Software Architecture and Techniques

Team and Technical Excellence for Architects

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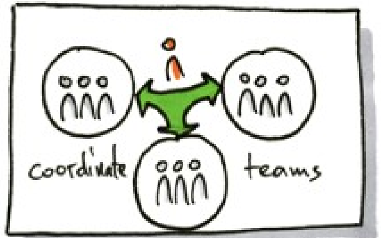
Lecture Content

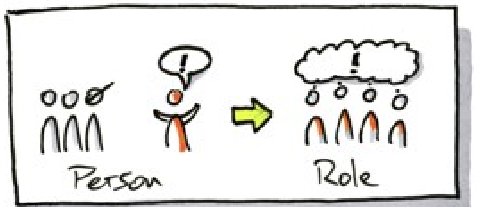
- *Why agile Architecture and Design?*
- *Evolution of Software Architecture over the last Decades*
- *What is agile Architecture?*
- *Agile Approaches with Scrum, XP, LeSS*
- *Refactoring*
- *Errors, Vulnerabilities, Smells*
- *Architecture of Components and Subsystems*
- *Quality Attributes of Software Architecture*
- *-ility Attributes*
- ***Architecture Documentation***
- ***Architecture Trends I***
- ***Architecture Trends II***
- ***Workshop***
- ***Team and Technical Excellence for Architects***

Administration

- Please provide feedback to the content and form of the lecture
- Do you have any questions concerning examination or grading?

Architect





lead technically

- technology evangelist
- engineering practises
- technical spikes
- non-functional specs
- write code

understand stakeholders

- big picture
- talk to all stakeholders
- learn about all view points
- understand the user
- help the PO

coach the team

- architecture is team work
- coordinate
- pair program
- educate
- support SM

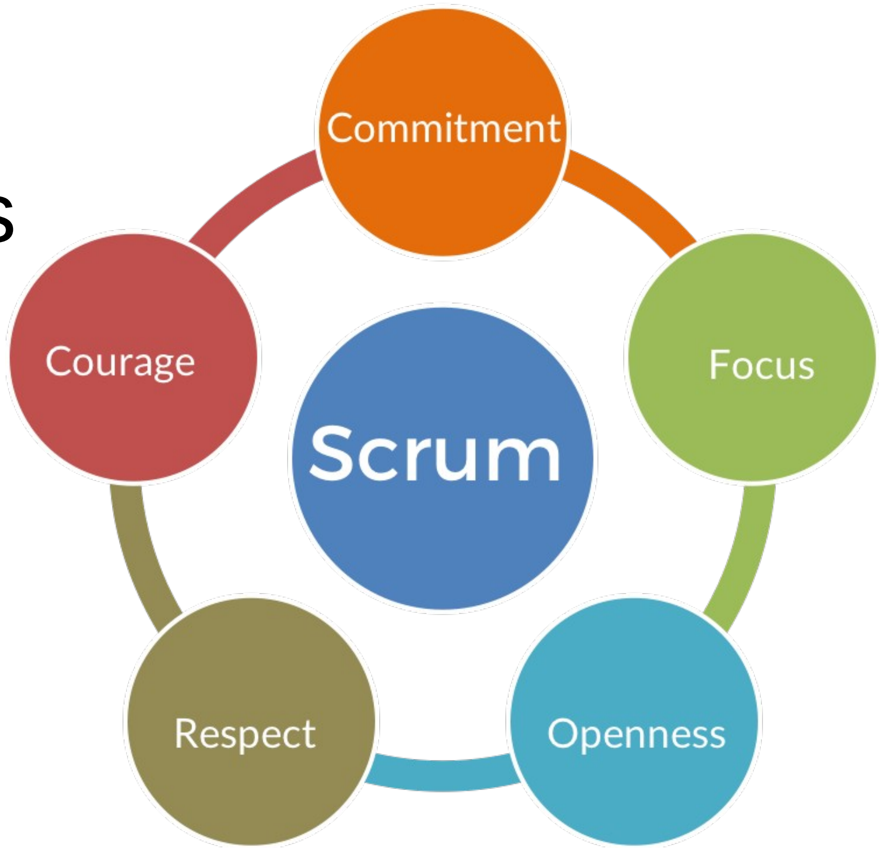
- communicate
- use effective tools
- be part of the team
- learn to be a good designer
- make sure decisions are made

Architect as a Teacher

- **Teaching** is a way to **learn**
  - Go deeper in the taught field because you must answer questions, write a blog, hold a workshop
  - Respect and like people you teach to
  - Understand what your teaching goals are and develop a strategy
  - Evaluate psychology to find out best learning practices for your target audience

Architect as Tech Leader

- **Facilitate** creation of architecture, not enforcing it
- **Transition** architectural skills to team members
- Realize architectural **spikes** to learn and reduce risk
- **Mentor** in technical **guidance**



Architect as a Coach

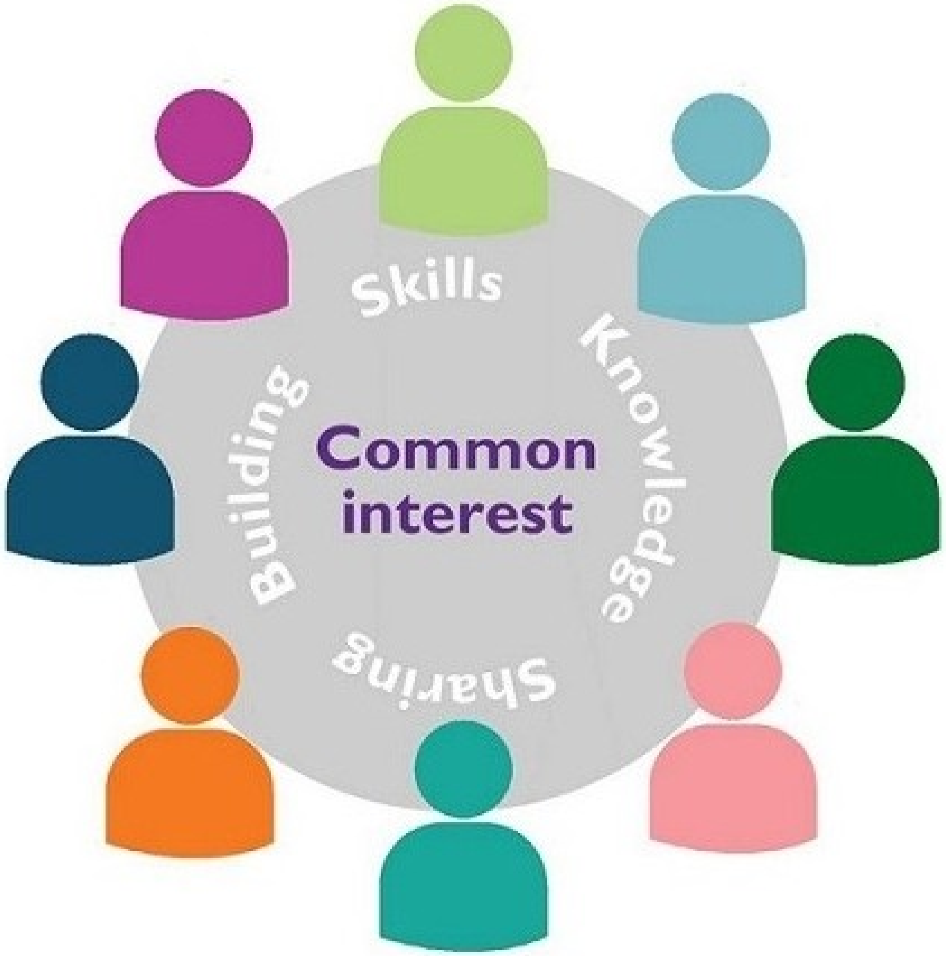
- A coach goal is to nurture developers and designers to become better than you are
- A coach is not the player playing the game, and only the player wins
- Often the coach goes away after tremendous successes and a new coach will bring fresh ideas

Teaching Techniques

- Community of practice
- Pair programming
- Design workshop, Event Storming
- Coding dojo
- Design and code review
- Workshop and presentations

Community of Practice

A community of practice *CoP* is, according to cognitive anthropologists Jean Lave and Etienne Wenger, a group of people who share an interest, a craft, or a profession.



Self-Teaching Techniques (1/2)

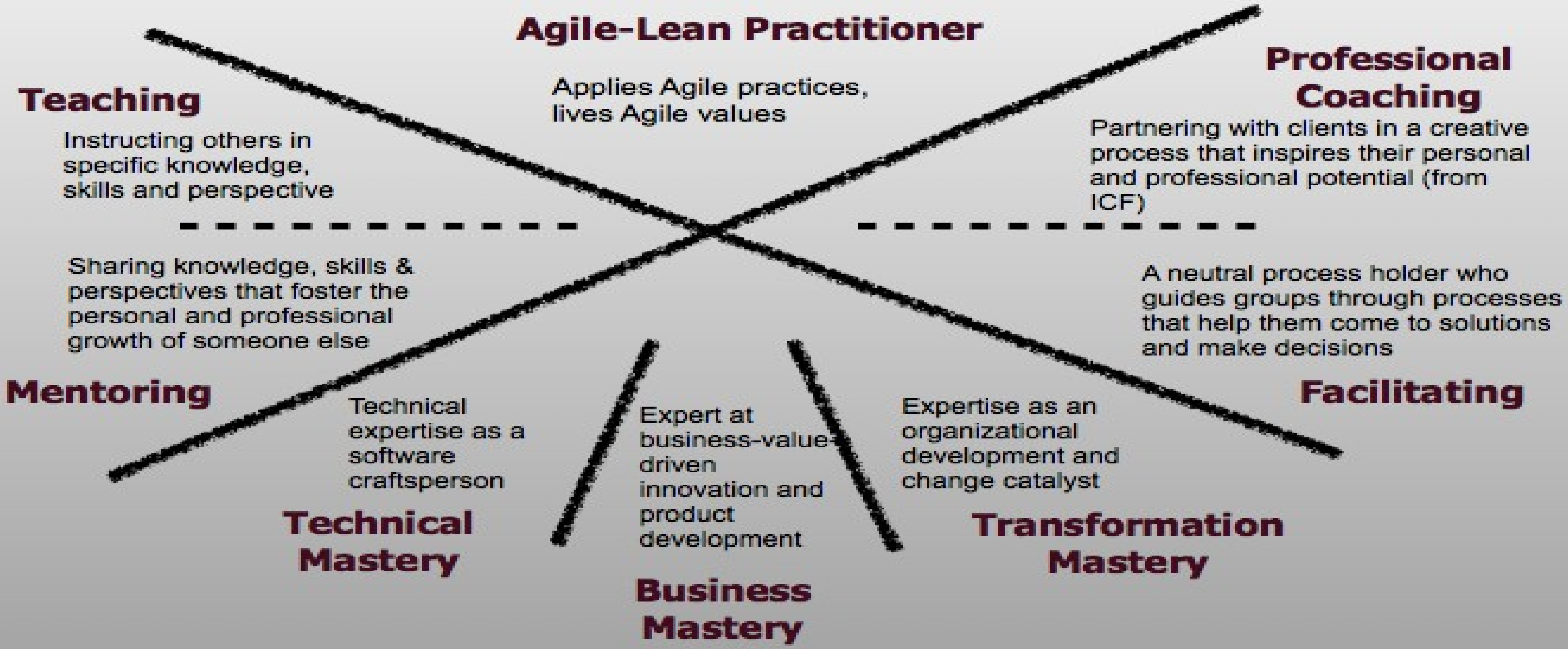
- Articles e.g. Baeldung,
- Source code examples e.g. StackOverflow
- Java Magazines see HSLU library
- Technical blogs see blog list
- Youtube Channels
- Books see books list and HSLU library
- Open Source contributions

Self-Teaching Techniques (2/2)

- Block a 4 hours session at least every two weeks to learn
- Have a budget to buy technical books
- Have a list of preferred blogs
- Ask questions in forums
- Be a member of a user group
- Have a budget to attend conferences

Coding Learning Techniques

- Pair programming
- Open source projects
- Refactoring sessions
- Mob programming
- IDE trainings
- Defect driven development



Agile-Lean Practitioner

Applies Agile practices, lives Agile values

Teaching

Instructing others in specific knowledge, skills and perspective

Professional Coaching

Partnering with clients in a creative process that inspires their personal and professional potential (from ICF)

Mentoring

Sharing knowledge, skills & perspectives that foster the personal and professional growth of someone else

Facilitating

A neutral process holder who guides groups through processes that help them come to solutions and make decisions

Technical Mastery

Technical expertise as a software craftsperson

Business Mastery

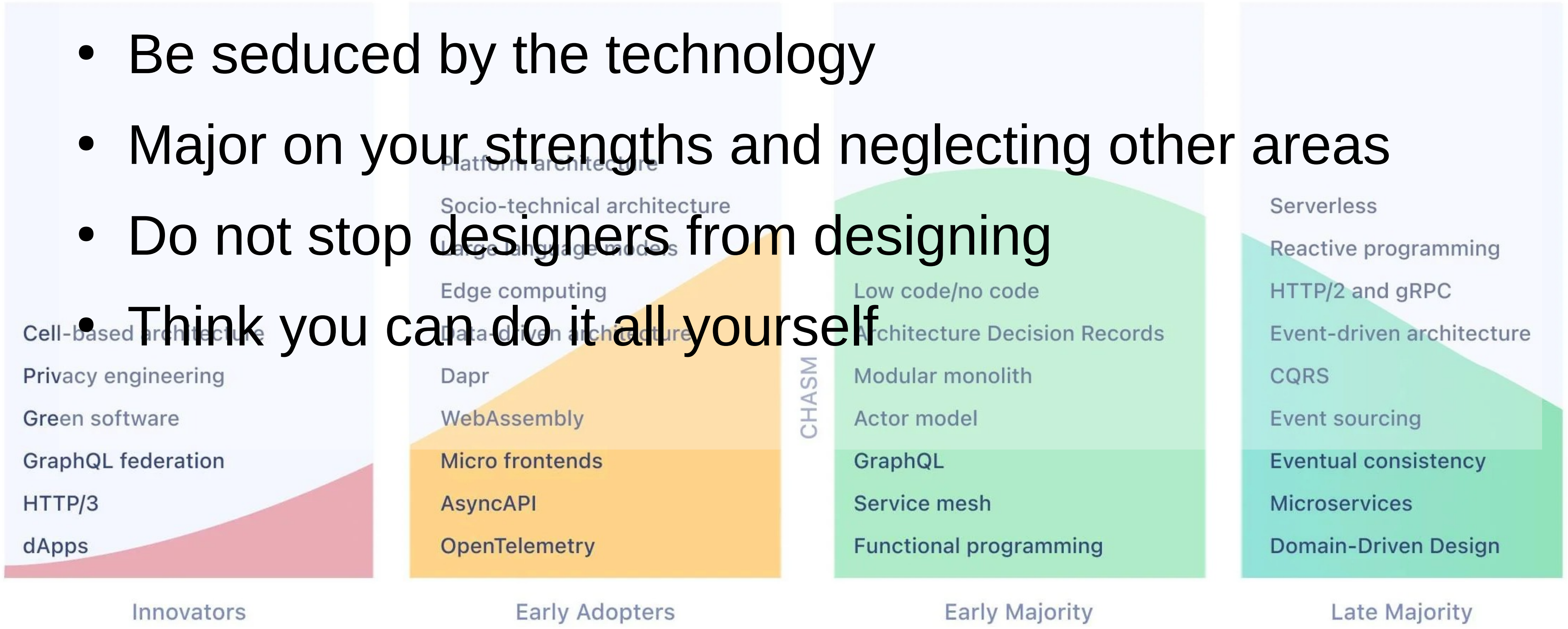
Expert at business-value-driven innovation and product development

Transformation Mastery

Expertise as an organizational development and change catalyst

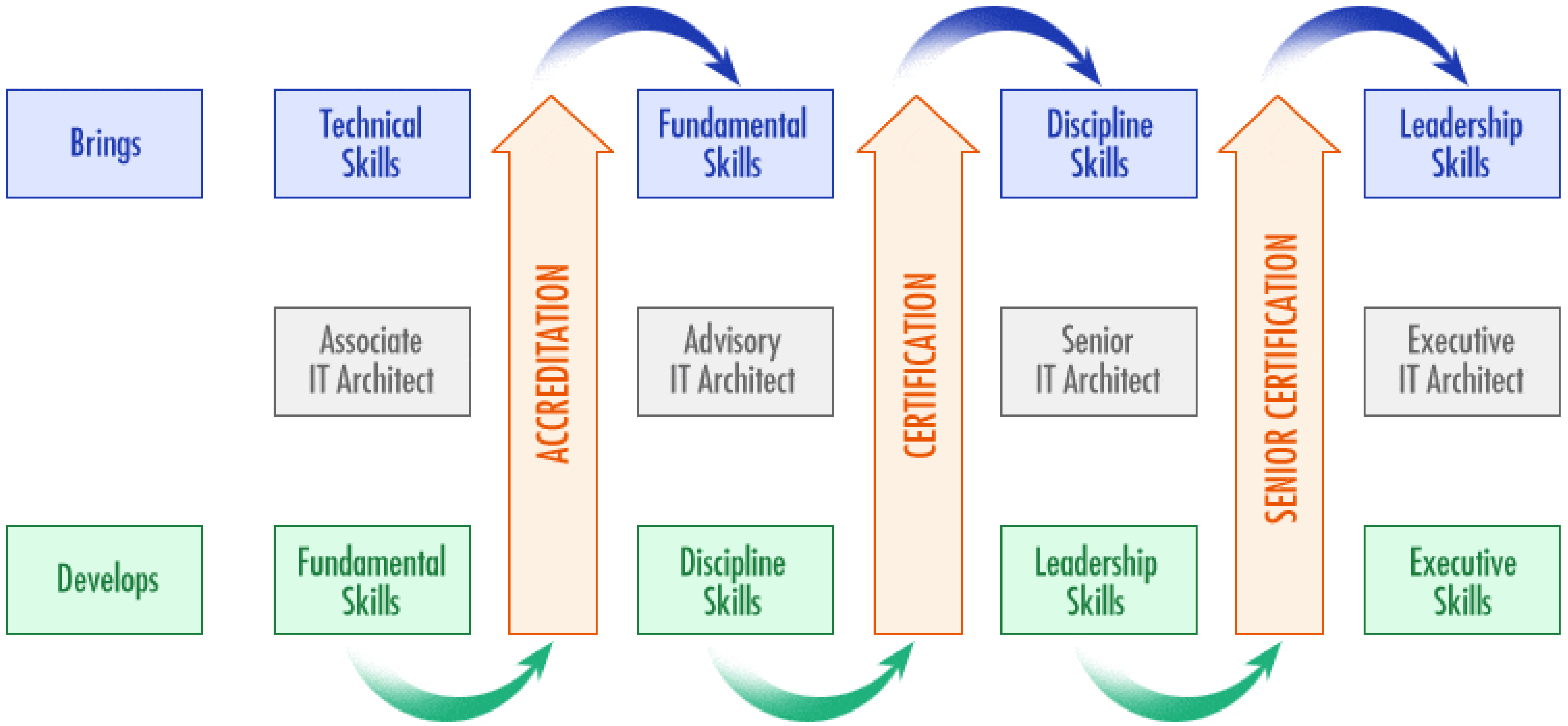
Five Top Mistakes (IBM)

- Believe the requirements
- Be seduced by the technology
- Major on your strengths and neglecting other areas
- Do not stop designers from designing
- Think you can do it all yourself



Ten Top Mistakes (Woods)

- Scoping Woes or Errors
- Not Casting Your (Stakeholder) Net Widely
- Focusing on Functions (Forgetting Qualities)
- Using Box and Line Descriptions (Too Simple Diagrams)
- Forgetting that *it Needs to be Built*
- Lack of Platform Precision
- Performance Assumptions
- Do-It-Yourself Security
- Lack of Disaster Recovery
- No Back-out Plan


Brings
Technical Skills
Fundamental Skills
Discipline Skills
Leadership Skills
Associate IT Architect
Advisory IT Architect
Senior IT Architect
Executive IT Architect
ACCREDITATION
CERTIFICATION
SENIOR CERTIFICATION
Develops
Fundamental Skills
Discipline Skills
Leadership Skills
Executive Skills

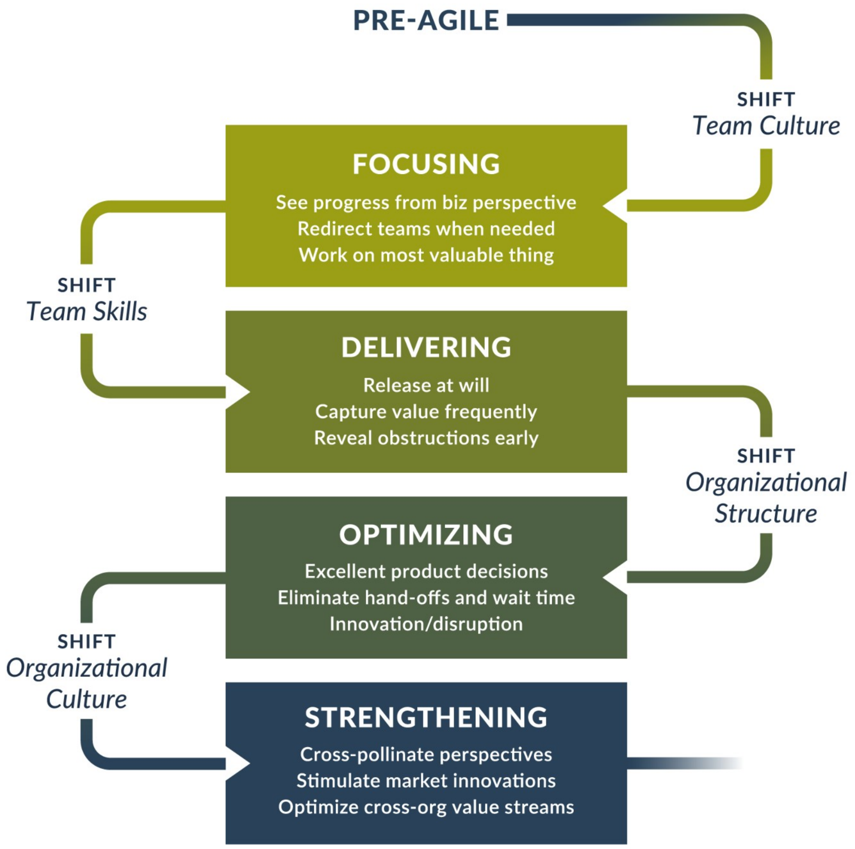
Positive
Inclusive
Promotes Improvement

THE AGILE FLUENCY™ MODEL

CHART YOUR AGILE PATHWAY

Fluency: Routine, Skillful Ease
Comes From Investment In Learning

SWAT Goals



FOCUSING
See progress from biz perspective
Redirect teams when needed
Work on most valuable thing

DELIVERING
Release at will
Capture value frequently
Reveal obstructions early

OPTIMIZING
Excellent product decisions
Eliminate hand-offs and wait time
Innovation/disruption

STRENGTHENING
Cross-pollinate perspectives
Stimulate market innovations
Optimize cross-org value streams

INVEST IN:
Full-time team members
Team workspace
Business representation
Team coaching
Management training

AGILE FUNDAMENTALS: 2-6 MO.
Basic Scrum
Kanban

INVEST IN:
Productivity dip
DevOps, UX, etc. in team
Technical training & mentoring

AGILE SUSTAINABILITY: +3-24 MO.
Extreme Programming
DevOps Movement

INVEST IN:
Market focus
Business expertise in team
Team business ownership
Management coaching

AGILE'S PROMISE: +1-5 YR.
Lean Startup
Lean Software Development
Design Thinking
Beyond Budgeting

INVEST IN:
Inventing new practices
Cross-organization focus

AGILE'S FUTURE
Complexity Theory
Organization Design Theory
Alternative Governance Structures

AGILE FLUENCY PROJECT
agilefluency.org

CULTURE = "How we do things around here to succeed."

"The Reengineering Alternative."
William Schneider

REALITY ORIENTED (Actuality)

POSSIBILITY ORIENTED

PEOPLE ORIENTED (Personal)

COMPANY ORIENTED (Impersonal)

"We succeed by working together."

Affiliation
Synergy

COLLABORATION

Partnership
Trust
Interaction
People
Teams
Diversity
Egalitarian

"We succeed by getting and keeping control."

POWER

SECURITY

CONTROL

Predictability

RULE BOOK

Process

Standardization
Hierarchical
Stability
Order

"We succeed by growing people who fulfil our vision."

CULTIVATION

GROW

Purpose/Faith
Dedication
Let things Evolve
Subjectivity
Creativity

"We succeed by being the best."

Efficiency
Professionalism

COMPETENCE

#1

Meritocracy
Craftsmanship
Achievement
Expertise
Creativity
Be the Best

cc Agilitrix 2011

Agile HR - Also for Architects

Collaborative networks over hierarchical structures

→ Self-selecting teams, mob programming, remote-only teams

Transparency over secrecy

→ Access to all financial data

Adaptability over prescriptiveness

→ Rolling budgets

Inspiration and engagement over management and retention

→ Why are we working on this product?

Intrinsic motivation over extrinsic rewards

→ No bonuses, no MBO, evaluations by peers, 360 evaluation

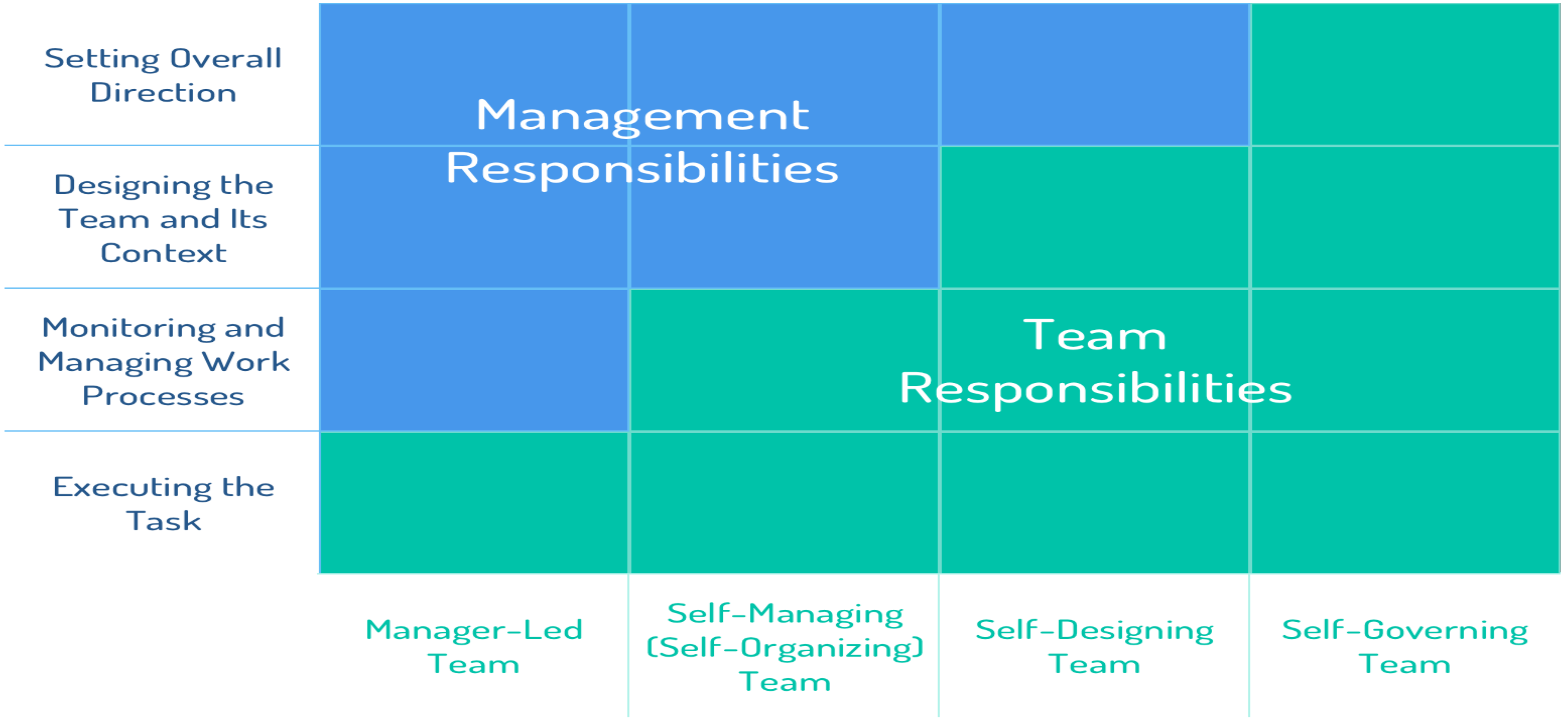
Ambition over obligation

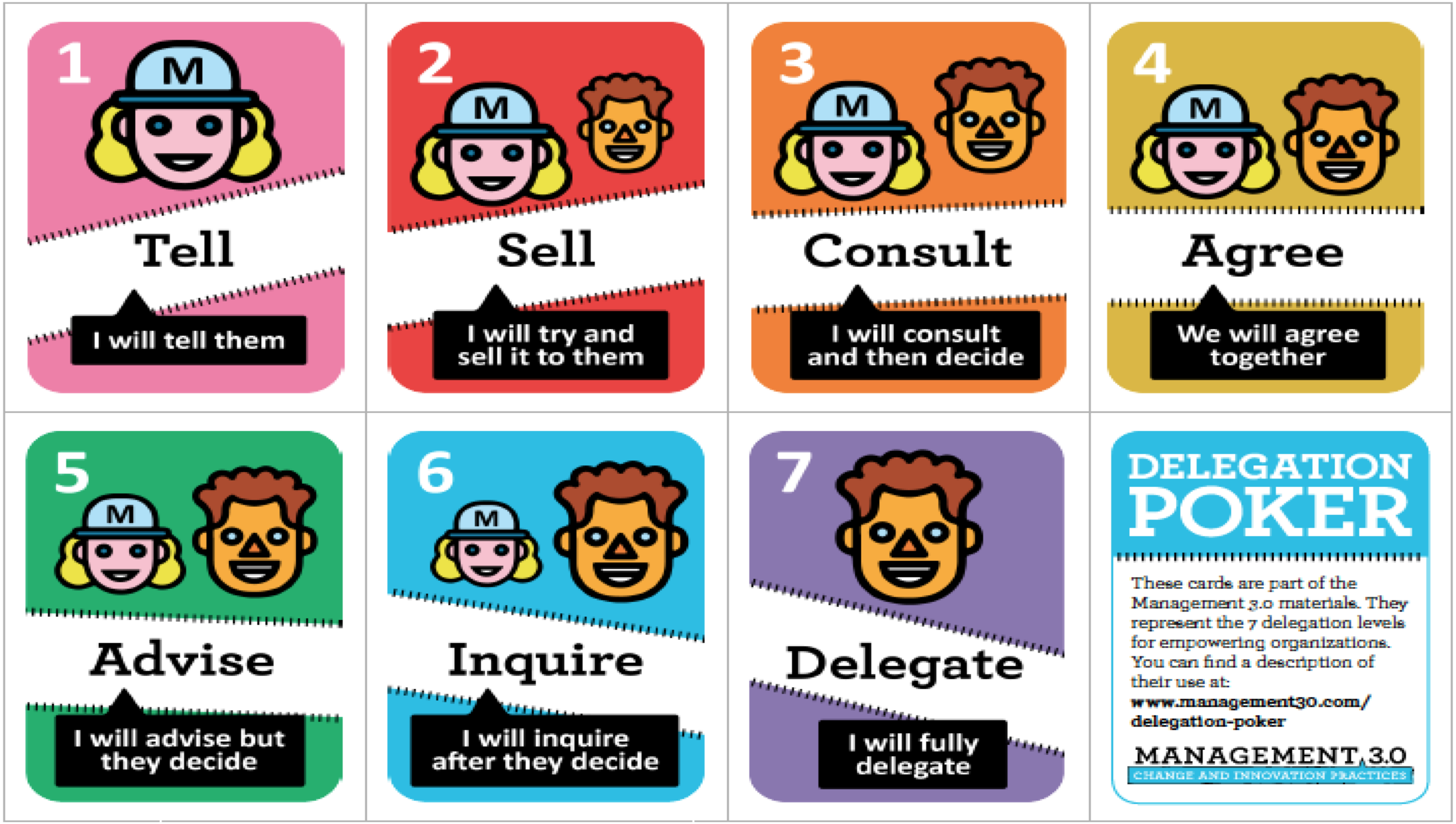
→ Curriculum based design

Agile Culture

- **Customer** Centric *instead of Plan Centric*
- **Small** Teams *instead of Departments*
- **Network** Connections *instead of Hierarchical Organizations*

Self-Organizing Teams


Setting Overall Direction
Designing the Team and Its Context
Monitoring and Managing Work Processes
Executing the Task
Management Responsibilities
Team Responsibilities
Manager-Led Team
Self-Managing (Self-Organizing) Team
Self-Designing Team
Self-Governing Team



1 Tell
I will tell them

2 Sell
I will try and sell it to them

3 Consult
I will consult and then decide

4 Agree
We will agree together

5 Advise
I will advise but they decide

6 Inquire
I will inquire after they decide

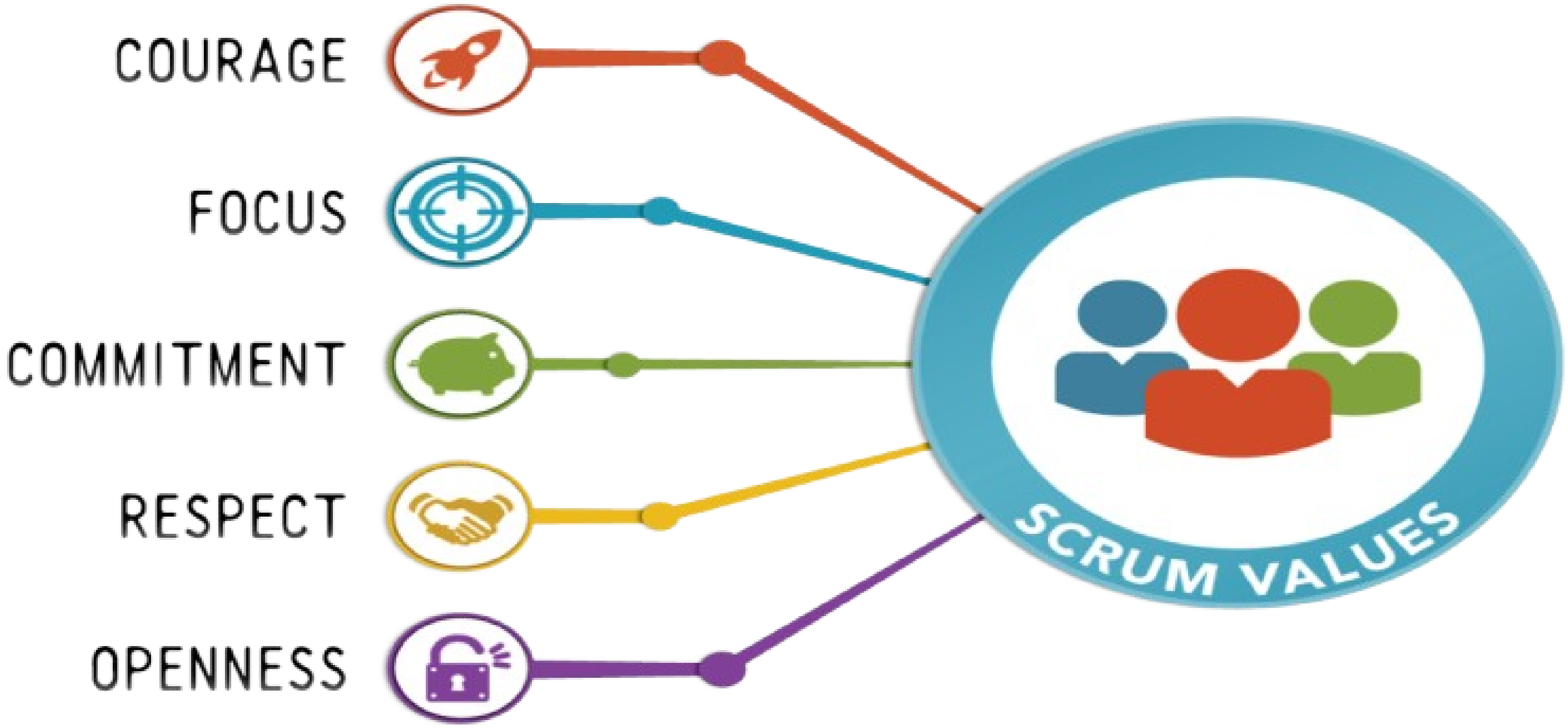
7 Delegate
I will fully delegate

DELEGATION POKER

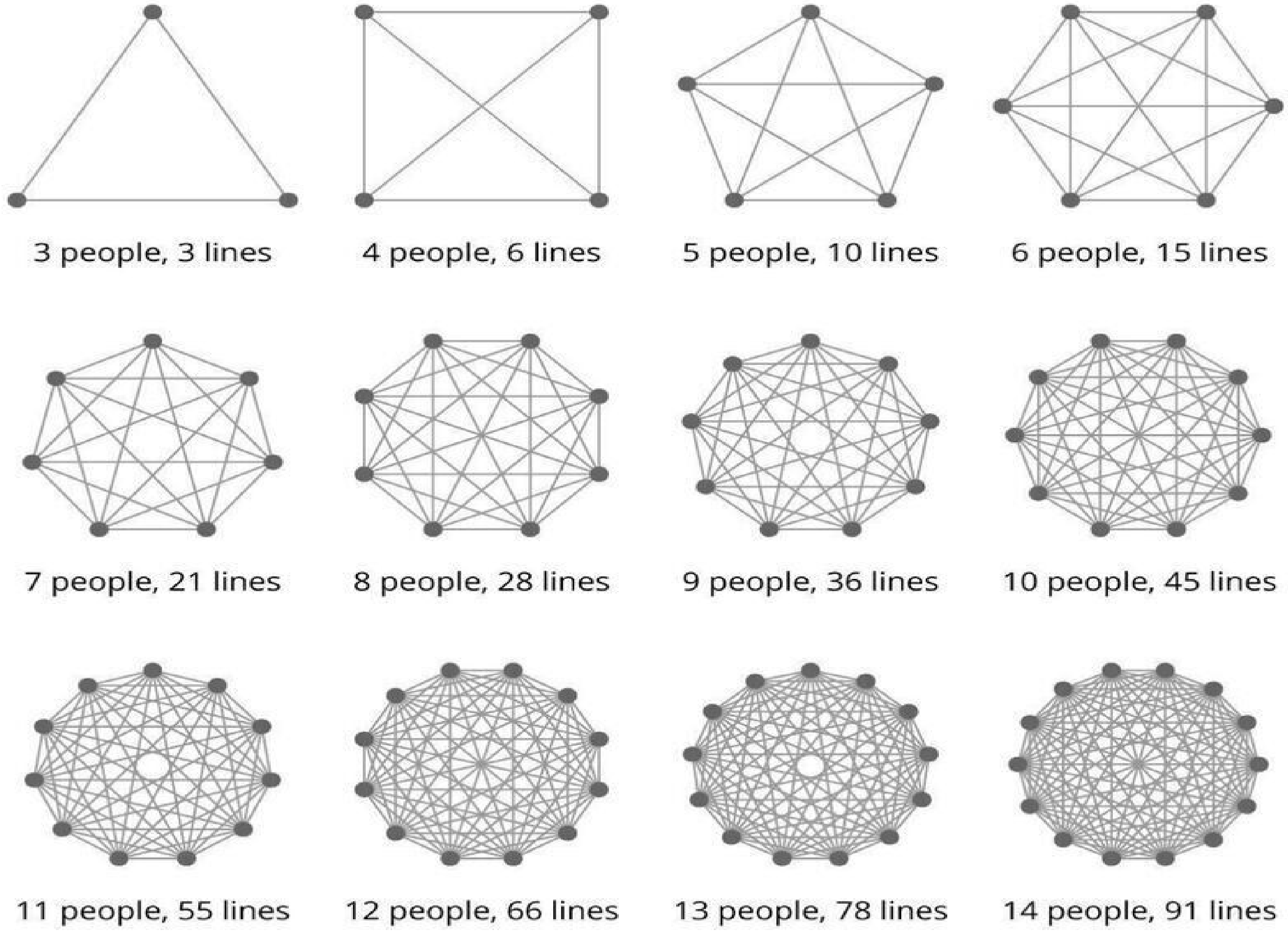
These cards are part of the Management 3.0 materials. They represent the 7 delegation levels for empowering organizations. You can find a description of their use at:
www.management30.com/delegation-poker

MANAGEMENT 3.0
CHANGE AND INNOVATION PRACTICES

True North - Scrum Values



Small Teams


3 people, 3 lines
4 people, 6 lines
5 people, 10 lines
6 people, 15 lines
7 people, 21 lines
8 people, 28 lines
9 people, 36 lines
10 people, 45 lines
11 people, 55 lines
12 people, 66 lines
13 people, 78 lines
14 people, 91 lines

Reflections (1/2)

Any **organization** that **designs** a system will produce a design whose structure is a **copy** of the organization's communication structure.
— Melvin E. Conway, 1967

- *Agile approach is a way to break Conway’s Law*

Reflections (2/2)

Do not fight to change a **culture**. Change the organization’s **structure** and **processes**. The culture will naturally evolve.

Do not force common **goals** and **accountability**. Require **pair** and **mob programming** for example.

Exercises (1/2)

- Read article “High Performance Teams: The Foundations”
- Draw your vision of agile architecture
- Write down why you want to be an architect – or why you do not want to be one -
- Reflect why software is strategic for the company you are working for – or will work for, or the company your parents are working for -

Exercises (2/2)

- Themes brought by attendees