The difference between style and fashion is quality!

Was Armani und andere uns über gute Software Architektur verraten!

Tobias Leicher
IT Architect and zChampion for Modernization

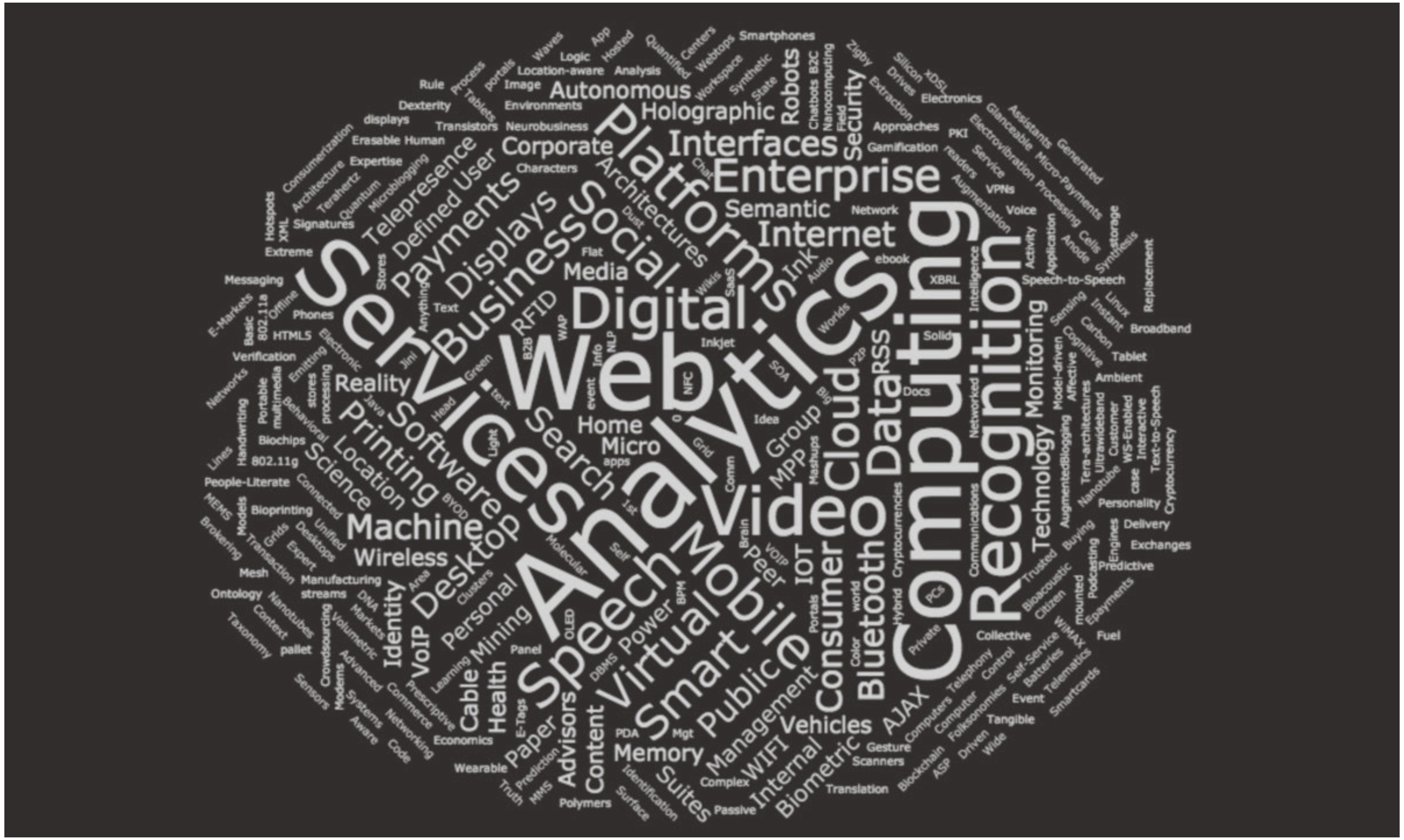
IBM

Fashion in den 80ern

Style in den 80ern

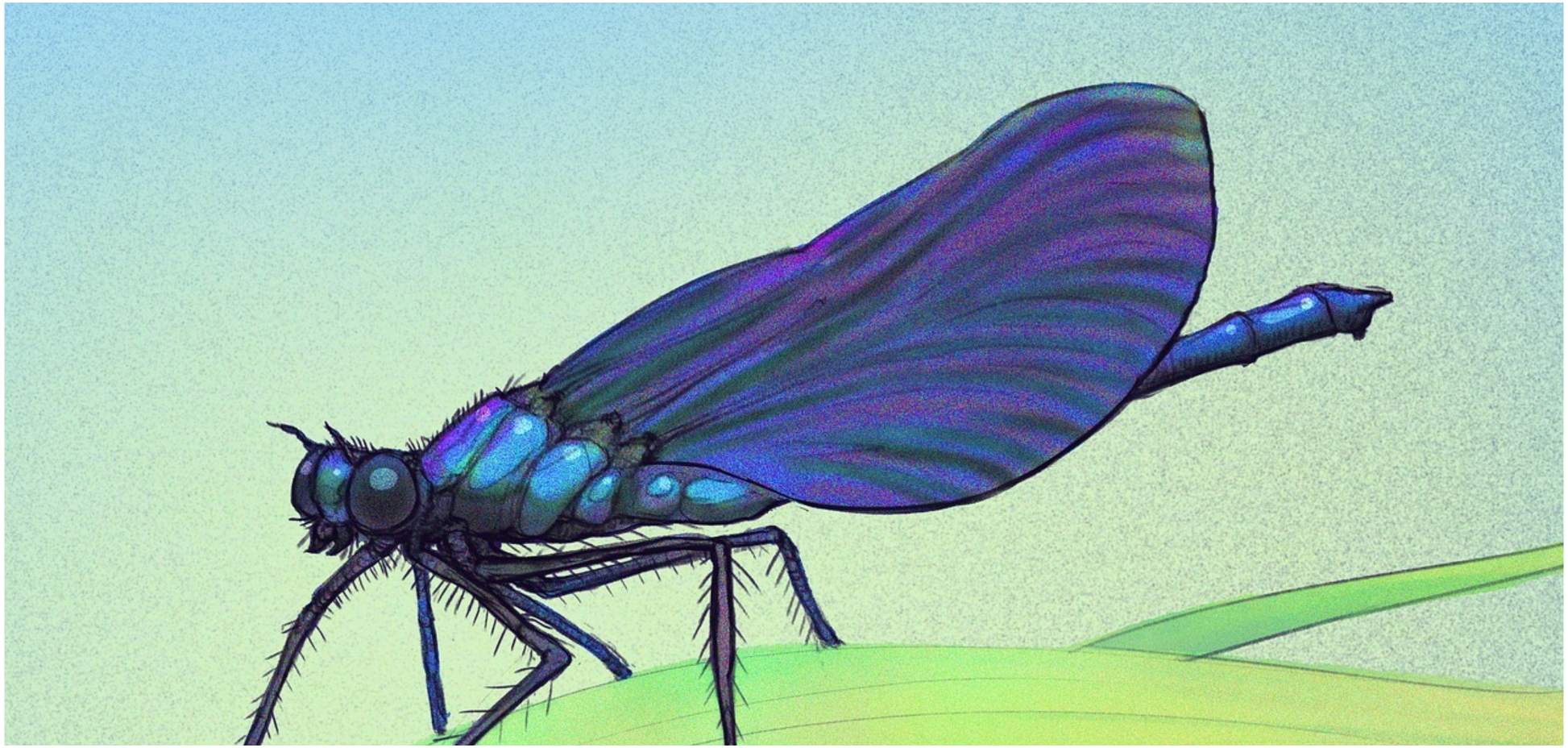
Fashion fades, style is eternal

What about Fashion in IT?



We're terrible at making predictions. Especially about the future.

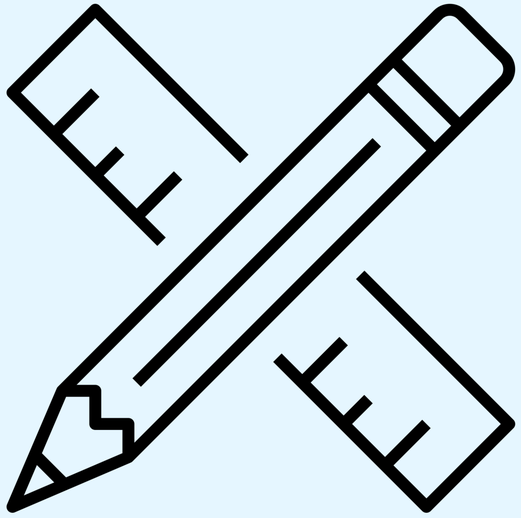
An alarming number of technology trends are flashes in the pan.



Lots of technologies just die. Period.

Some technologies keep receding into the future

What is good style in Application Architecture?

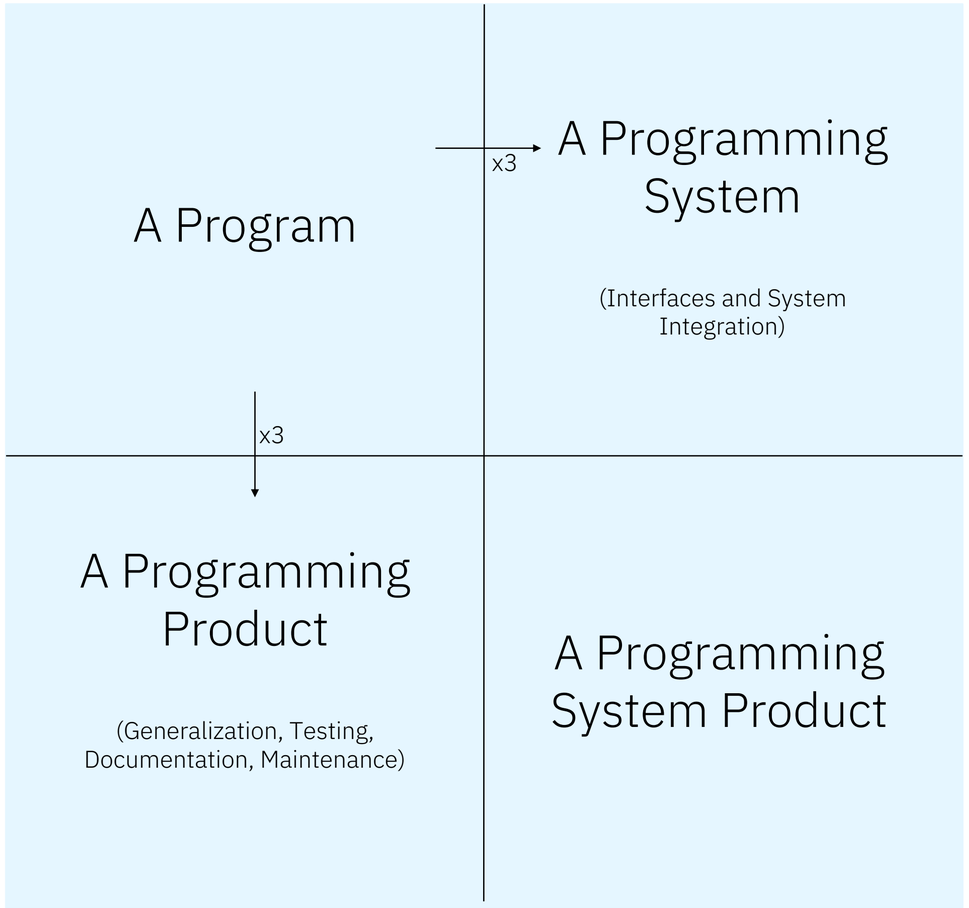


A more general Approach lend by the “real” Architects

Good architecture is a blend of functionality, aesthetics, sustainability, and emotional resonance:

- Functionality
- Aesthetics
- Sustainability
- Innovation
- Emotional and Cultural Impact
- User-Centric

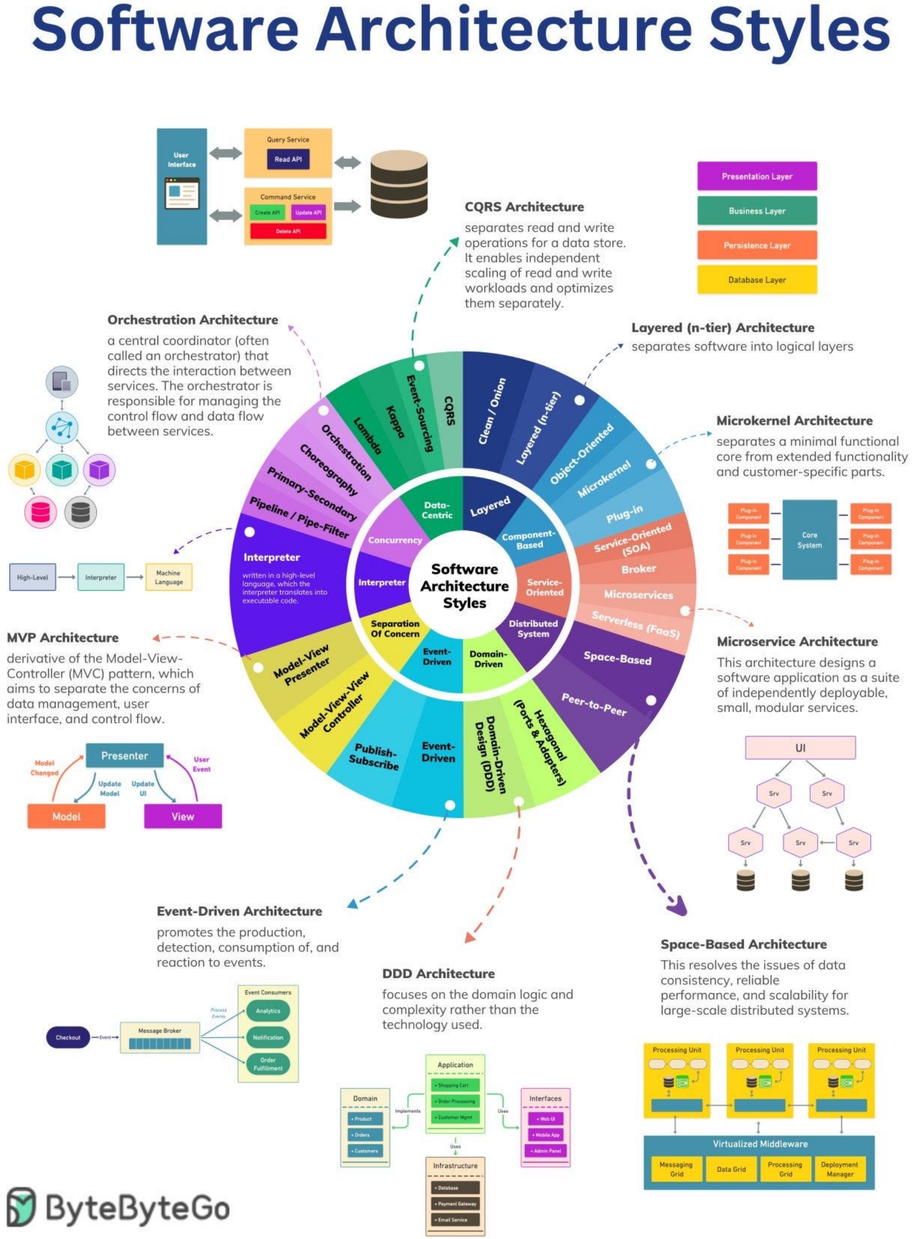
Basic Idea by Fred Brooks



What are general criteria for Software Architecture:

Well-designed architecture is:

- **Maintainable**: It's easily adaptable to new features, evolving requirements, and scaling needs.
- **Flexible**: The architecture can accommodate changes and adjustments efficiently.
- **Scalable**: It can be scaled up or down as needed.
- **Reliable and Available**: The system can operate under predefined conditions and maintain high availability.



Can you spot a conflict?

Tobi’s opinion:

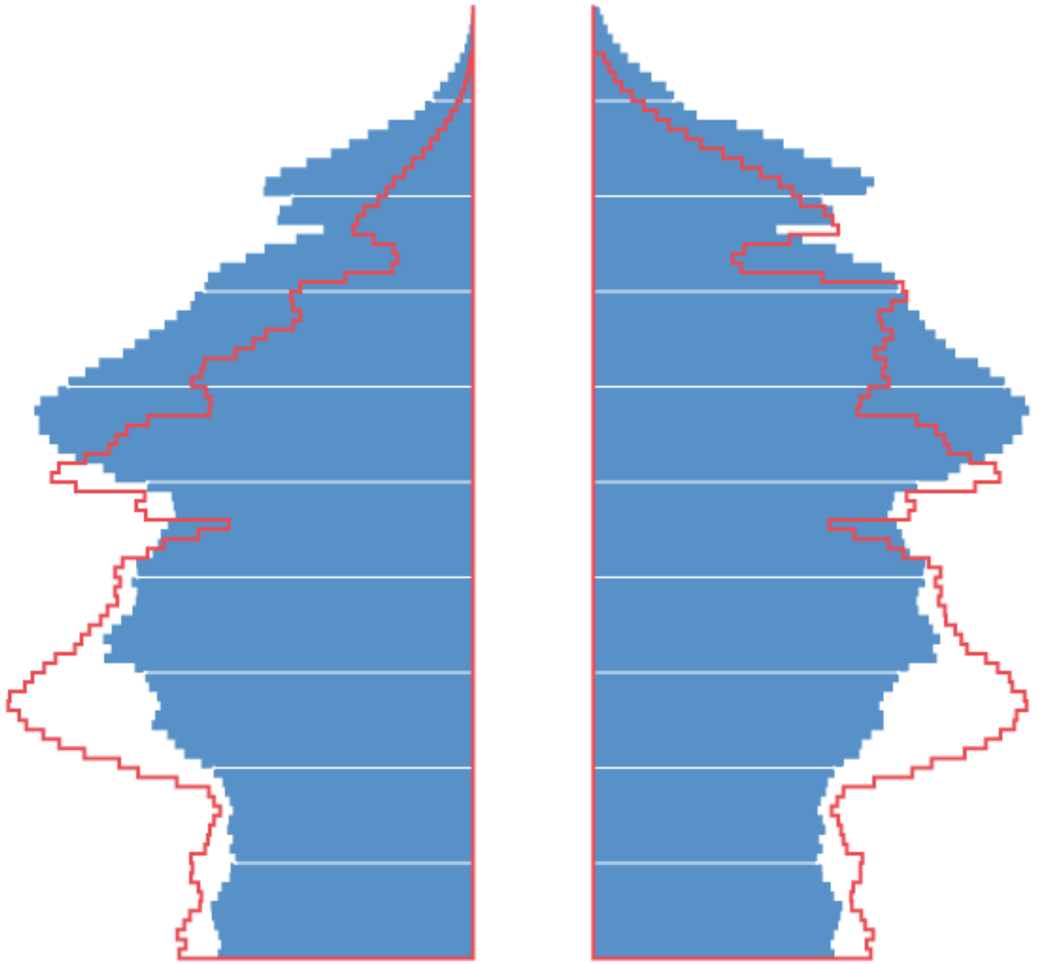
We in IT mostly do not care what the best needed solution is…

WHAT IS HE SAYING ?

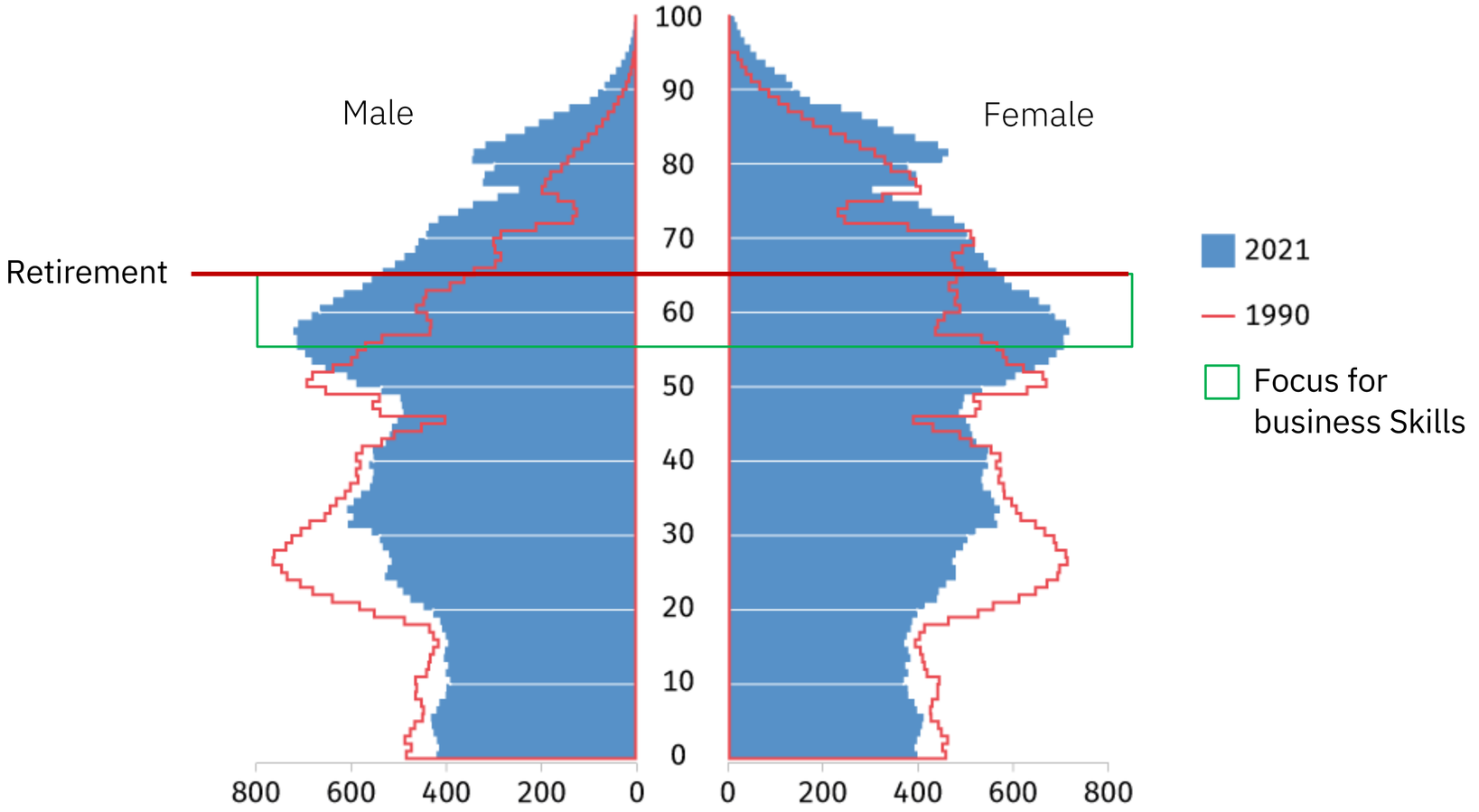

Developers
love to
play!


So What? Can’t we have fun at work? What is your Problem dude?

Was ist das?



The Age Distribution of the German Population 1990 and 2021



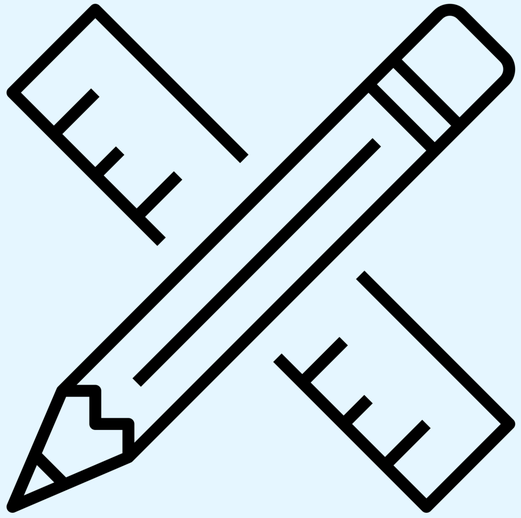
2021

1990

Focus for business Skills

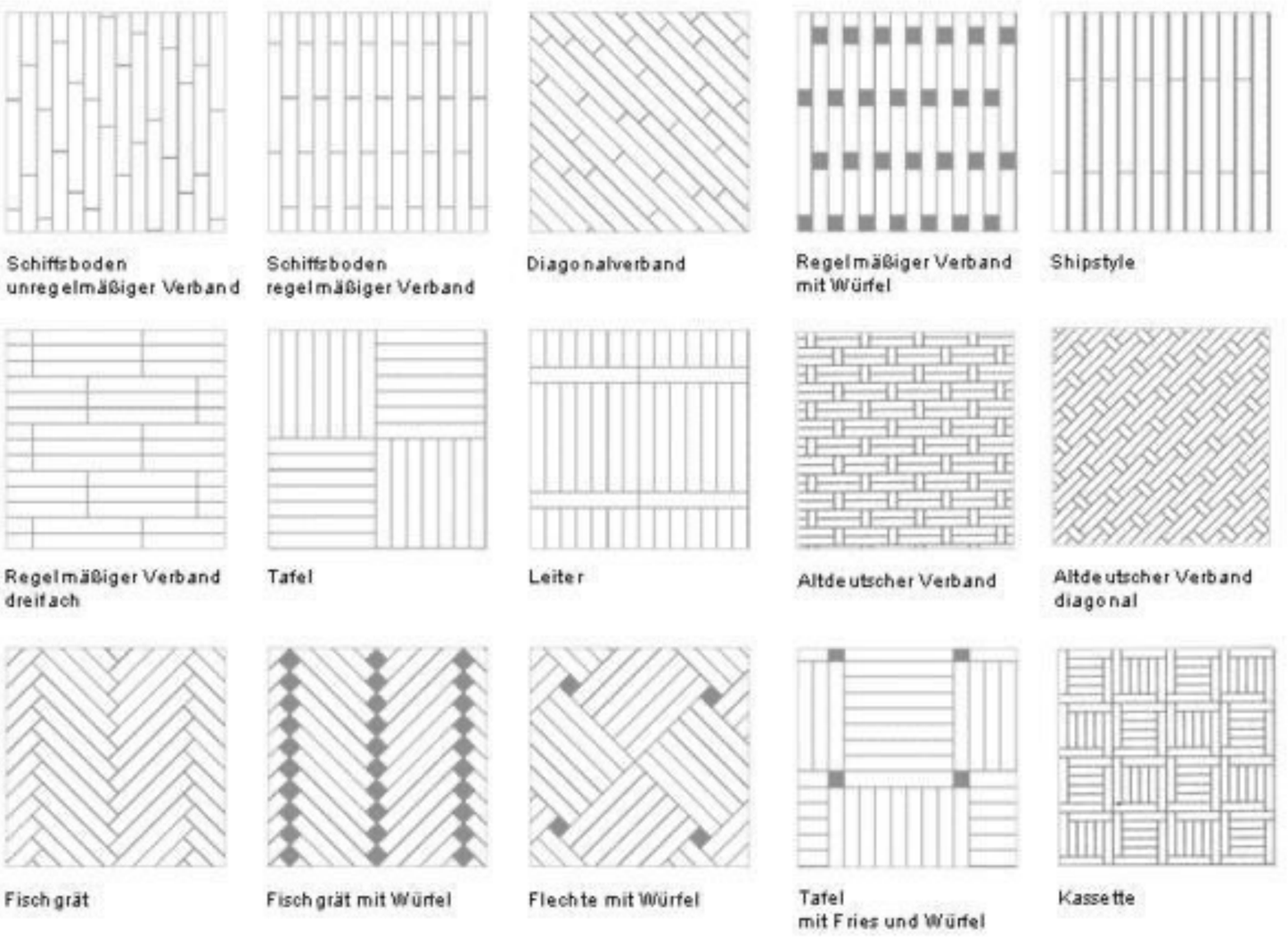
Switzerland

How to fix the issues we really have?

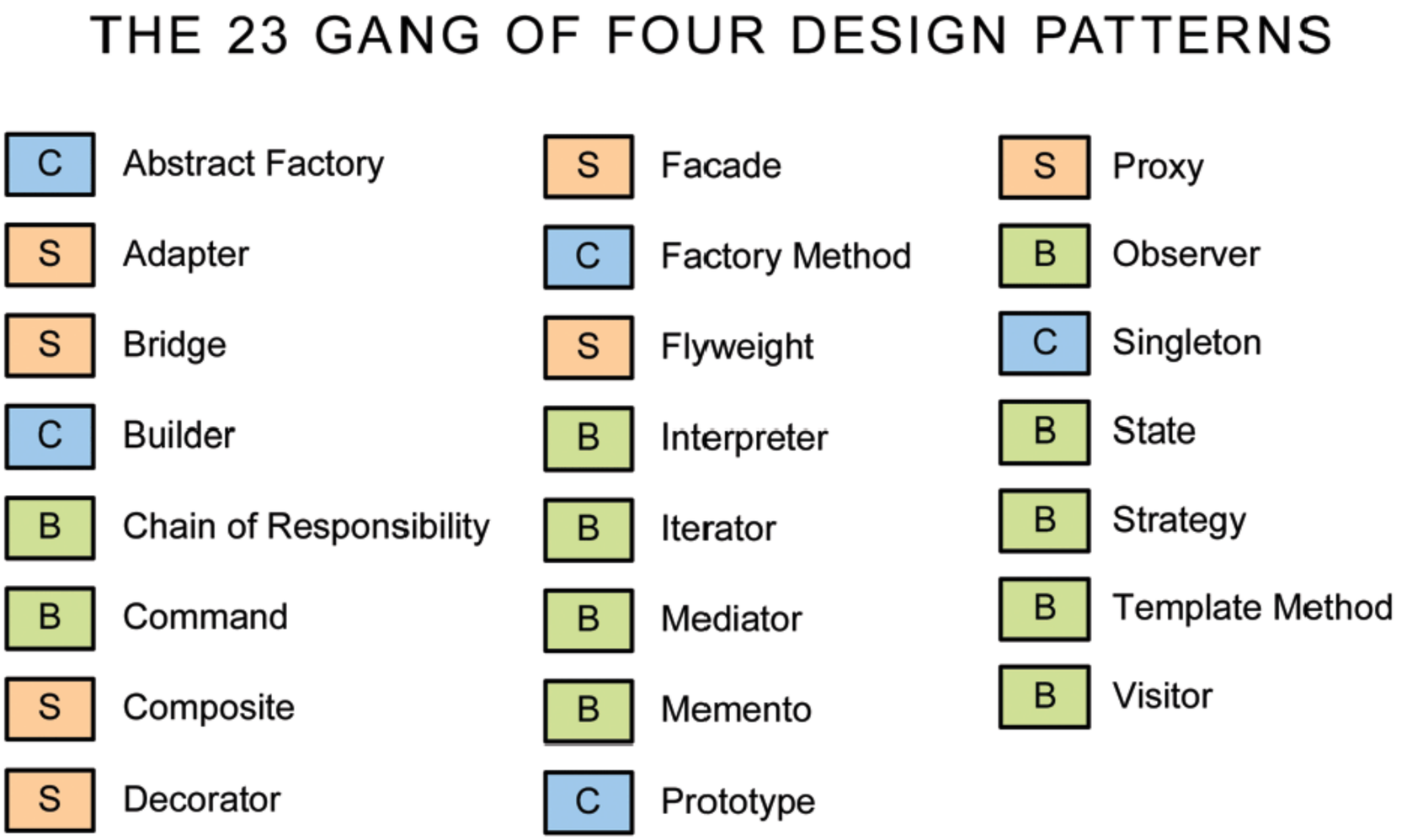


1. We can solve nearly of our Problems with the technology at hand

Crafting always used Patterns!



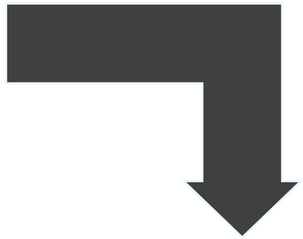
The traditonal (GoF) Patterns consiste of Patterns that care about how to create Objects (Creational Patterns), how objects are composited and are in context with each other's (Structural Patterns) and finally how objects interact with each other’s and how responsibilities are flowing amongst them. There are meanwhile a lot more patterns. Good Craftspeople know and apply them at any point



2. Less Fashion, more style and quality

Good code matters more than fancy frameworks or cool languages

```
void remove_list_entry(linked_list* entry)
{
  linked_list* prev = NULL;
  linked_list* walk = head;
  while (walk != entry) {
    prev = walk;
    walk = walk->next;
  }
  if (!prev) {
    head = entry->next;
  } else {
    prev->next = entry->next;
  }
}
```

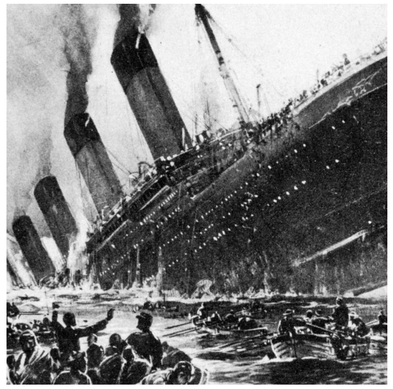


```
void remove_list_entry(linked_list* entry) {
   // The "indirect" pointer points to the
   // *address* of the thing we'll update
   linked_list** indirect = &head;

   // Walk the list, looking for the thing that
   // points to the entry we want to remove
   while ((*indirect) != entry)
      indirect = &(*indirect)->next;

   // .. and just remove it
   *indirect = entry->next;
}
```

3. Less overengineering, more good craftspeople ship!

What difference does it make if you are an engineer or a craftsperson?

VS



Being a Craftsperson

Training: Craftspeople often acquire their skills through apprenticeships, vocational training, or on-the-job experience. Formal education is not always a requirement, and mastery is typically achieved through hands-on practice.

Skills: A craftsman typically possesses hands-on skills and expertise in a specific trade or craft, such as woodworking, metalworking, masonry, or other skilled manual labor. Craftsmen often work with traditional tools and techniques and focus on producing high-quality, often custom-made, products or services.

Scope: Craftspeople typically work on a smaller scale, producing tangible, often one-of-a-kind, objects or providing specialized services in their respective crafts. Their work is often artisanal and may involve a high level of attention to detail.

Being an Engineer

Training: Engineers typically have formal education, often with a bachelor's degree or higher in engineering or a related field. They also frequently undergo internships and gain practical experience during their education.

Skills: An engineer, on the other hand, is a professional who applies scientific and mathematical principles to design, develop, and optimize systems, structures, or products. Engineers work with advanced tools, software, and technology to create innovative solutions and often have a strong foundation in mathematics, physics, and engineering principles.

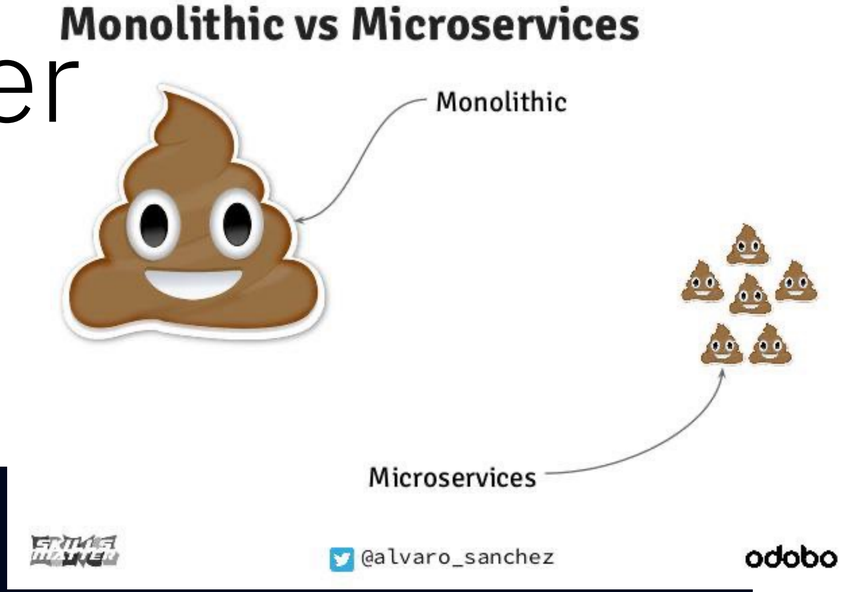
Scope: Engineers work on a broader scale, tackling complex projects that can range from designing bridges, electrical systems, and software applications to developing industrial processes or solving environmental problems. Their work often has a more significant impact on society and technology.

Lets follow some wise people

“The difference between style and fashion is quality.”

- Giorgio Armani

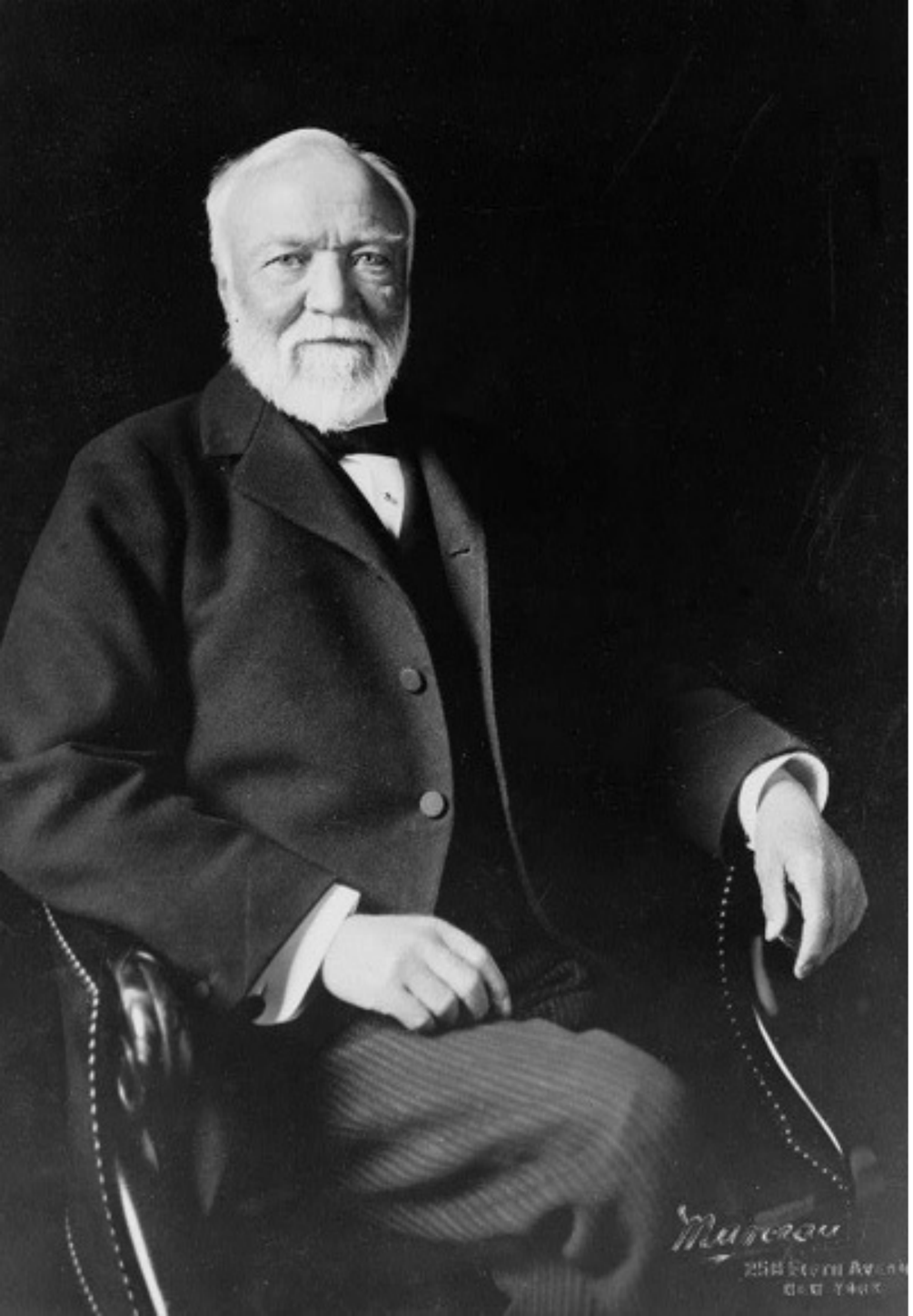
Microservices are not the Answer



Video Streaming

Scaling up the Prime Video audio/video monitoring service and reducing costs by 90%

The move from a distributed microservices architecture to a monolith application helped achieve higher scale, resilience, and reduce costs.



“The surest foundation of a manufacturing concern is quality. After that, and a long way after, comes cost.”

- Andrew Carnegy

We need good Developers!

Be an Engineer, not a Frameworker

Time to level up.

John Raines · Follow

10 min read · Mar 7, 2022

2.9K 37

“The general tendency is to over-design the second system, using all the ideas and frills that were cautiously sidetracked on the first one.”

“All programmers are optimists”

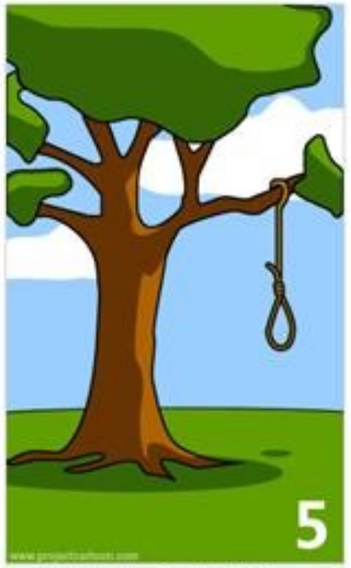
- Fred P Brooks

How the customer explained it

How the project leader understood it

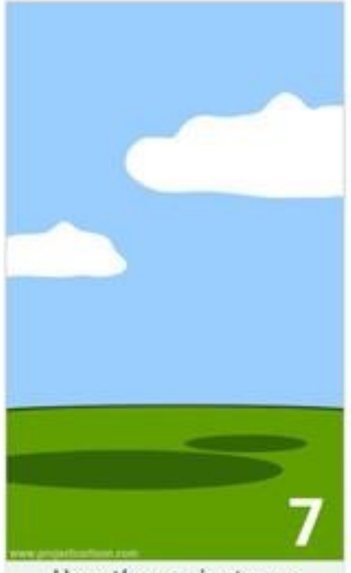
How the analyst designed it

How the programmer wrote it



What the beta testers received

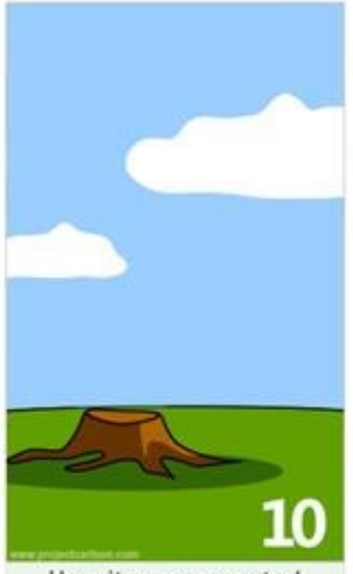
How the business consultant described it



How the project was documented

What operations installed

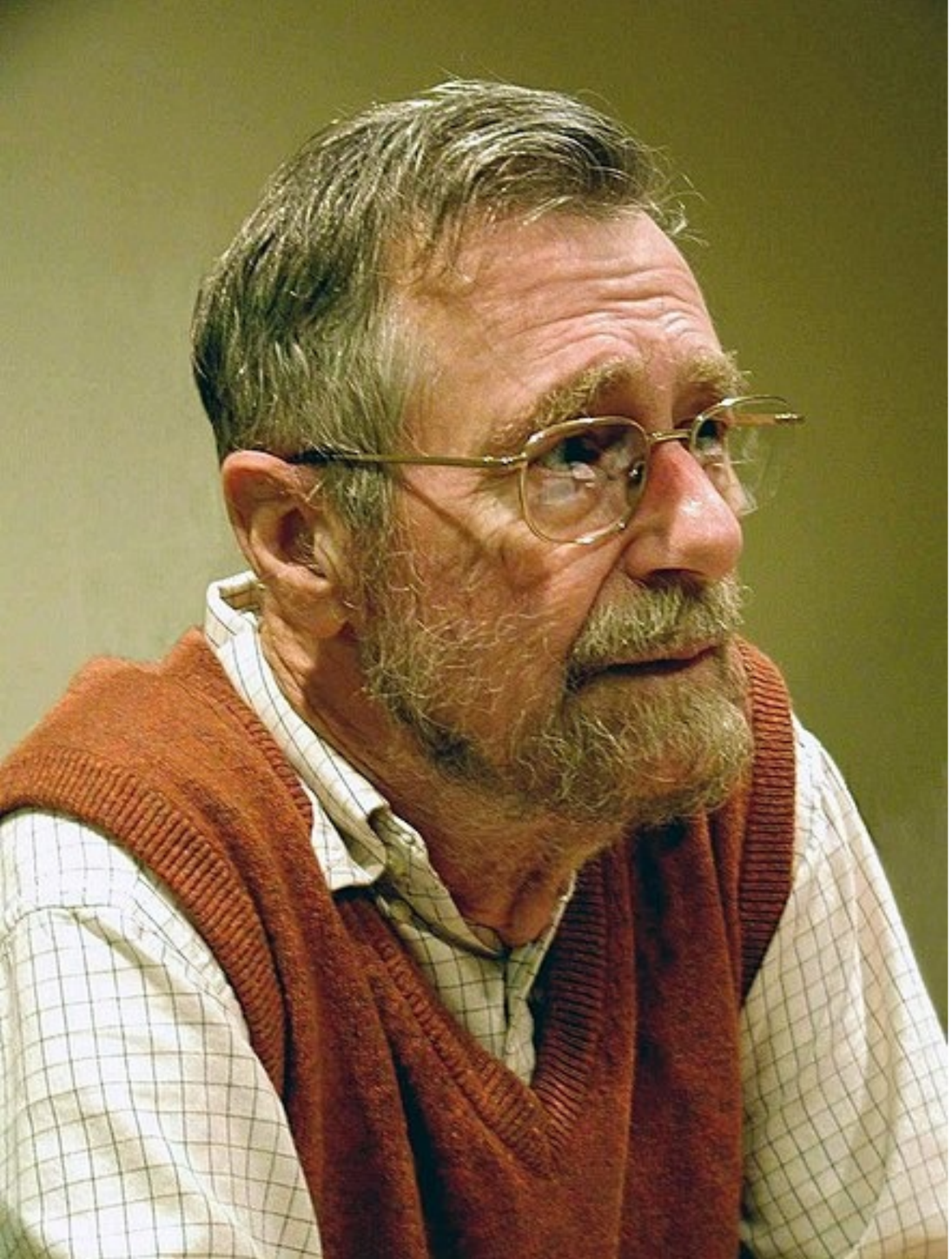
How the customer was billed



How it was supported

What marketing advertised

What the customer really needed



“Computer Science is no more about computers than astronomy is about telescopes.”

- Edsger W. Dijkstra

Let’s ask a real Expert in this, meet Steve, who started with the S/360 and still works on z16

“Did Development really change in the last centuries?”

“Of course the Development Tools and Deployment Processes, but wait actually **Development did not change that much all.**

The most important thing is to understand what it is you want the programm to do, the rest is pretty much straight forward”

“Nothing ever get thrown away, actually the only thing thrown away pretty frequently is Programming Languages”

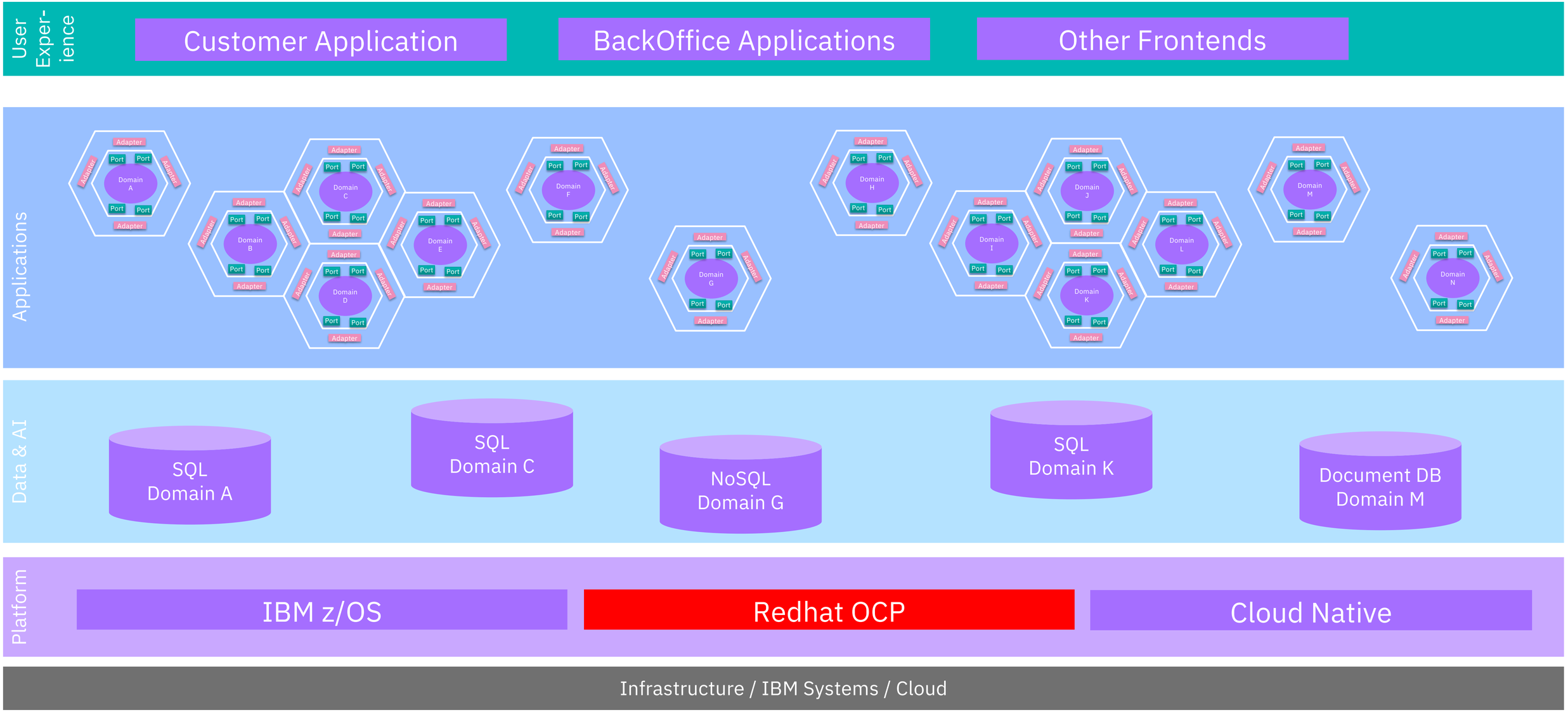
“The computer was born to solve problems that did not exist before.”

- Bill Gates

“All parts should go together without forcing. You must remember that the parts you are reassembling were disassembled by you. Therefore, if you can’t get them together again, there must be a reason. By all means, do not use a hammer.”

- IBM Manual, 1925

A reference Architecture for state of the Art Core Applications



"Lügen erscheinen dem Verstand häufig viel einleuchtender und anziehender als die Wahrheit, weil der Lügner den großen Vorteil hat, im voraus zu wissen, was das Publikum zu hören wünscht.”

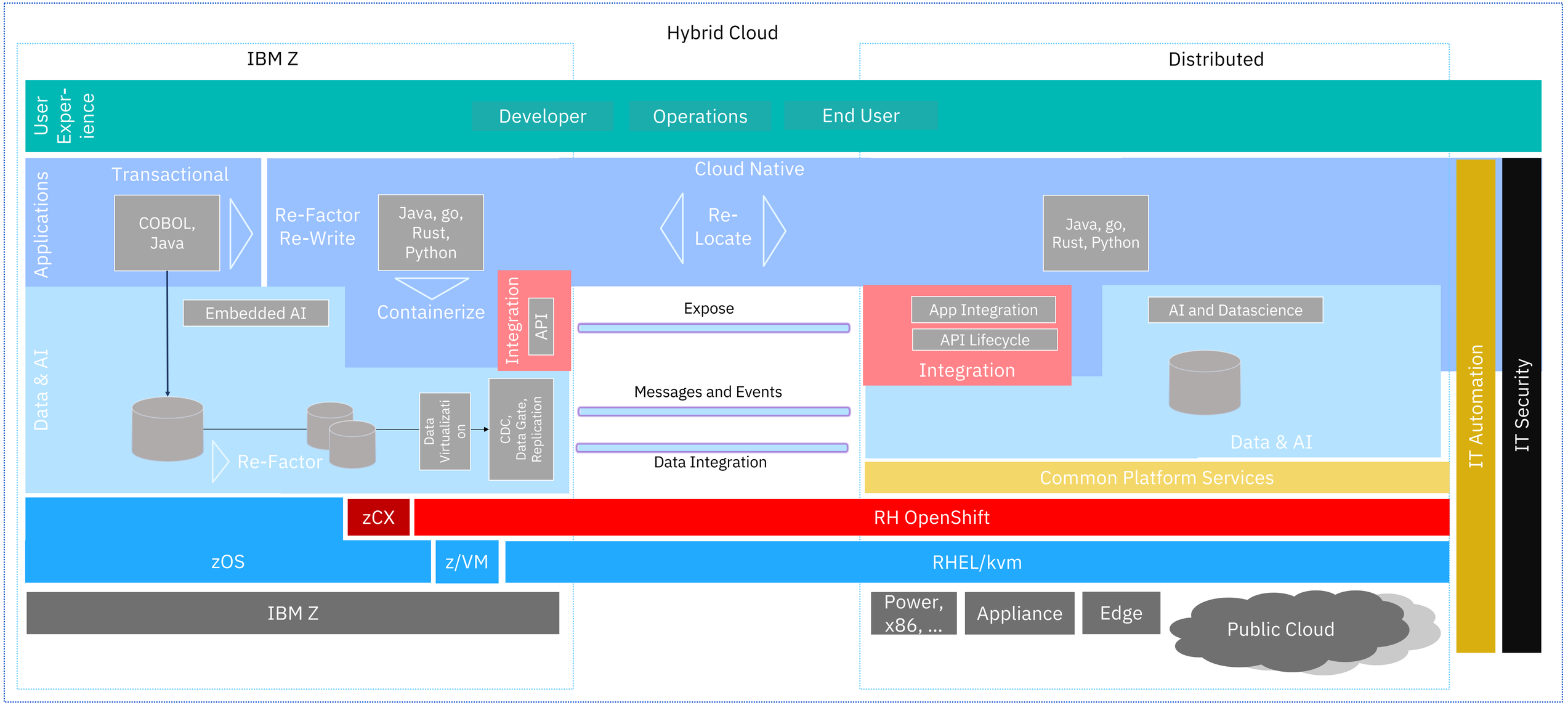
- Hannah Arnedt


AWS re:Invent
The world is asynchronous

“The human race builds too many walls and not enough bridges.”

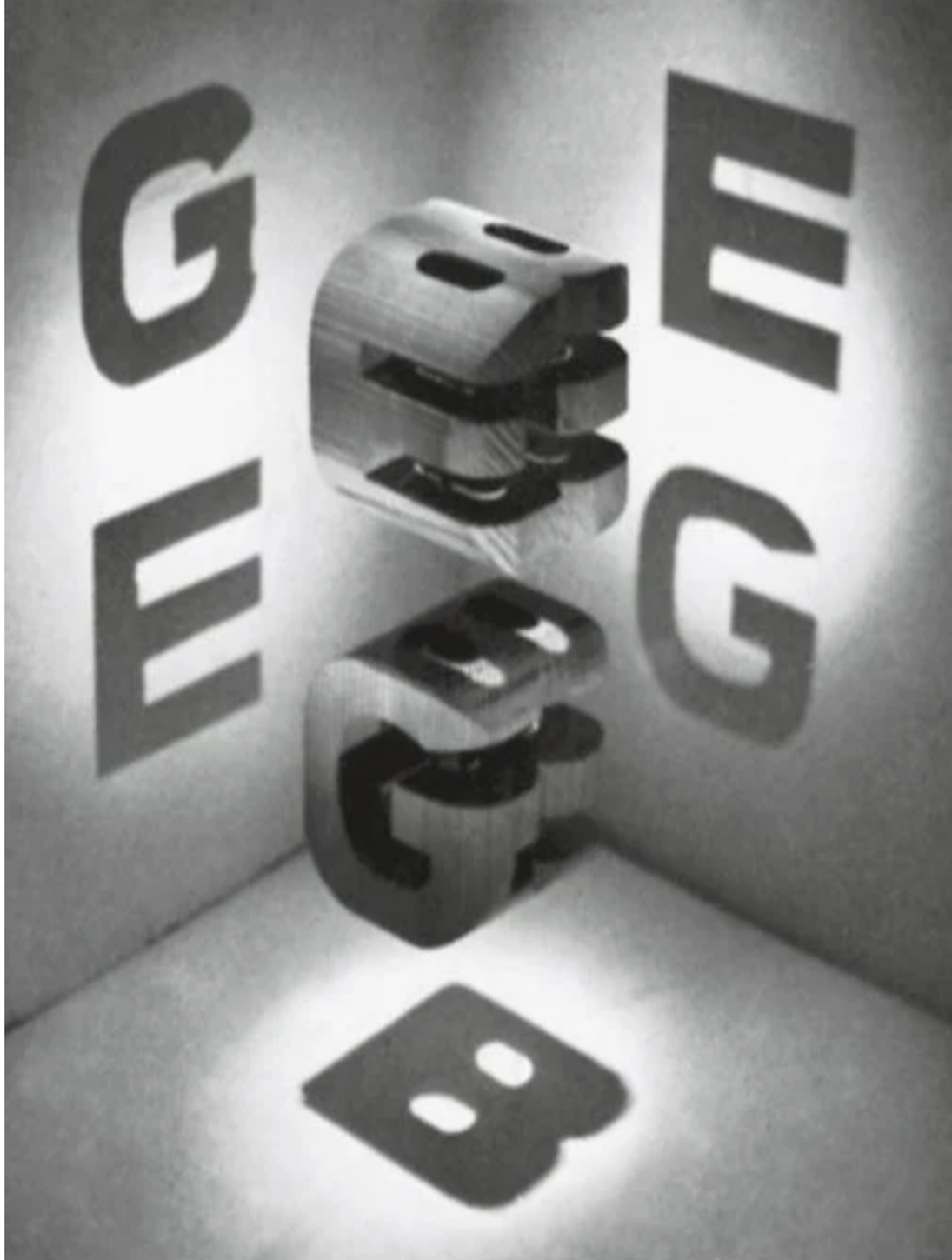
- Frank Lloyd Wright

A reference Architecture for a hybrid Cloud Architecture including IBM zSystems

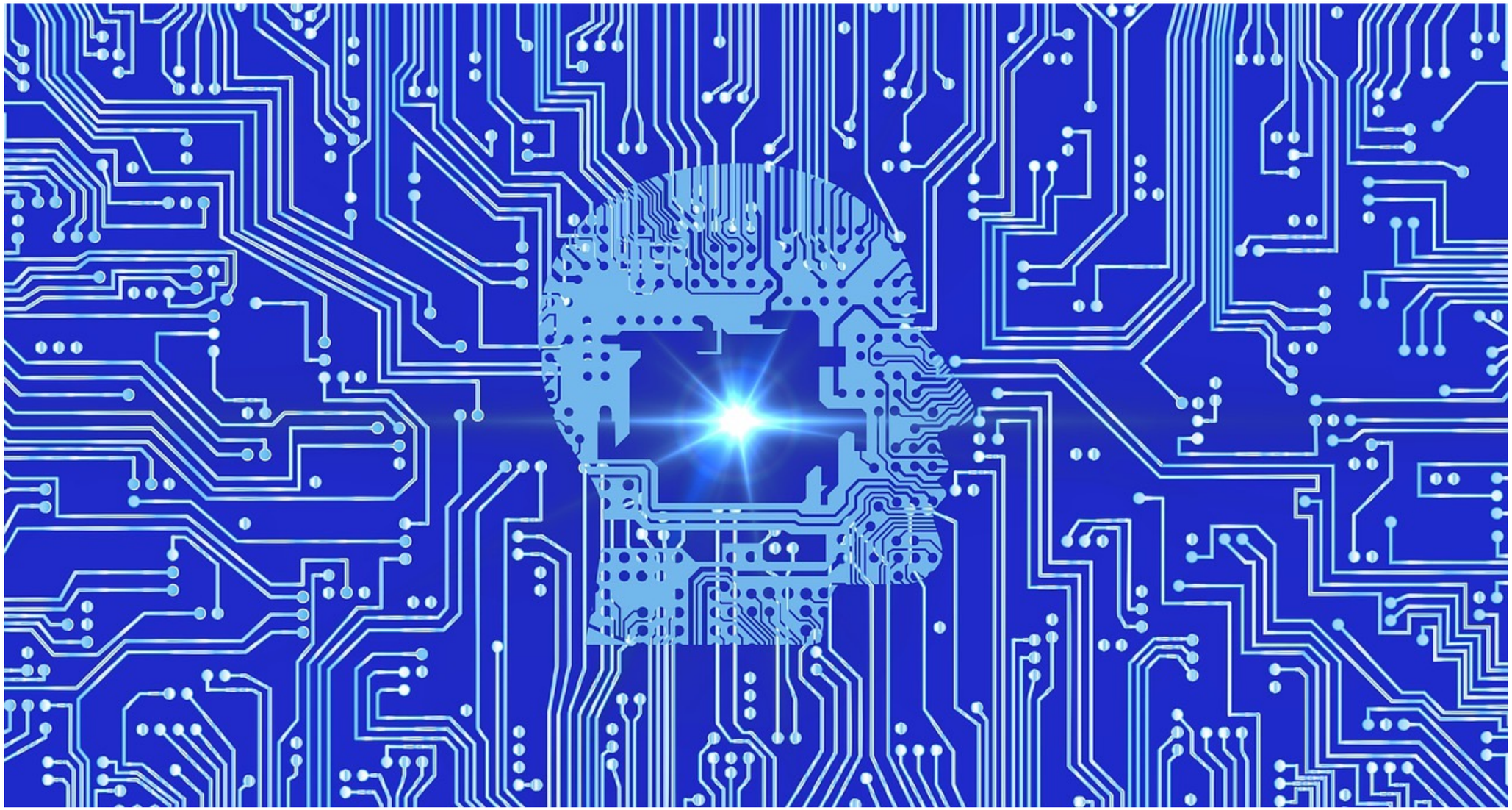


“Sometimes it seems as though each new step towards AI, rather than producing something which everyone agrees is real intelligence, merely reveals what real intelligence is not. ”

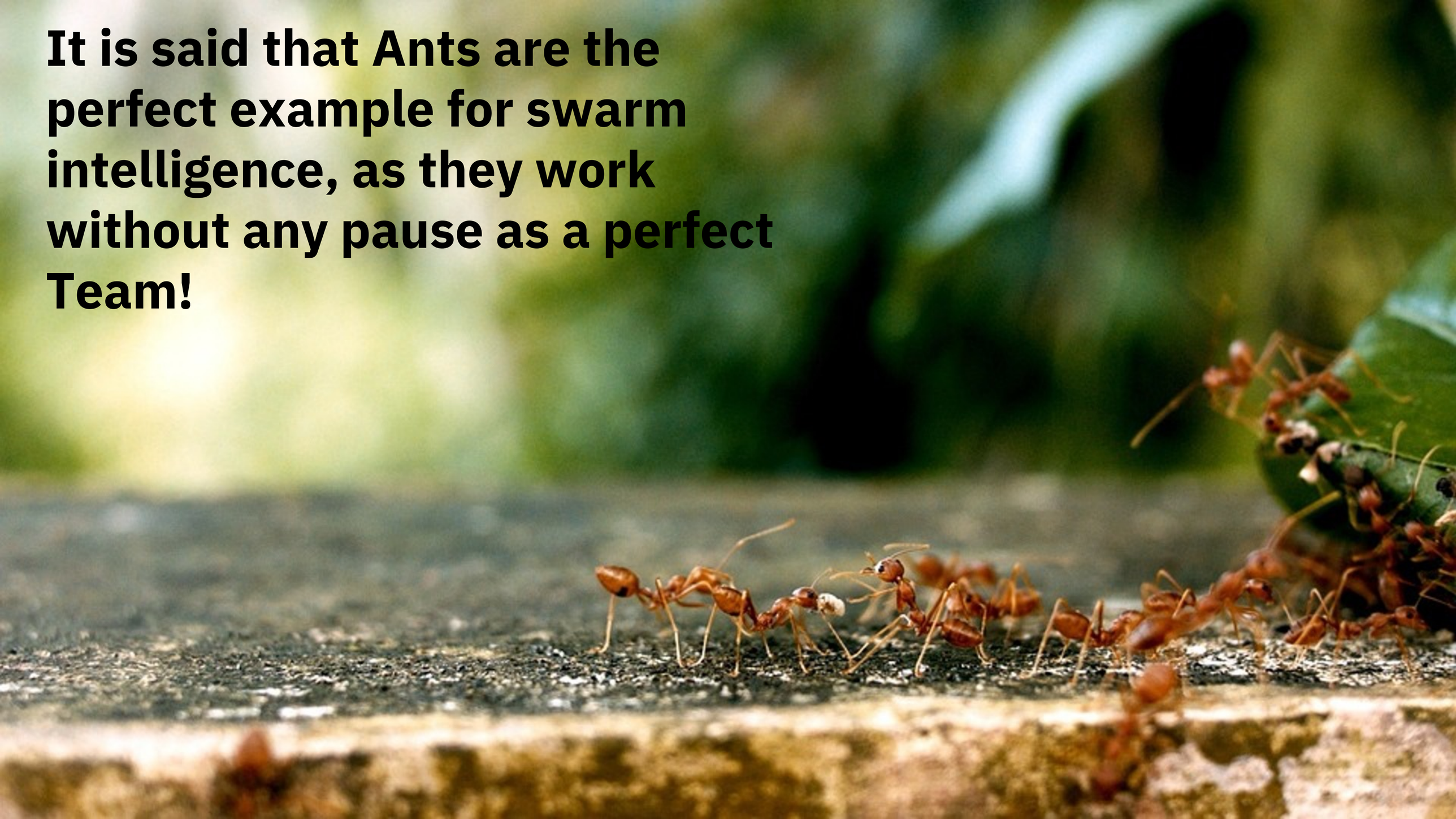
- Douglas R. Hofstadter



AI will not be the answer!



Common sense is not so common!


It is said that Ants are the perfect example for swarm intelligence, as they work without any pause as a perfect Team!

Only 2.6% of the Ants work together, a quarter does nothing and half of the ants sit at home doing nothing...

Daniel Charbonneau and Anna Dornhaus, Behavioural Ecology and Sociobiology (Bd. 69, S. 1459, 2015)


Ever noticed, that meetings
have strange dynamics?

There is a high chance that we sometimes act more stupid as a Swarm!

The Mainframe – A new Hope

A long time ago, in a galaxy far, far away....
It was a period of archaic computing.
Different Computer Architectures broke Customers Applications all the Time.

Because of a big investment of Tom Watson Jr, Son of the founder of IBM, a new Hope arise for all the users in the world. The information about this new Architecture was strong enough to safe the world of chaotic programming.

So a lot of IBM staff went on and tried to save the people and restore freedom to the galaxy...

System/360-40

TRACK 35
IBM
PRESS
CONFERENCE
8:30 AM
Departure.
Poughkeepsie,
New York
COACH
1
2

IBM SYSTEM/360

IBM SYSTEM/360

Now one new computer fills all your data processing needs

You can easily increase the size of SYSTEM/360 when your business grows or you want to add new applications.

You don't have to revise most of your programs. You don't have to switch to new input and output devices.

Any program that works on the smallest configuration can work on the largest.

Same goes for the programming systems. The simplest operating system, the simplest language translator or object program can work on any SYSTEM/360.

Same goes for input and output devices. Any printer, tape, storage unit, reader or terminal that works in a small configuration works in a larger one. You choose what you need now. You add new components when you need them.

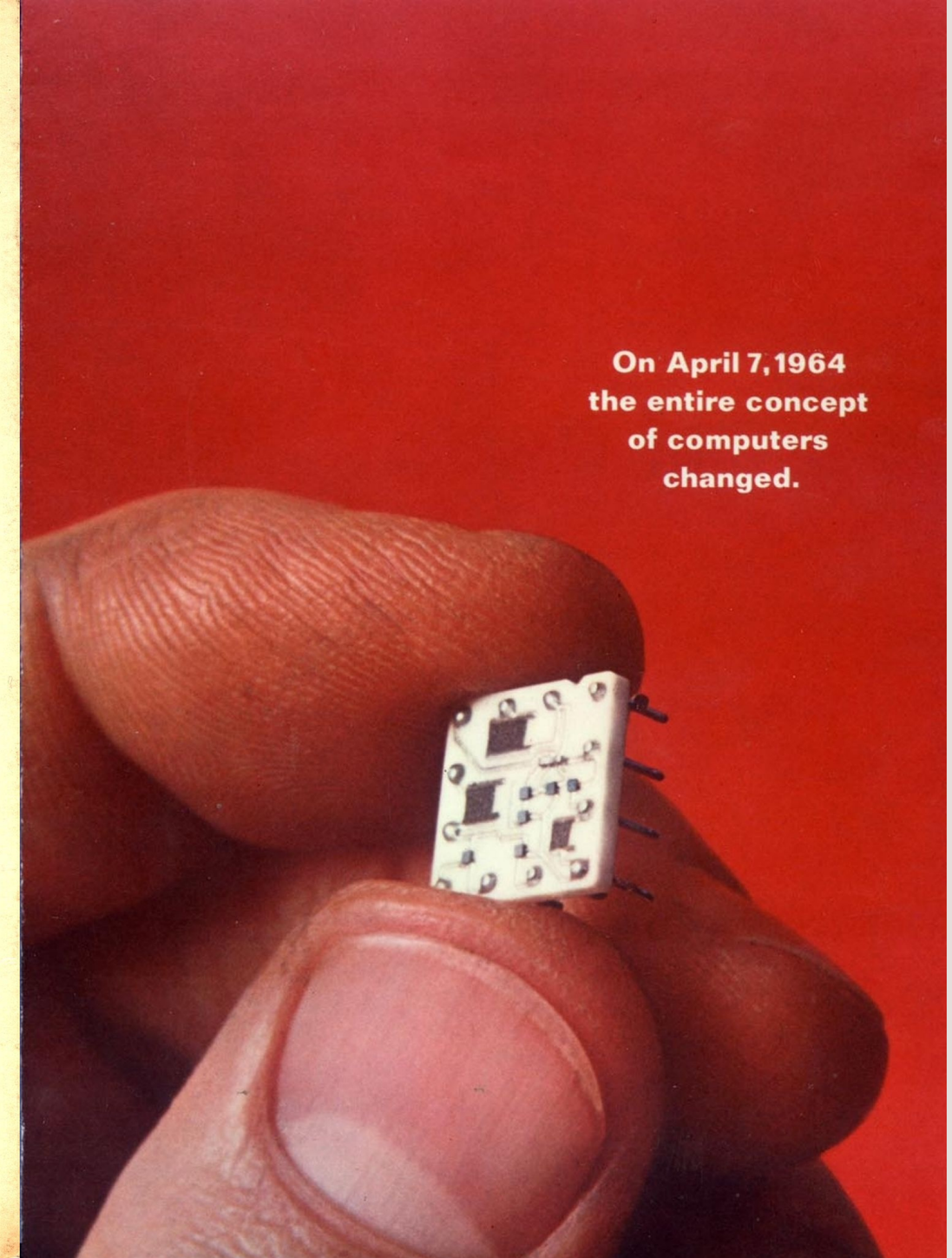
This is true from the smallest configuration to the largest configuration.

SYSTEM/360 solves today's problems. And it expands to solve tomorrow's problems, too.

It cuts today's costs....and it will also cut tomorrow's. There's never been a system quite like it.

IBM® DATA PROCESSING

Litho in U.S.A. 520-0958



IBM'S $5 BILLION GAMBLE

Thomas Watson Jr. believed that if you made computers smaller, cheaper, and more powerful, all businesses would adopt them. To achieve this vision, he bet the company and greenlighted the $5 billion IBM 360 project.

Die Designkriterien für IBM Z


Reliability

Availability

Serviceability

Security

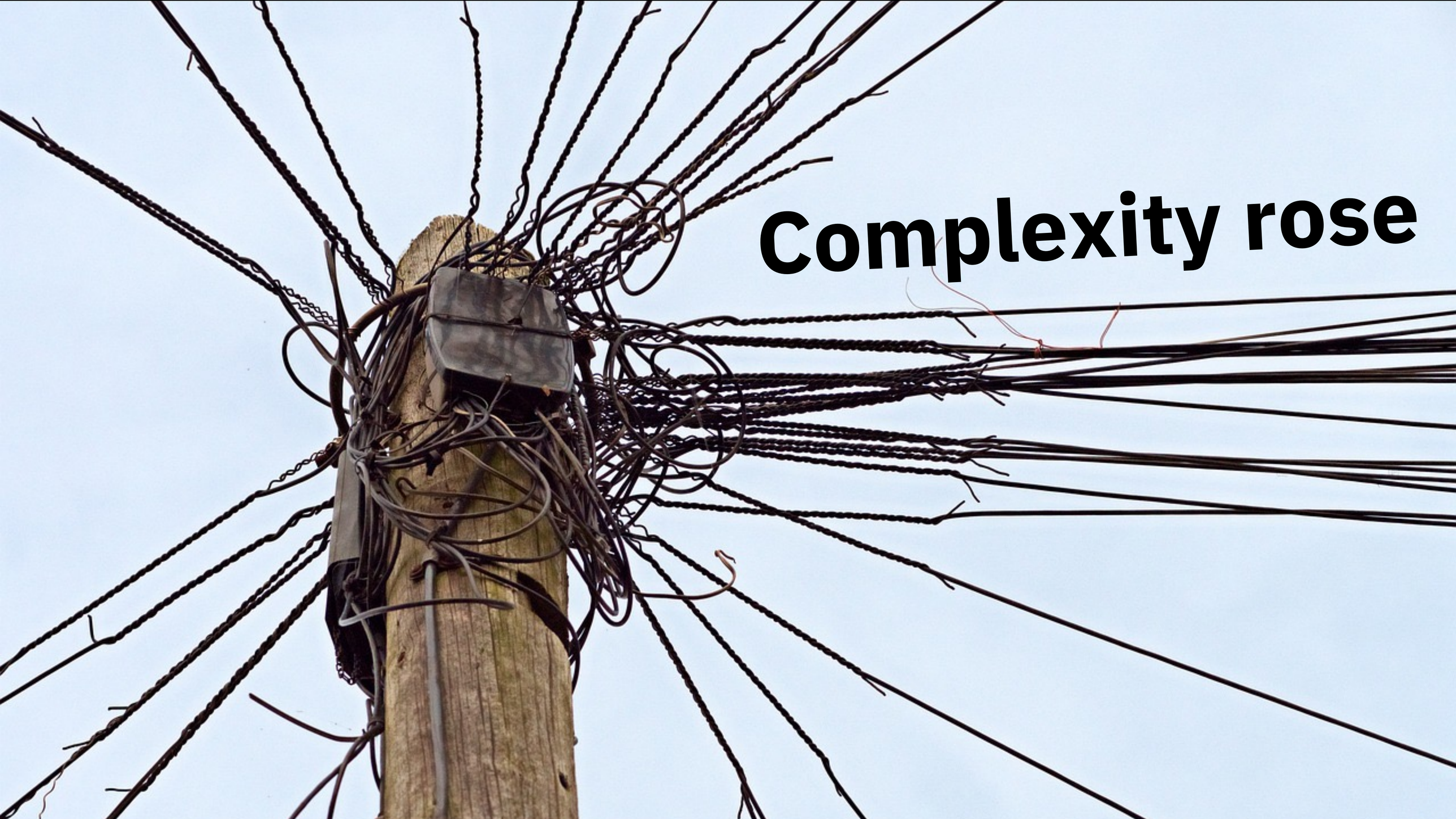
Compatibility

The Empire Strikes Back

It is a dark time for centralized computing. Although the dark of the chaotic computer architectures was fought a new complexity has arisen and have driven the Host forces from their base and pursued them across the world.

Still running the most critical systems the Mainframers hide in the dark and still run without any issues and nearly zero down time.

The distributed world caught up in many places and even the host was also enhancing the capabilities it has, a lot of people did think the mainframe was dead and the PC folks were shocked by the fact the Mainframe is their father.


Complexity rose


CeBIT
HANNOVER
13. - 20. 3. 2002
Wir stellen aus:
Halle 1, Stand B42
Vor dreißig Jahren lag sie voll im Trend.
Genau wie Ihr Mainframe.

Where is SUN today?

Return of the Mainframe

The young Generation working with System Z starts to form a rebellion against the masses of distributed servers in their datacenters. Even the newest weapons of the distributed world are meanwhile adapted by the Mainframe forces.

To fight against the still attacking distributed forces, the mainframe rebellion is sending Java and Linux into the battelfield to have the same weapons on both sides.

In the end, the Mainframe is still the central dataprocessing engine in the galaxy and it even proved that new workload can run cheap and highly available on the platform.

IBM Z und LinuxONE in Deutschland, Österreich & Schweiz

Essentieller Markt mit innovativen Kunden für die Weiterentwicklung von IBM Z

150+
Kunden in Deutschland, Österreich und Schweiz

20+
Business Partner unterstützen diese Kunden mit z/OS, VM, VSE, Linux

50+
Software Hersteller entwickeln Lösungen für IBM Z & LinuxONE

Durch enge **Zusammenarbeit mit IBM Labors** liefern DACH Kunden einen signifikanten Beitrag zur Roadmap von IBM Z (z.B. zBLC, Design Councils, Sponsor Users...

Starke Mainframe **Community** durch **IBM Events** (zSymposium, Zeit für Z, zPremier, Think,...), **GSE** und **Ökosystem** Veranstaltungen

Innovative Lösungen auf IBM Z, LinuxONE und HyperProtect Services in IBM Cloud

IBM Labors in **Böblingen** und **Rueschlikon**

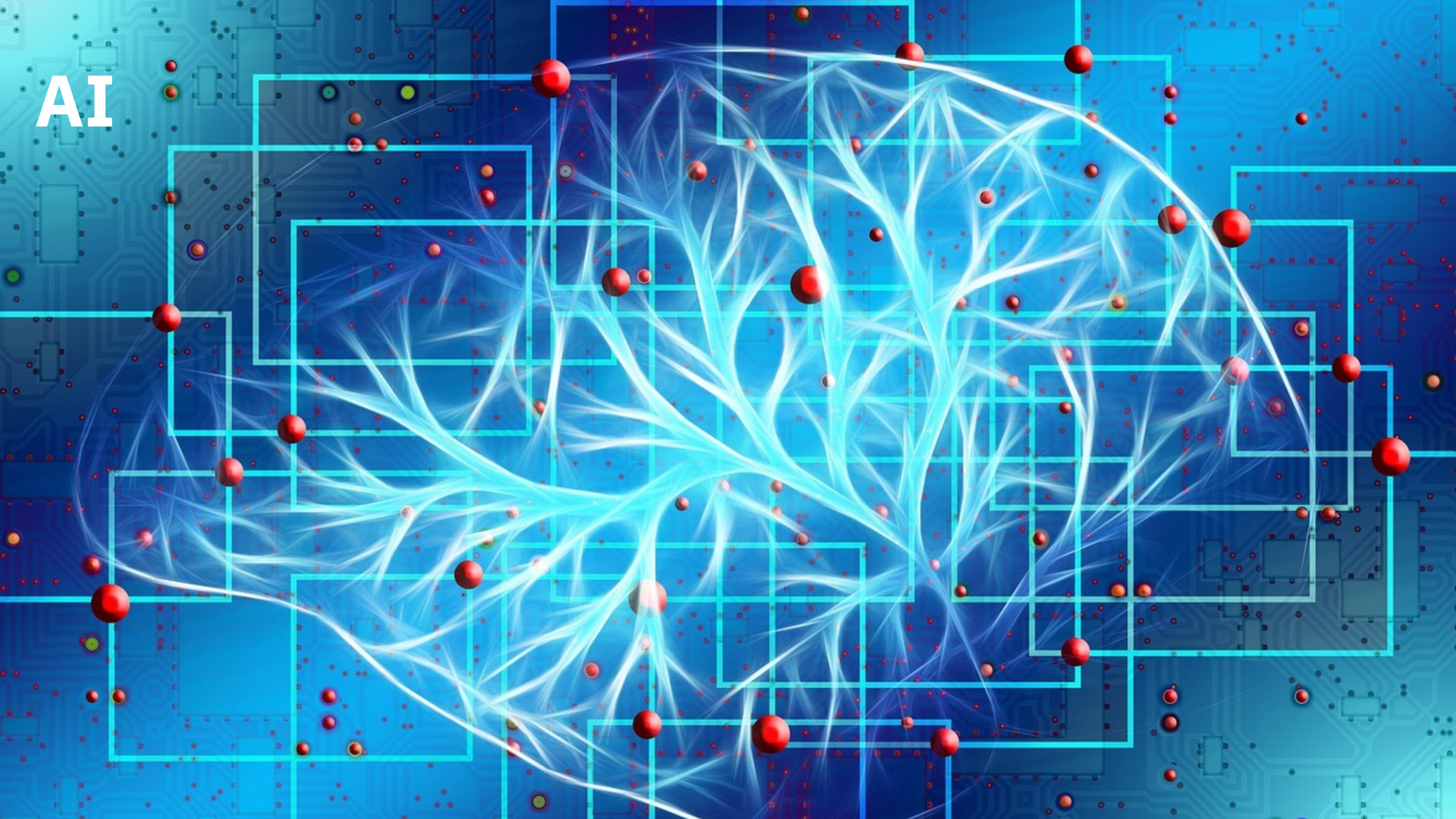
Fokus auf Skills

- 3 Hauptschulungspartner
- Young Talent Community
- Kooperation mit 20+ Universitäten
- Academic Mainframe Consortium
- European Mainframe Academy

5 Gründe warum IBM Z eine Plattform mit Zukunft ist!

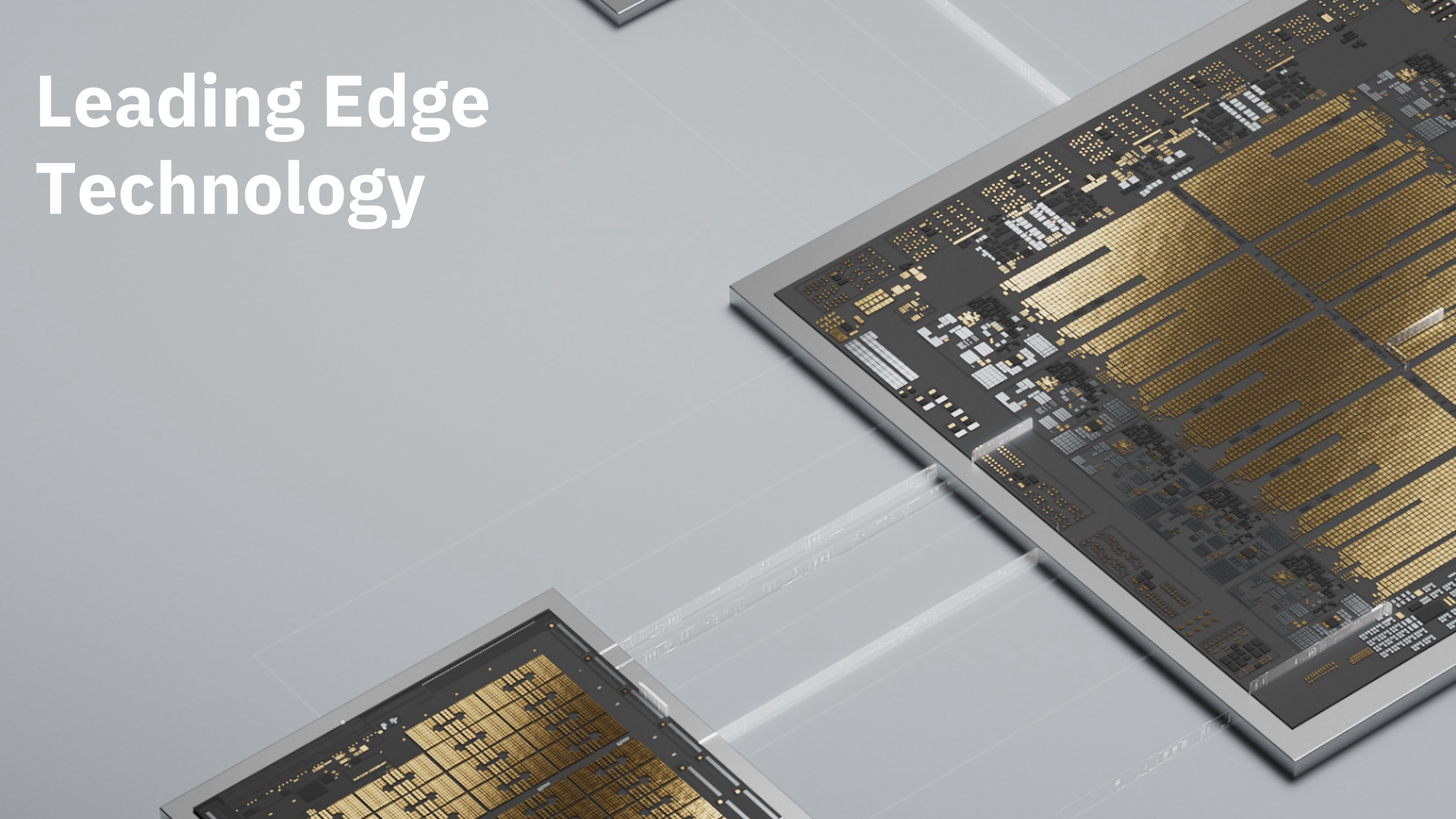
Nachhaltigkeit mit IBM Z

Highest SLAs

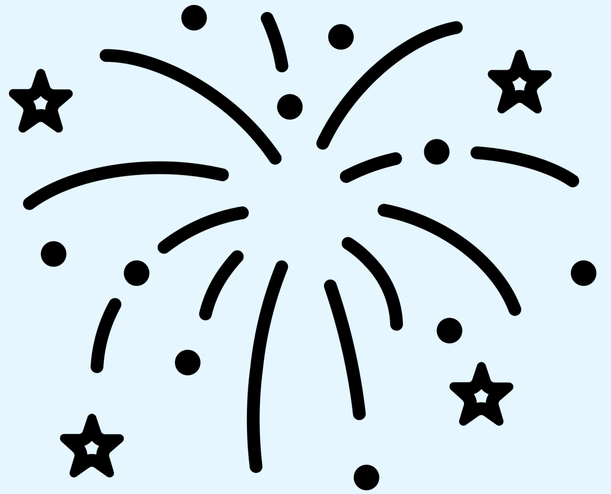

AI

Cyber Security

Leading Edge Technology

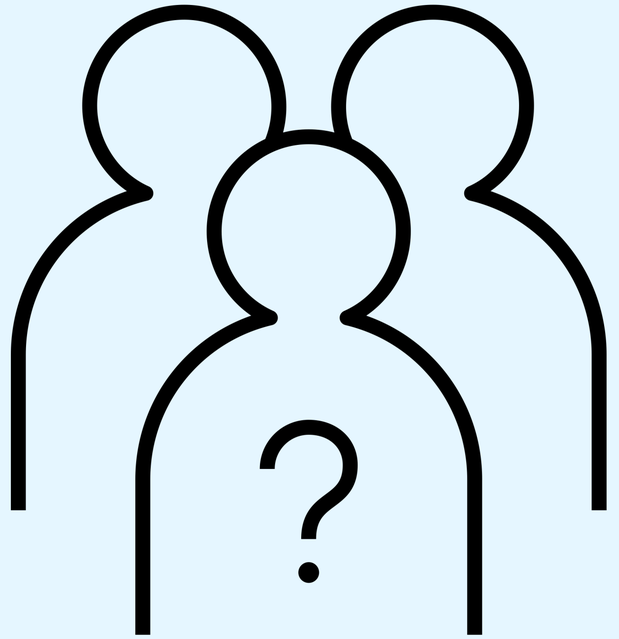


Also ist alles gut?



We need to work on our application landscape!

So what are reasons to act?



The business is changing

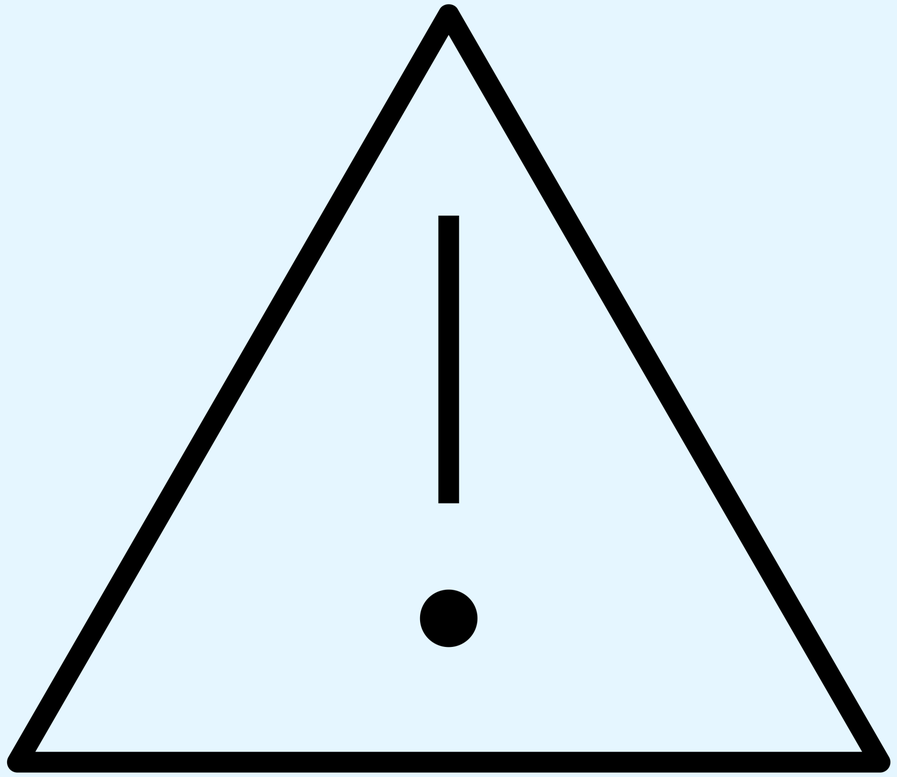
Technical Debt

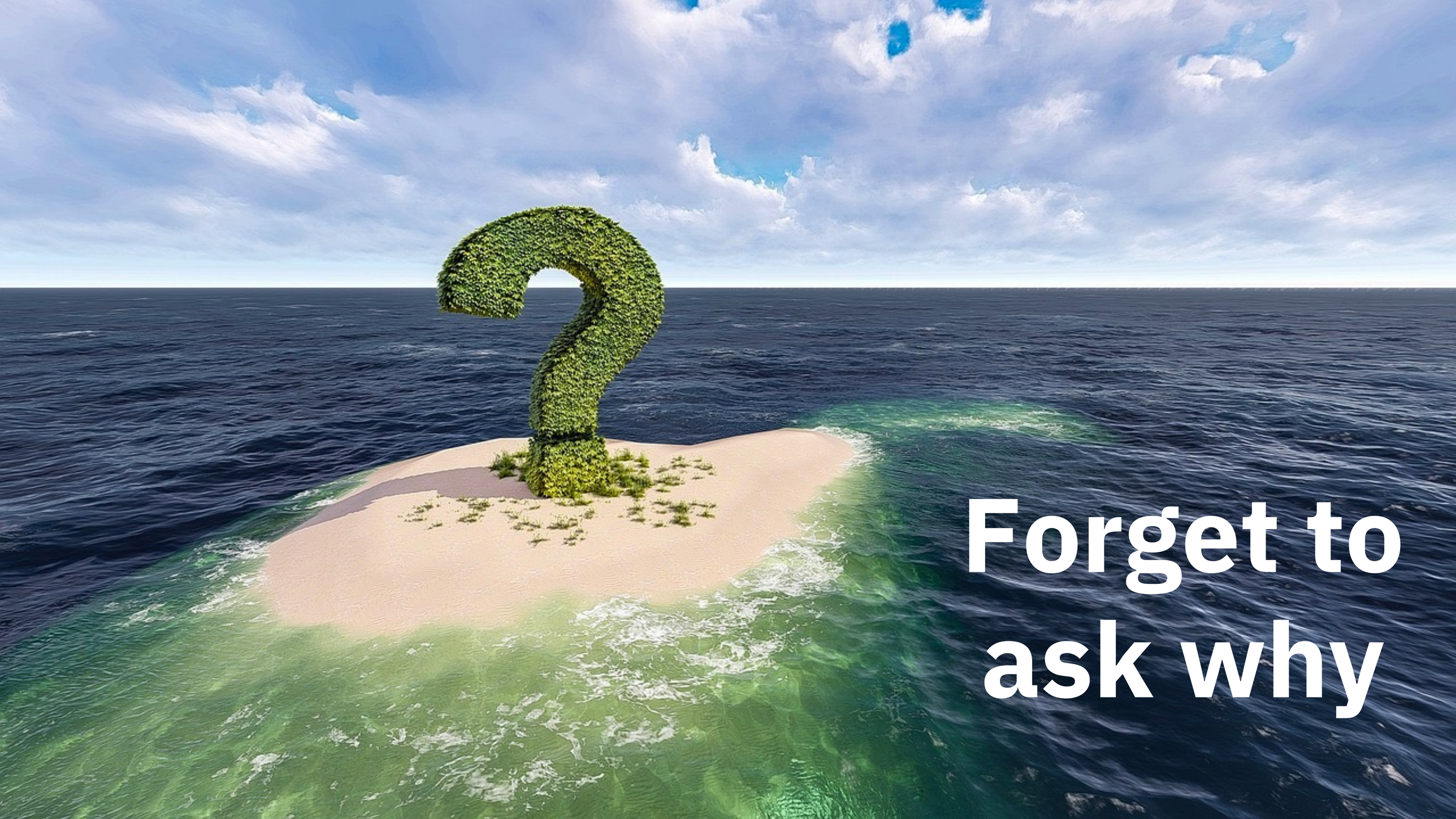
Security is at risk

Missing Skill


Cost

Anti-Patterns to avoid



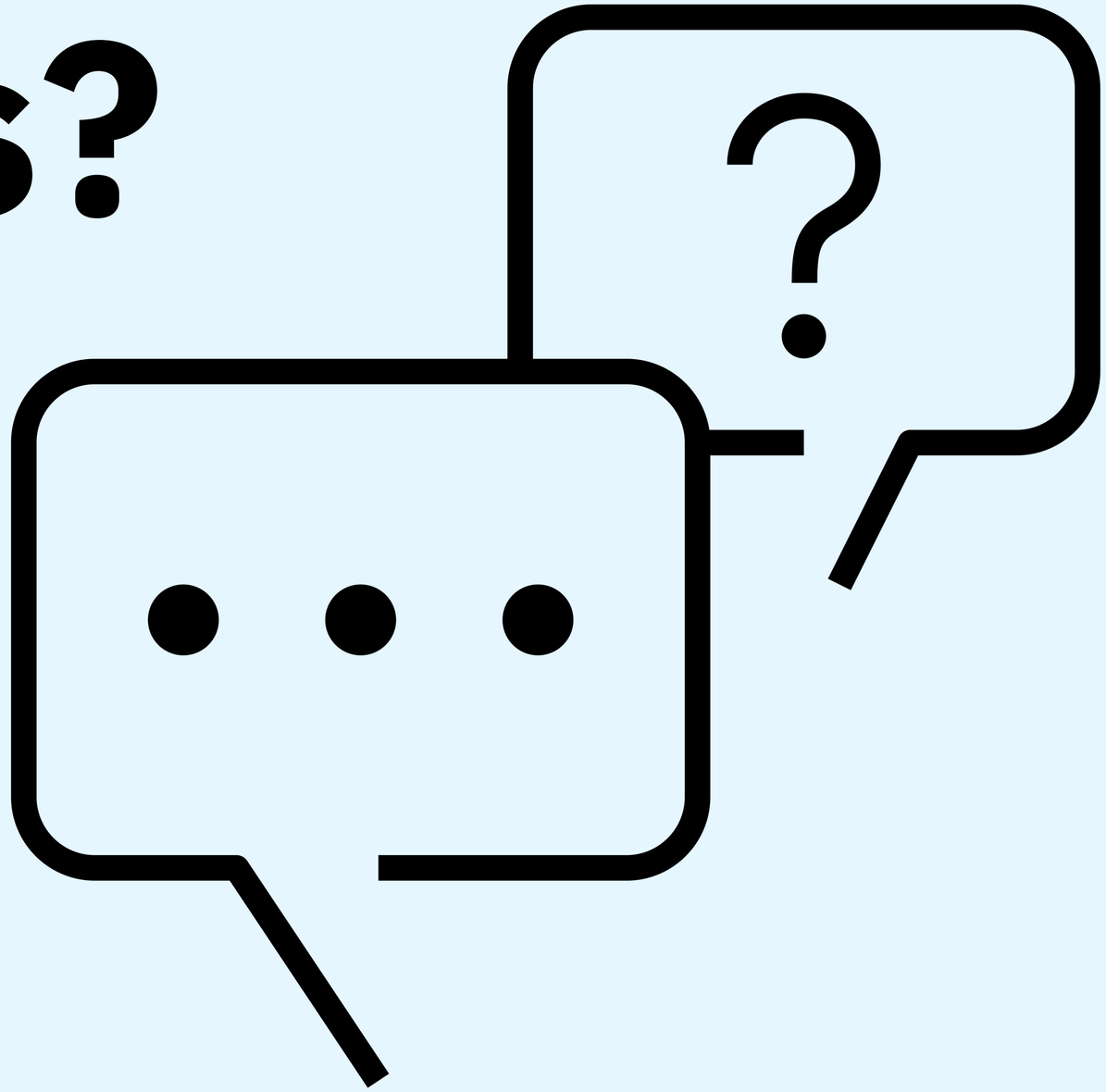

Forget to
ask why


Believe
in Magic
or silver
Bullets

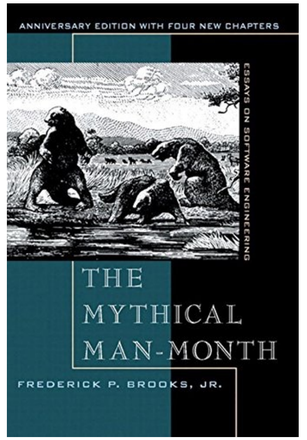

It’s
Old


Follow
the
Mainstream

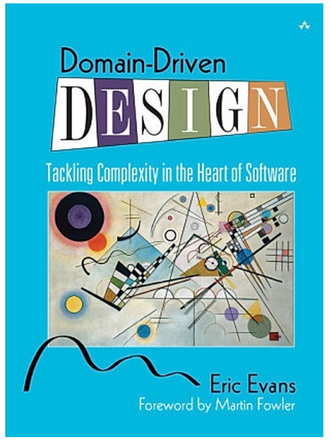
Questions?



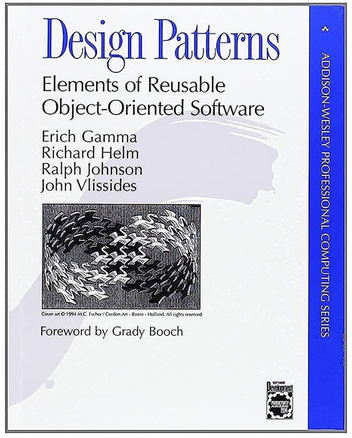
Tobi’s Reading Recommendations



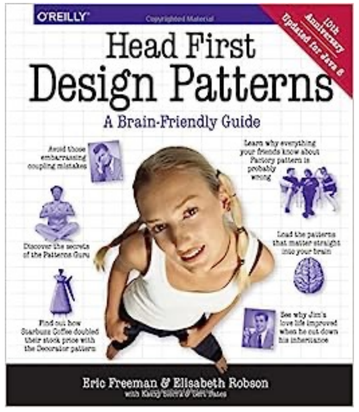
Learn how we did not made progress and do better!



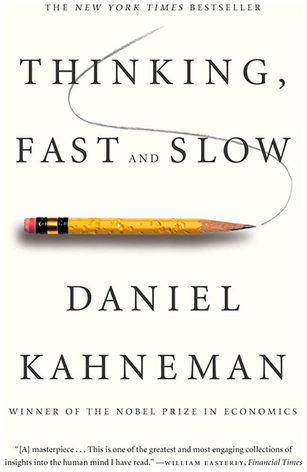
Learn how to do good SW Design and why domains matter!



Patterns are still a crucial way to good design choices



If you like to learn but find the GOF Book boring!



Don’t let your mind fool you :)

A classic everyone should have read

With you today

Tobias Leicher
Principal IT Architect and
zChampion for Modernization

tobias.leicher@de.ibm.com
+49 151 – 15 16 24 89