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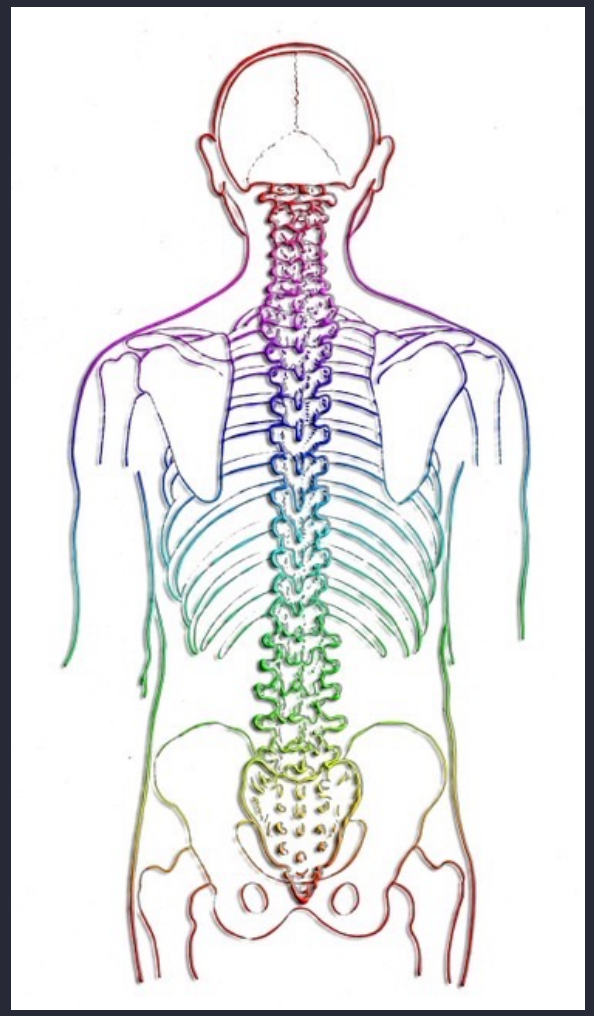
SURGERY ON THE LIVING BACKBONE

MICROSERVICE-TRANSFORMATION OF MISSION CRITICAL SYSTEMS

SAG 2022

Holger Cermann, Christian Nicu, Tim Lüecke

WHAT IS A „MISSION CRITICAL BACKBONE“



Mission Critical /ˈmɪʃən kɹɪtɪkəl/

- **„We‘ll send all our workers home!“**
  System downtimes have massive impacts on operational processes.
- **„There is no plan B!“**
  Big impact on business continuity plan.

Backbone /ˈbækˌbəʊn/

- **„The digital core!“**
  Foundation for many systems and departments.
- **„Spider in the web!“**
  Systems interweaving many processes and departments.

… and it‘s typically very big …

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LARGE-SCALE SYSTEMS WITH MILLIONS LOC

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BESPOKE SOLUTION TAILORED TO THE NEEDS OF THE CUSTOMER

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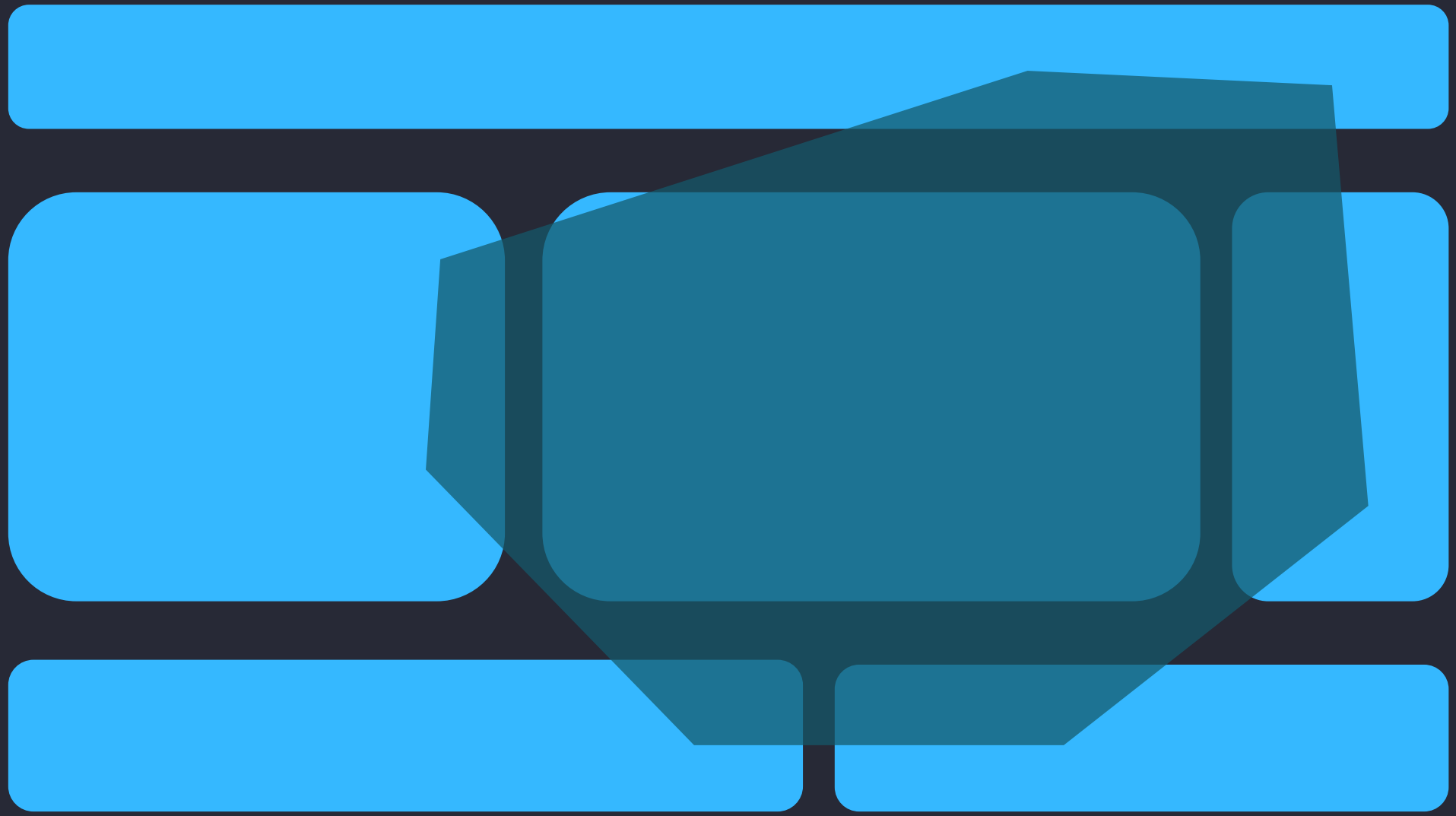
COVERING A LARGE DOMAIN CONTAINING MULTIPLE SUBDOMAINS



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CONTAINING COMPLEX BUSINESS AND PROCESS LOGIC

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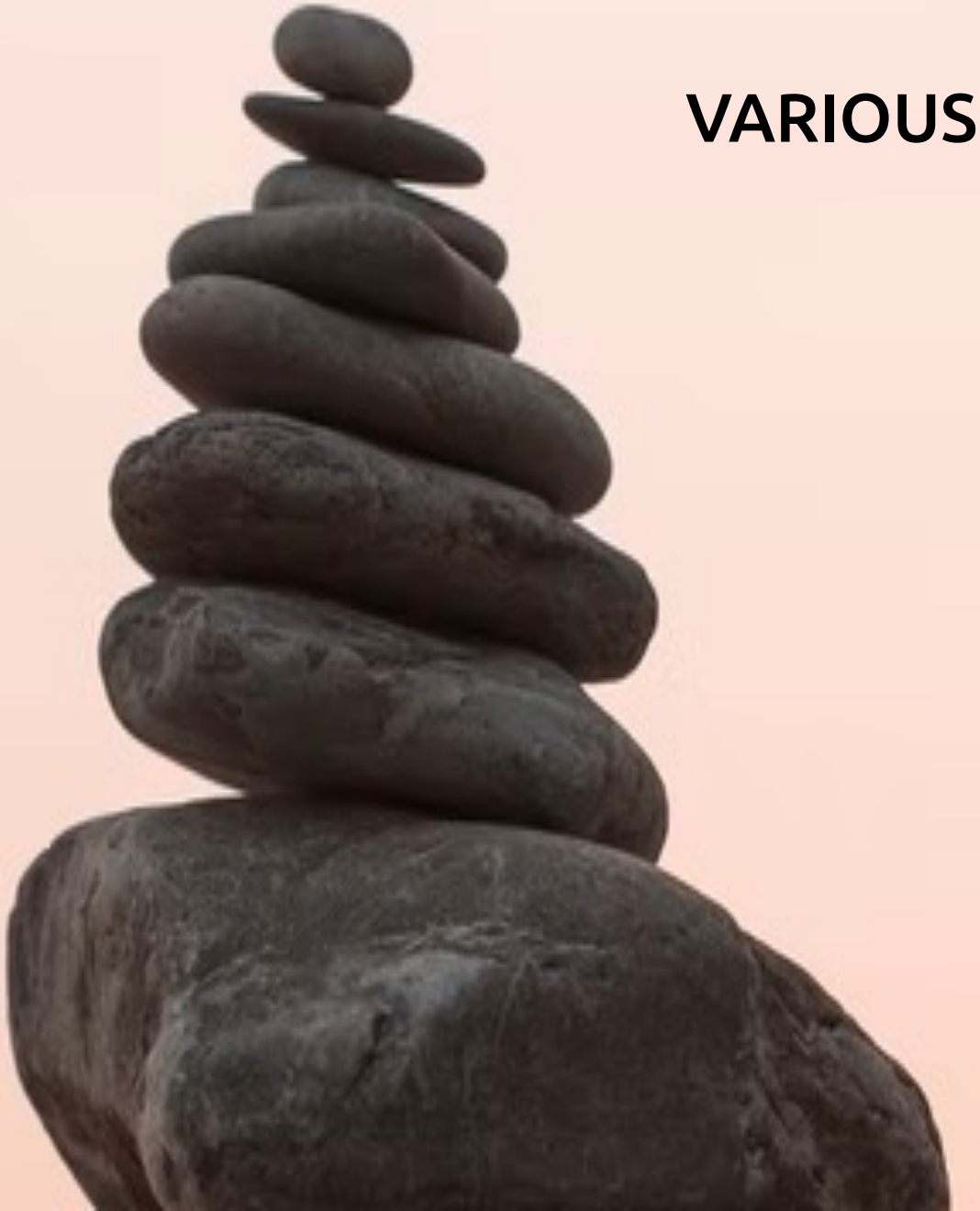
VARIOUS NON-FUNCTIONAL REQUIREMENTS



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USED WORLDWIDE IN THE WHOLE ENTERPRISE

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CENTER OF THE APPLICATION LANDSCAPE WITH MANY COMPLEX INTEGRATIONS

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... RESULTING IN AN INVESTMENT OF > 100 MILLIONS

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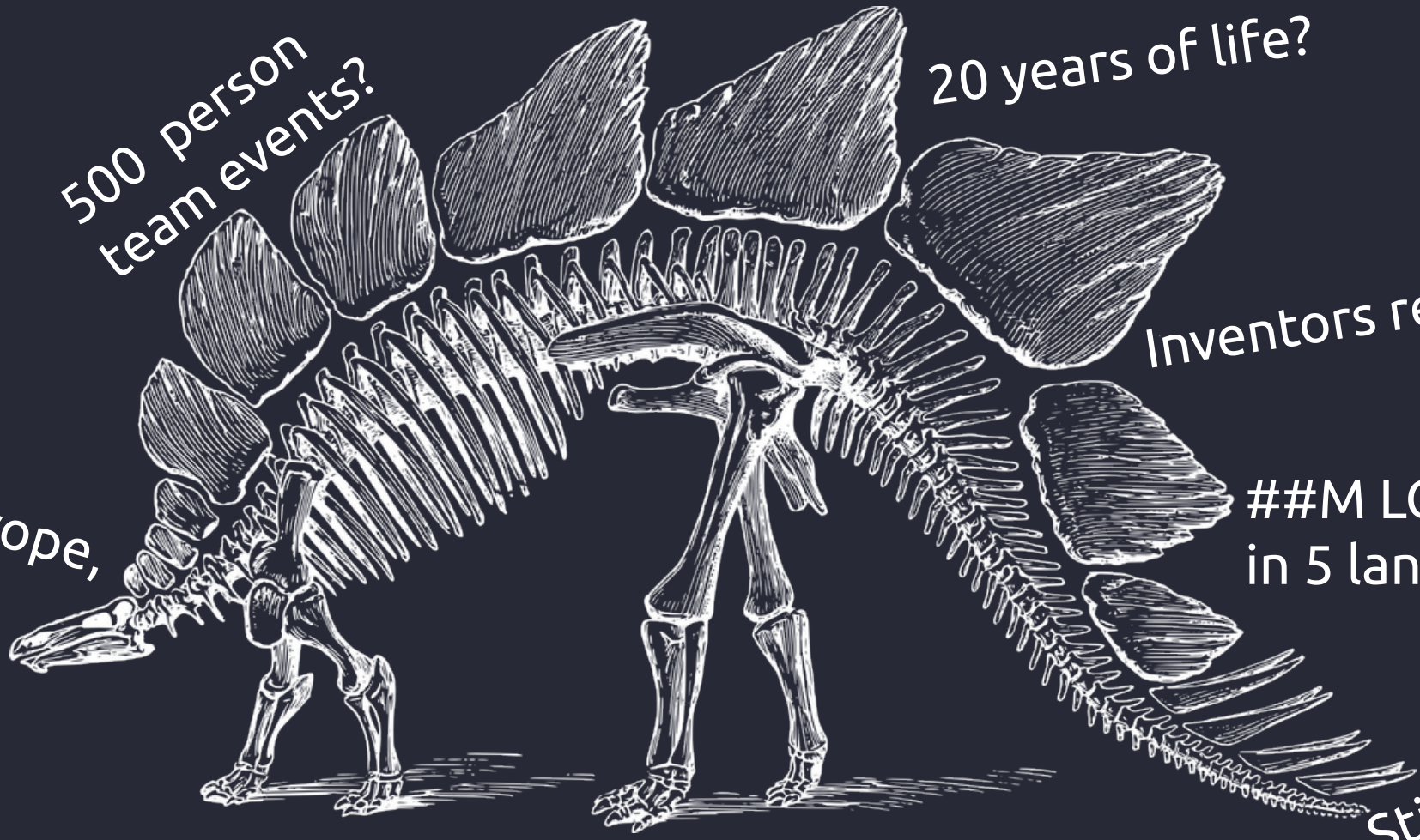
ISSUE: AN OLD MISSION CRITICAL BACKBONE TENDS TO OUTGROW!



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WOULD WE BUILD THE SYSTEMS THE SAME WAY TODAY?

≠

Bad architecture
at that time!

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ALTHOUGH SUCCESSFUL, THE FACTS FROM 10 YEARS AGO ARE NO LONGER VALID TODAY AND WE FEEL THE PAIN

Today, we are here:

and need to get here:

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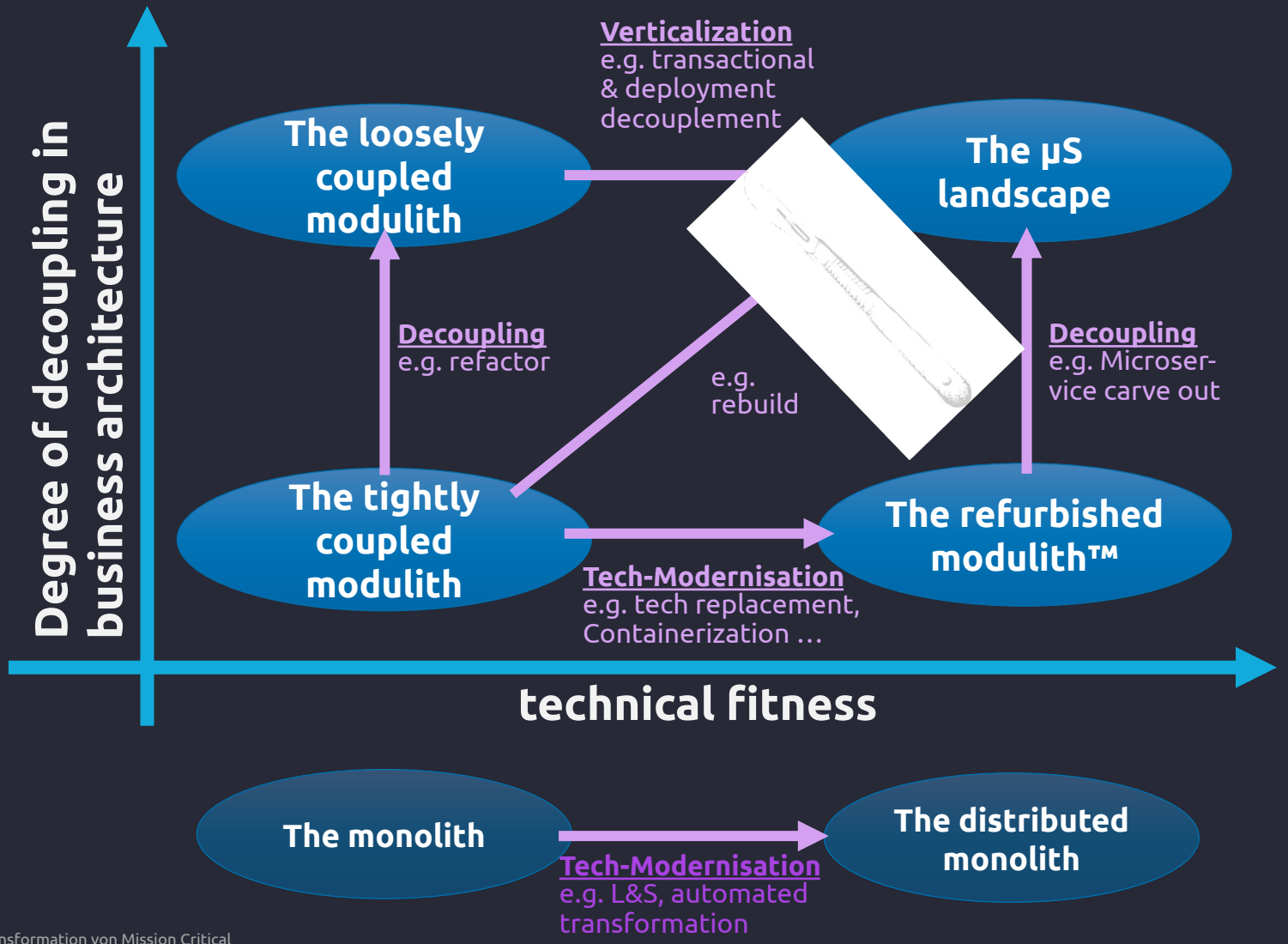
A CLASSIFICATION FOR MISSION CRITICAL SYSTEM MODERNIZATION



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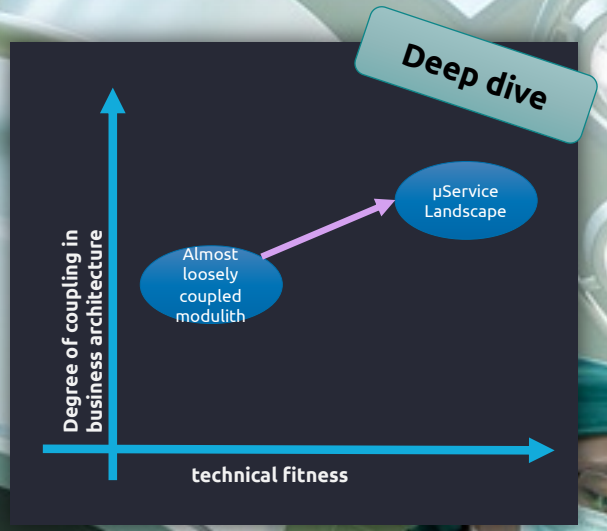
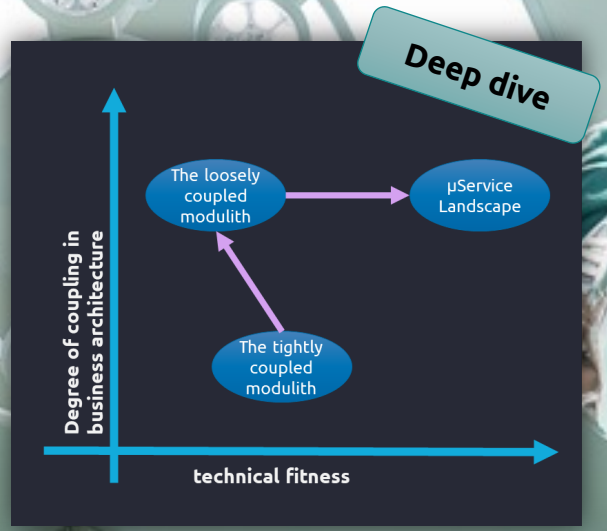
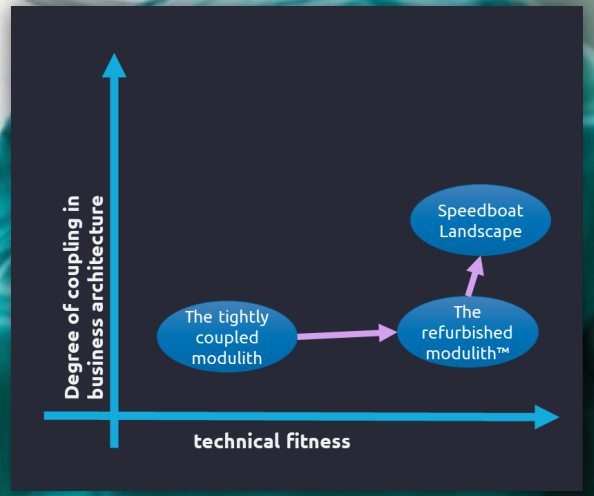
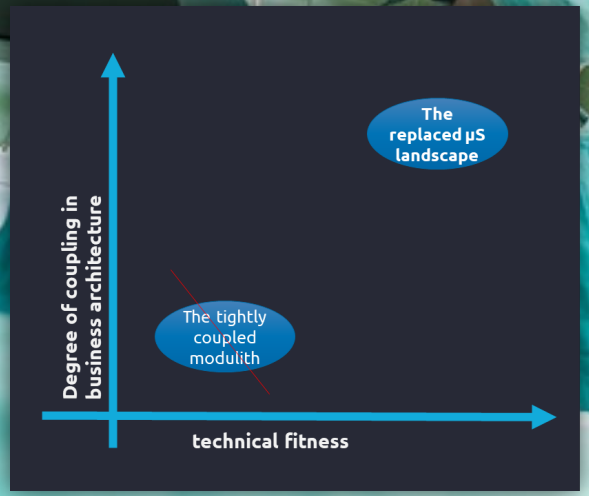
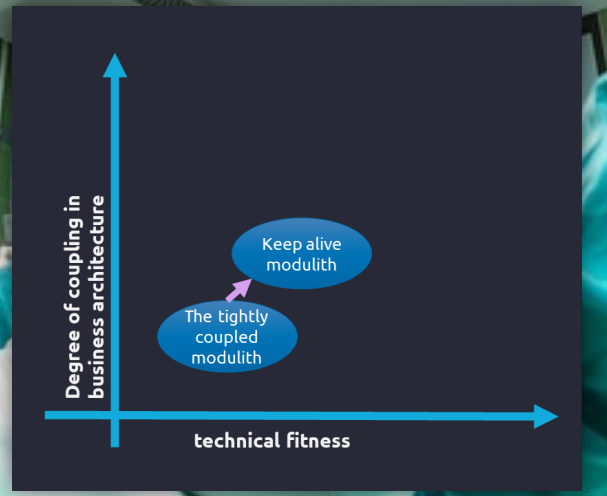
WE SEE MULTIPLE LARGE EXAMPLES IN OUR TRANSFORMATIONS







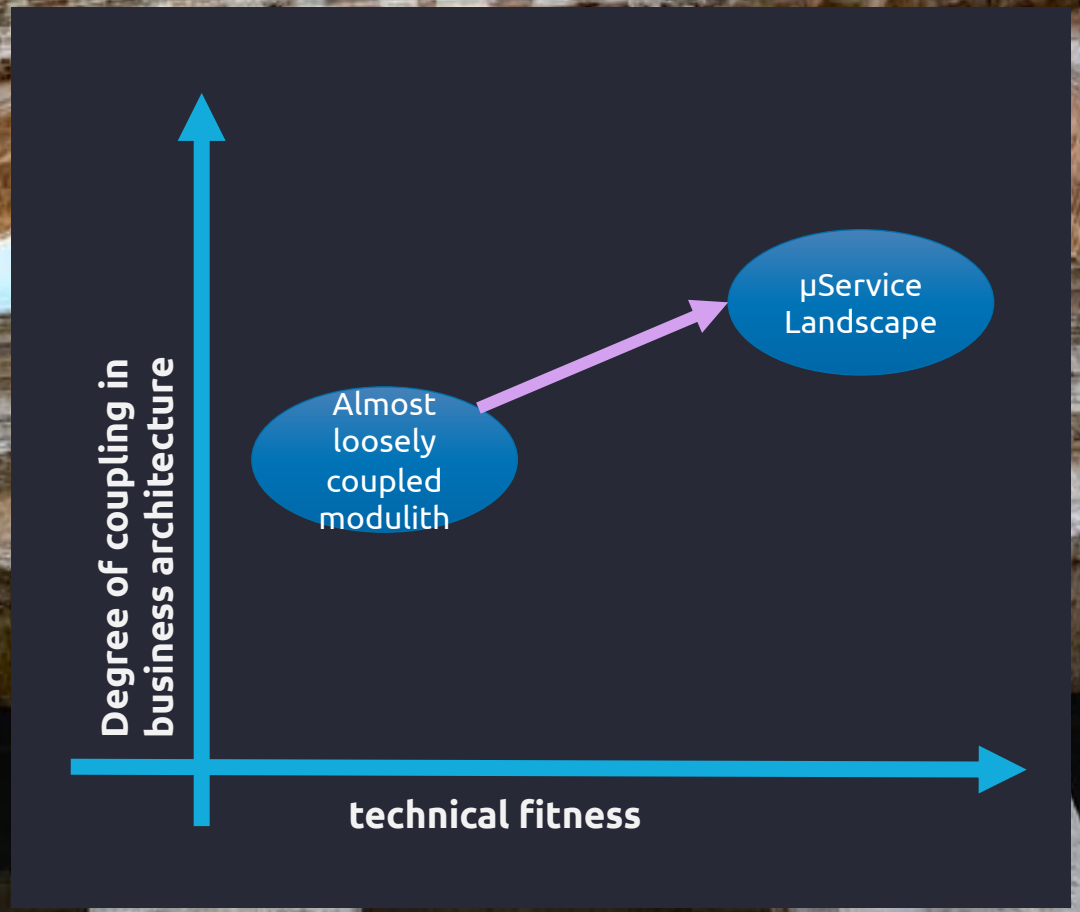




… and more!

STRUCTURED LEGACY SYSTEMS WITH LEGACY TECHNOLOGY

- ANTIQUE/EXOTIC TECHNOLOGY
- MORE STRUCTURED THAN YOU WOULD THINK
- NOBODY WANTS TO LEARN THE ROPES ANY MORE



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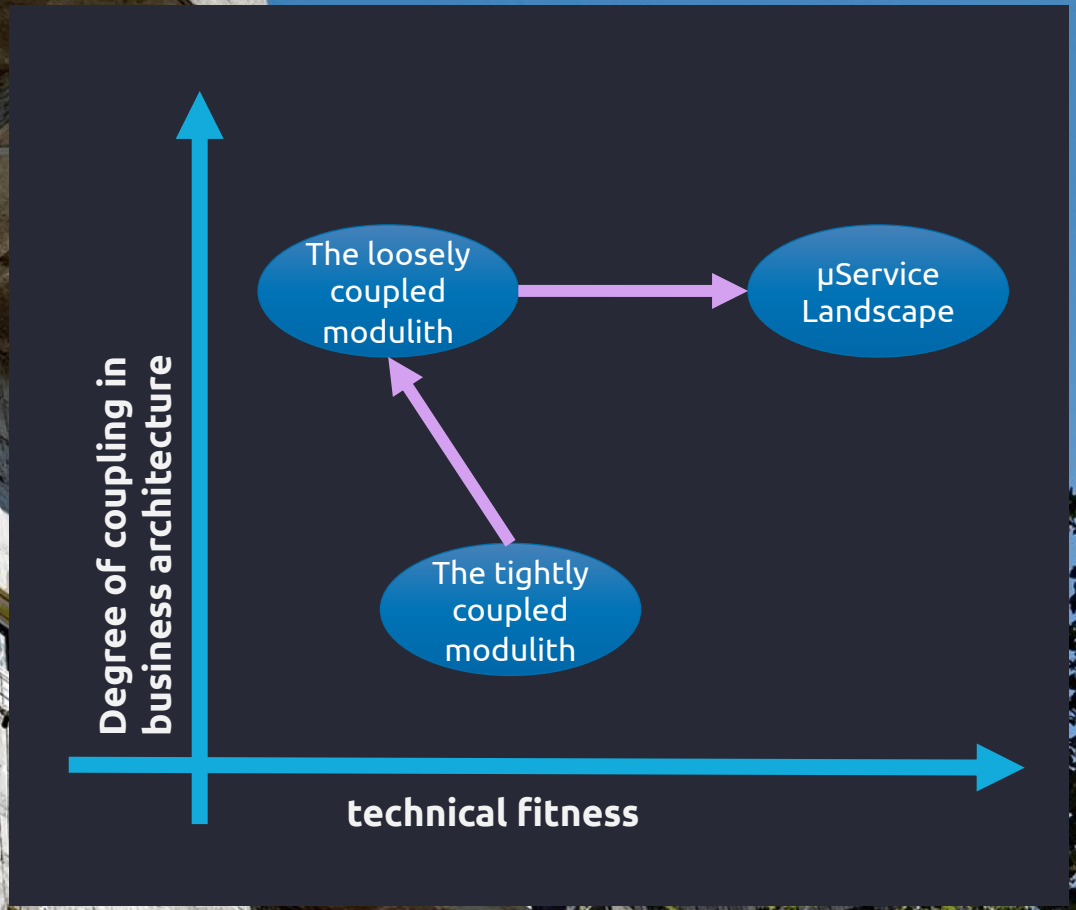
TOO LARGE SYSTEMS WITH ALMOST CURRENT TECHNOLOGY

REASONABLY UP-TO-DATE TECHNOLOGY

CURRENT OPERATING MODELS CANNOT BE IMPLEMENTED WELL

DEVELOPERS ARE ALREADY TURNING UP THEIR NOSES A BIT



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TRANSFORM BASED ON YOUR GOALS

COST REDUCTION

Different (partial) roadmaps cause big cost differences!

RISK REDUCTION

Focus to reduce risks, enhance stability, enable scaling!

TECHNICAL FITNESS

Technology modernization and cloud move are key!

BUSINESS VALUE

Prioritize carve-outs that enable new business value!

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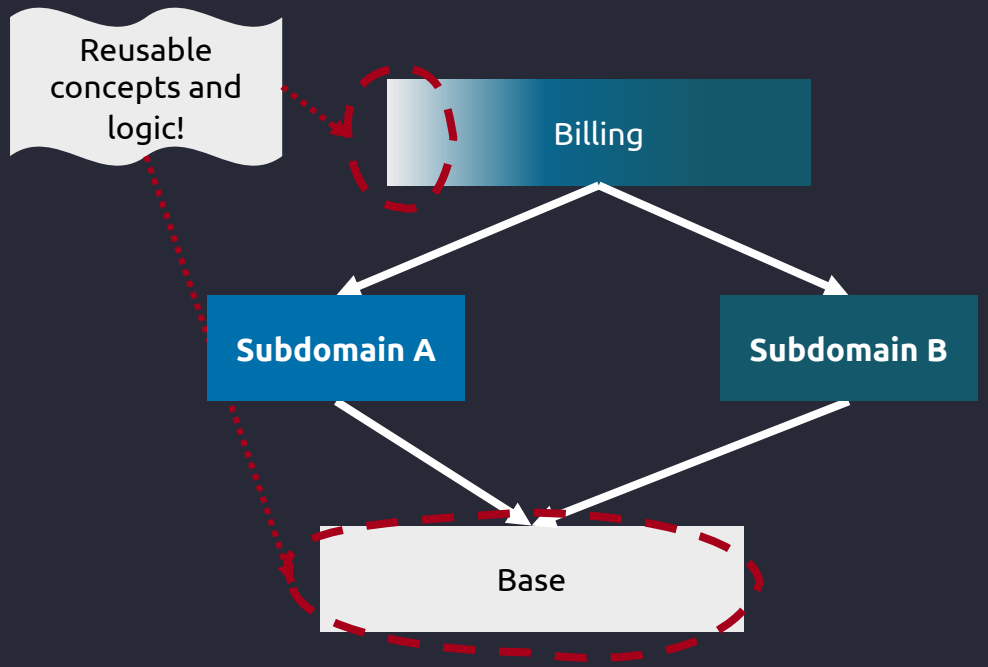
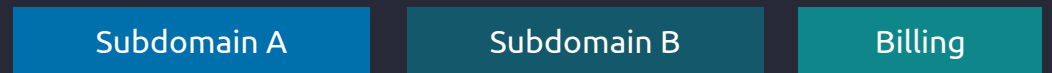
KEEP YOUR MIND ON THE ORGANIZATION!

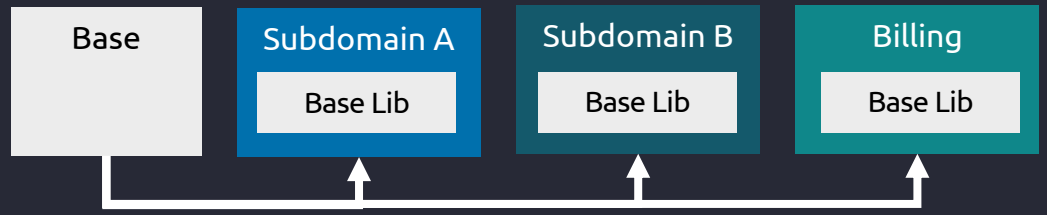


Simplified, multiply by 20 for real-world

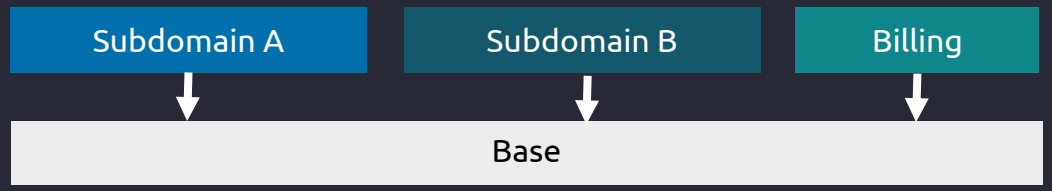
How to transform?



Option1: Separate Ways - Code Duplication



Option 2: Reuse via replication + libraries



Option 3: Reuse via service

"*The lesser of two evils is still evil.*" - Solomon

Lesson: root problem is a sociotechnical one
Remember: dependencies in a distributed system *should* be organizational dependencies!

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HAVE STAMINA DURING YOUR TRANSFORMATION!

it will be very expensive

it will take very long

You will even have to invest into refactoring of your legacy system to build interfaces and boundaries

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AVOID “SEDIMENT ARCHITECTURE”!
REALLY FINISH PARTS!

The fancy lambda speedboat

Last year’s container carve out

Last decades JEE modernization

„Some“ residual core

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ENVISION A BRIDGE TO YOUR TARGET!

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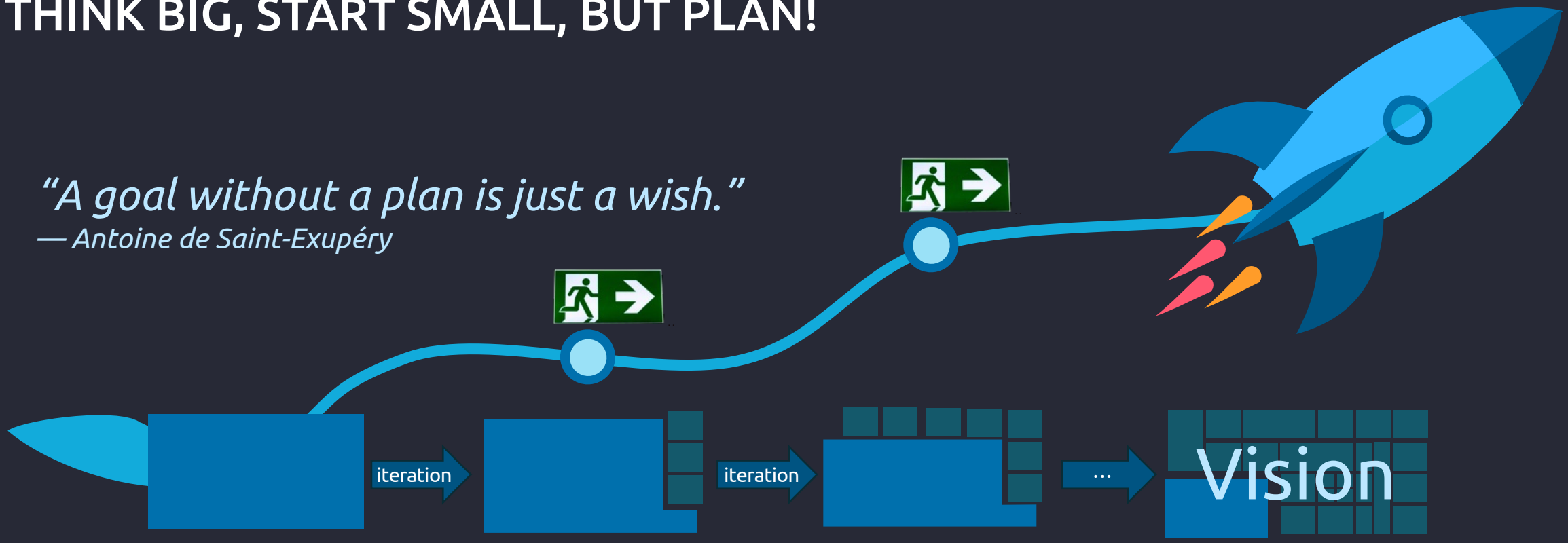
THINK BIG, START SMALL, BUT PLAN!

“A goal without a plan is just a wish.”
— Antoine de Saint-Exupéry



Safe pitstop model

1. Have vision and possible path in mind
2. Plan save exit points with acceptable ROI and target architecture
3. Ensure management commitment to continue to next pit stop

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SIX WISDOMS TO TAKE WITH YOU

1. Know your goals, make them explicit!
2. Keep your mind on the organization!
3. Don’t underestimate what you are doing!
4. Avoid sediment architecture!
5. Envision a bridge to your target!
6. Think big, start small, but plan!

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