

> 13th Model-Driven Requirements Engineering Workshop - Keynote

The three horizons of digital design: from vision to ready-to-code-modeling of requirements

Dr. Martina Beck
Hanover, September 5th 2023



MAIBORNWOLFF

> Vita

Martina Beck



Digital Designer

Interdisciplinary Studies M.A. (1986 – 1991)

- › Linguistics & computer science
- › At the Friedrich-Alexander-University in Erlangen Nuremberg

Interdisciplinary doctorate Dr. phil. (1991 – 1996)

- › Employed at Chair of Programming Languages and Compiler Construction

sd&m (today: Capgemini) (1996 – 2011)

- › Software Software Engineer & IT Consultant

MaibornWolff GmbH (2011 – now)

- › Head of “Frühe Phasen”
- › Head of “Digital Design & Engineering”
- › Managing Director MaibornWolff

Passions

- › Bridgebuilder between positions
- › Love to ask the “right” questions



We, as MaibornWolff, are a **German IT consultancy and software development** company founded in 1989.

With our team of more than **900 employees**, we specialize in **custom-made software development** for our clients – including mobile engineering, data analytics, cloud computing, IT security, and a lot more technologies.

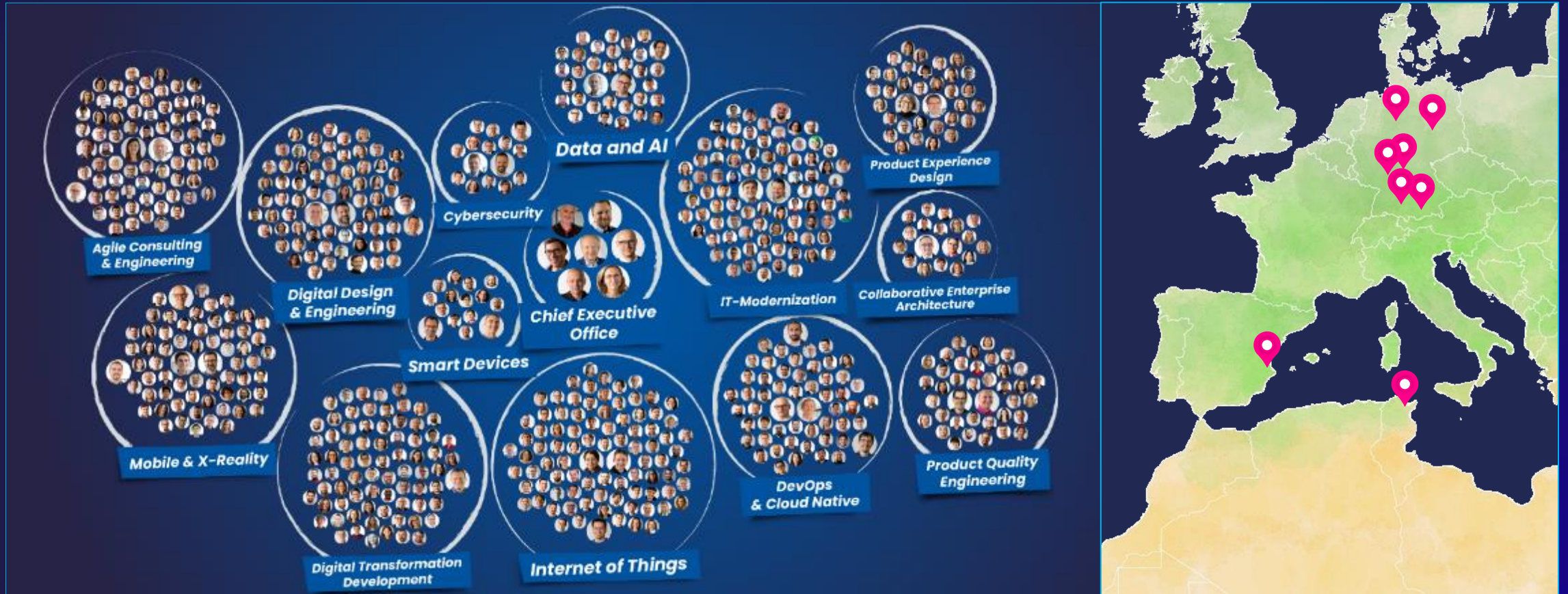
We have a strong **focus on agile software development methodologies** and are committed to delivering high-quality software solutions.”

We have a **diverse customer base** that includes companies from industries as automotive, manufacturing, healthcare, financial services, tourism etc.

For our customers we implement **a large variety of individual solutions** in each single customer project.

> 900 Software Engineers organized in 13 technology-focused departments.

360° coverage of state-of-the-art technologies



CreditPlus



Miele



> Our service offering

„Early Phases“ as an overarching discipline.

The **Early Phases** have long been a flourishing discipline at MaibornWolff:

- **Project initiation:** vision, project assignment, research assignments.
- **Rough conception:** framework conditions, solution alternatives, ...
- **Business conception:** business cases, business data models, dialogs ...

→ We never called ourselves RE, but for sure we engineered requirements to design software.

Then the SE world has become agile.



**„We know our requirements.
We can start coding right away.“**
Car manufacturer

**„We know we need a chatbot.
We can start coding right away.“**

Operator of an industrial park



**„We know our stakeholders and priorities.
We can start coding right away.“**

Insurance company



Everything is about agile teams, scrum teams or developer teams.

Nobody asks for RE any more!



Everything is about agile teams, scrum teams or developer teams.

**Service Offerings concerning “early phases”
were no longer bought.**



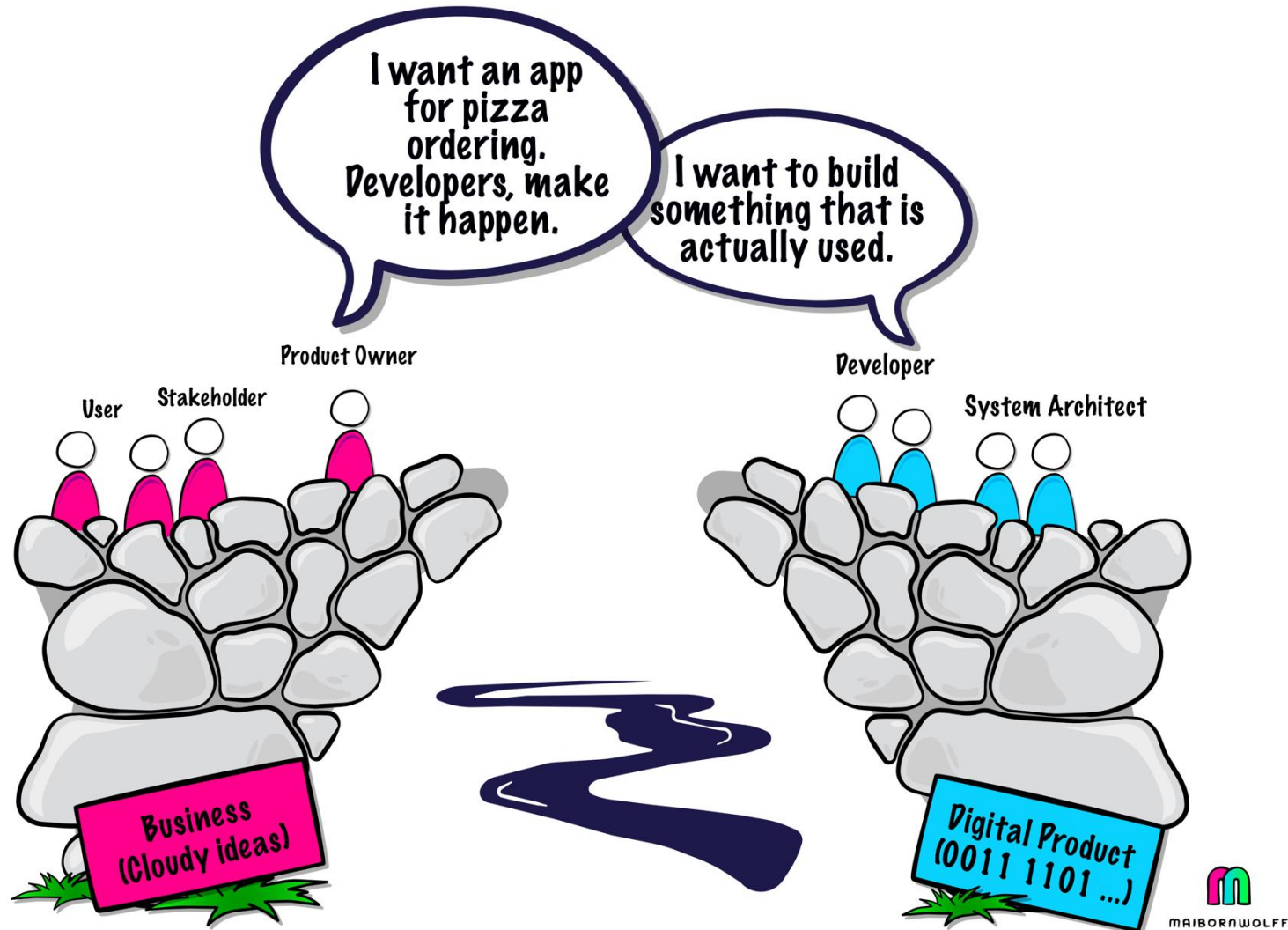
> „We know our needs – let’s start coding“

STOP! Some magic to do before to start and while coding



>What does this mean?

Broken Bridges between different worlds?



>The stakeholders seem unhappy.

Add more developers!



What is needed to bridge the gap?



> One more dimension: Materials science

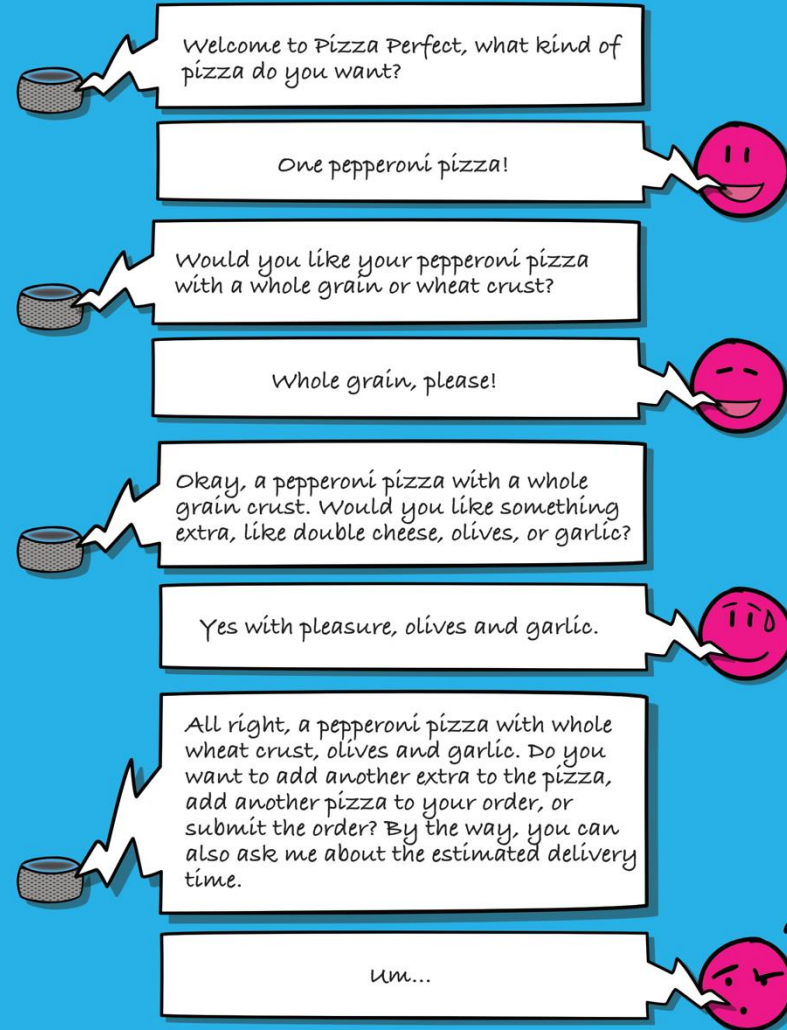
Material matters!



GUI



VUI



> Chairman of the International Requirements Engineering Board (IREB)

Kim Lauenroth reconsiders “solution-neutral” requirements 2015

“I need an UI for my customers to order their pizza on their way home.”

“The attempt to formulate **“solution-neutral” requirements** leads, among other things, to “waxy statements” being formulated in a requirements document that are neither implementable nor testable, nor do they offer any added value at all.”
(2015)



> Chairman of the International Requirements Engineering Board (IREB)

Kim Lauenroth introduced a broader view on RE

“My only concern is that **requirements engineering**
is perceived for what it is: **a design discipline ...**”
(2015)





But that is not all ...

We reduce the term "design" often to such associations.

Sure, that's design!



> Chairman of the International Requirements Engineering Board (IREB)

Kim Lauenroth introduced a broader view on RE

“My only concern is that **requirements engineering** is perceived for what it is: **a design discipline ...**”
(2015)

“Understanding **digital as material** is one of the core ideas of digital design.”
(2021)



> BITKOM role ideal.

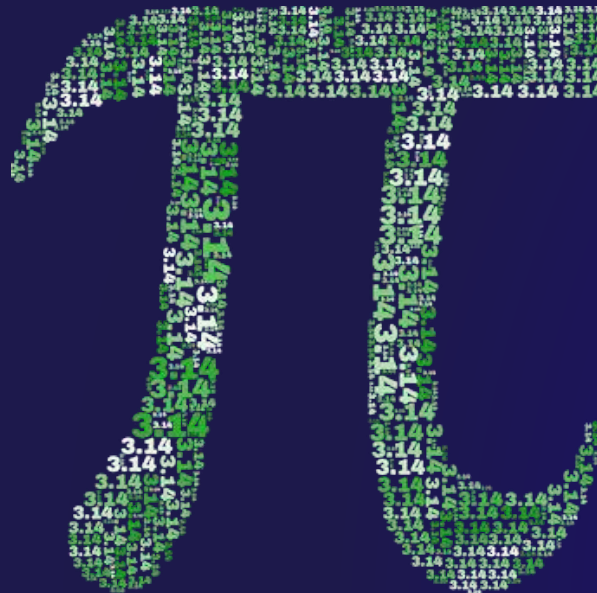
Digital Design is a new profession with a PI-shaped Profile.

Methods & procedures (cross-sectional competence)

- Project management & Agile methods
- Development of software (quality assurance, development processes, ...)
- Economic aspects
- Psychological basics
- ...

Design competence

- Requirements Engineering
- Usability Engineering
- Interaction design
- ...



Digital materials science

- Possibilities and limitations of software and hardware
- Devices: notebook, tablet, smartphone, VR/AR glasses ...
- Forms of interaction: Keyboard, mouse, touch, speech, gesture ...
- ...

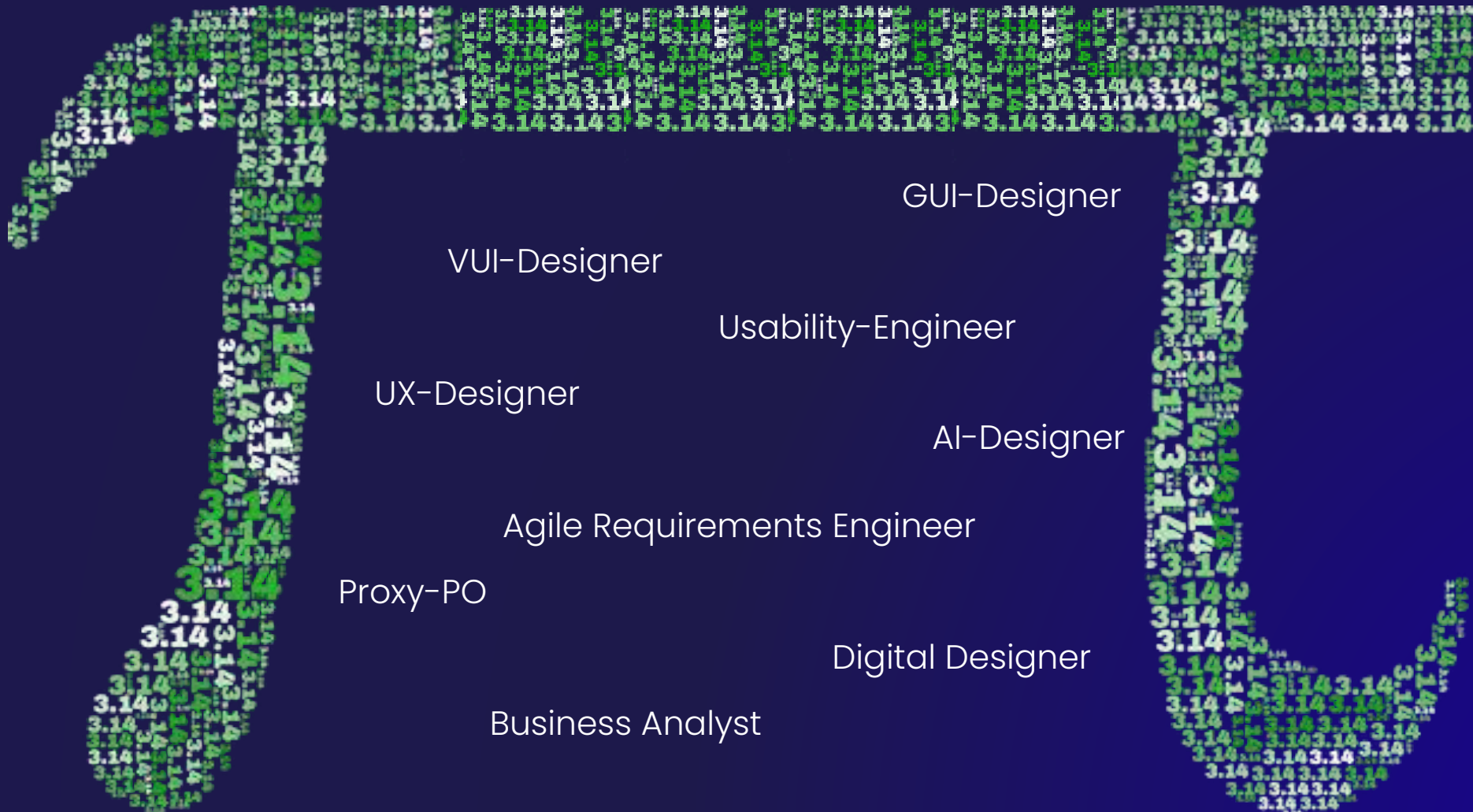


Is this the ideal digital designer?



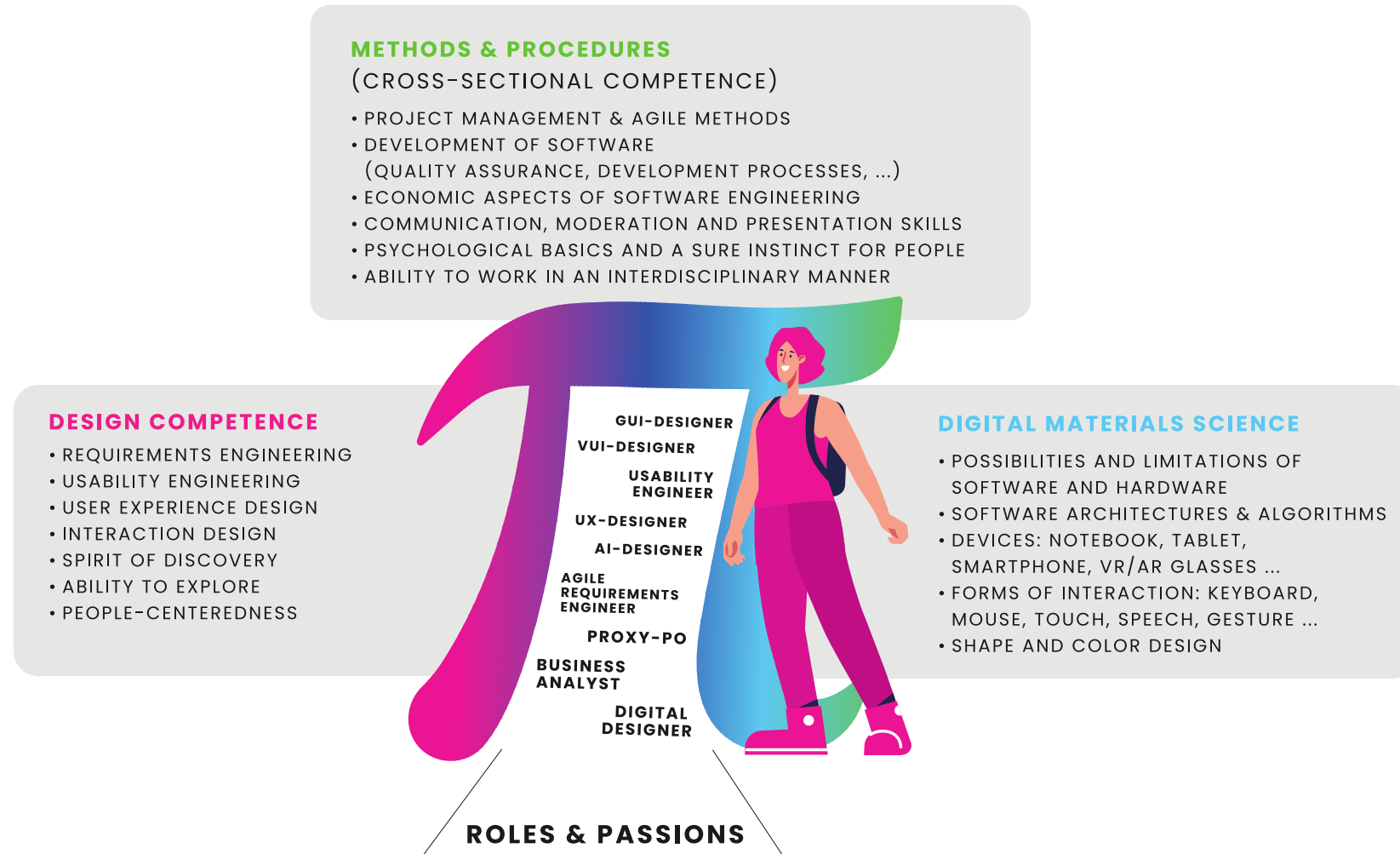
MAIBORNWOLFF

Digital Design is an “umbrella profession”.



DIGITAL DESIGN

THE BITKOMS π -SHAPED ROLE IDEAL



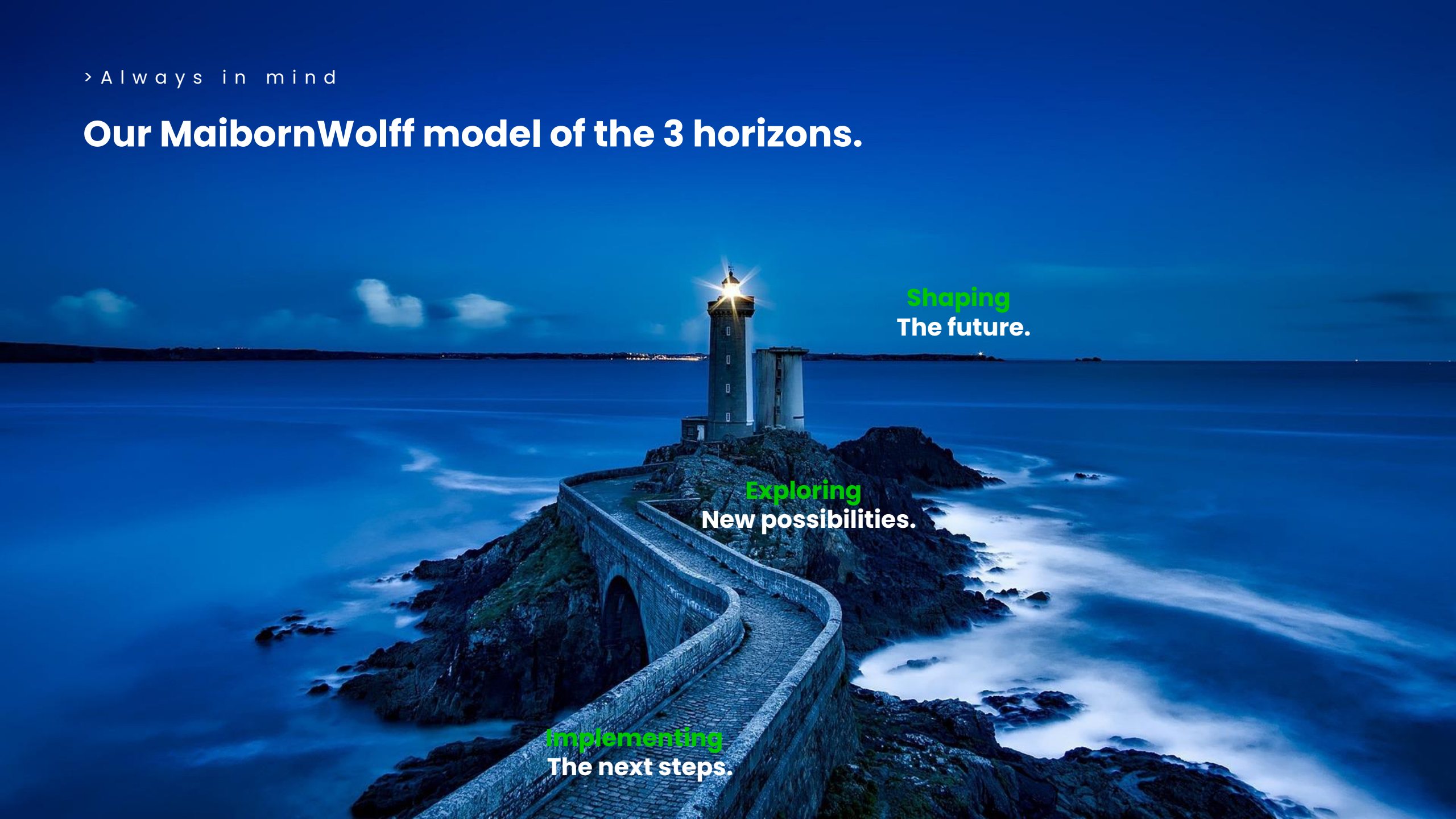
> Always in mind

Our MaibornWolff model of the 3 horizons.

Shaping
The future.

Exploring
New possibilities.

Implementing
The next steps.



Digital Design

We integrate in the agile world: requirements engineering, service, UX and UI design.

We design on the basis of our technical know-how

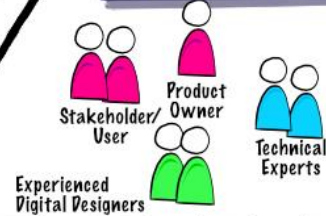
We design with 3 horizons in mind



Digital Designer

You need at least **30%** Digital Design profession in every project!

Horizon 1: Shaping



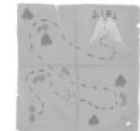
VISION



Design Thinking



Personas Empathy Maps



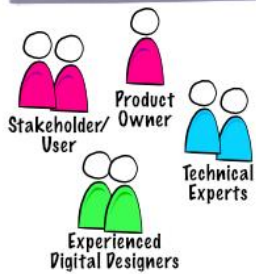
Roadmap



Big Picture

PROJECT SETUP

Horizon 2: Exploring



Co-creative scribbling

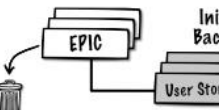


Story Map



Non-functional requirements

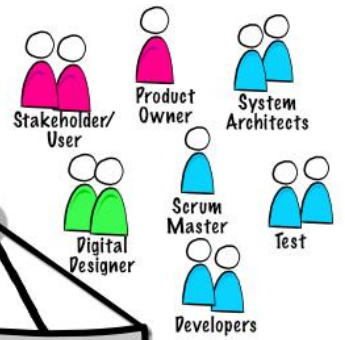
Specify epics early on



Keep requirements in scope

Consciously adapt requirements

Horizon 3: Implementing



Sort out early and build only the "right" features

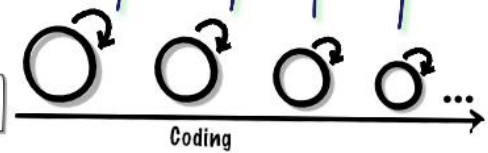


- Functional description/detailing
- Meaningfulness: Who needs what and when?
- Acceptance criteria
- Placement in Big Picture
- Happy Flows
- Edge Cases
- Cut & Granularity

Prioritize requirements



Sprint Backlog



Coding

Fully specify user stories

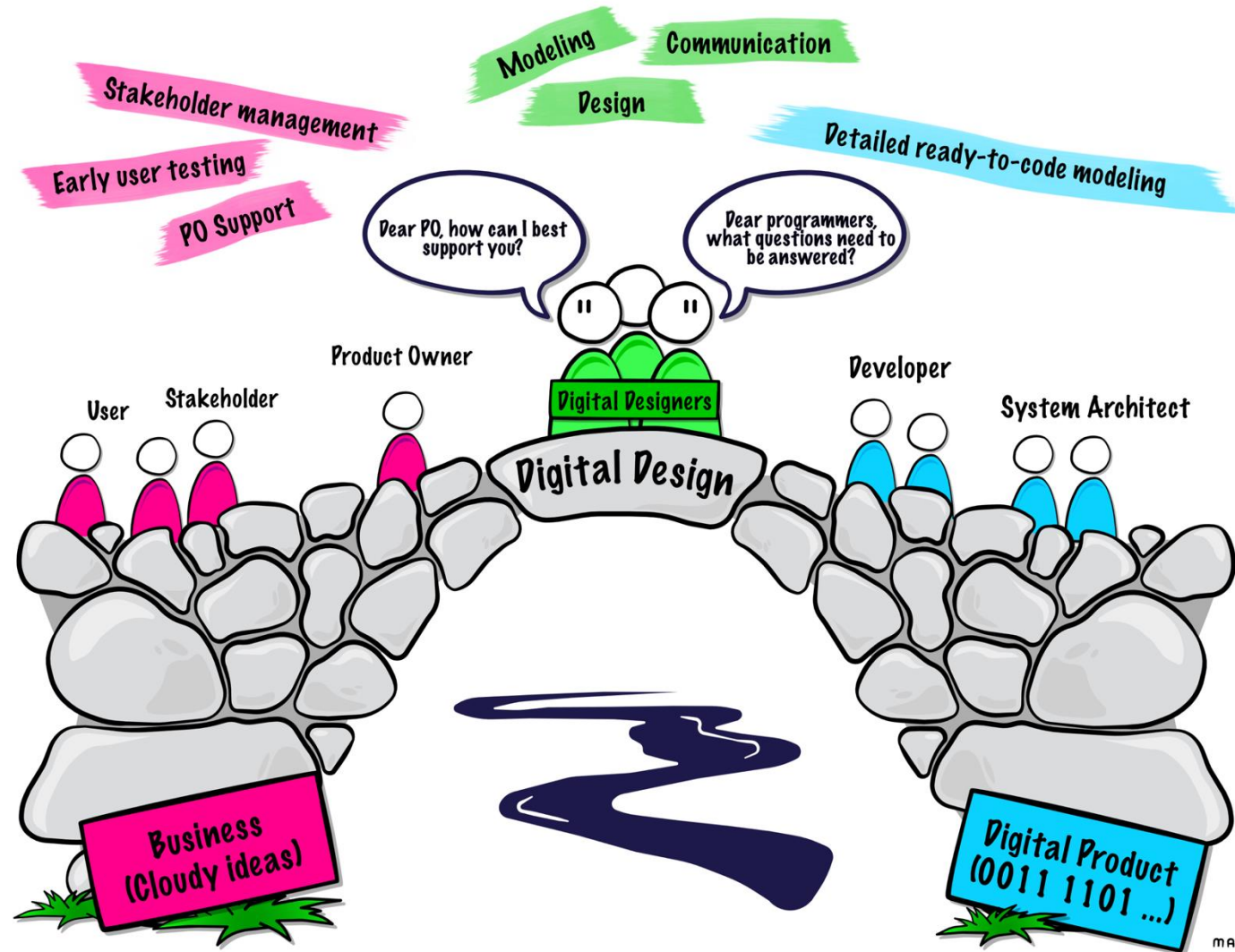
VELOCITY ↑
PRODUCTIVITY ↑
QUALITY ↑
EFFICIENCY ↑



MAIBORNWOLFF

> Digital Designer

The Bridge Builders.



You cannot not design!

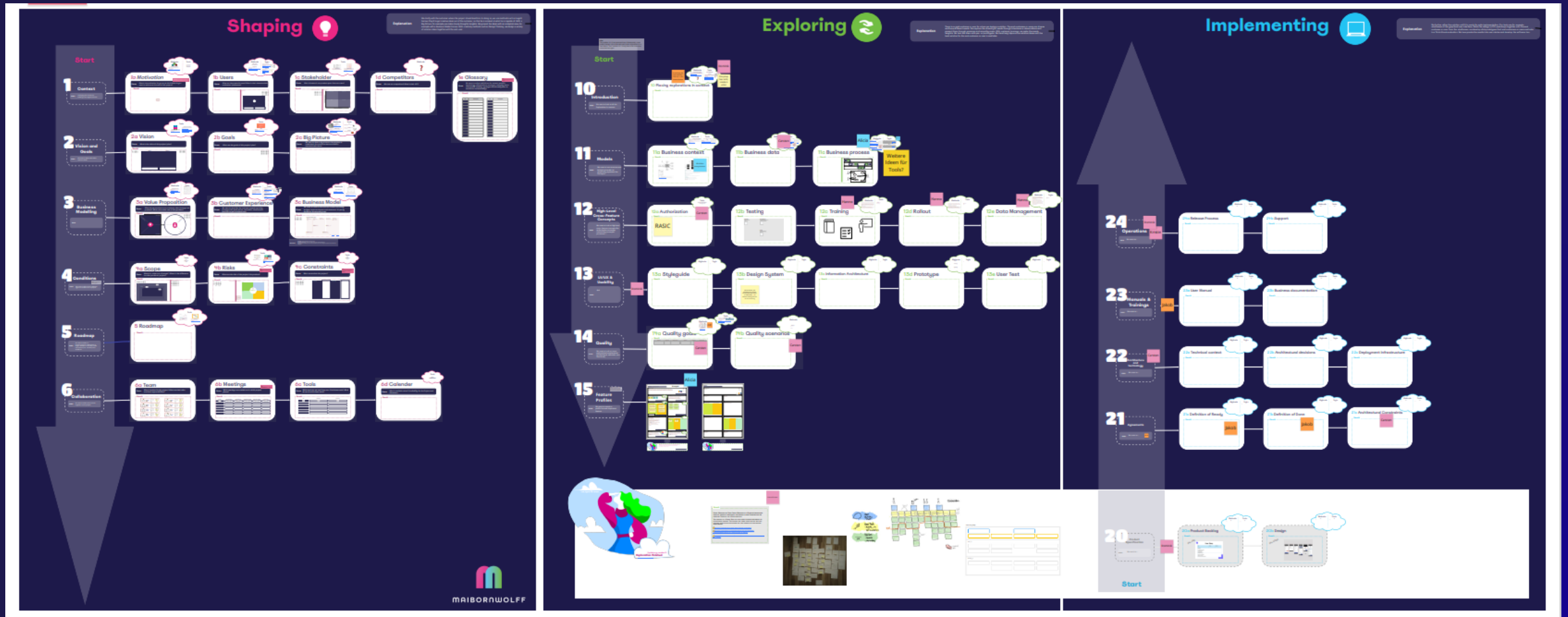
30% Digital Design in every digitalization project!

Where to start?



> Process. Artifacts. Methods.

It's not magic after all!



> Where to start?

Just listen ...



Endless meetings ...

... the discussions go round in circles!



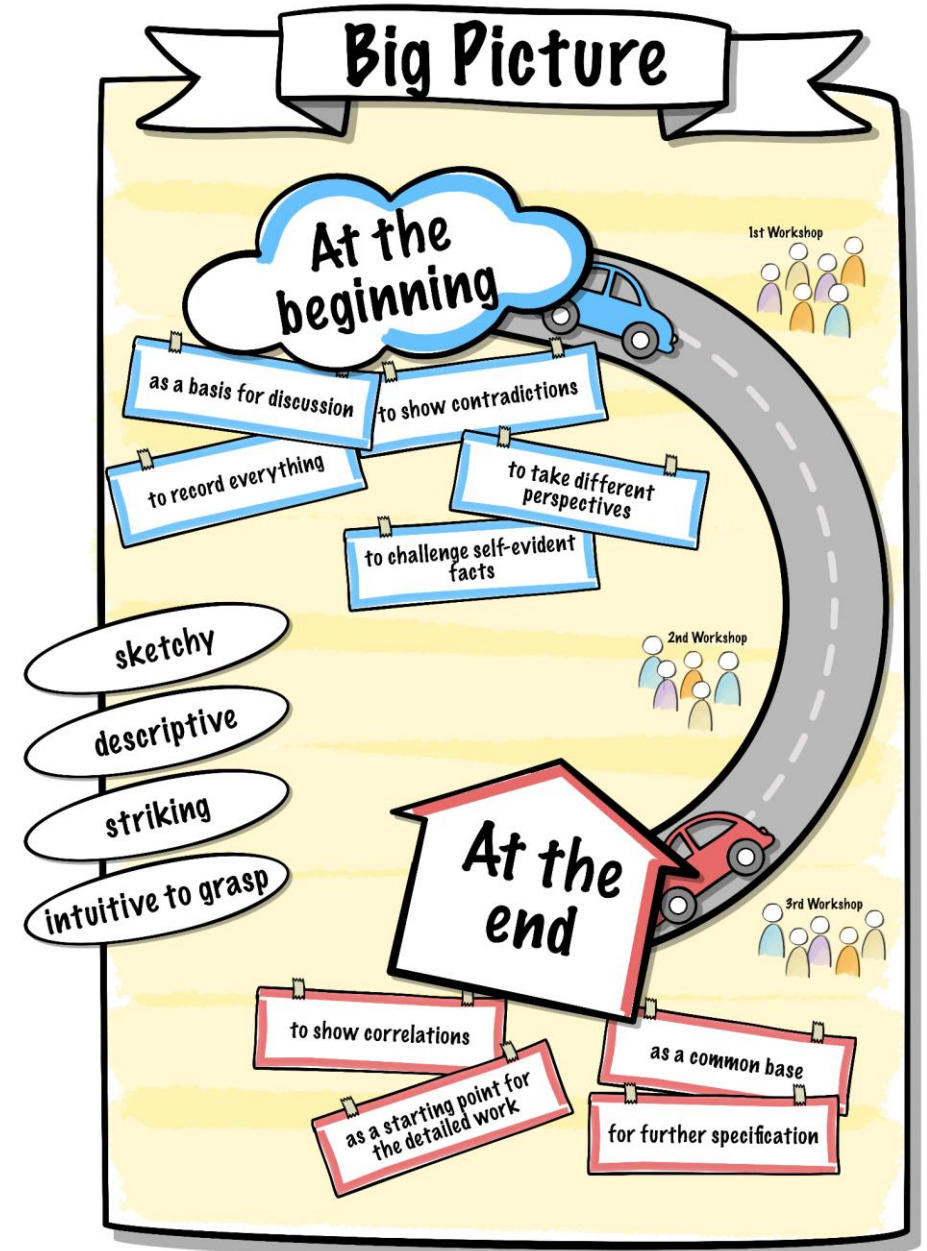
Where is this going to lead?

To a cool digital result?

> Where to start?

Draw pictures

- Be brave
- Take a pen and start drawing
- Get the pictures out of the head
- With the attitude “model to be wrong”



> Where to start?

Draw by following the rules

1. Clarify the question and give the image an appropriate caption.
2. Use symbols that are as striking and meaningful as possible.
3. Use the same symbols for the same objects and different symbols for different objects.
4. Make properties like quantity, number and order visible, i.e. use a single symbol if you mean a single object, draw multiple symbols for multiple objects.
5. Be as concrete as possible and as open as necessary.
6. Visualize the people involved (roles, actors). Use unique symbols and label them.
7. Draw interactions - for example, using arrows - and name them with verbs.
8. Visualize the relationships between the actors.
9. Visualize sequence and temporality in reading direction. Differentiate between before and after, actual and target.
10. Always record what you have already experienced, even if a different granularity arises at certain points.





Project Initiation Deck

Scope.
Design.
Change.



MAIBORNWOLFF

Project Initiation Deck



Motivation & Goals



Project Idea



Target Processes



Target Organization



Feasibility Analysis



IT Systems



Content Delimitation



Project Environment



Approach



Member



Team & Project Organization



Sponsors



Success Factors & Risks



Costs & Benefits



Mindset



Culture & Cultural Change



Driving Forces & Barriers



People, Animosities, Stakeholders



Change Support



Behavior



Skills & Knowledge

Scope.
Design.
Change.

Project Initiation Deck

 Motivation & Goals

 Project Idea

 Target Processes

 Target Organization

 Feasibility Analysis

 IT Systems

 Content Delimitation

 Project Environment

 Approach

 Member

 Team & Project Organization

 Sponsors

 Success Factors & Risks

 Costs & Benefits

 Mindset

 Culture & Cultural Change

 Driving Forces & Barriers

 People, Animosities, Stakeholders

 Change Support

 Behavior

 Skills & Knowledge

Scope.
Design.
Change.



MAIBORNWOLFF

Motivation & Goals

- > What is the starting point for the project idea?
- > What is the motivation behind the project idea?
- > Which pains and requirements does the project idea address?
- > What will be improved or changed by the project?
- > What are the goals of the project?
- > How do the goals of the project relate to the company's goals?
- > Which trends or developments in the company (could) affect the project?



MAIBORNWOLFF

Project Idea

- > What is the professional basis of the project?
- > What is the key project idea?
- > What are the guiding principles?
- > What will be newly introduced by the project? What will become obsolete?
- > Who came up with the idea?
- > Who is the projects "father/mother"?

Sponsors



MAIBORNWOLFF

- > What kind of sponsor does the project need to ensure that the project succeeds/to have backing even in difficult times?
- > What are the requirements for a sponsor?
- > Does he/she have to be from the top management?
- > Does the sponsor have enough time to actively play his/her role?
- > Who wants this project from business side?
- > Who is committed to it on IT side?
- > Who will help if project premises change?



MAIBORNWOLFF

Driving Forces & Barriers

- > What favors the project?
- > What drives the project? Is it professionally or technically driven?
- > What other trends drive the project (e.g. market, competition, end customer,...)?
- > What is slowing down the project?
- > What are the conceivable obstacles?
- > What trend could slow down the project?



MAIBORNWOLFF

Driving Forces & Barriers

- > What favors the project?
- > What drives the project? Is it professionally or technically driven?
- > What other trends drive the project (e.g. market, competition, end customer,...)?
- > What is slowing down the project?
- > What are the conceivable obstacles?
- > What trend could slow down the project?

Project Initiation Deck



Motivation & Goals



Project Environment



Mindset



Project Idea



Approach



Culture & Cultural Change



Target Processes



Member



Driving Forces & Barriers



Target Organization



Team & Project Organization



People, Animosities, Stakeholders



Feasibility Analysis



Sponsors



Change Support



IT Systems



Success Factors & Risks



Behavior



Content Delimitation



Costs & Benefits



Skills & Knowledge

Scope.

Design.

Change.

Thank you.

people. code. commitment.



Digital Designer

Dr. Martina Beck

Managing Director at MaibornWolff

Tel: +49 151 544 22 055

Email: martina.beck@maibornwolff.de

