

3.– 6. September 2012
in Nürnberg



Herbstcampus

Wissenstransfer
par excellence

Pure Magie oder doch nur geträumt?

Möglichkeiten und Grenzen emergenter Architektur

Uwe Friedrichsen

codecentric AG

ABOUT ME ...

Name: Uwe Friedrichsen

Professional experience: Several years ...

Focus areas:

- Making teams, projects and systems successful – with a special focus on architecture and agility
- Holistic thinking, connect ideas and concepts, make people think
- New technologies & concepts

Current position: CTO at codecentric AG



AGENDA

Motivation

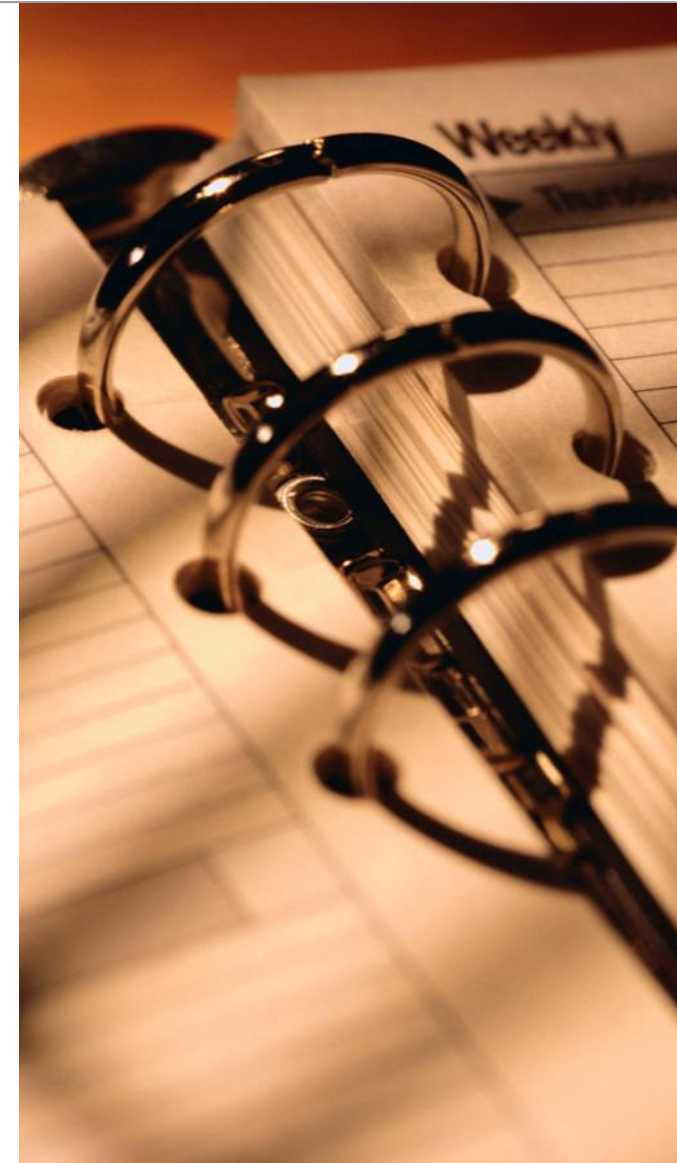
About architecture

Activities of architectural work

Objectives of architectural work

A joint approach

Conclusion





Why are we doing architectural work at all?
Can't we just do it all emergent?

DEFINITION OF EMERGENCE

„**Emergence** is the way complex systems and **patterns arise** out of a multiplicity of relatively simple interactions.“

Source: Wikipedia

„**Emergence** is the arising of **novel** and coherent **structures, patterns** and **properties** during the process of self-organization in complex systems “

Source: Jeffrey Goldstein (via Wikipedia)

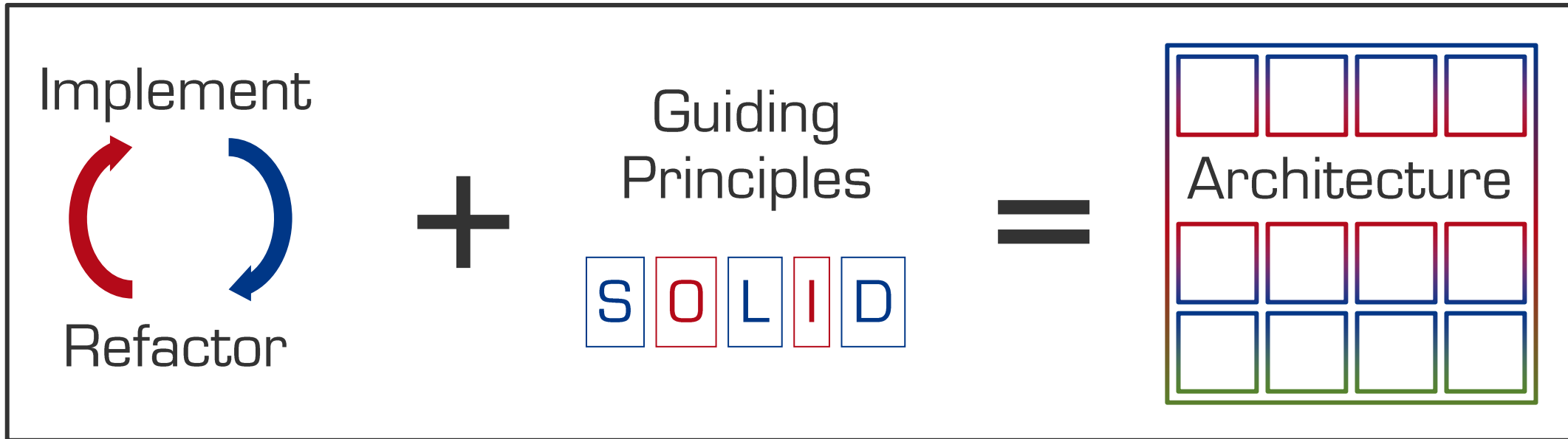


$$1 + 1 > 2$$

„The result is more than the sum of its parts“

Source: ezmosaic.com

EMERGENT ARCHITECTURE – THE IDEA



No explicit architectural design
(Done by developers only)

Yet working
(optimal)
architecture



So, can't we just get rid of those (annoying) architects?

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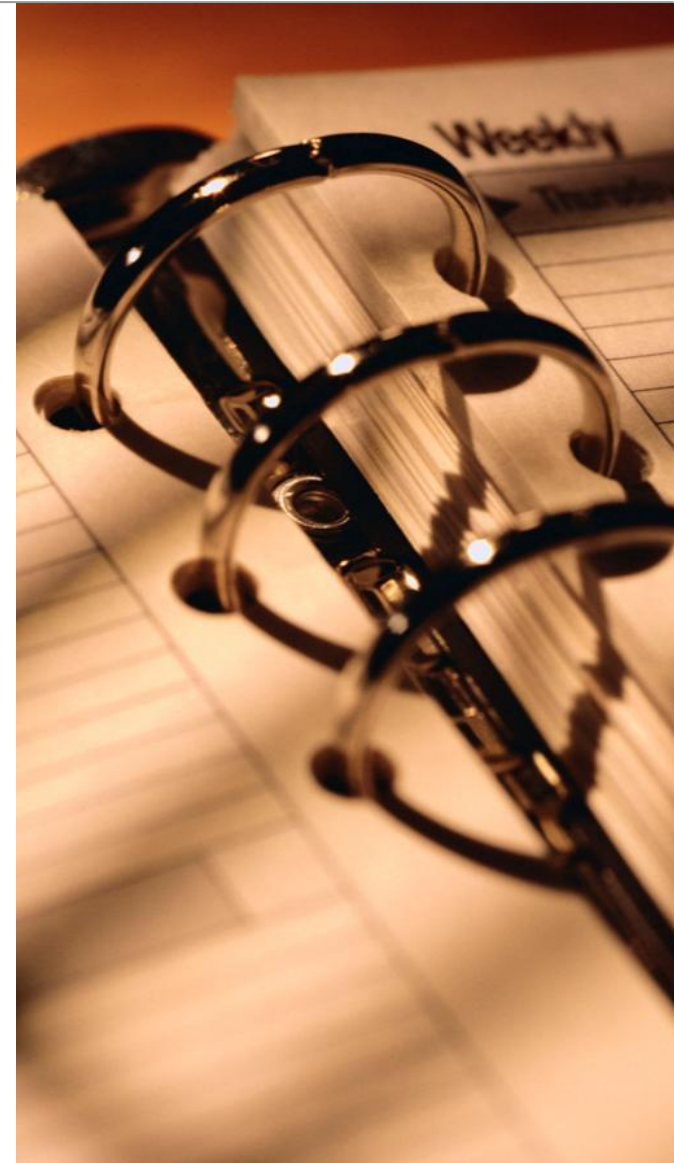
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WHAT IS ARCHITECTURE ABOUT?

Why?



Goals

- **Maximise satisfaction** of all involved **stakeholders** throughout the lifecycle of the concerned system
- **Minimise total costs** (across all types of costs) affected by the system throughout the lifecycle of the system

How?



Activities

- **Align** the solution to its mission (**understand** stakeholder needs and **find** the right solution)
- **Structure** the solution domain (**design** the solution right to **support** communication and implementation)

What?



Objectives

- Achieve the required **quality attributes**
- **NFR** implementation
- Management of **complexity** and **changeability** throughout the lifecycle of the concerned system

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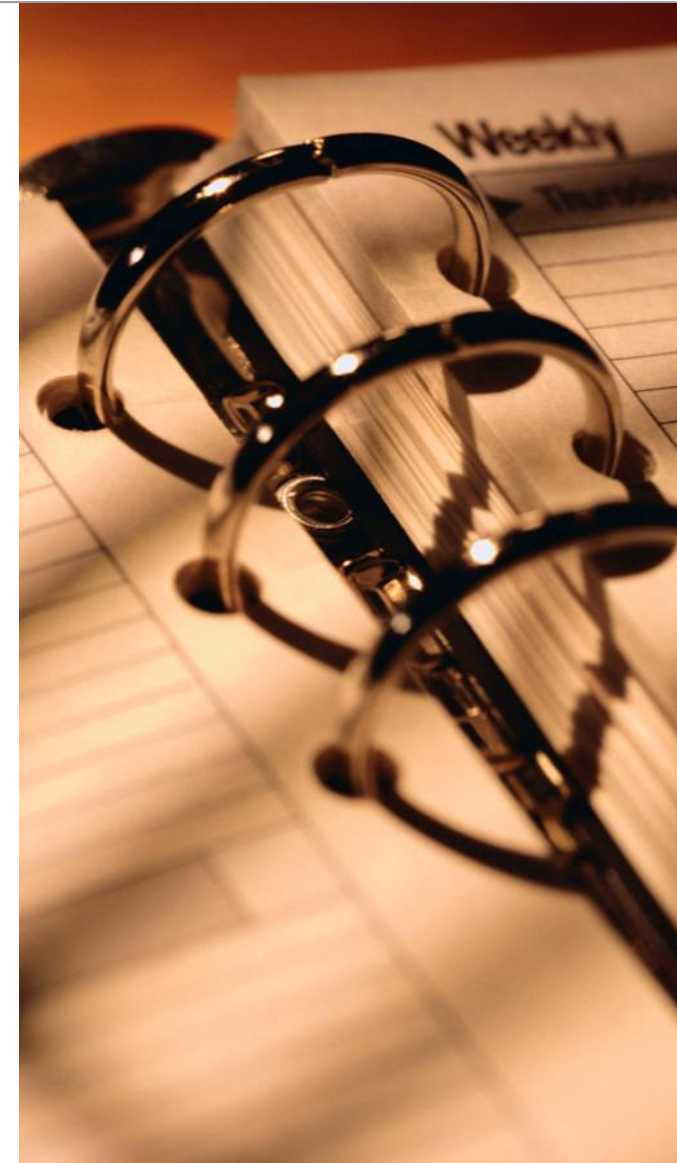
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ALIGNMENT

It's all about soft skills ...

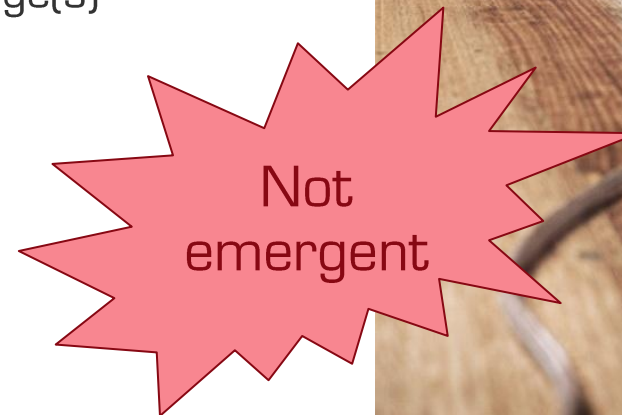
Communication, negotiation, mediation, conflict management, ...
Team-play, impart knowledge, convince, listen, ...
A long and bumpy road

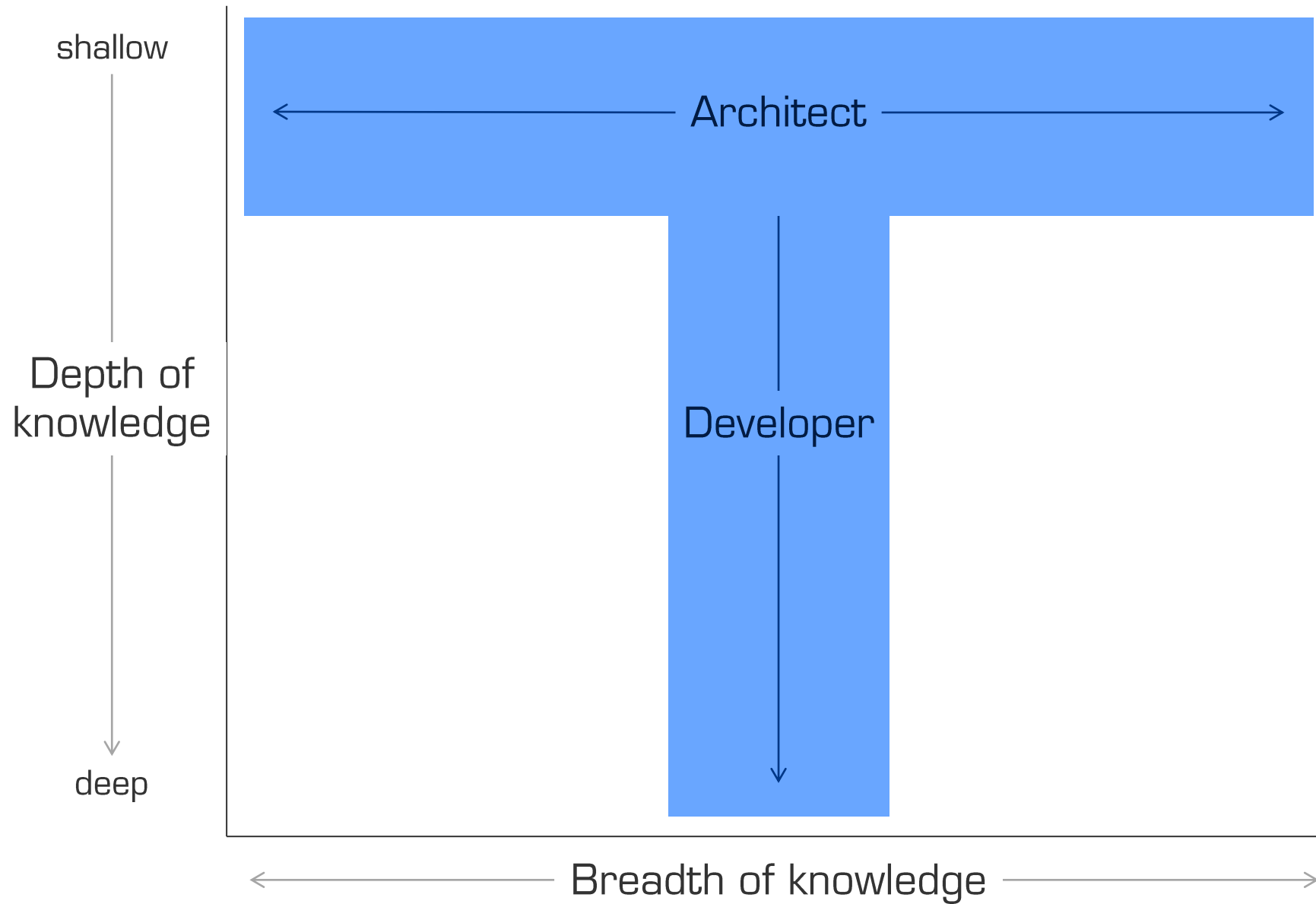
... understanding your stakeholders ...

Learning to understand your stakeholders language(s)
... to understand their needs and pains
Learning to speak your stakeholders language(s)
... to become accepted as a professional peer
Learning about organisation and politics
... for not getting caught in the crossfire

... and goal orientation

Always asking yourself if your current activities suit the mission





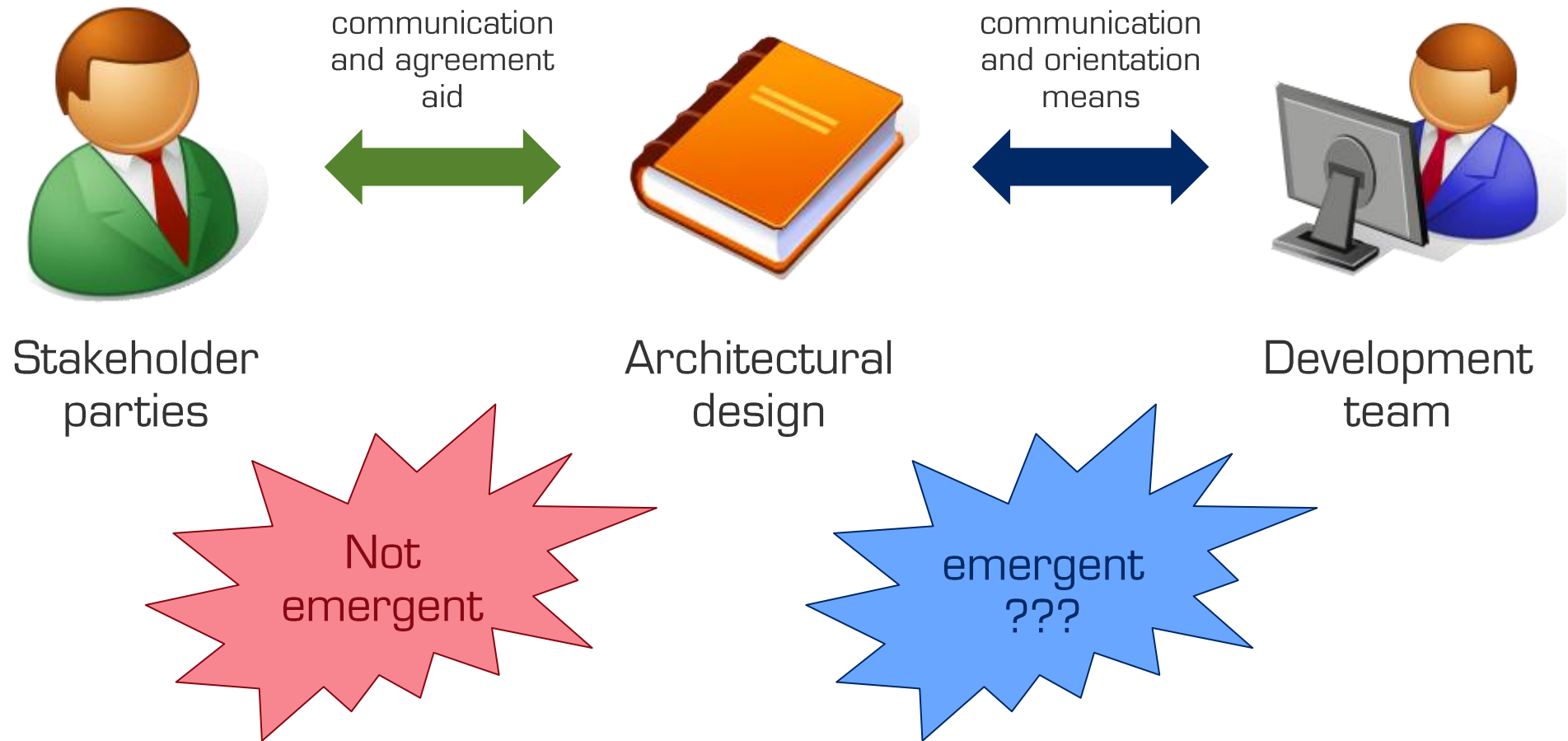
Architect Competency Framework (Bredemeyer Consulting)

	What you KNOW	What you DO	What you ARE
Leadership	<ul style="list-style-type: none"> • Yourself 	<ul style="list-style-type: none"> • Set team context (vision) • Make decisions (stick) • Build teams • Motivate 	<ul style="list-style-type: none"> • You and others see you as a leader • Charismatic and credible • You believe it can and should be done, and can lead the effort • You are committed, dedicated, passionate • You see the entire effort in a broader business context
Consulting	<ul style="list-style-type: none"> • Elicitation techniques • Consulting frameworks 	<ul style="list-style-type: none"> • Build “trusted advisor” relationships with clients • Mentor junior architects • Understand what developers need from the architecture • Help developers see / utilise the value of the architecture 	<ul style="list-style-type: none"> • Committed to others’ success • Empathetic, approachable • An effective change agent, process savvy • A good mentor, teacher
Organisational Politics	<ul style="list-style-type: none"> • Who the key players are in the organization • What they want, both business and personal 	<ul style="list-style-type: none"> • Communicate, communicate, and communicate! • Listen, network, influence • Sell the vision, keep the vision alive • Take and retake the pulse of all critical influencers of the architecture project 	<ul style="list-style-type: none"> • Able to see from and sell to multiple viewpoints • Confident and articulate • Ambitious and driven • Patient and not • Resilient • Sensitive to where the power is and how it flows in your organization
Business Strategy	<ul style="list-style-type: none"> • Your organization’s (your clients’) business strategy and rationale • Your (your clients’) competition (products, strategies and processes) • Your company’s (your clients’) business practises 	<ul style="list-style-type: none"> • Influence business strategy • Translate business strategy into technical vision and strategy • Understand customer and market trends • Capture customer, organizational and business requirements on the architecture 	<ul style="list-style-type: none"> • Visionary • Entrepreneurial
Technology	<ul style="list-style-type: none"> • In-depth understanding of the domain and pertinent technologies • Understand what technical issues are key to success • Development methods and modelling techniques 	<ul style="list-style-type: none"> • Modelling, Trade-off analysis • Prototype/ experiment/ simulate • Prepare architectural documents and presentations • Technology trend analysis/roadmaps • Take a system viewpoint 	<ul style="list-style-type: none"> • Creative / Insightful • Investigative • Practical/pragmatic • Tolerant of ambiguity, willing to backtrack, seek multiple solutions • Good at working at an abstract level

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Consulting	<ul style="list-style-type: none"> • Elicitation techniques • Consulting frameworks 	<ul style="list-style-type: none"> • Build "trusted advisor" relationships with clients • Mentor junior architects • Understand what developers need from architecture • Help developers see / understand the architecture 	<ul style="list-style-type: none"> • Accessible • Able to communicate • Intelligent, process savvy • Influential
Organisational Politics	<ul style="list-style-type: none"> • Who the key players are in the organization • What they want, both business and personal 	<ul style="list-style-type: none"> • Communicate with all critical players • Listen • Influence • Drive for all critical architecture project 	<ul style="list-style-type: none"> • Able to see from and sell to multiple viewpoints • Confident and articulate • Ambitious and driven • Patient and not easily frustrated • Resilient • Sensitive to where the power is and how it flows in your organization
Business Strategy	<ul style="list-style-type: none"> • Your organization's business strategy • Your (your client's) business strategy • Your (your client's) business model • Your (your client's) business processes 	<ul style="list-style-type: none"> • Translate business strategy into technical vision and strategy • Understand customer and market trends • Capture customer, organizational and business requirements on the architecture 	<ul style="list-style-type: none"> • Visionary • Entrepreneurial
Technology	<ul style="list-style-type: none"> • Understand the domain and technologies • Understand what technical issues are key to the business • Development methods and modelling techniques 	<ul style="list-style-type: none"> • Modelling, Trade-off analysis • Prototype/ experiment/ simulate • Prepare architectural documents and presentations • Technology trend analysis/roadmaps • Take a system viewpoint 	<ul style="list-style-type: none"> • Creative / Insightful • Investigative • Practical/pragmatic • Tolerant of ambiguity, willing to backtrack, seek multiple solutions • Good at working at an abstract level

STRUCTURE



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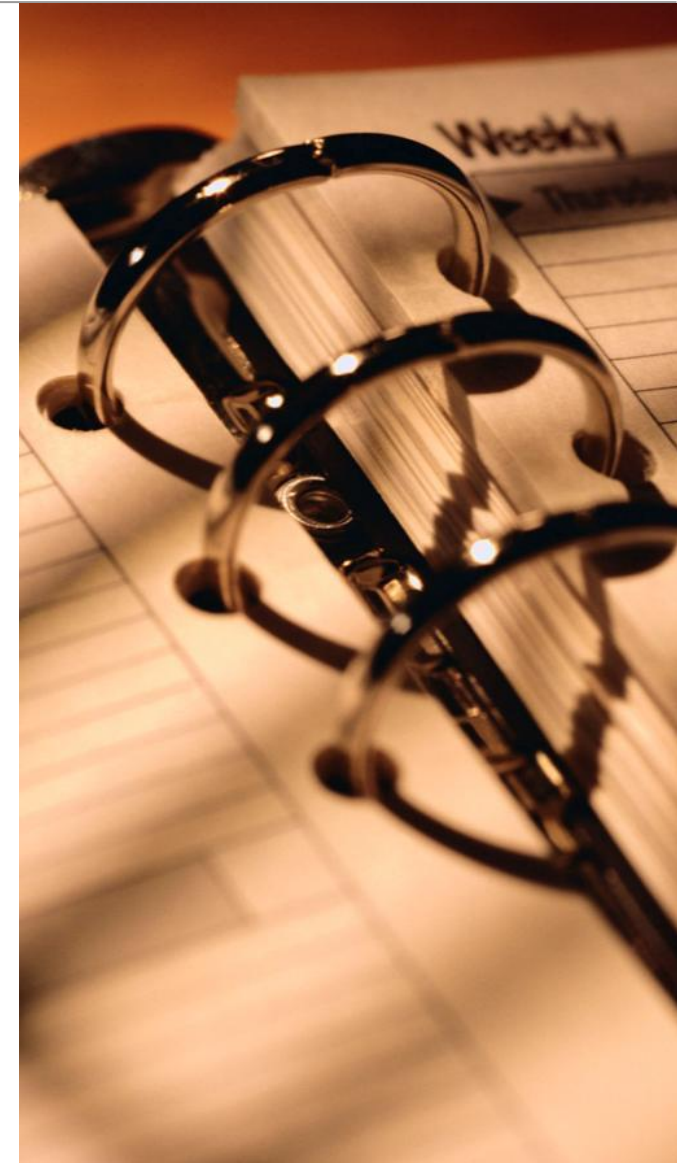
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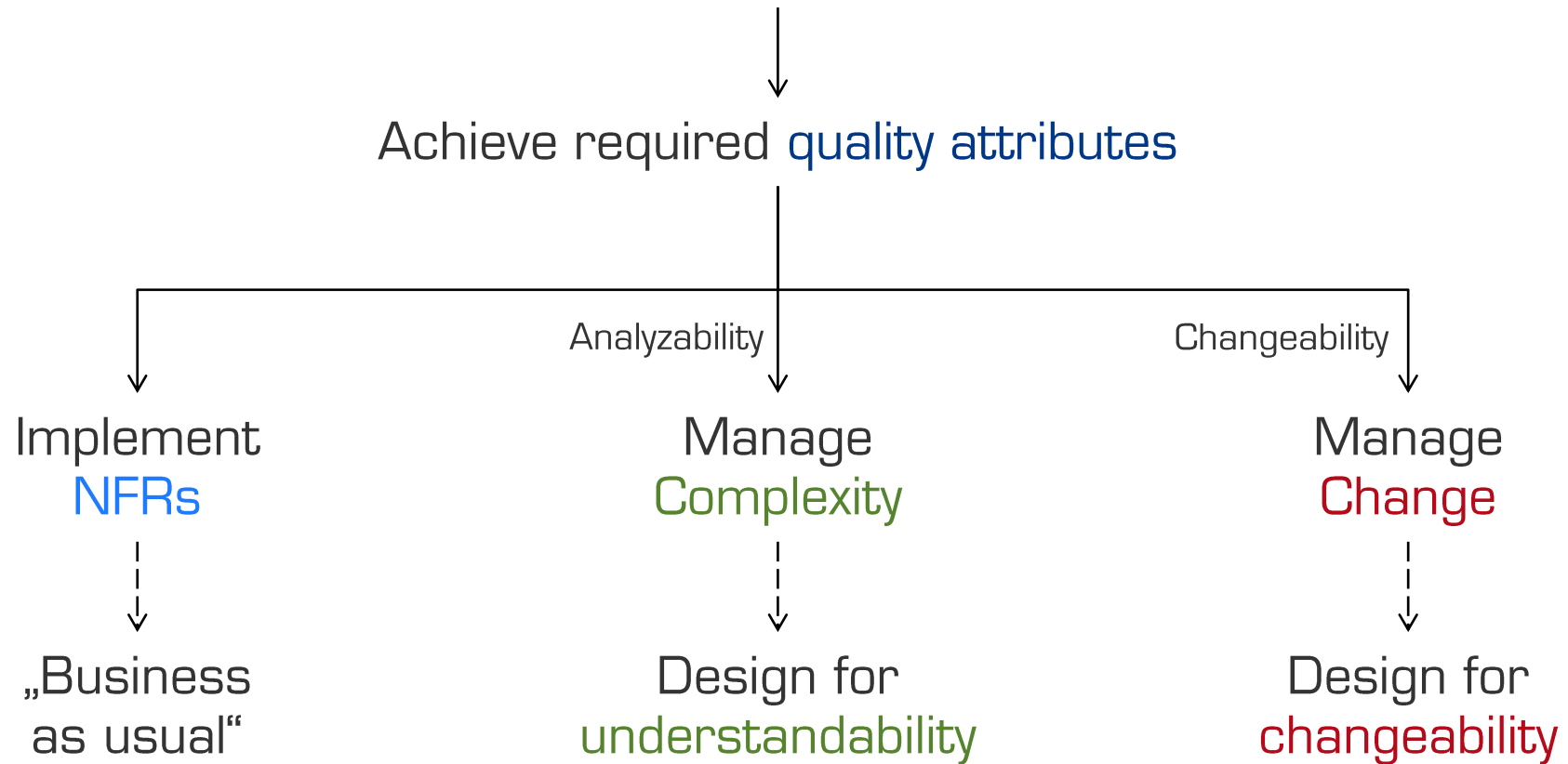
What?



Objectives

- Achieve the required quality attributes
- NFR implementation
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Architectural work



DESIGN FOR UNDERSTANDABILITY

It's about limitations and orientation

- Human brain is limited – can't keep track of too many details
- Needs structure for orientation
- The simpler the structure, the easier to use
- Too much structure is confusing
- Need to balance complexity of structure and details

Design for understandability

- Find the simplest, possible structure that suits the needs
- Always strive for solutions that are easier to understand
- No BDUF – It's not worth the effort
- Model the „form of the system“
- Let the „structure of the system“ evolve



Mostly
emergent

DESIGN FOR CHANGEABILITY

It's about future change requests





The Future Unpredictability Dilemma

DESIGN FOR CHANGEABILITY

It's about future change requests

Cant' predict the future

But there are different likelihoods for upcoming changes

Prediction with limited scope is possible and useful

Design for changeability

Understand the business domain

Read business strategies

Talk to stakeholders about their pains and drivers

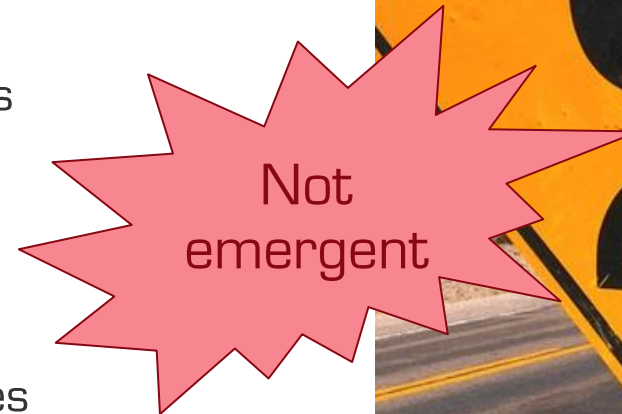
Look for business and IT trends

Do scenario based architecture assessment

Distill the „direction of change“

Provide flexibility points for the most likely changes

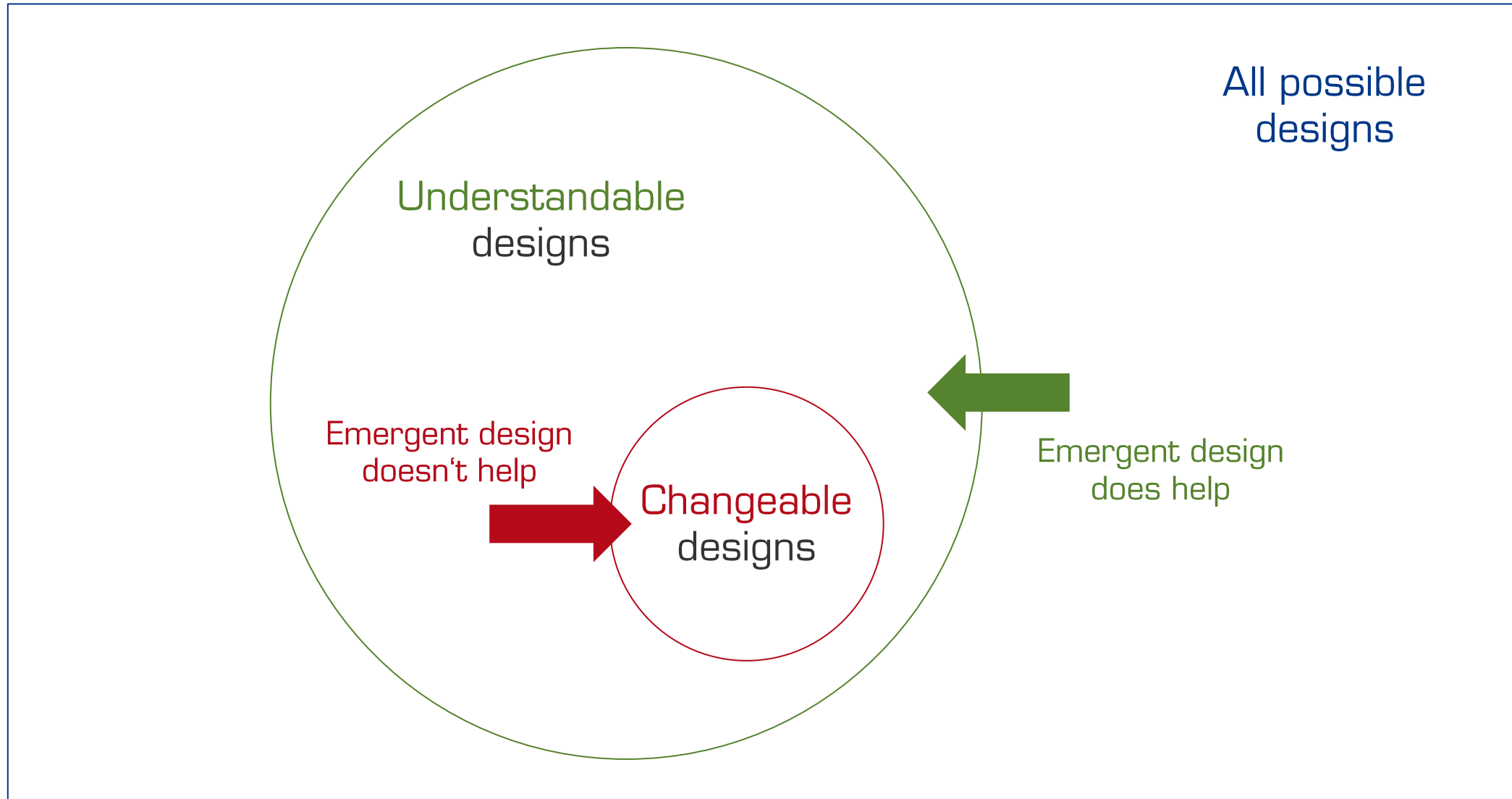
Re-evaluate regularly



A close-up photograph of bamboo stalks with green leaves, used as a background for a text overlay. The bamboo stalks are vertical and segmented, with distinct nodes. The leaves are long and narrow, some showing signs of aging or damage. The background is a soft-focus forest of bamboo.

A warning about flexibility

UNDERSTANDABILITY VS. CHANGEABILITY



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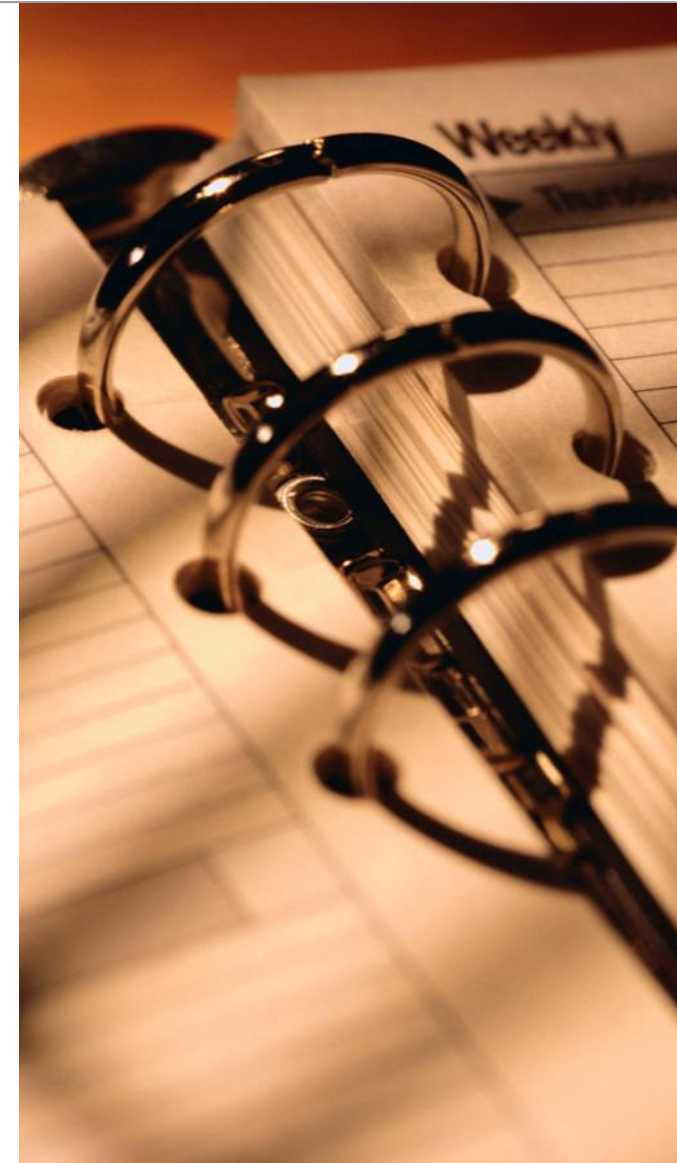
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System Architecture



Long-term stable

- Domain Essence („Form of the system“)
- Long-term stability
- Understand domains, extract essence, design and implement
- Additionally have a look at change frequency, Conways law, ???

Mid-term stable

- Structure for change (aligned with „direction of change“)
- Mid-term stability
- Understand business and IT drivers, trends and strategies, align structure and variability points with it
- Assess architecture (re-evaluate regularly)

Volatile

- Detailed structure („Structure of the system“)
- Changes frequently
- Develop emergent utilizing suitable design principles (i.e. SOLID)
- Usually biggest part of all design activities



Stakeholder parties

Align the solution to its mission
Understand the stakeholder
Talk stakeholders language
Requires lots of soft skills

Alignment

Structure

Long-term stable

Model domain
essence

Mid-term stable

Assess and model
flexibility points

Volatile

Use emergent
design

communicate, support, convince/enforce, verify

Focus on the non-obvious topics
Focus on core architectural principles
Create a few overview pictures as discussion base
Keep it simple – No BDUF
Don't sacrifice understandability for flexibility



Development team

AGENDA

Motivation

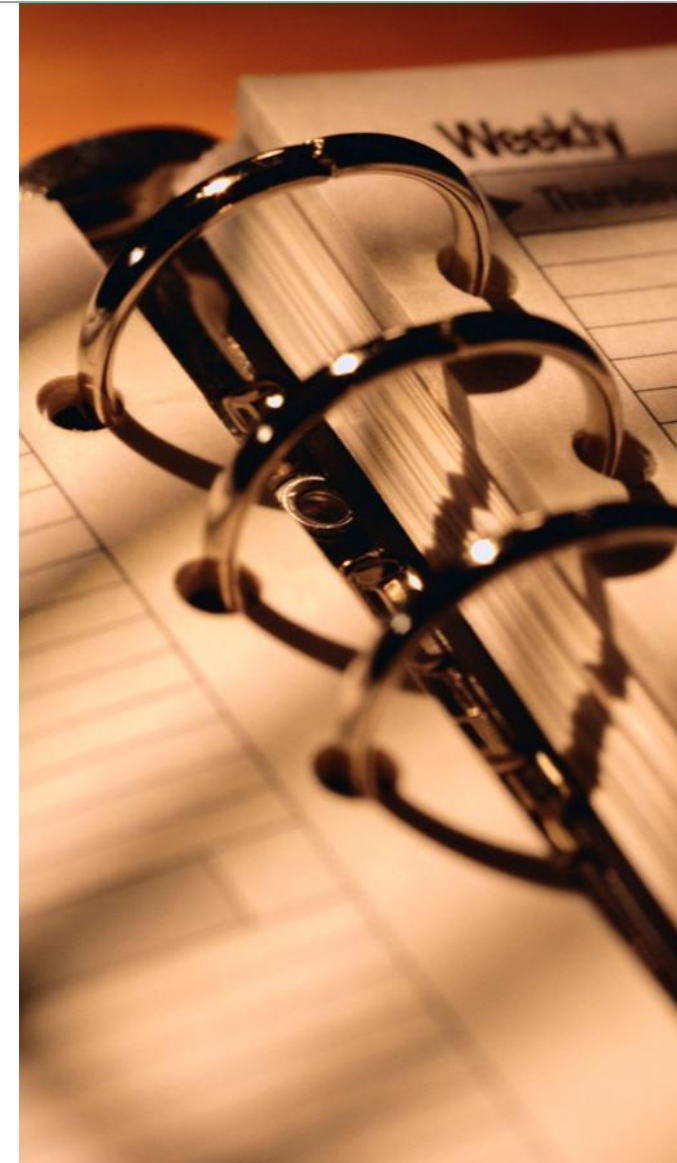
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Leverage the power of emergent architecture

Yet, emergent architecture cannot replace all architectural activities

Use gotten time to to non-emergent architectural work better

Don't try to be too flexible





Less is more!

L. Mies van der Rohe

THANK YOU FOR YOUR ATTENTION!

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QUESTIONS & DISCUSSIONS

