



SEBRAS - Stripes over Sprints

Systems Engineering and Agility – a new approach

SWISSED 2025. Eike Appel Zürich 15. September 2025

GfSE →
Gesellschaft für
Systems Engineering e.V.
GERMAN CHAPTER OF INCOSE



Working Group **Agility in Systems Engineering**

Gesellschaft für Systems Engineering e.V.

- Refounded in 2018
- **“better agile with Systems Engineering”**
- principles, best practices, methods, frameworks ... and underlying patterns, which take the best out of **agility & Systems Engineering**
- 10-20 alternating **active members**
- 2-3 **workshops/year** (face2face & online) plus **monthly exchange** (online)
- presentations, publications and more information here:
<https://www.gfse.org/de/arbeitsgruppe-agilese.html>
- Foundation of the SEBRAS 2024 under
 - Tim Weilkins, Thaddäus Dorsch, Paul Dahlke, Jürgen Rambo
- Co-Authors of Abstract and slides „Stripes over Sprints“
Thaddäus Dorsch and Jürgen Rambo



SEBRAS Gründungstreffen, Hamburg 2024, mit (v.l.n.r.):
Thaddäus Dorsch, Tim Weilkiens, Paul Dahlke, Jürgen Rambo
Fotograph: Marty

Why ...

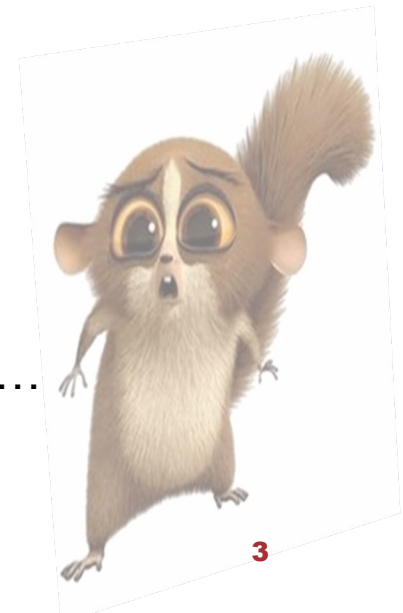
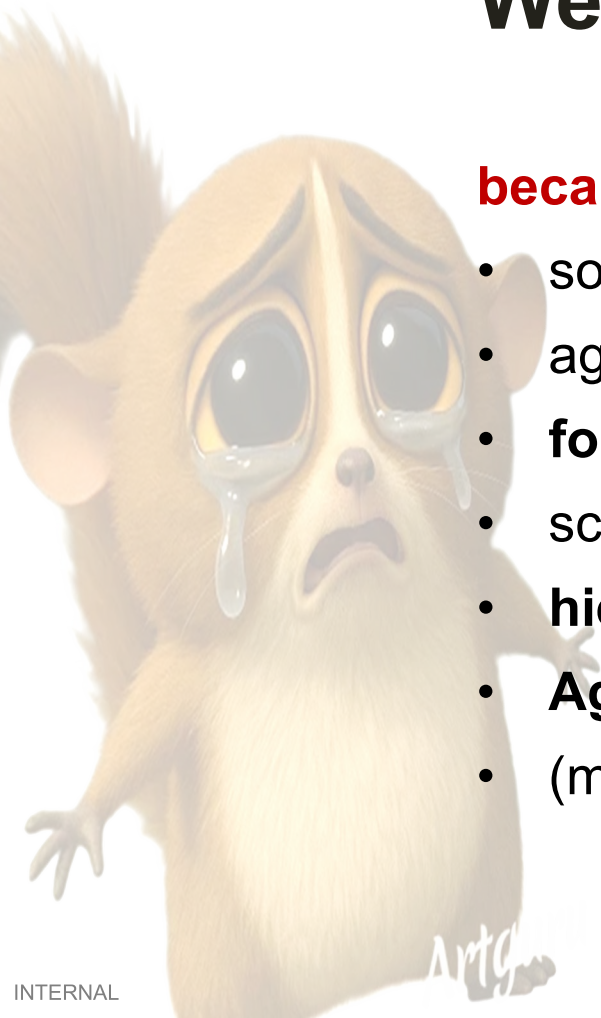
Systems Engineering needs more Agility!

We were

sad.. terrified.. disappointed...

because ...

- so many development projects still **miss** their **goals** (time / quality / costs)
- agile **transformations** have often **failed**
- **focus** on agility and SE is **lost**
- scaled agile **frameworks** often do not really bring improvement
- **hierarchical** structures, **silos** and **matrix** organizations **prevail**
- **Agility** is now seen as "**burned**"
- (model-based) **Systems Engineering** is often only found in **niches** ...



But we know ...

Systems Engineering and Agility empower each other!



Gerd Grillmeister: „Er will das Grillgut unter allen Bedingungen garen!“



Kurzbeschreibung:

- ist 41 und finanziell besser gestellt
- wohnt in einem Haus mit Garten
- lebt den "Digital Lifestyle"
- grillt oft und gerne
- liebt gute Qualität

Hauptaufgaben:

- Grill vorbereiten
- Grillgut garen
- Grill reinigen
- Spaß haben

sagt ...

- "Ich grille jederzeit und überall, nichts hält mich auf!"
- "Mein Grillgut ist immer auf den Punkt genau gegart."

denkt, fühlt ...

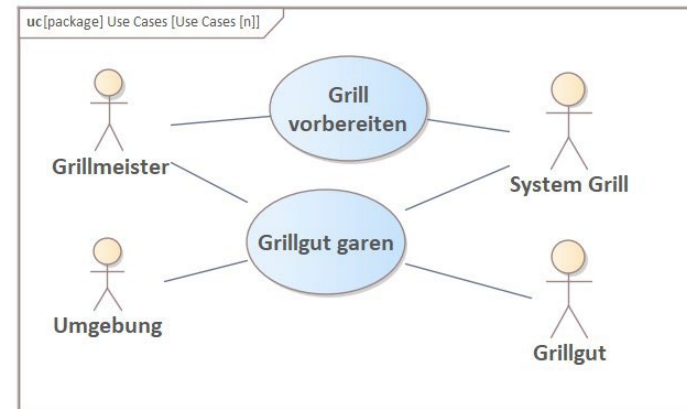
- "Mit eingeschränkter Sicht ist es schwer den richtigen Garpunkt zu finden."

Pains

- Grillgut ist verbrannt / nicht gar
- schlechte Grillbedingungen

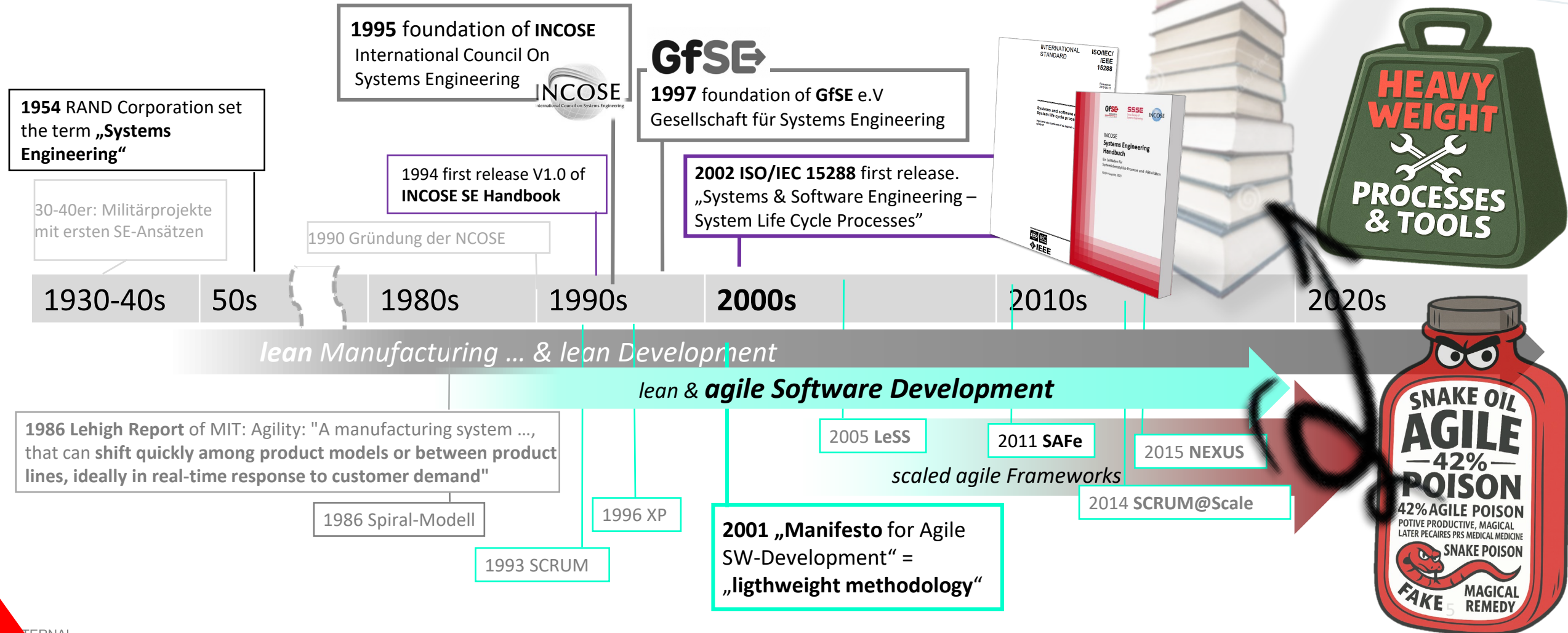
Gains

- Grill begünstigt gutes Ergebnis
- Spaß beim Grillen wird gefördert



Development of complex technical products...

The urban g'legend of agile vs. Systems Engineering...



structures in Systems Engineering

structures

as fundament, frame,
building blocks, ...
with which we develop.

- „only“ **complicated**
- projectable & measurable
- Easy to standardise

& culture of agile way of working!

culture

as behaviour, value, interaction,
...
how development really is
going on.

- **complex**
- dynamic
- emergent and only „observable“



Both are important and influence each other!

Agile & Systems Engineering

so many misinterpretations and flawed understandings

■ Systems Engineering

- SE as one-shot „**Best**“ **Practice and Waterfall** without iteration
- to many processes and **models from the ivory tower** and **heavy weight tools**.
- (to) strong **focus on technology** not enough "organizational development & culture"

■ Agile Development

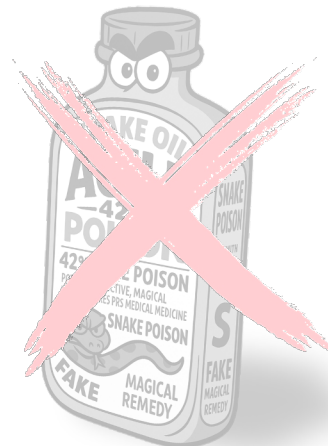
- **Obsessive believe in frameworks turns** „agile approaches“, to even less agile than waterfall
- "**lightweight development**" turned into **heavy weight processes** with many roles

light weight Systems Engineering AND real agility!

we do
Systems Engineering
better (with) agile!

As we

Put Stripes over Sprints!



SEBRAS

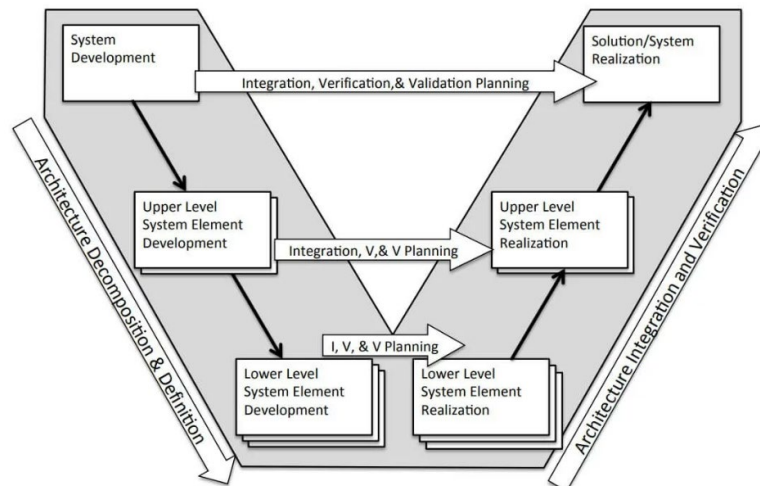
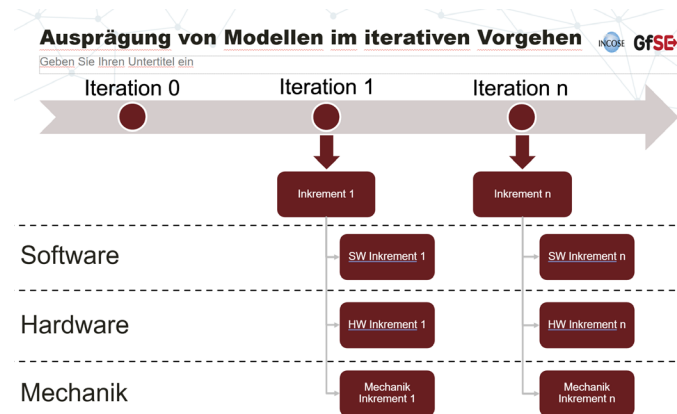
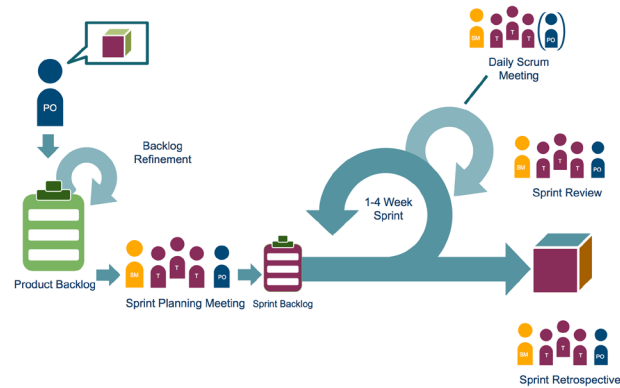
Systems
Engineering for
Business
Reactivity and
Agility with
Stripes



Think more SEBRAS!

Why we came to think more SEBRAS

Trying to find the perfect pattern of developmen!



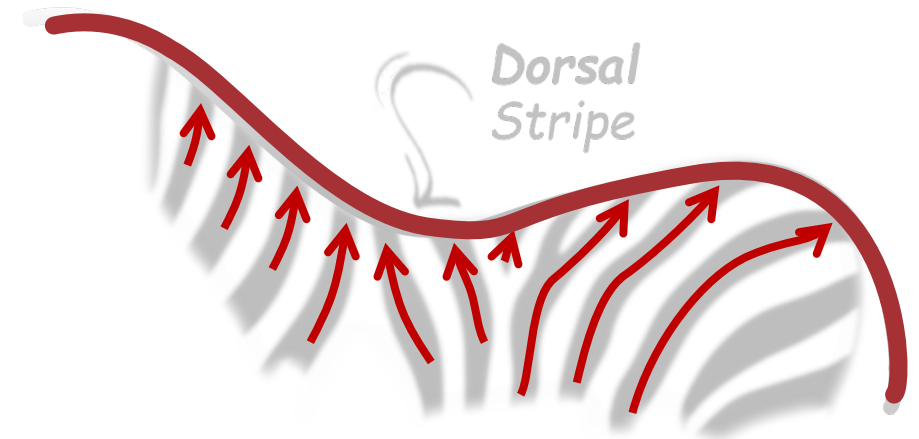
Dorsal Stripe

The **MBSE-Backbone** of the entire development

Think more SEBRAS!



- **The Point of Synchronisation** for all Stripes in the **dorsal model**
(Single Source of Truth, Digital Thread, ALM/PLM, Digital Master, Digital Twin, ...)
- Cross-link, mutual integrity and traceability of all **Stripe results over the T-O-B perspectives**
- Starting point of the backlog and **planning** of the next pattern stripes.
- Following the **rythm of stripe cycles and continuously maintained** (CI/CD)
- Scale at more than 5 Teams with a dedicated **Dorsal-Stripe Team**



The (Pattern-)Stripe

Stripes for development

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the development activities in a pattern-stripe run through all phases of classic development (V-Model)

- **Typical Stripe-Activities:**

1. Planning
2. Development
3. Review
4. Retrospective

- **Stripe-length** between 3 days and 6 weeks
- **Stripe Team:** commonly recommend **7+/-2**, max 12 Members

Stripe teams are:

- Organized in **cross functional** teams
- **Analyse** the problem before jumping into solutions
- Develop in **iterative** steps
- Are not afraid to use **models** as their back-bone
- Use also informal models to keep up **pace**
- Create **consistency** to the overall model

Also checkout our paper from “Tag des Systems Engineering 2023”:

[TdSE23] P. Dahlke *et al.*, "**Besser agil im Systems Engineering mit Modellen**", *Tag des Systems Engineering*, Jg. 2023, S. 172–178, 2023.

Think more SEBRAS!

Basic patterns of stripes

Wir distinguish four kinds.

*Head
Stripe*

*Dorsal
Stripe*

*Tail
Stripe*

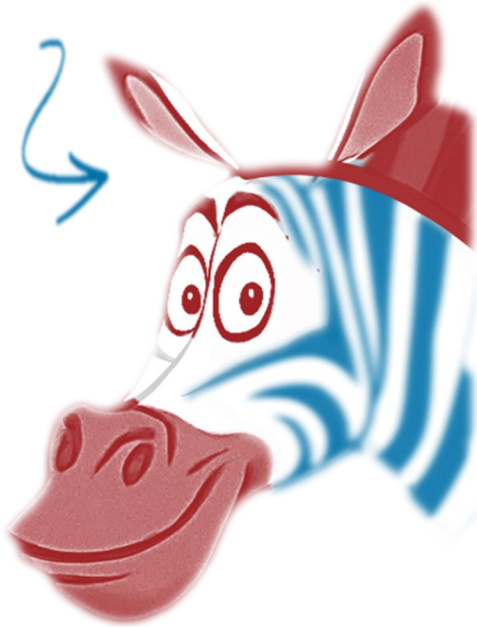
*Pattern-
Stripes*



Head - & Tail Stripe

The beginning of the end

Head
Stripe



- Both are different to the rest of the project
- They are **NOT THE PATTERN** for the rest of the project
- They often have different **responsibilities** or are a place of hand over between life cycle phases

Tail
Stripe



Think more SEBRAS!

Development is like a **Sebra**

Every development is unique but following similar patterns!

... although sometimes your **hairs** might stand on end ...

Keep eyes and ears
wide open and follow your
instincts

... when traversing **ups and downs** in the project...

...



Every product and project is unique,
but has similar **patterns!**

→ We recommend to use stripes!

...many **options**
are possible in the end
and ...



... be aware that it
does not turn out stinky ...:-

Think more SEBRAS!

Recognize and use patterns and stripes...

focus on good practice eg. SCRUM-Sprints, **BUT not** blindly

One Stripe is based on human beings & communication in its focus ...

- common **values** and principles
- **trust** & psychological safe place
- **transparency** – distinctiveness for all
- **feedback loops** for never ending „Inspect & Adapt“
- **retrospectives** for continuous improvement...

Stripes use ...

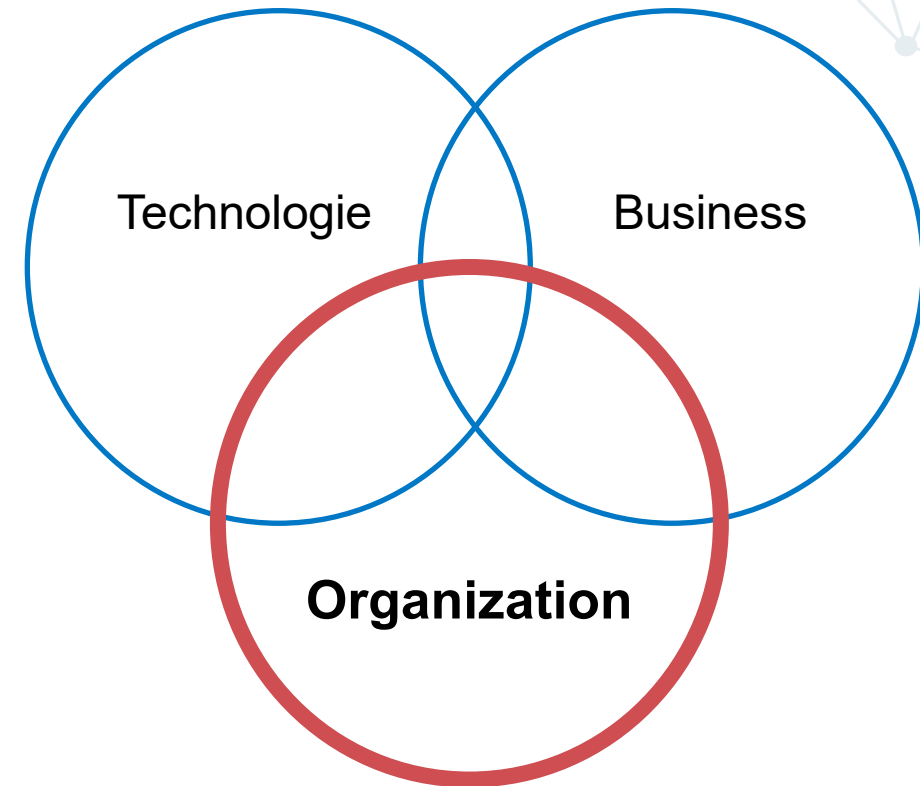
- **prioritized goals**, use backlogs with requirements & architectures
- dedicated **Teams**, ... **BUT not always the same!**
- clear **Responsibilities** (Stripe-Keeper), **BUT not always the same!**
- short **cycles** (timeboxes), ... **BUT not always the same!**



T-O-B Perspektiven

All Stripe take care of them always and **EVERYONE** – but with different intensity

- **T - Technology** – **System to be developed**
Technical scope, technical needs and goals, Requirements, Architecture, Tools, Implementation, Validation and Verification, ...
- **O - Organization** – **System developing**
Structural and cultural Aspects, Organisational structure, Teams, roles, responsibilities, Work-Split models, interfaces for communication values and principles, ...
- **B - Business** – **business system**
Company goals, business goals, strategic goals stakeholder management, revenue, requirements management, risk management
- Every Stripe **prioritizes EVERY perspective always** - though with different intensity.
One perspective has always the focus in one stripe.



Never forget Conways Law
and **cross-link** the perspectives permanently like the
Organization must be linked to **Business & Technologie**

Stripe Keeper

... earn their stripe again every time

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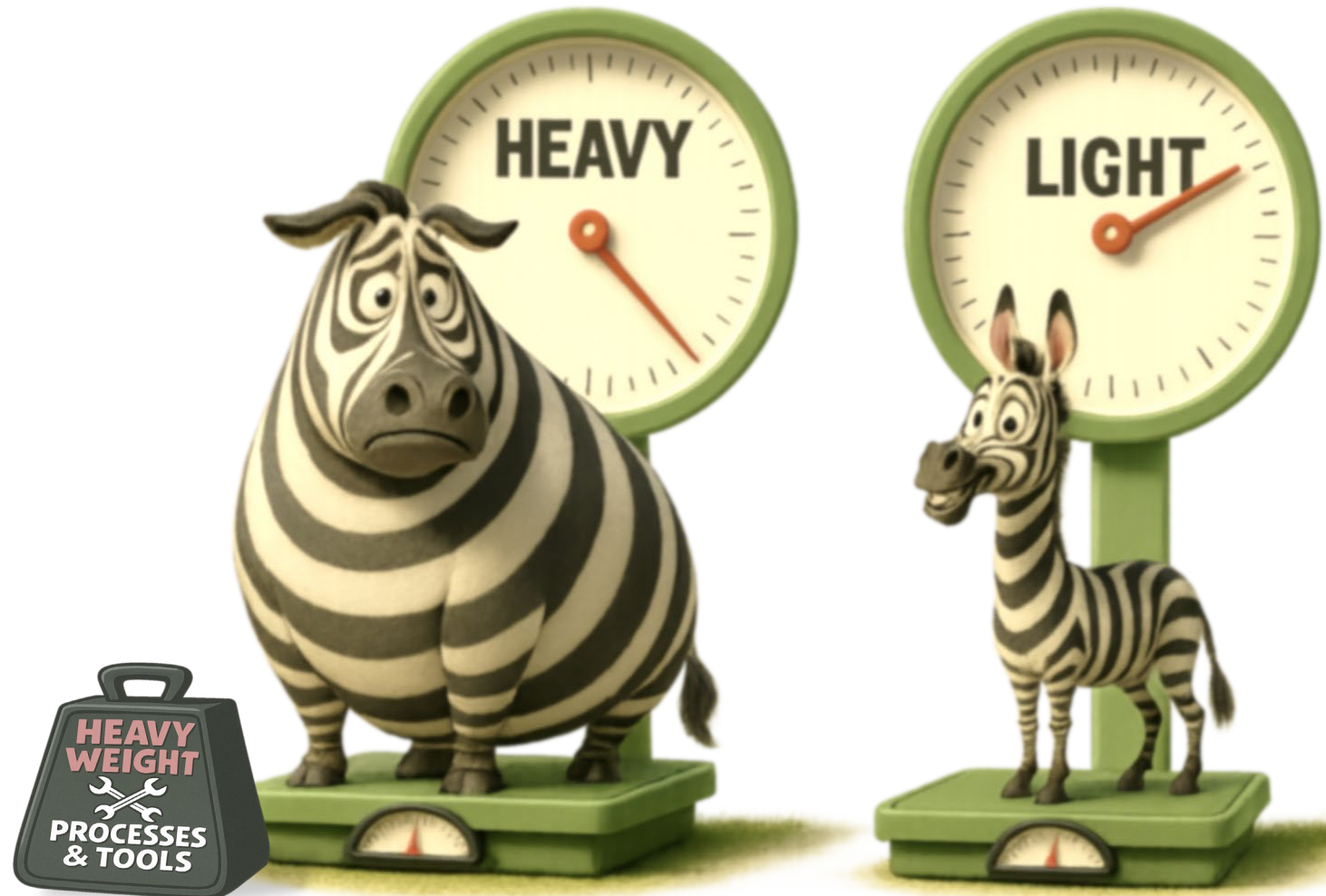
- Shall be aware of the **big picture and the details** at once
- Every T-O-B perspective has one **Accountability**
- **Keeper** of the Stripes is always the person taking care of the **perspective in focus**
- Can change every stripe – according to experience
- **Are NOT „the Boss“** but Facilitator & Servant Leader



Think more SEBRAS!

Please keep it leight weighted...

Big SEBRAS are often slow and less agile ;-)



Think more SEBRAS!

SEBRAS is a Thinking **MODEL**

It shall animate Thinking on what is **really important during development!**

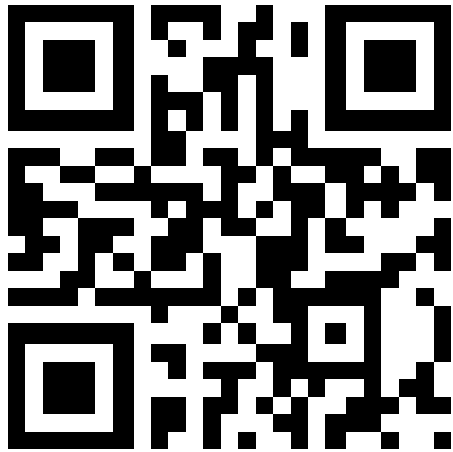


*„We hope, that this shared and common work [...] helps others,
**think development, methods & organization in a
new way!**
If so, we reached our goal.“ **

*freely quoted after <https://agilemanifesto.org/history.html>

With **AI** all can improve ...

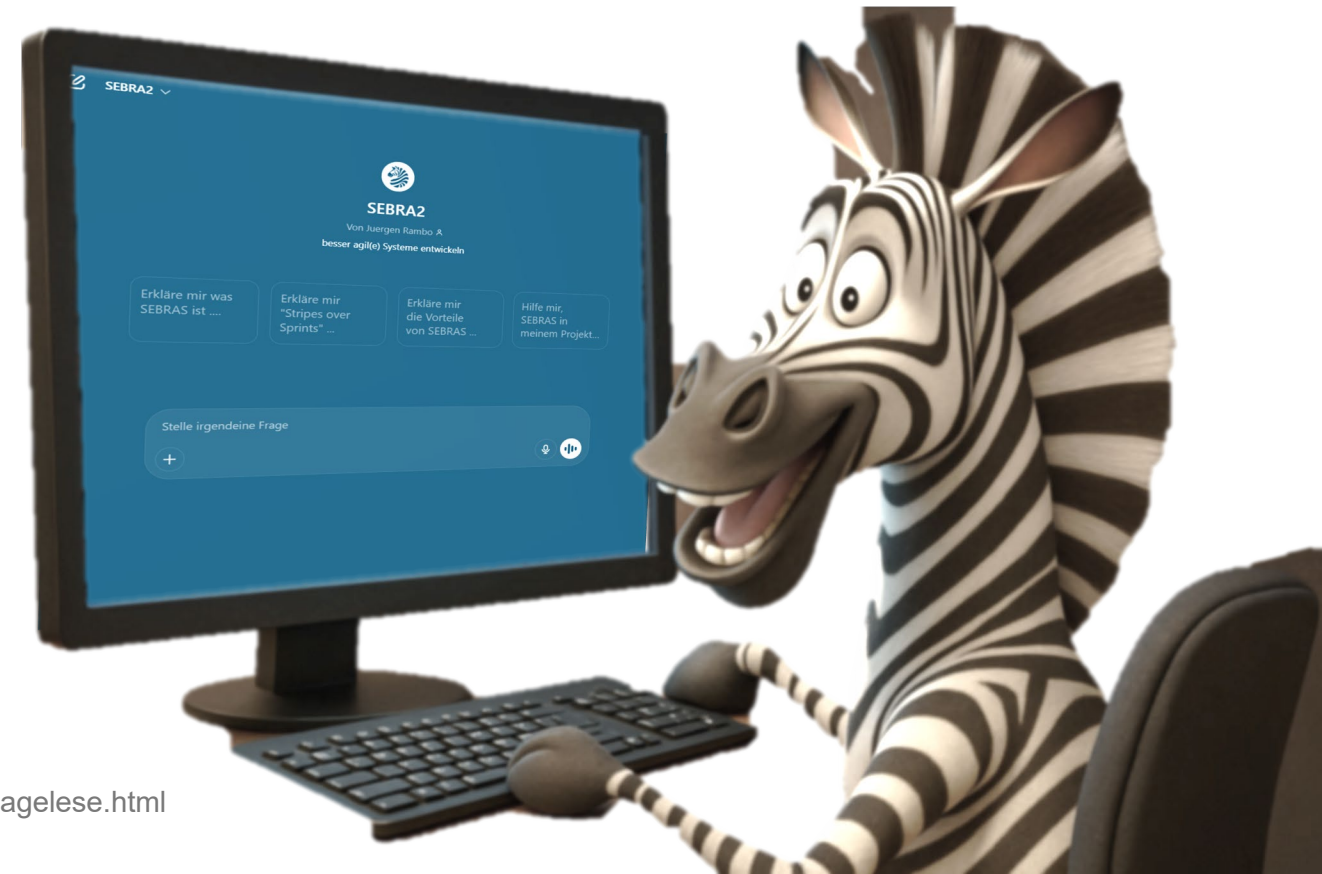
The SEBRAS ChatBot in ChatGPT already awaits your questions



As OpenAI ChatGPT-Nutzer feel free to use:

<https://tinyurl.com/SEBRAS>

<https://chatgpt.com/g/g-nqiQ0wH85-sebra2>



SEBRAS – SWISSED2025 check out our group under www.gfse.org/arbeitsgruppe-agelese.html