

Prof. Dr. Henning Femmer

Information Management

Transforming Business Strategy into IT Strategy
& Forging Business Strategy from IT Strategy



WS 2024/2025

Chapter 0: Course Overview

TOPICS: WHY IS IM SO IMPORTANT? - WHAT MAKES THIS COURSE SO EXCITING? - HOW DO I GRADE? - WHAT DO I EXPECT FROM YOU, WHAT CAN YOU EXPECT FROM ME?

... a warm welcome ...



... tell us about yourself ...

Bio: Dr. Henning Femmer

- **2006-2012:** Studied Software engineering in Munich, Belfast, Washington D.C.
- **2012-2017:** Ph.D. at Chair for Software & Systems Engineering of Prof. Broy, TU Munich
- **Since 2013:** Developer, Consultant, Co-Founder of Qualicen (2016)
- **Since 2021:** Prof. for Information Systems, RE and IT QM



After this course, you will:

know

... the tremendous impact of IT on business strategy.

be able to

... describe existing business processes in using modeling languages.

... transform business strategies into an IT strategy.

... manage the transformation of a SME into a digitized company.

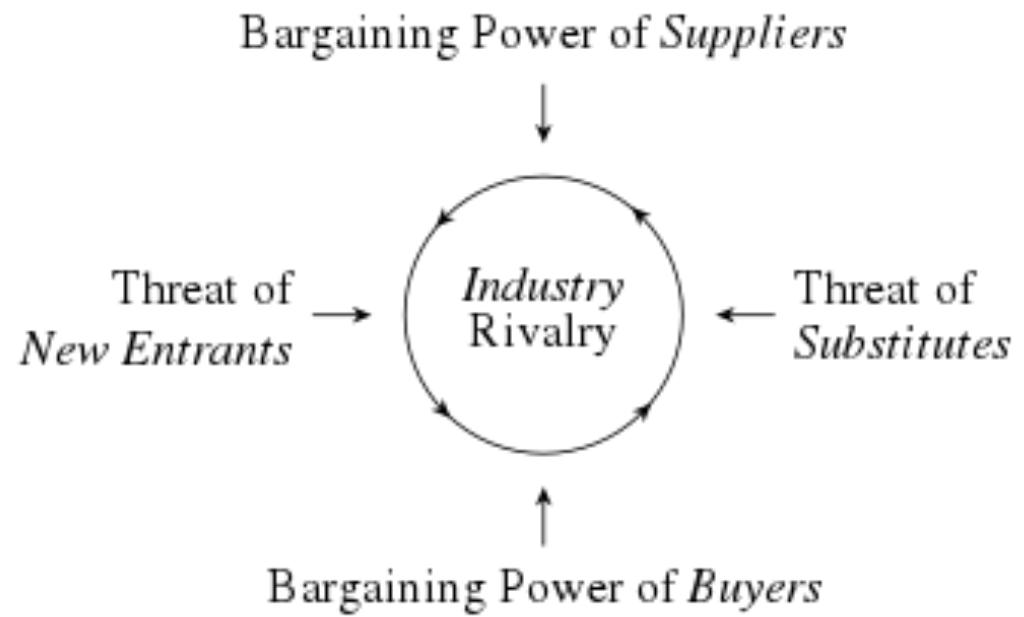
value

... IT as the centerpiece of managing companies in the 21st century.

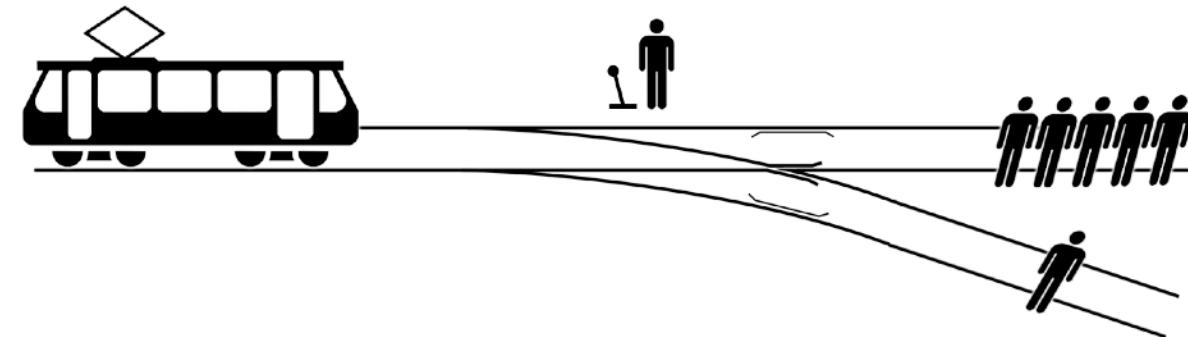
In more detail, topics include:

- Understanding the information demand of a company
- Supporting the company in building IT systems
- Understanding the current trends in IT infrastructure
- Managing an IT Landscape
- Understanding the interplay of IT strategy and company strategy
- Understanding the role of ethics in IT

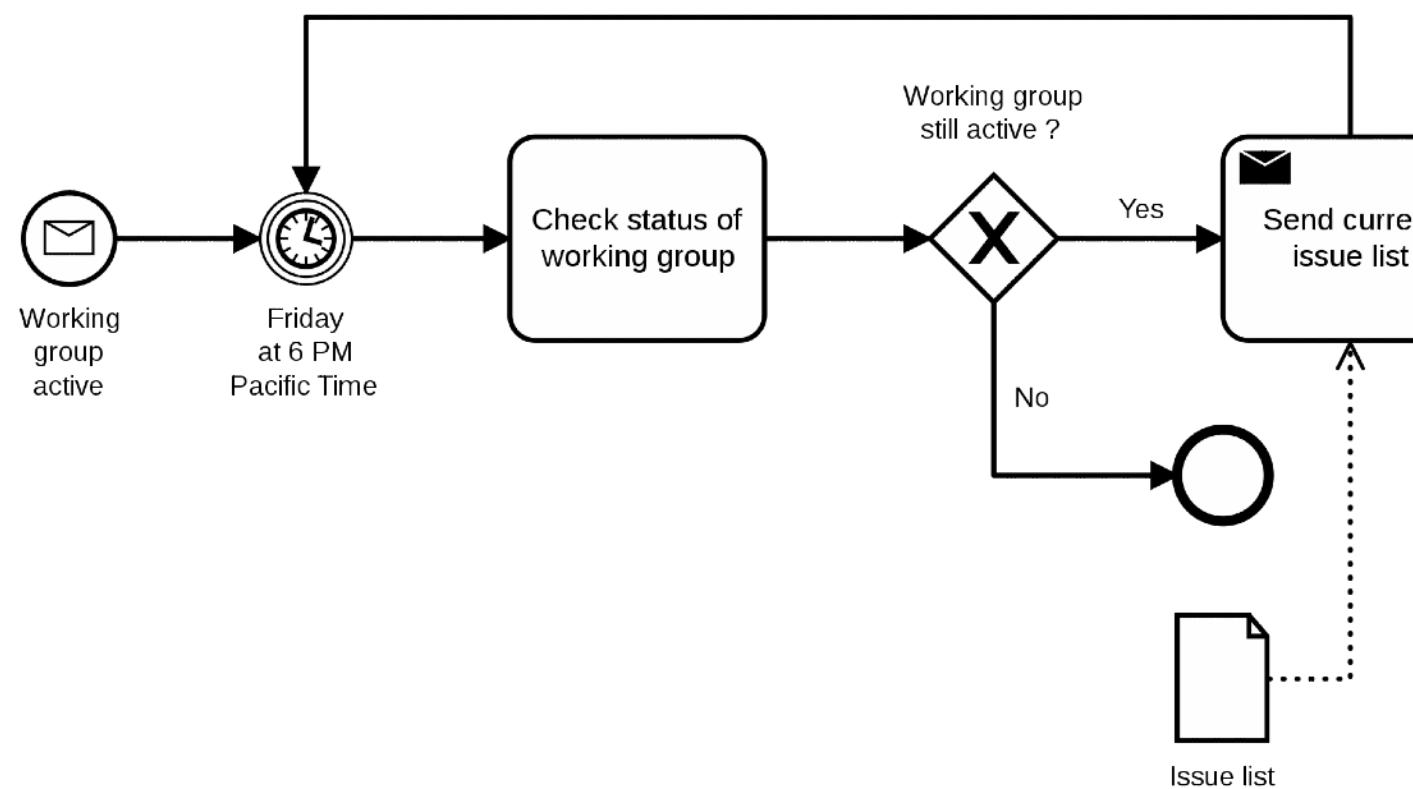
Some Highlights of the Course



Understanding Business Strategy & Impact on IT



Current Trends: Ethics in IT



Helping deciders structure their processes

[Wikipedia: BPMN](#)

[Wikipedia: Porter's Five Forces](#)

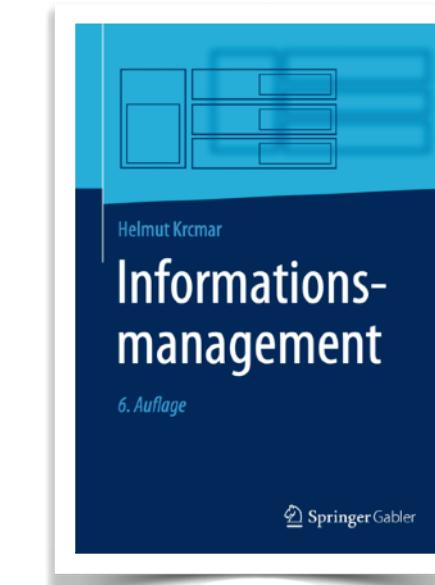
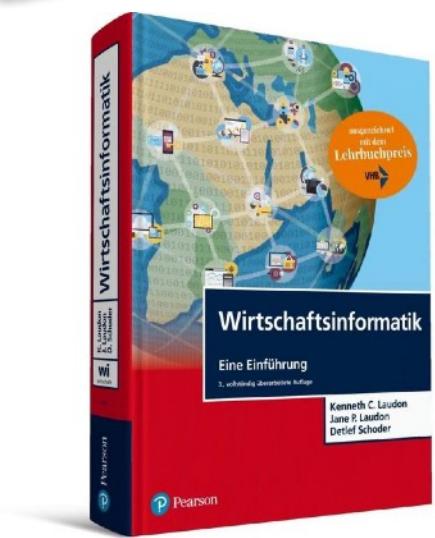
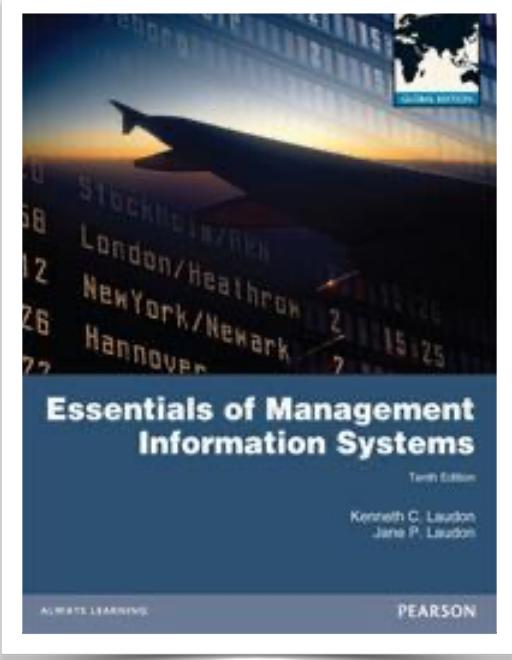
Guest Lecture

Marlon Kampmann

Workshop on Robotic Process Automation



Sources for this Lecture



- Laudon & Laudon: Essentials of Management Information Systems.
- Laudon, Laudon, Schoder: Wirtschaftsinformatik - Eine Einführung.
- Krcmar: Informationsmanagement.
- Ko: Foundations of Information. <https://faculty.washington.edu/ajko/books/foundations-of-information>
- Further material by Prof. Daniel Mendez, BTH and Prof. Andreas Vogelsang, Cologne University



My Expectations



Information Management 1 / 2

Modul: Pflichtfach

Planmäßig im: 2. Semester

Modulverfügbarkeit: 1 / Jahr

Kreditpunkte: 5

Dauer: 1 Semester

Einfluss auf die Abschlussnote:
siehe Fachprüfungsordnung (FPO)

Modulbeauftragte/r hauptamtl. Lehrende/r:

Prof. Dr. Xyz N.N.

Verantwortlicher Fachbereich: TBW

Lehrveranstaltungen:

Vorlesung

2 [sws]

Geplante Gruppengröße: Semesterstärke

Projekt

2 [sws]

Geplante Gruppengröße: 12

Studiengangvarianten:

Studienart:

Vollzeitstudium

Arbeitsaufwand:

150 Stunden

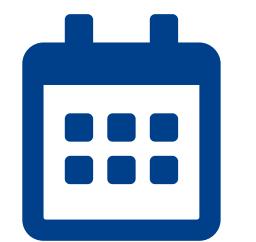
Kontaktzeit:

45 Stunden

Selbststudium:

105 Stunden

Get in touch!



Moodle-Course:

Information Management WiSe25/26

Appointments

<https://calendly.com/henning-femmer>

Everything else:

femmer.henning@fh-swf.de

Final Exam



Date: Tentative Feb 2nd, 2026,
5:00 PM

Format:
Written Exam

Subject of the exam:
Everything from the lecture +
everything from the exercises.

Pro-Tip: Do the exercises!

MUST register for exam!

**„Software is
eating the
world.“**

**Marc Andreessen,
Co-Founder of Andreessen Horowitz
(Netscape, Facebook, Groupon,
AOL, Twitter, Digg, ...)**



A portrait of Prof. Dr. Dr. h.c. Manfred Broy. He is an elderly man with white hair and a beard, wearing round glasses and a dark blue corduroy jacket over a striped shirt. He is gesturing with his right hand while speaking.

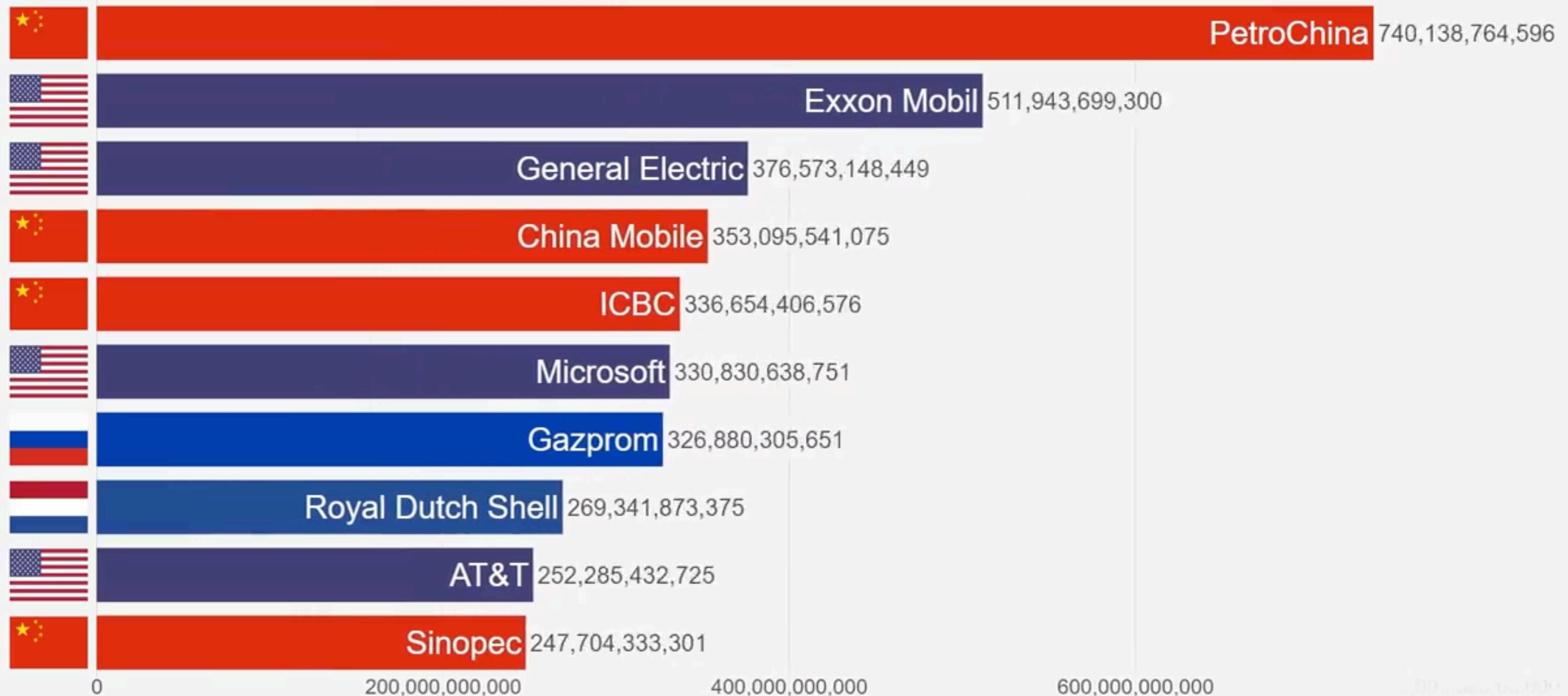
„Die Frage darf nicht sein, welche Rolle Software im Auto spielt, sondern muss lauten: Welche Rolle spielt das Automobil in einer Softwarewelt?“

Prof. Dr. Dr. h.c. Manfred Broy

Most Valuable Companies In The World

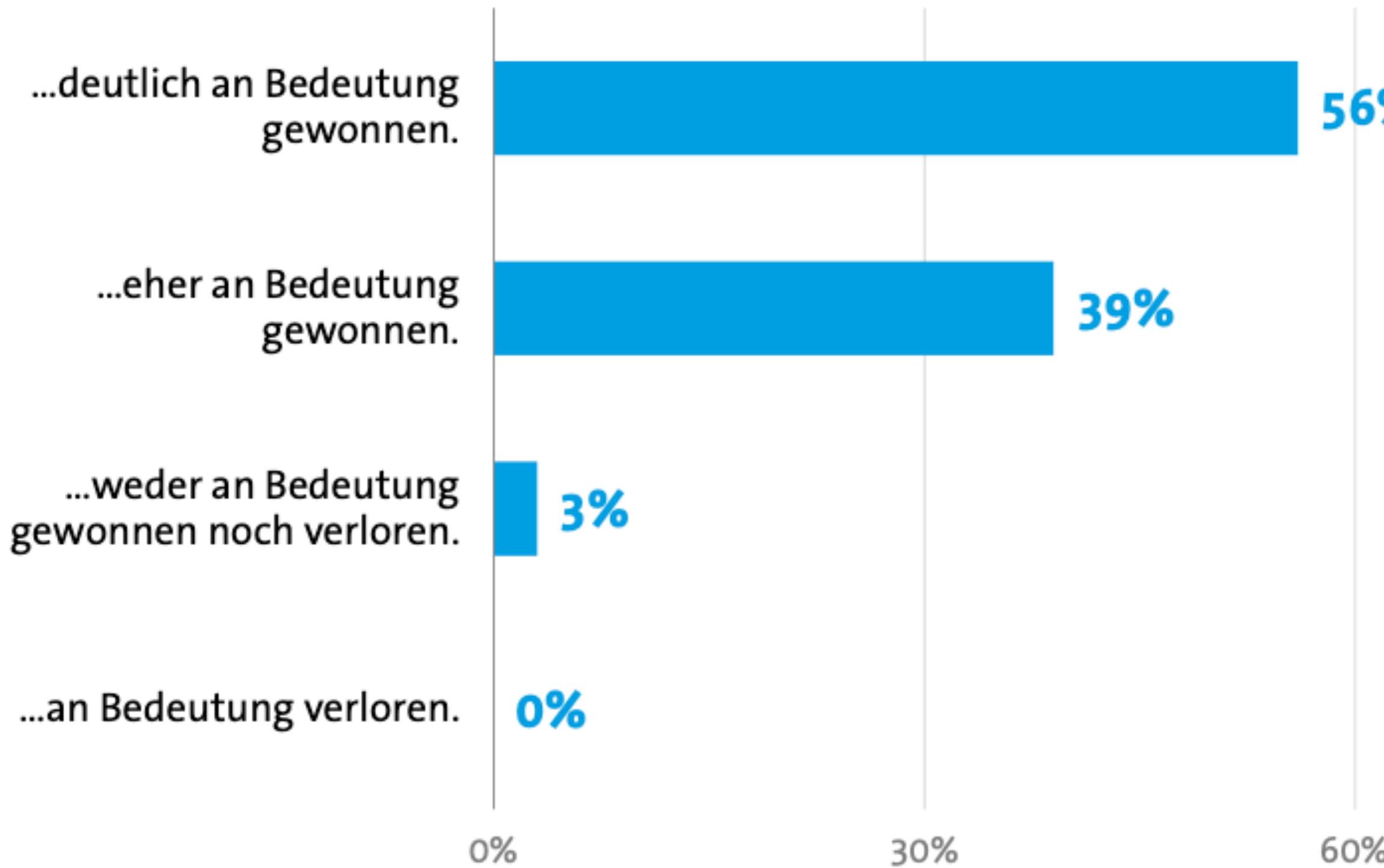
Jan-08

Market Cap in US Dollars



Digitalisierung gewinnt in den Unternehmen massiv an Bedeutung

Durch die Corona-Pandemie hat die Digitalisierung für unser Unternehmen...



77%

Unternehmen, deren **Geschäftsmodell** bereits digitalisiert ist, kommen besser durch die Corona-Pandemie.*



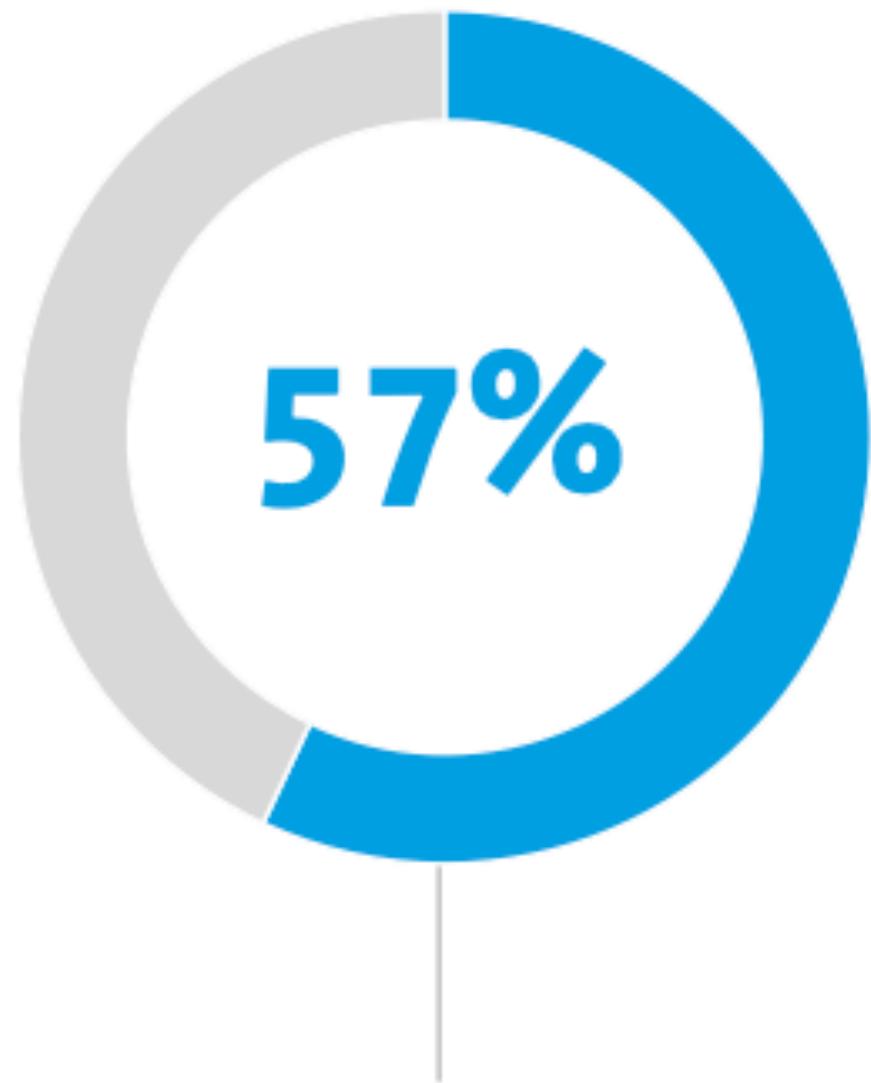
76%

Unternehmen, deren **Geschäftsprozesse** bereits digitalisiert sind, kommen besser durch die Corona-Pandemie.*

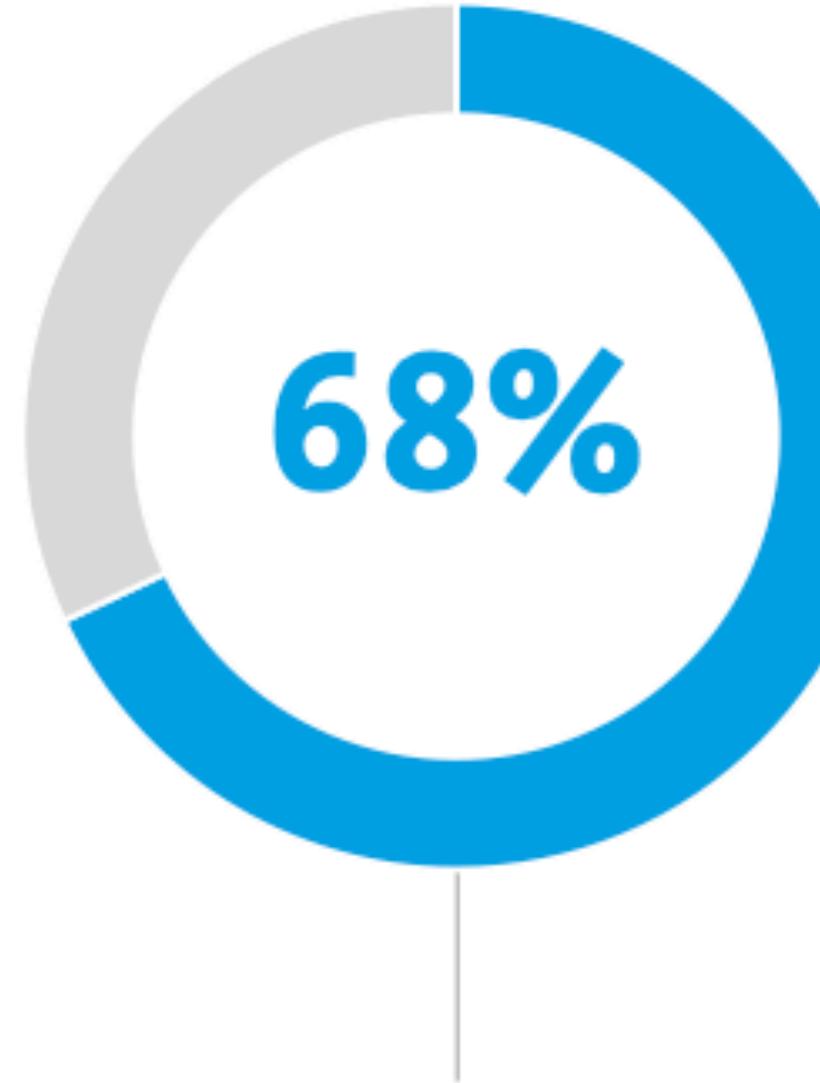
5 Basis: 551 Industrieunternehmen ab 100 Mitarbeitern in Deutschland | *Aussagen »trifft voll und ganz zu« & »trifft eher zu« | Quelle: Bitkom Research 2021

Industrie 4.0 braucht qualifizierte Fachkräfte

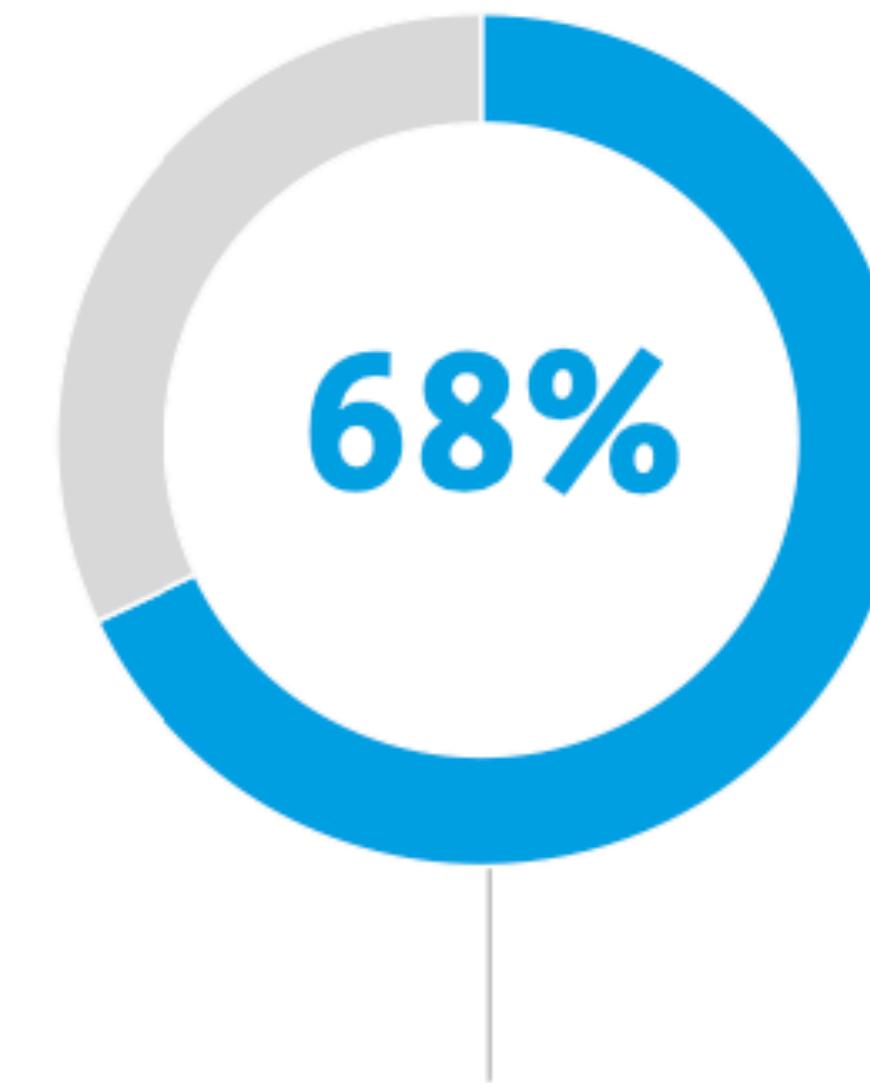
Inwieweit stimmen Sie den folgenden Aussagen im Zusammenhang mit Industrie 4.0 zu bzw. nicht zu?*



Durch Industrie 4.0 entstehen
neue Arbeitsplätze **für gut
ausgebildete Fachkräfte**.



Wir **investieren in die
Weiterbildung** unserer Mitarbeiter
rund um Industrie 4.0.

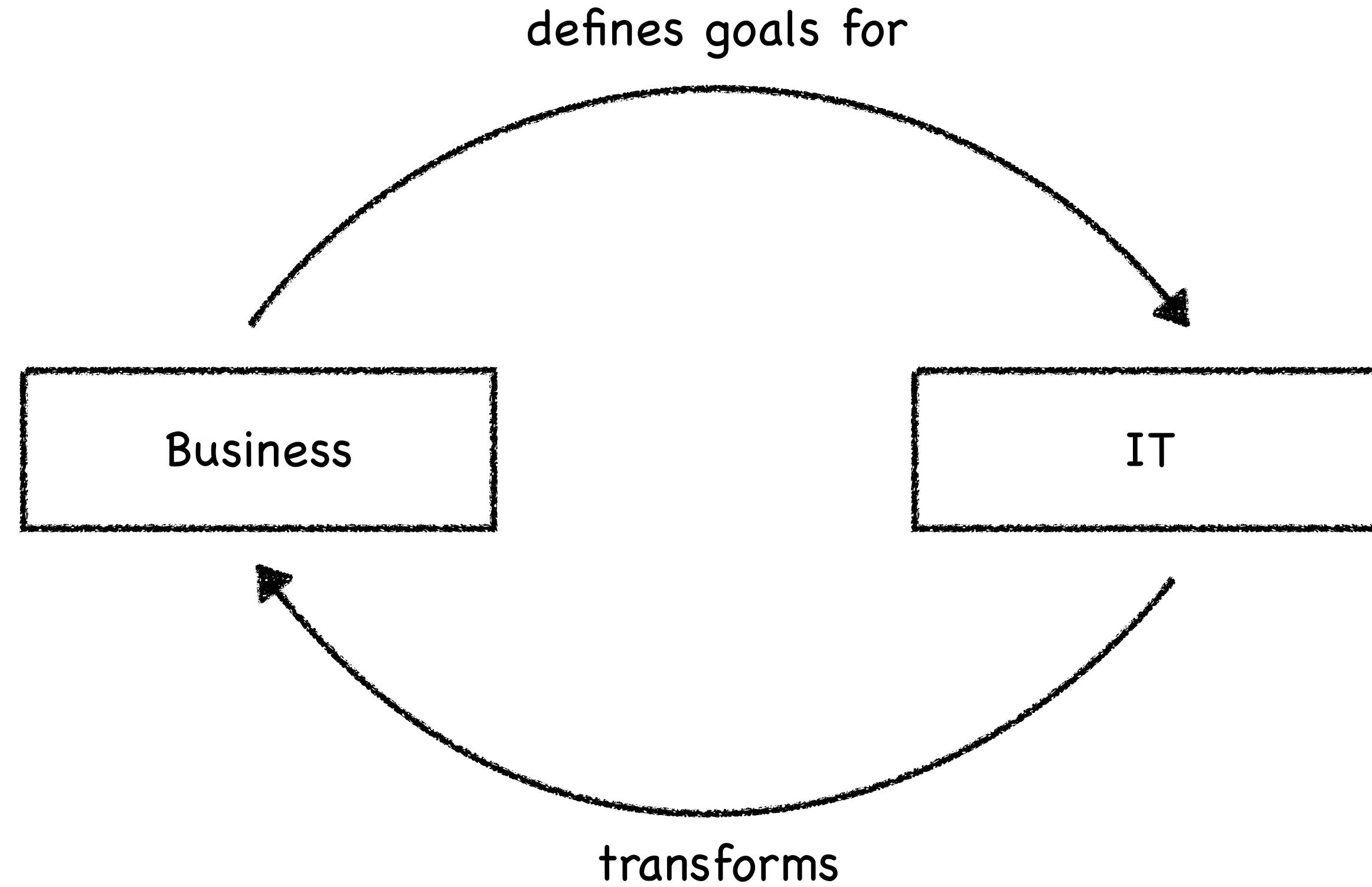


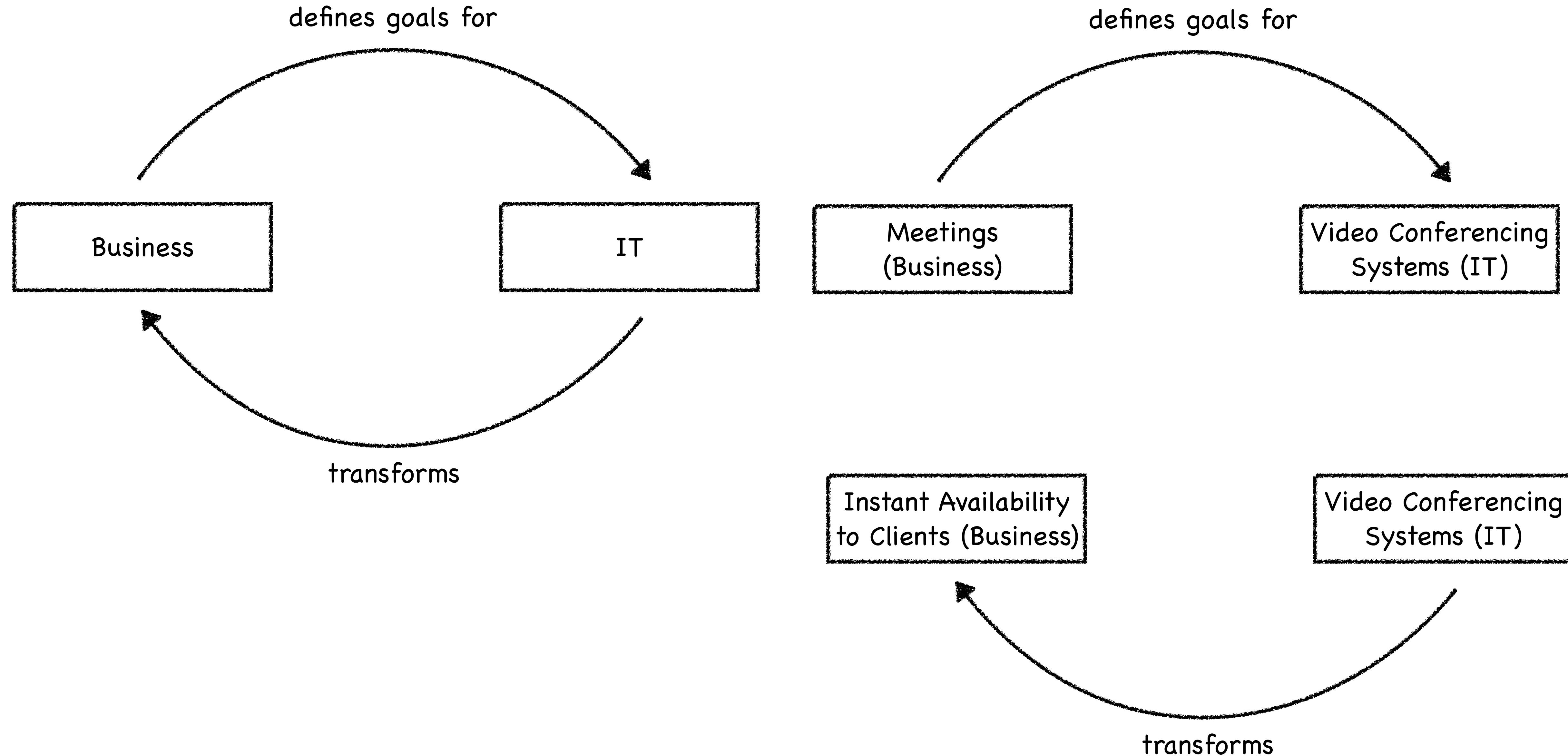
Durch Industrie 4.0 fallen
Arbeitsplätze **für gering
qualifiziertes Personal** weg.

Basis: 552 Industrieunternehmen ab 100 Mitarbeitern in Deutschland | *Werte für »stimme voll und ganz zu« und »stimme eher zu« |

9 Quelle: Bitkom Research 2020

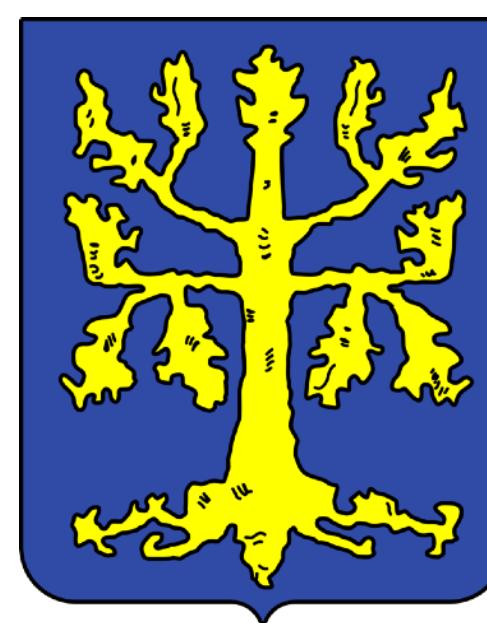
bitkom







Choose your fighter:



Munich RE



URBANMAKER



OpenAI



WAEZHLZ

?

Chapter 1: Information Management Basics

TOPICS: HISTORY OF IM - DEFINITION OF IM - THE ROLE OF THE CIO



**Without materials nothing exists,
without energy nothing happens,
without information nothing makes sense.**

Quoted after: Picot, A. (1988). Die Planung der Unternehmensressource „Information“. Internationales Management-Symposium „Erfolgsfaktor Information“ (S. 223–250). Düsseldorf.

IM is still relevant today!

- Artificial Intelligence
- Text Production / Natural Language Processing
- Cloud Technologies
- Containerization
- 1000s of software stacks
- Bring-your-own-device (BYOD)
- ...

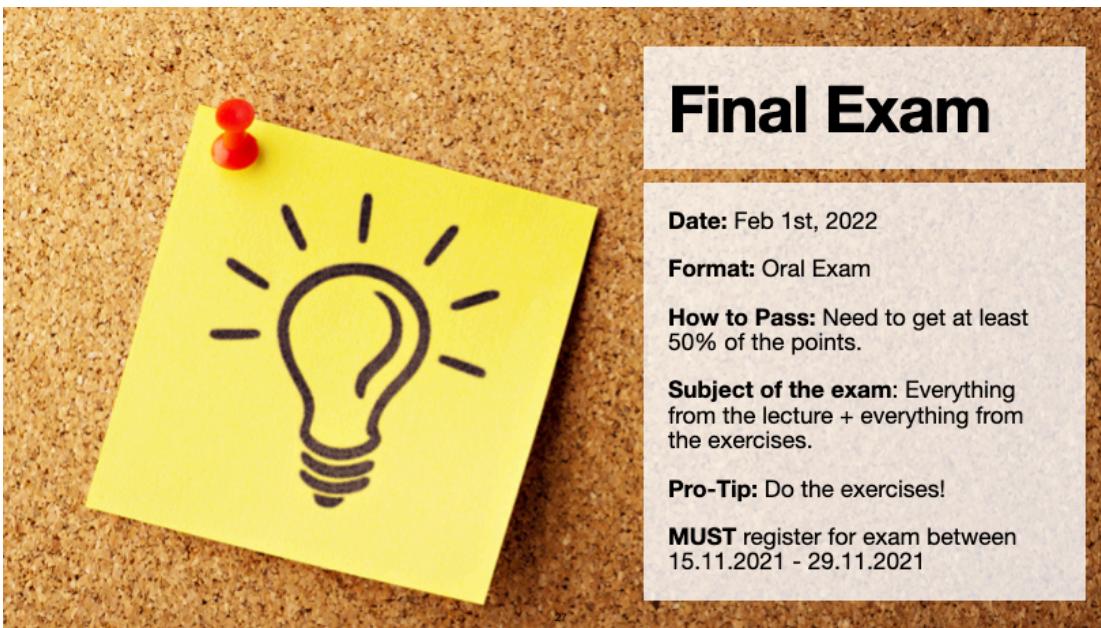
As a company: ***How the heck do you manage this mess???***

So what is
information
... for you?

From a business perspective, *information* is a strange good...

Some of its Properties:

- It's immaterial, is not used up with usage
- Information creates benefits to its user
- Information is not a free good (e.g. air) -> can have a cost-adequate value
- Value of an information depends on context (incl. time)
- Value of an information can be adjusted by adding, selecting, concretizing, removing. Information can be extended.
- Information has qualities, such as completeness, correctness, ...
- Information can be easily copied without quality loss
- Information usually needs a standardized encoding to be transported
- Information can be transported at the speed of light (see next slide)





Sh*t They're Saying About Sh*t My Dad Says

"This book is refreshingly different, and readers are hooked. It's like a continual stream of wisdom." —MELISSA MARCUS

"An eye-opening introduction to a man and his dad who are both very funny." —CHRISTIAN LEBEDEV

"Read this without your feet up because it's compelling." —JULIA KELL

"Sh*t My Dad Says" highlights the real life of a dad, and it's a must-read for anyone who wants to know more about their own father or the father figure in their life." —CHRIS HEDGES

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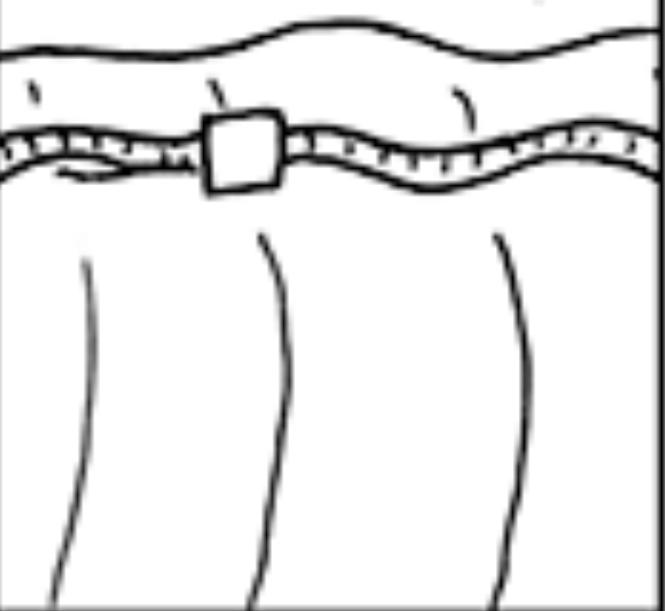
"Read this without your feet up because it's compelling." —JULIA KELL

WHEN AN EARTHQUAKE HITS,
PEOPLE FLOOD THE INTERNET
WITH POSTS ABOUT IT - SOME
WITHIN 20 OR 30 SECONDS.

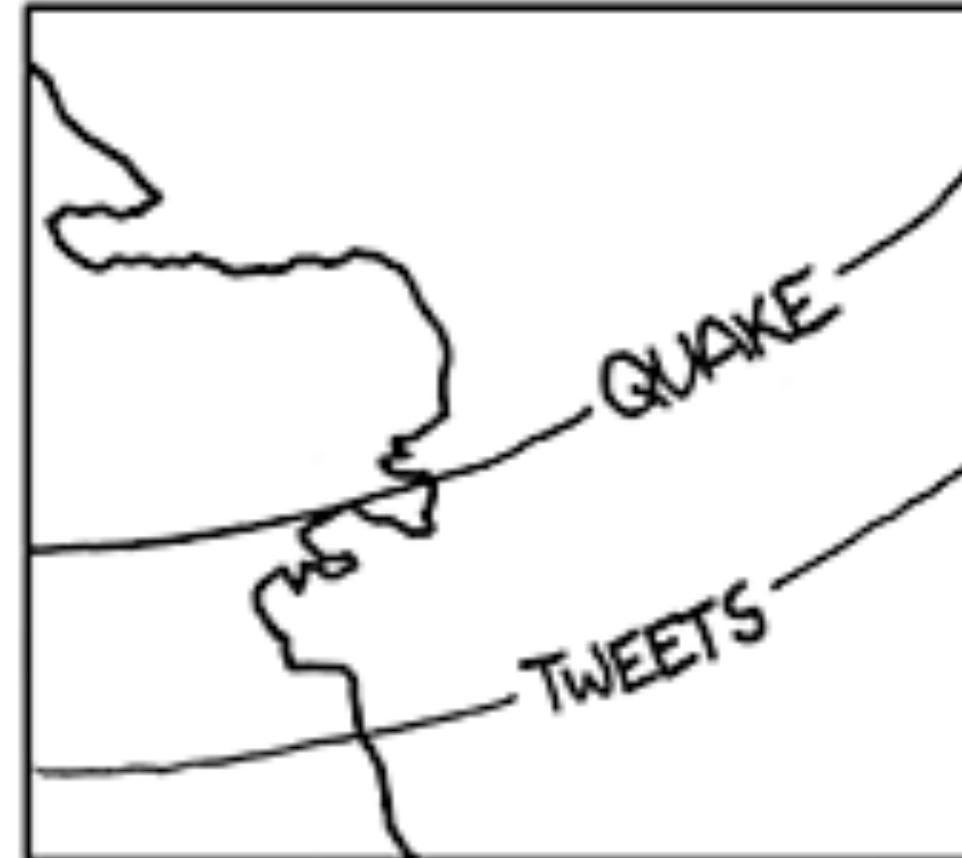
RT @ROBM163 HUGE
EARTHQUAKE HERE!



DAMAGING SEISMIC
WAVES TRAVEL AT
3-5 KM/S. FIBER
SIGNALS MOVE AT
~200,000 KM/S.
(MINUS NETWORK LAG)



THIS MEANS WHEN THE SEISMIC
WAVES ARE ABOUT 100 KM OUT,
THEY BEGIN TO BE OVERTAKEN BY
THE WAVES OF POSTS ABOUT THEM.



PEOPLE OUTSIDE THIS RADIUS
MAY GET WORD OF THE QUAKE
VIA TWITTER, IRC, OR SMS
BEFORE THE SHAKING HITS.

WHOA!
EARTHQUAKE!



SADLY, A TWITTERER'S
FIRST INSTINCT IS NOT
TO FIND SHELTER.

RT @ROBM163 HUGE
EARTHQUAKE HERE!





„I am being informed.“



Information is a process!



„Information can be stored and retrieved, e.g. book.“



„Information is the opposite of randomness.“

Information is a quantification of surprise!

Shannon Information

- An event with probability 100% is perfectly unsurprising and yields no information.
- The less probable an event is, the more surprising it is and the more information it yields.
- If two independent events are measured separately, the total amount of information is the sum of the self-information of the individual events.

$$I(x) := -\log_b [\Pr(x)] = -\log_b (P).$$

- Usually: $b=2$ for bits
- **Entropy** „is a measurable physical property of a state of disorder, randomness, or uncertainty.“

$$H_1 = E[I] = \sum_{z \in Z} p_z I(z) = - \sum_{z \in Z} p_z \log_2 p_z$$

- **Result:** How many bits would I *theoretically* (perfect compression) need to describe it?

Definitions

Let's get some terms straight.

My depot is
increasing in
value :)

FRA:VOW3 +5%

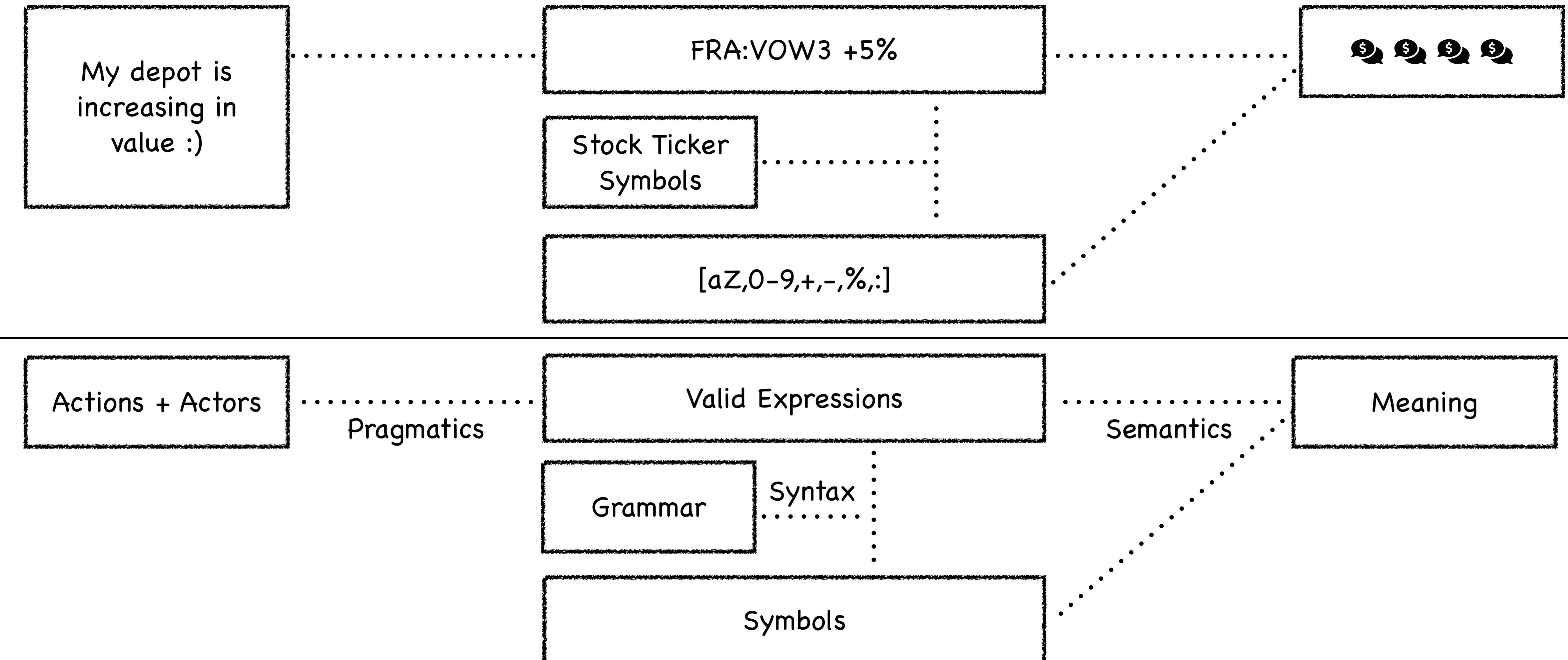
Stock Ticker
Symbols

[aZ,0-9,+,-,%,:]



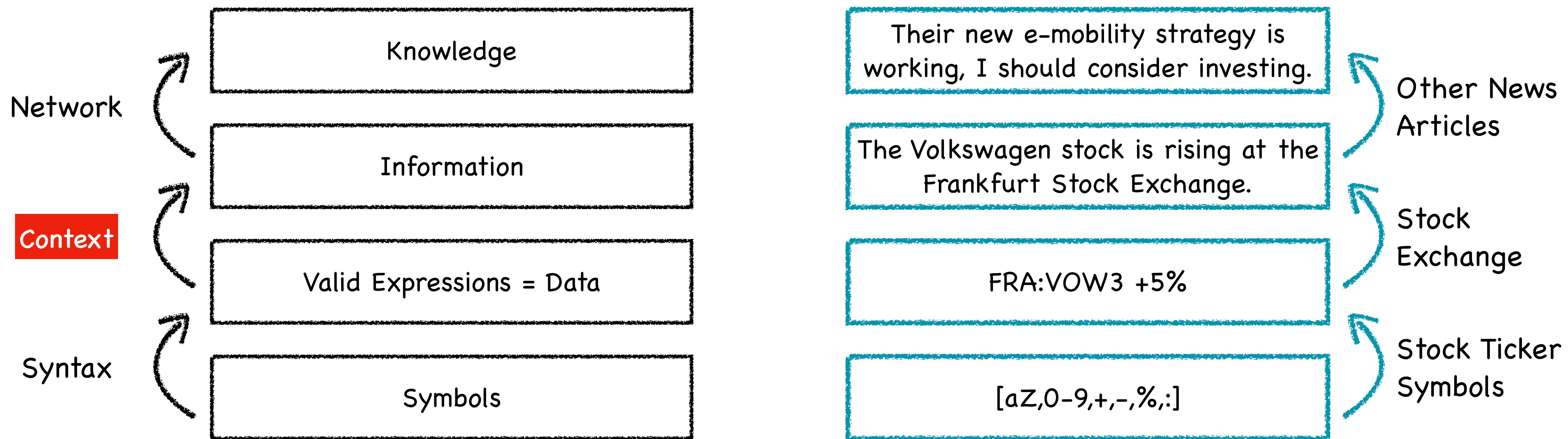
Definitions

Let's get some terms straight.



Definitions

Let's get some terms straight.



Definitions

Let's get some terms straight.

Knowledge: An interconnected system of information in a mind.

Amy Ko. Foundations of Information

Be careful with this one...

Information is data that has been shaped into a form that is meaningful and useful (...).

Laudon&Laudon. Essentials of Management of Information Systems.

Data: A set of analog or digital symbols that someone might perceive in the world and ascribe meaning.

Amy Ko. Foundations of Information.

Knowledge

Information

Valid Expressions = Data

Symbols

How context influences information:

- I have been to war.
- In that war, I have killed many people.
- Sometimes, killing in that war brought me joy and laughter.
- The war was a game called Call of Duty Black Ops: Cold War.
- The game was designed by Treyarch and Raven Software.
- I play it with my friends.



What shapes the context?

- How was the information created?
- When was the information created?
- For whom was the information created?
- Who created the information?
- Why was the information created?

The same applies to data!

 Amy Ko. Foundations of Information, Chapter: Data, information, knowledge.
<https://faculty.washington.edu/ajko/books/foundations-of-information>

**Careful when interpreting data.
Ethical issues and room for manipulation!**

Want to know more?

 [Can AI Fix Your Credit?, In Machines We Trust, MIT Technology Review.](#) Discusses credit reports and the context they miss that leads to inequities in access to loans such as credit cards, car purchases, and homes.

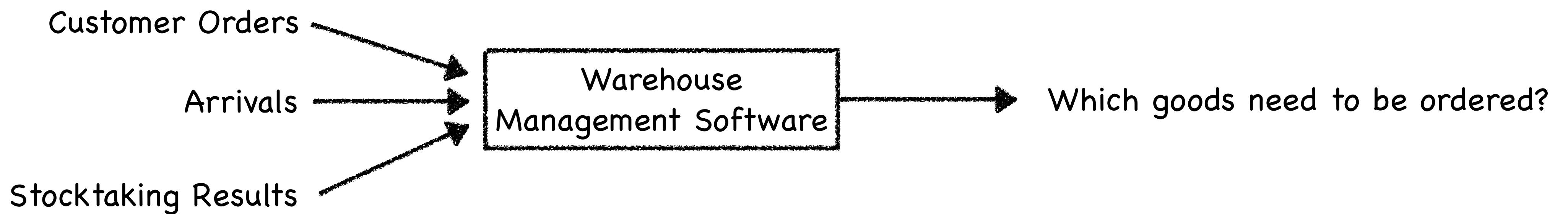
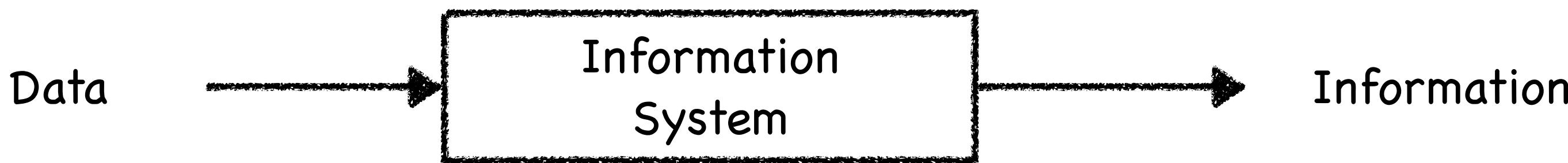
So what is
information
... for you?

So what is an
*information
system*
... for you?

From (Information) Technology to Information Systems

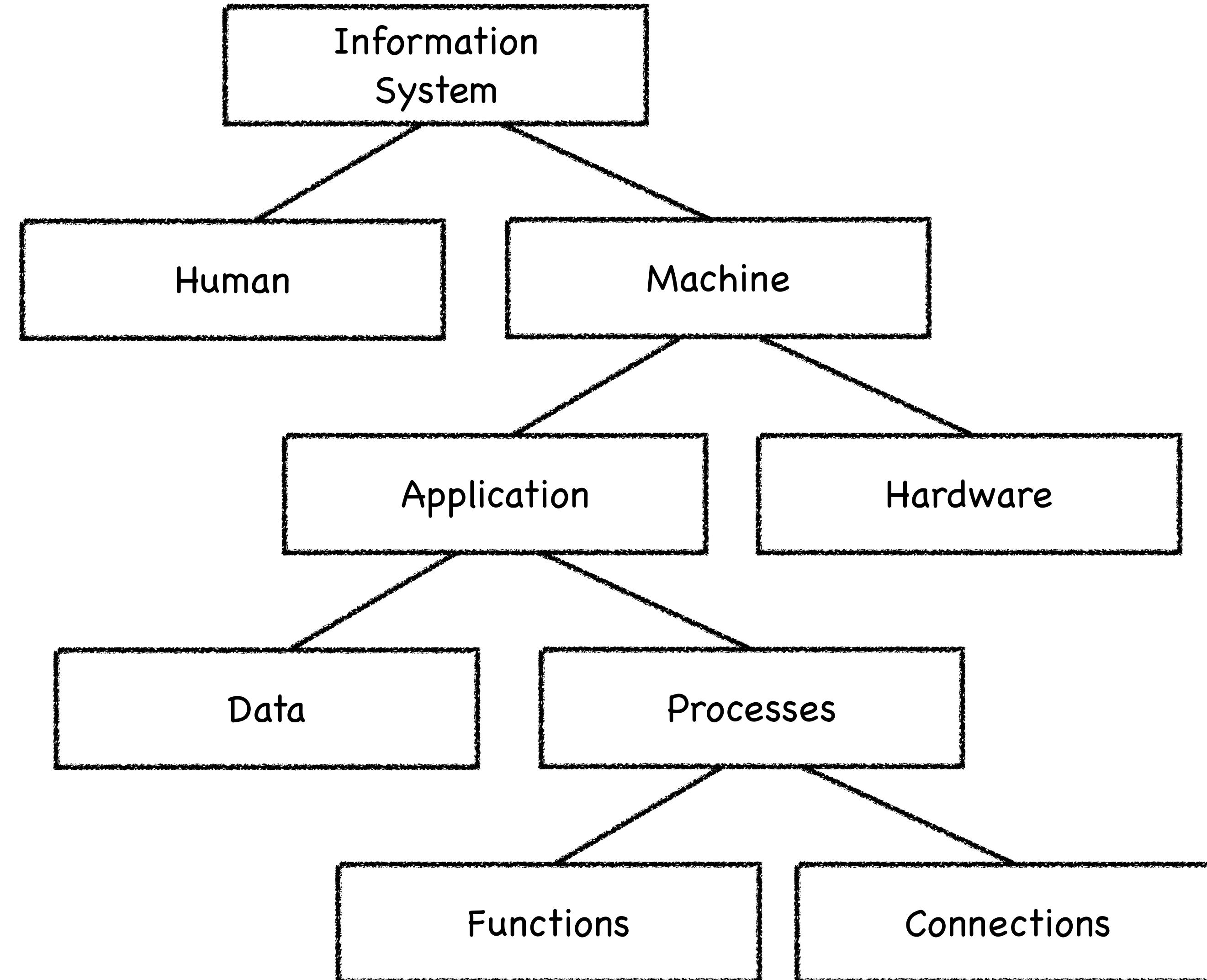
- Technology: „any application of knowledge, scientific or otherwise, for practical purposes, with its use evolving to refer to whatever recent inventions captivated humanity“
- What's the trend?

15000 BC	stone tools
2700 BC	abacus
900's	gunpowder
1100's	rockets
1400's	printing press
1730's	yarn spinners
1820's	motors
1910's	flight
1920's	television
1930's	flying
1950's	space travel
1960's	lasers
1970's	computers
1980's	cell phones
1990's	internet
2000's	smartphones

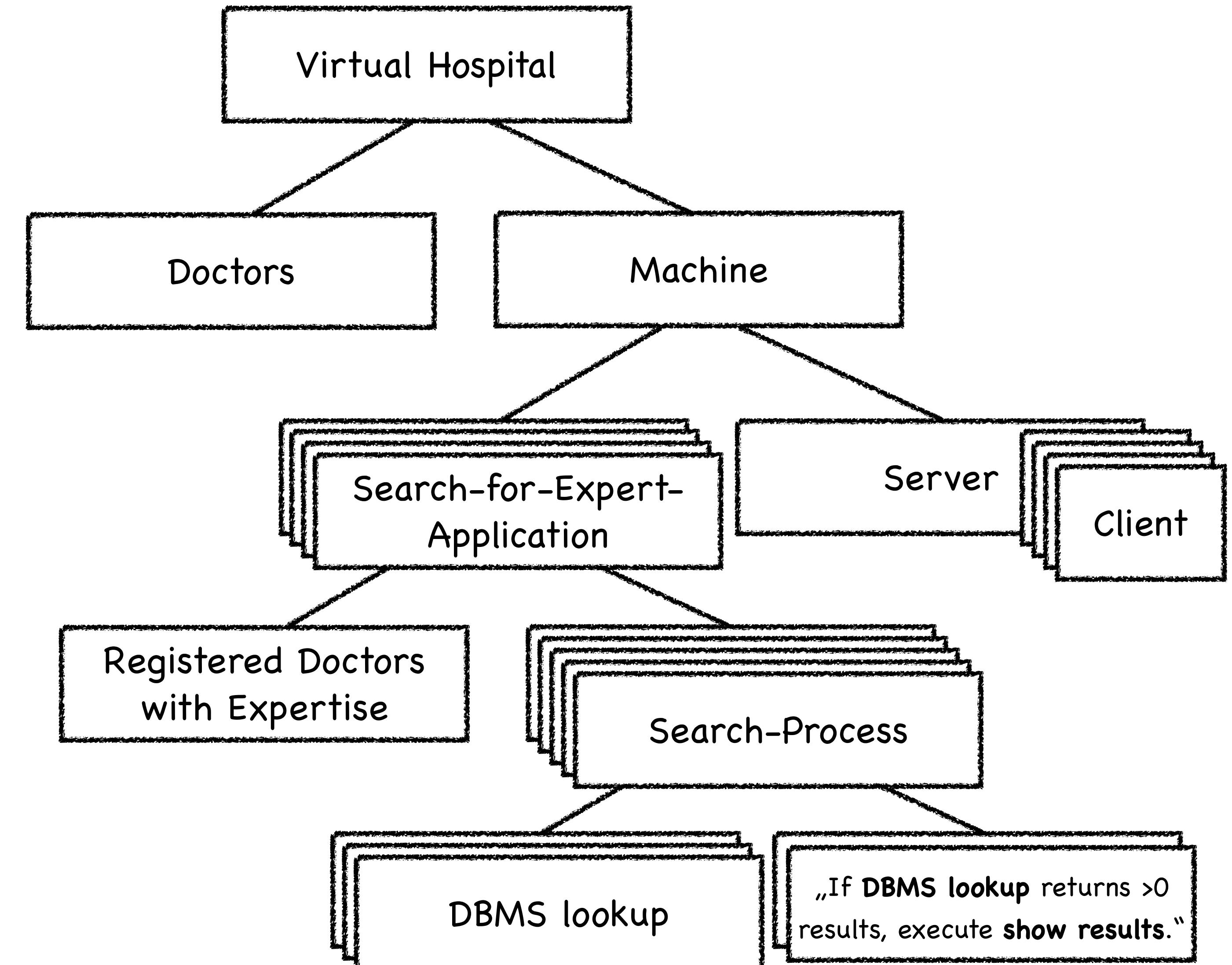
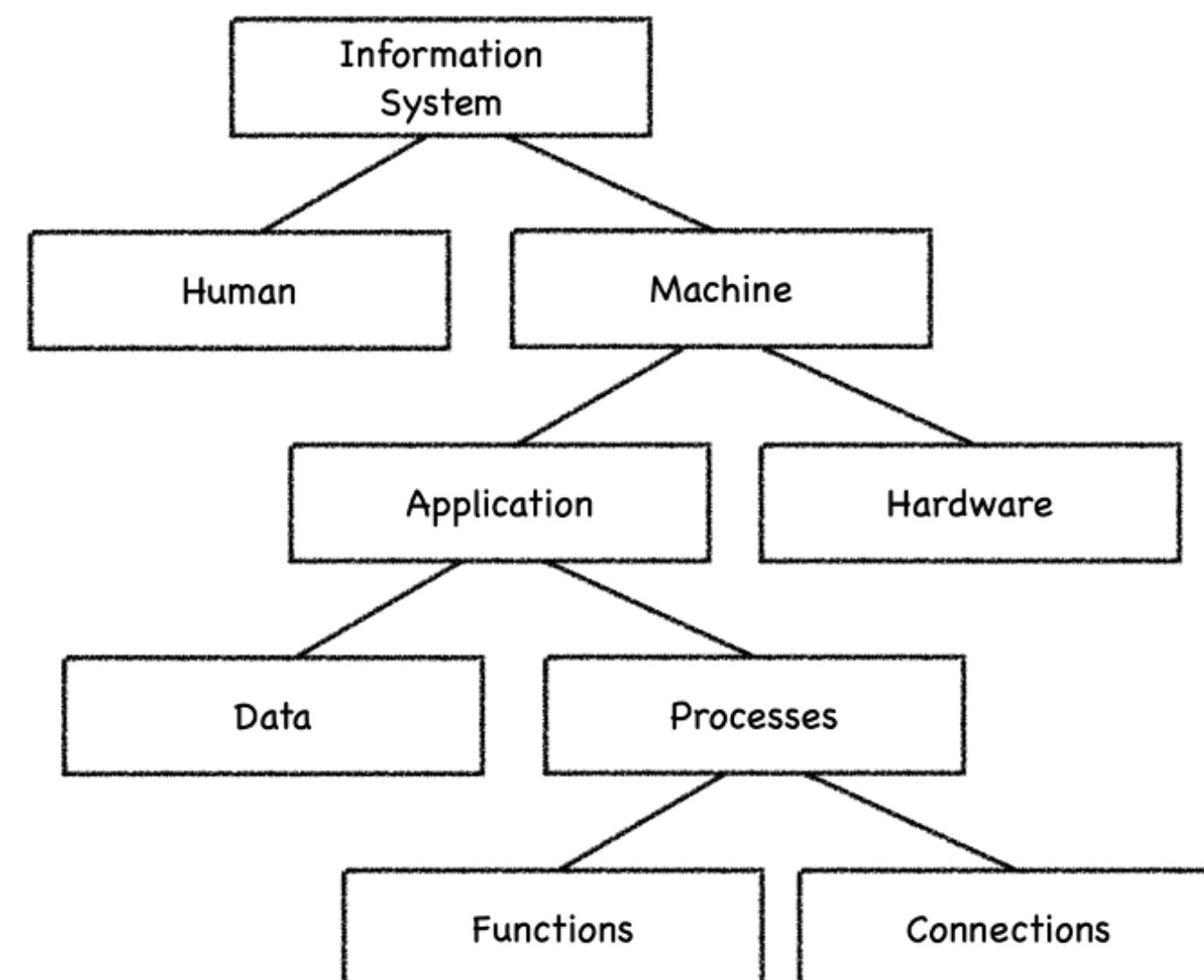


Definitions

Let's get some terms straight.



Definitions



So what is
*information
management*
... for you?

Management includes the activities of setting the strategy of an organization and coordinating the efforts of its employees (or of volunteers) to accomplish its objectives through the application of available resources, such as financial, natural, technological, and human resources.

<https://en.wikipedia.org/wiki/Management>

Information management is the regime that oversees the investment in new **information systems** and the operation of existing systems. Information management requires the deployment of a diverse range of management skills in order to successfully deliver the benefits of information systems investments.

Bytheway, A. (2003) Exploring Information Management. In: Proceedings of CISTM 2003. Cape Town, The Information Institute.

„hm...
What is it, really?“

„The overarching challenge for a leader today is to prepare his or her organization to respond to surprises, to at times be the instigator of those surprises, and to do it all faster than traditional ways of making decisions allow. The period of rapid and chaotic change in which we find ourselves keeps the buzzword industry busy – be resilient, be innovative, be agile, be adaptive.

Fine, the executive says, now what?“

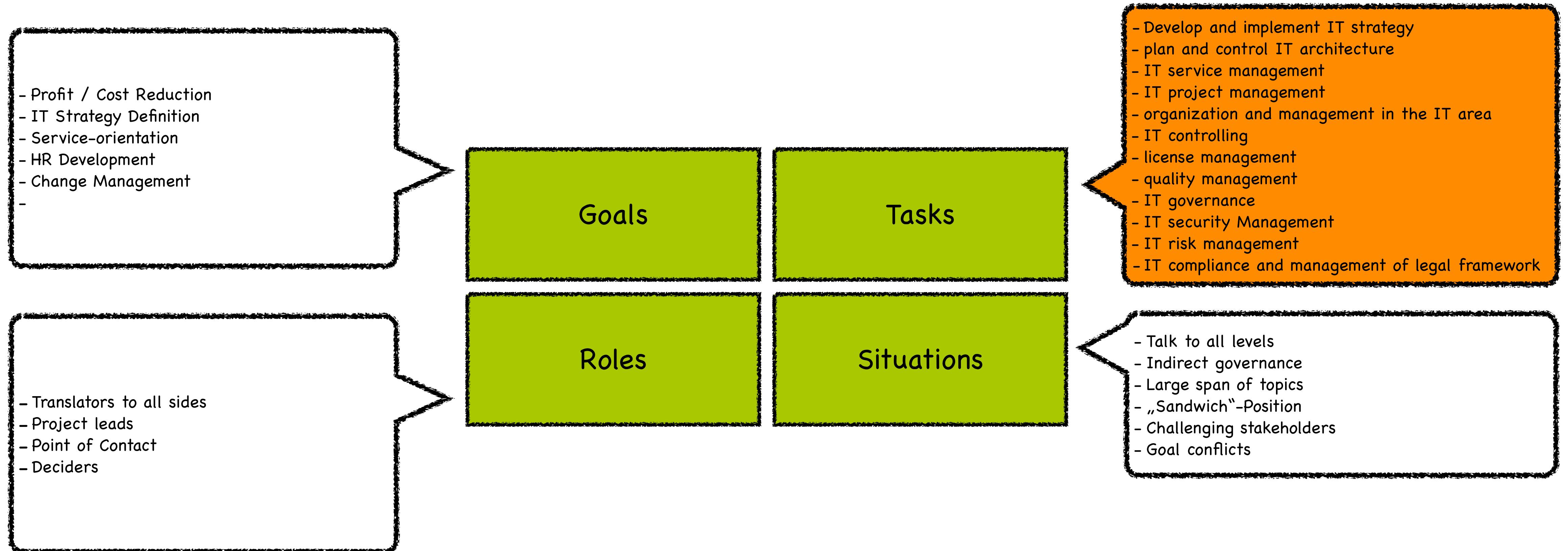
Hoque, F., Fillios, M. J. C. Jr., Kirkpatrick, T., Mimms, J., Palepu, K., Sambamurthy, V., & Zmud, R. (2007). Business Technology Convergence Index. Stamford.

Viewpoints on Information Management

1. (Solution-oriented Viewpoint)
2. Task-oriented Viewpoint
3. Layer-oriented Viewpoint
4. Finally: A consolidated Viewpoint

IM is a set of tasks!

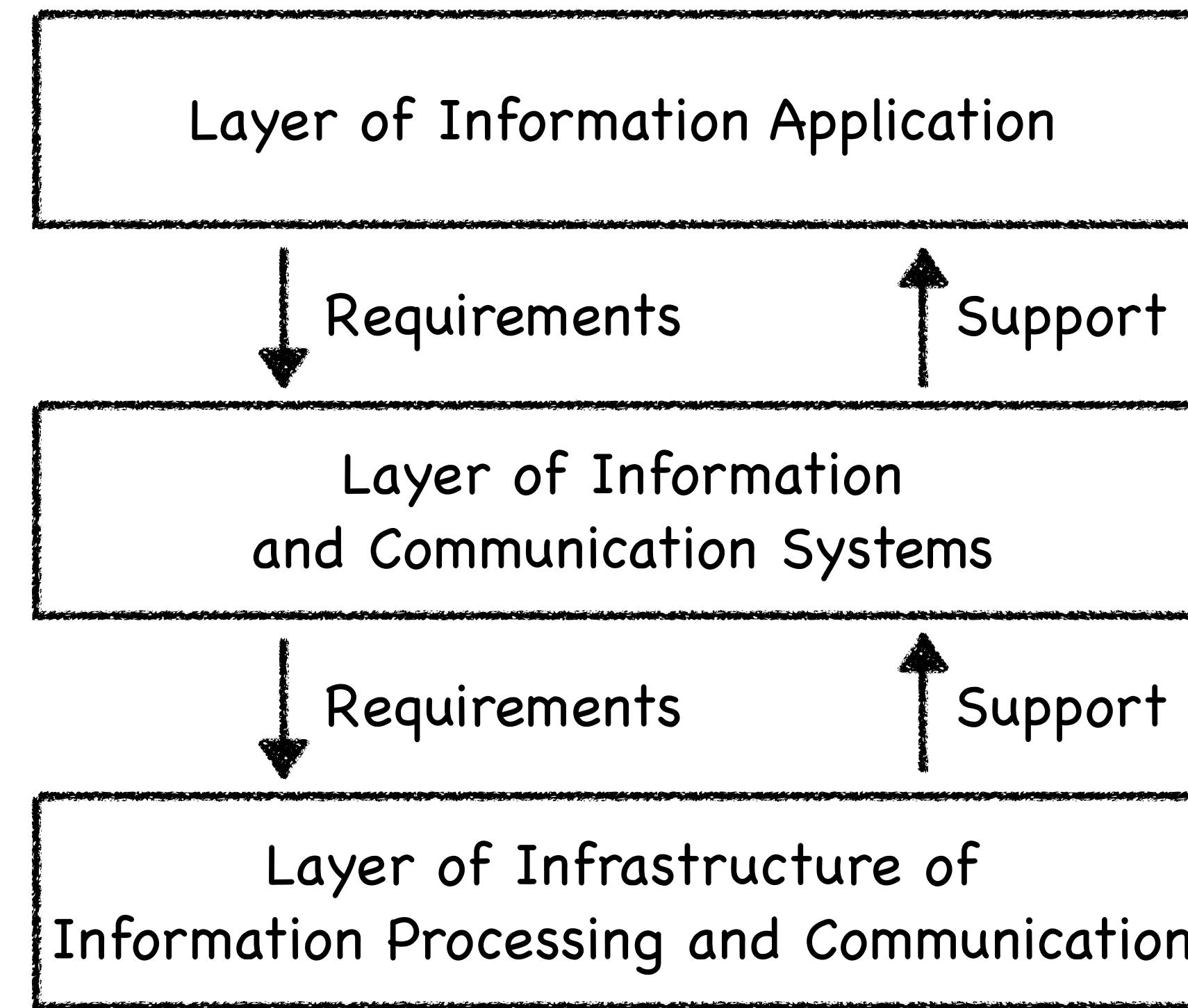
Viewpoint 2: Task-oriented Viewpoint



- Krcmar, Helmut. "Informationsmanagement." *Informationsmanagement*. Springer Gabler, Berlin, Heidelberg, 2015, p.97.
- Tiemeyer, E. (2013). *IT-Management – Herausforderungen und Rollenverständnis heute*. München: Carl Hanser Verlag.

IM is about Layers!

Viewpoint 3: Layer-oriented Viewpoint



A Consolidated Viewpoint: **IM after Krcmar**

Managing Information Management

- IT Strategy
- IT Governance
- IT Processes
- IT HR
- IT Controlling
- IT Security

Management of the Information Economy

- Demand
- Supply
- Usage

Management of Information Systems

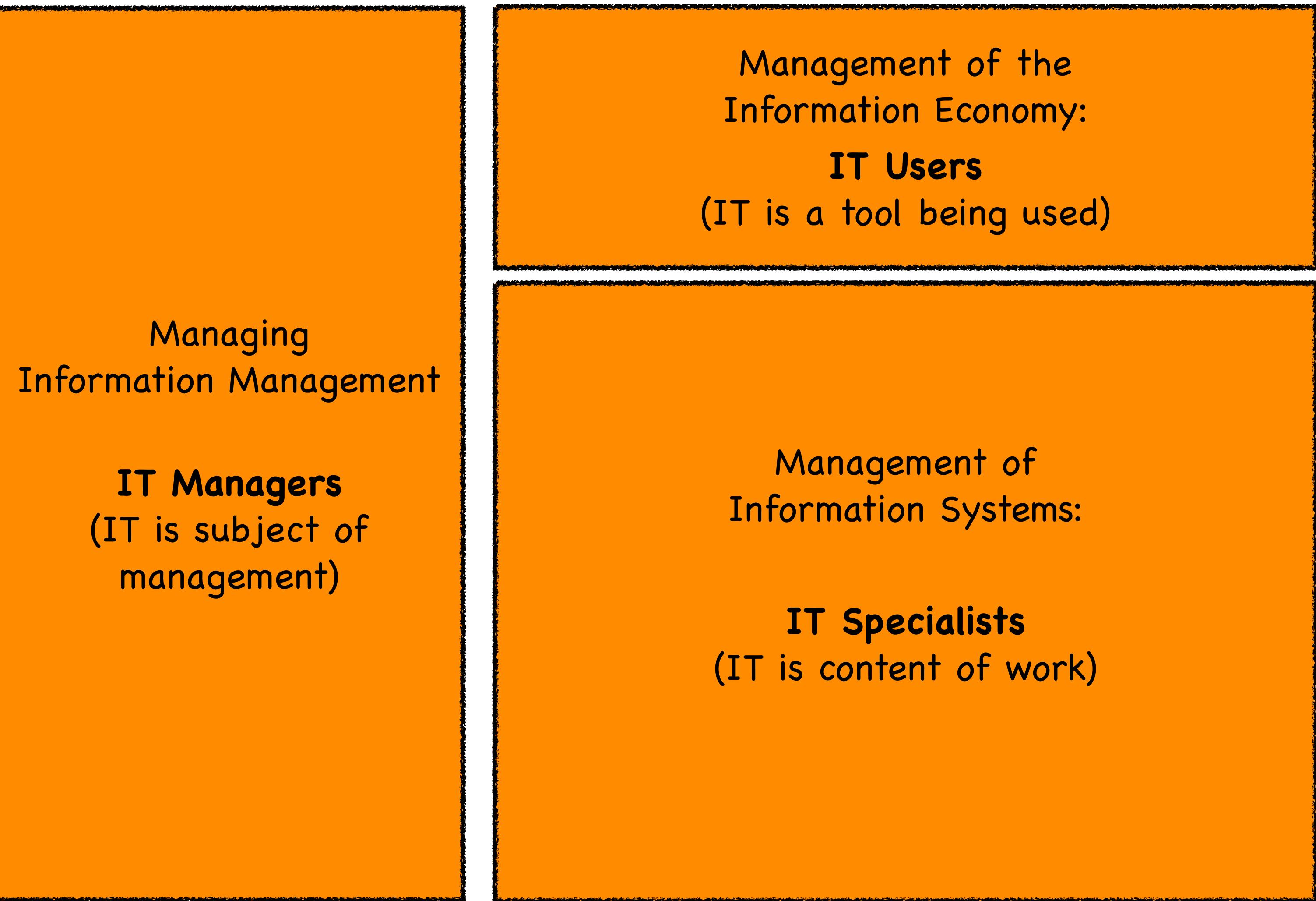
- Data
- Processes
- Application Life Cycle and Landscape

Management of Information and Communication Technologies

- Storage
- Processing
- Communicating
- Tech Stacks

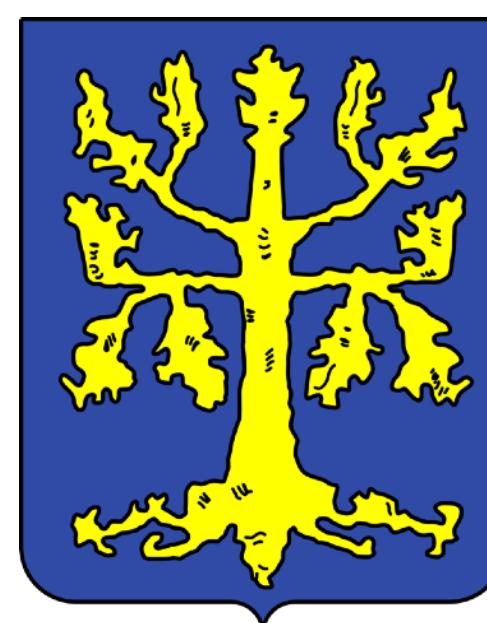
A Consolidated Viewpoint:

IM after Krcmar

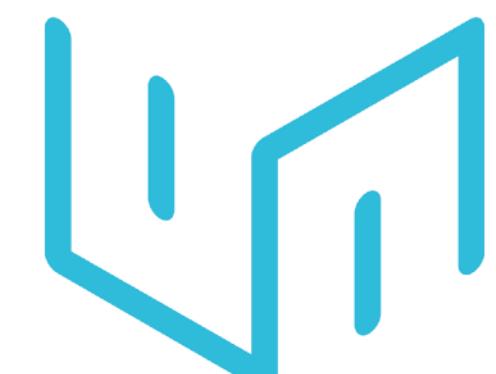




Choose your fighter:



Munich RE



URBANMAKER



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WAEZHLZ

?



**... what are you interested
most in this course?**

And **who is in charge?**

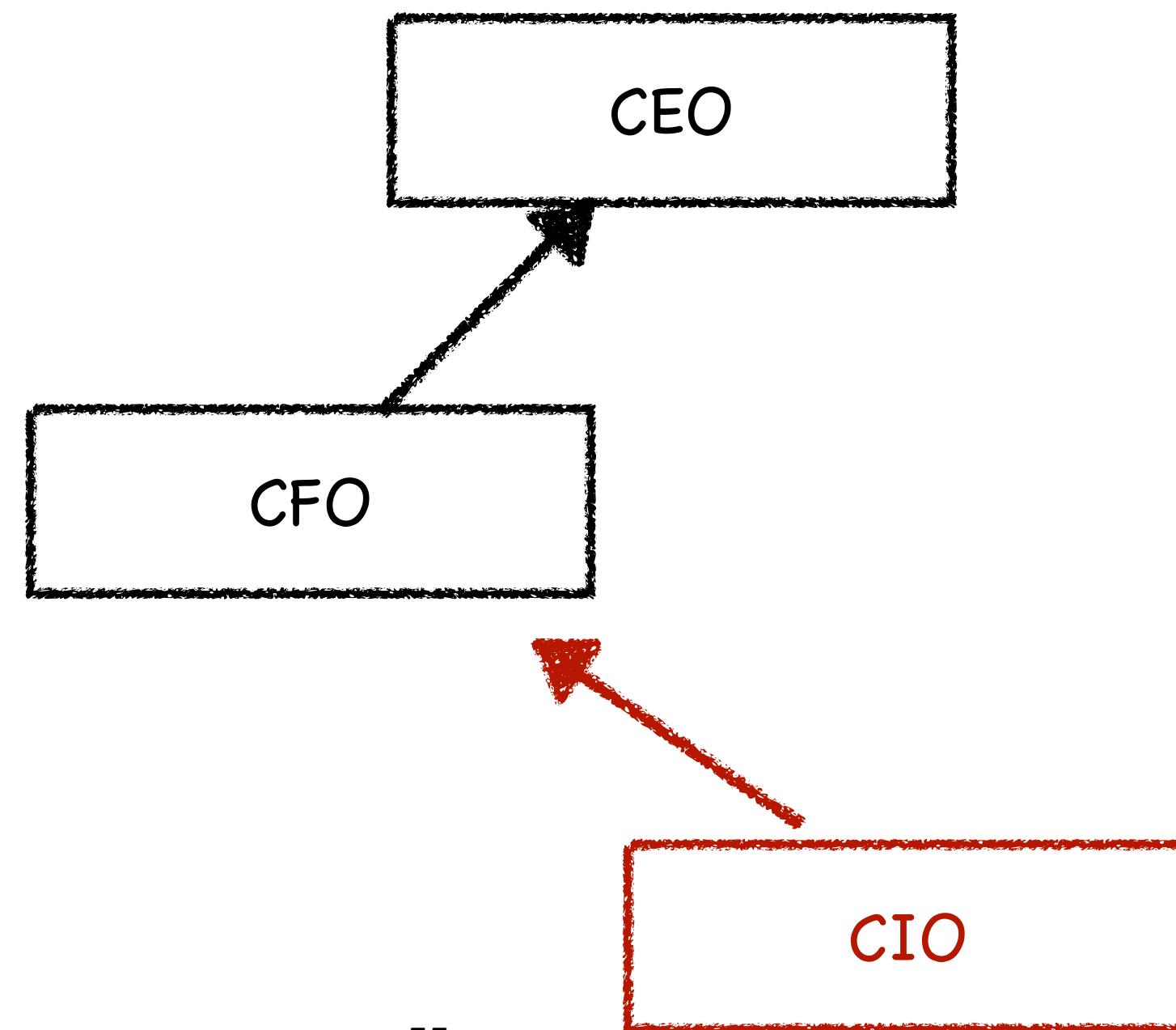


DNA of a CIO | Career advice from IT leaders, Microsoft, Kinross and City of Toronto

The CIO

Used to be organized under the CFO: „Cost-Factor“, „head of data center“

Now: Sometimes Board Member, directly reporting to the CEO, „drive innovation in the company“





Which things do you need to know?

Which skills do you need to have?

Book Recommendation

