar with. Thank you

10 months ago

This is common :-/

We need to **grow** the

software architects

of tomorrow

To become a successful master mason in the medieval era, whatever one’s origins or education, patently required a man of immense talent. Such a man needed to be a master in the handling of physical and human resources – to be able to direct them with imagination, ingenuity and efficiency toward a mercurial goal always framed by a host of compromises.

The opportunities for such a man whose creativity was matched by his organisational and diplomatic ability were varied and great.

Leadership

and

soft skills?

A 21st century software architect

A conflict in team structure

Dedicated software architect

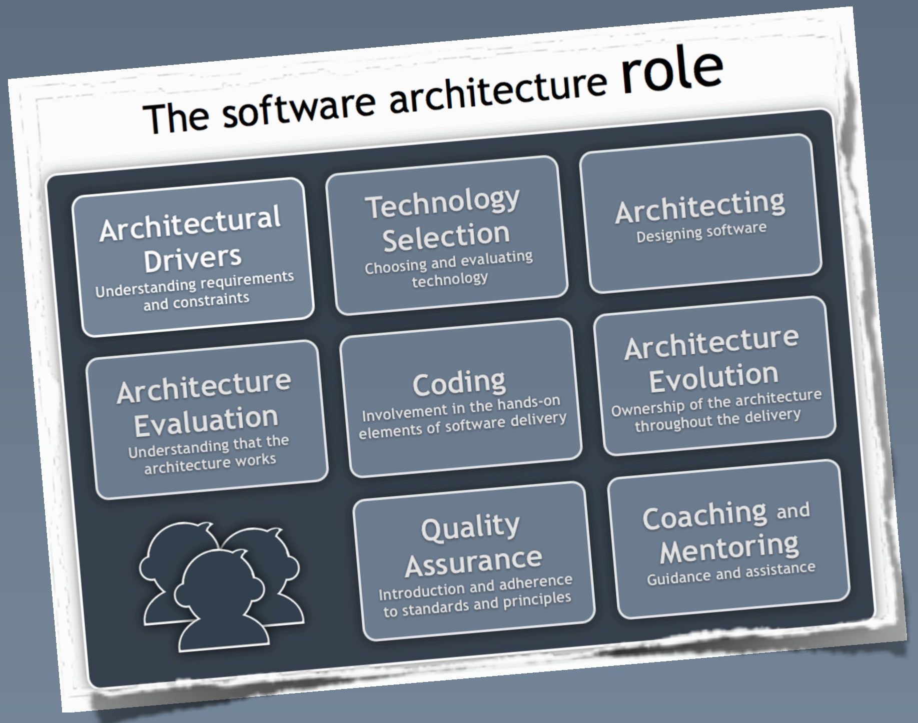
Single point of responsibility for the technical aspects of the software project

vs

Everybody is a software architect

Joint responsibility for the technical aspects of the software project

Is a collaborative and lightweight approach to software architecture the missing piece of the jigsaw?



The software architecture **role**

Architectural Drivers
Understanding requirements and constraints

Technology Selection
Choosing and evaluating technology

Architecting
Designing software

Architecture Evaluation
Understanding that the architecture works

Coding
Involvement in the hands-on elements of software delivery

Architecture Evolution
Ownership of the architecture throughout the delivery

Quality Assurance
Introduction and adherence to standards and principles

Coaching and Mentoring
Guidance and assistance

The role

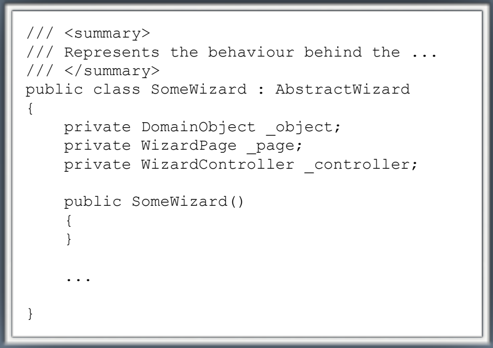
"Just enough"

Understand how the significant elements fit together

Identify and mitigate the key risks

Provide firm foundations and a vision to move forward

The process



```
/// <summary>
/// Represents the behaviour behind the ...
/// </summary>
public class SomeWizard : AbstractWizard
{
    private DomainObject _object;
    private WizardPage _page;
    private WizardController _controller;

    public SomeWizard()
    {
    }

    ...

}
```

The Conclusion

Software development teams need

one or more

master builders

Number 1

The Conclusion

The master builders are in a leadership role that should be **collaborative** and include **coaching**

Number 2

The Conclusion

Effective and efficient

communication

is a key skill for master builders

Number 3

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Communication
Effective sketches and lightweight documentation
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Structure, shared vision, risks and firm foundations

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http://www.historylearningsite.co.uk/medieval_masons.htm

Stonemasonry

http://en.wikipedia.org/wiki/Stonemasonry

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The Medieval Stonemason and the Master Mason

http://rachel-bellerby.suite101.com/the-medieval-stonemason-and-the-master-mason-a65816