Design in Practical Application,
Creativity and Process to form an Expertise L4

Johannes Schaede © **2023**

Creativity Training

A small little test for you :

Mobile phones provide excellent records of best practice, repairs, navigation, cooking etc.

Alas, you may want to follow the instructions on screen and use both hands. Build a device which is universally applicable for using screen based instructions from your smart phone

CUSTOMER

MOTHER N

You shall not spend more than 40€

MONEY

You shall build and install in max. 1 to 2 hrs.

You shall be done in 60min

TIME

Group 1 : paper and pencil

Group 2 : laptop

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A small little exercise

A small little exercise for you :

Write a One Page Memo to convince your board to implement your favourite idea for a disruptive product

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L4 Recommendations

1. Career Planning
2. Chances and Threats
3. The larger picture
4. Task 4 and Book 4

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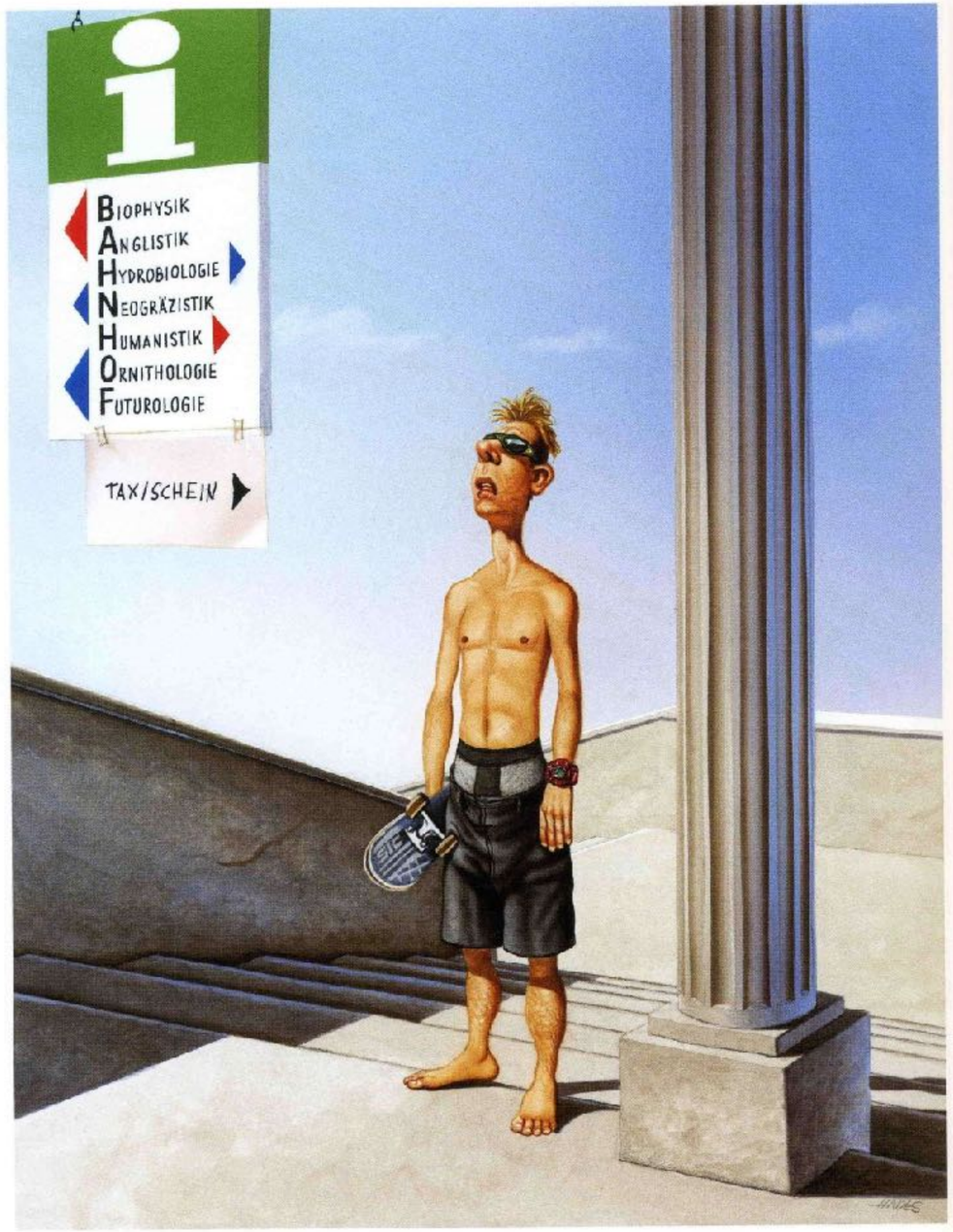
Career Planning : Where to go ?



Studium heute: Immer diese Entscheidungen

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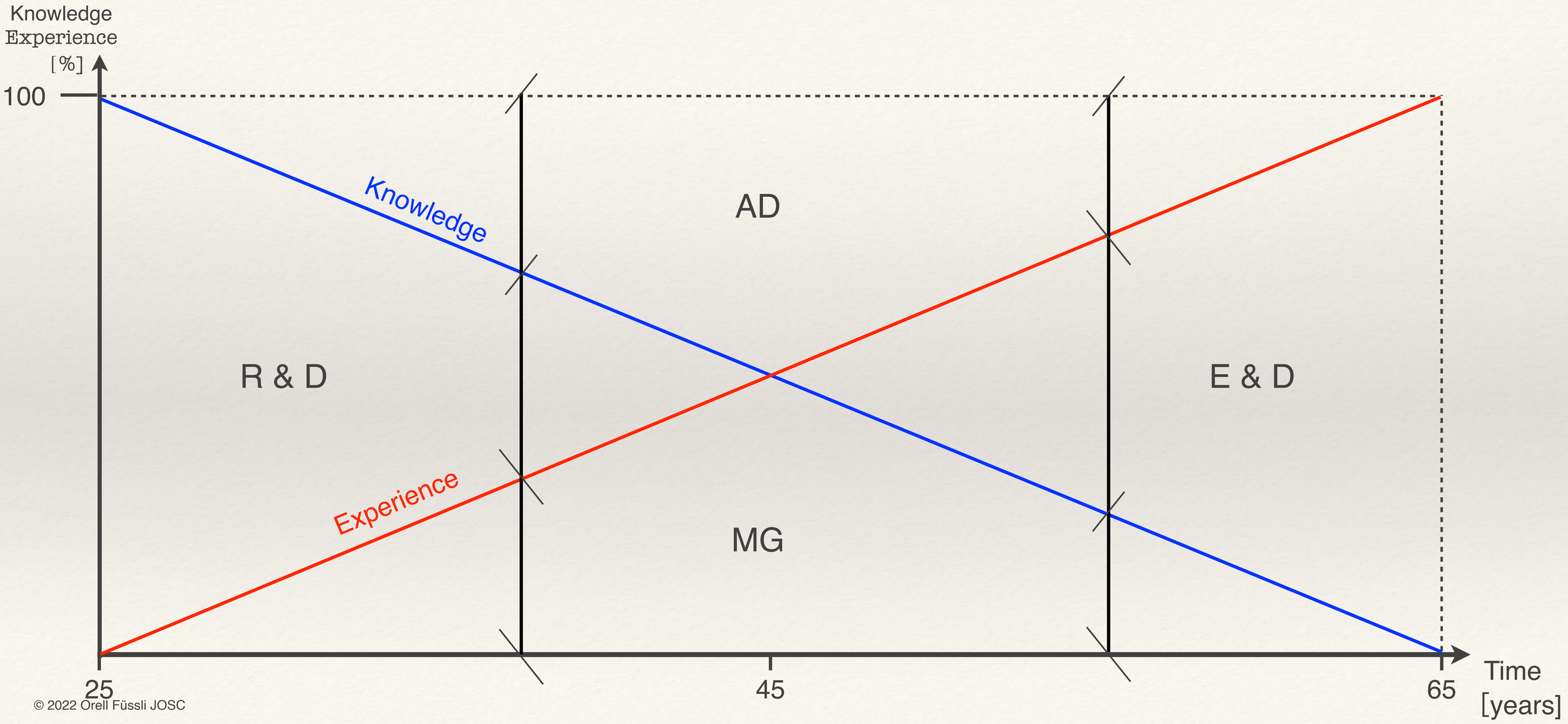
Career Template for Engineers



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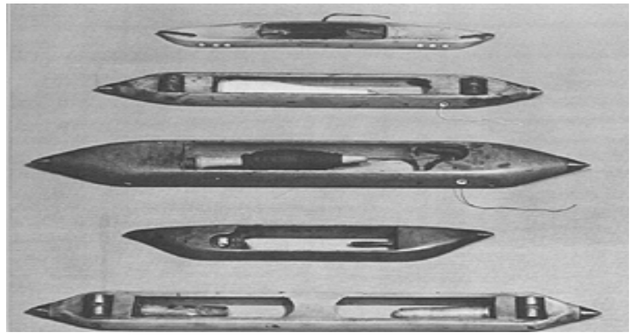
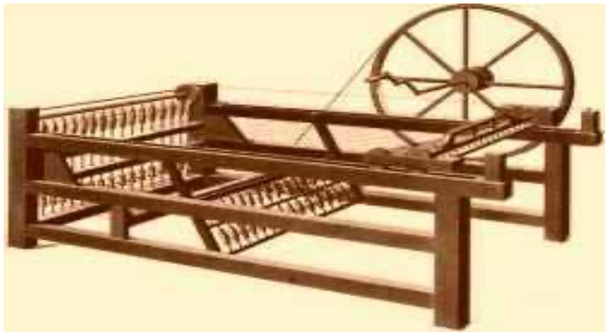
Machine and Plant engineering in Germany (2)

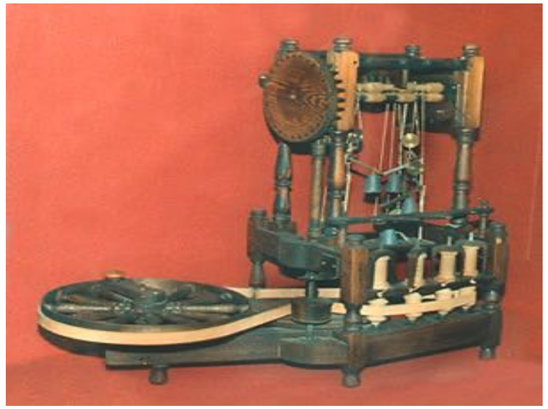
Weak participants in world market

Textile Machines

- Important Inventions in history :
  - 1733 John Kay, Flying Shuttle
  - 1764 James Hargreaves, Spinning Jenny
  - 1764 Richard Arkwright, Waterframe
- Industry Kernel
  - 1783 Platt Broth., Saddleworth-Bolton
  - 1797 Dobson & Barlow, Bolton
  - 1803 Asa Lees on Greenacres Moor







Remarks from the wooden siege

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Machine and Plant engineering in Germany (3)

Strong Participants in world market

Automotive

- ➢Important Inventions in history :
  - ➢Carl Benz Motorwagen
  - ➢Diesel Motor
  - ➢Wankel Motor
  - ➢Porsche Boxer Motor
- ➢ Industry Kernel
  - ➢Mercedes Benz
  - ➢Horch / Audi
  - ➢Volkswagen
  - ➢Porsche

The inventions carry the prestigious names of the key inventors

Remarks from the wooden siege

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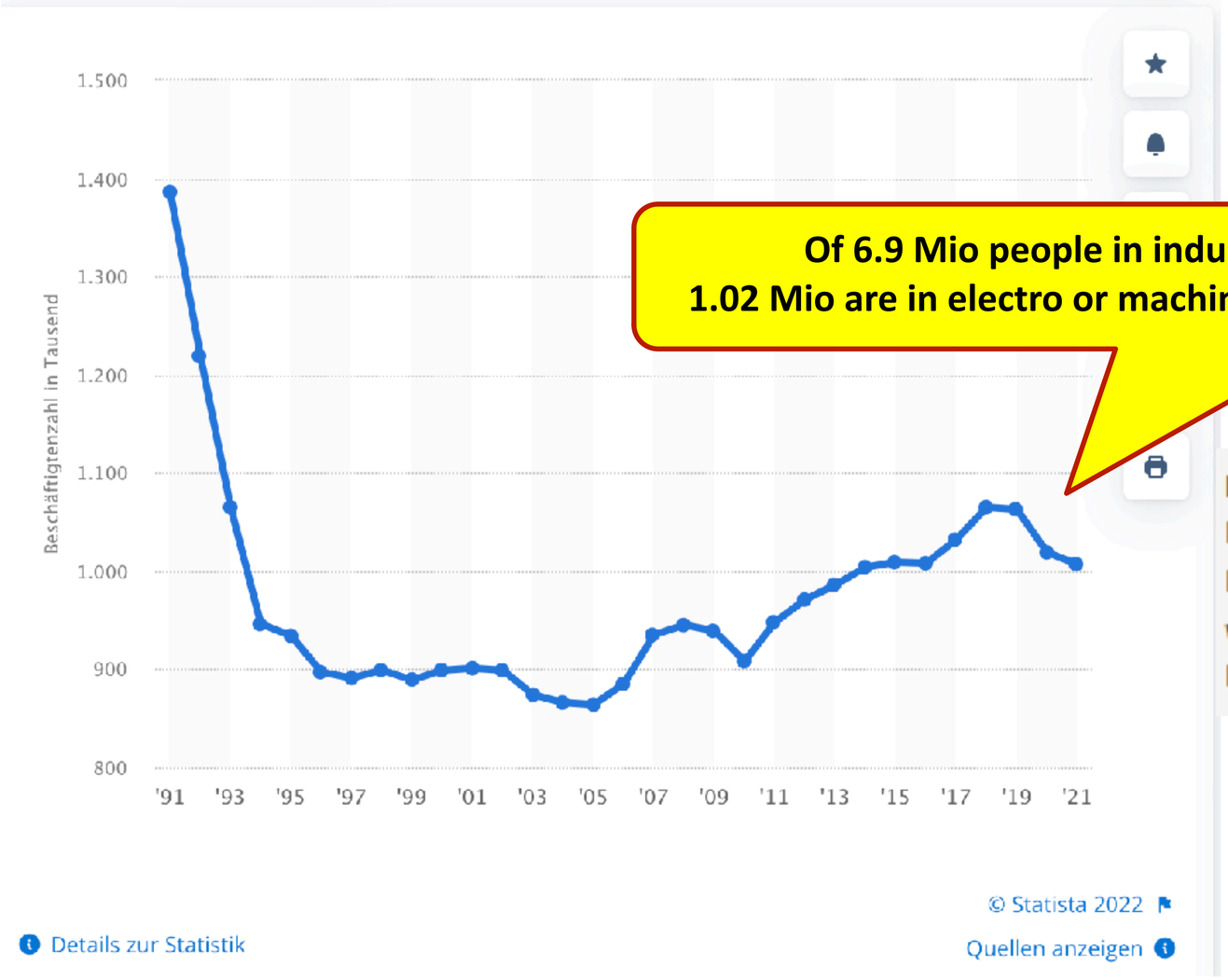
German machine industry is «midsize»



Of 6.9 Mio people in industry
1.02 Mio are in electro or machine industry

Industrieller Mittelstand

Im Maschinenbau dominieren mittelständische Betriebs- und Entscheidungsstrukturen. 87 Prozent der Unternehmen beschäftigen weniger als 250, nur circa zwei Prozent mehr als 1000 Mitarbeiter. Zwei Drittel der Unternehmen haben sogar weniger als 100 Beschäftigte.

http://www.vdma.org/article/-/

66% companies <100 employees
86% companies <250 employees
2% companies > 1.000

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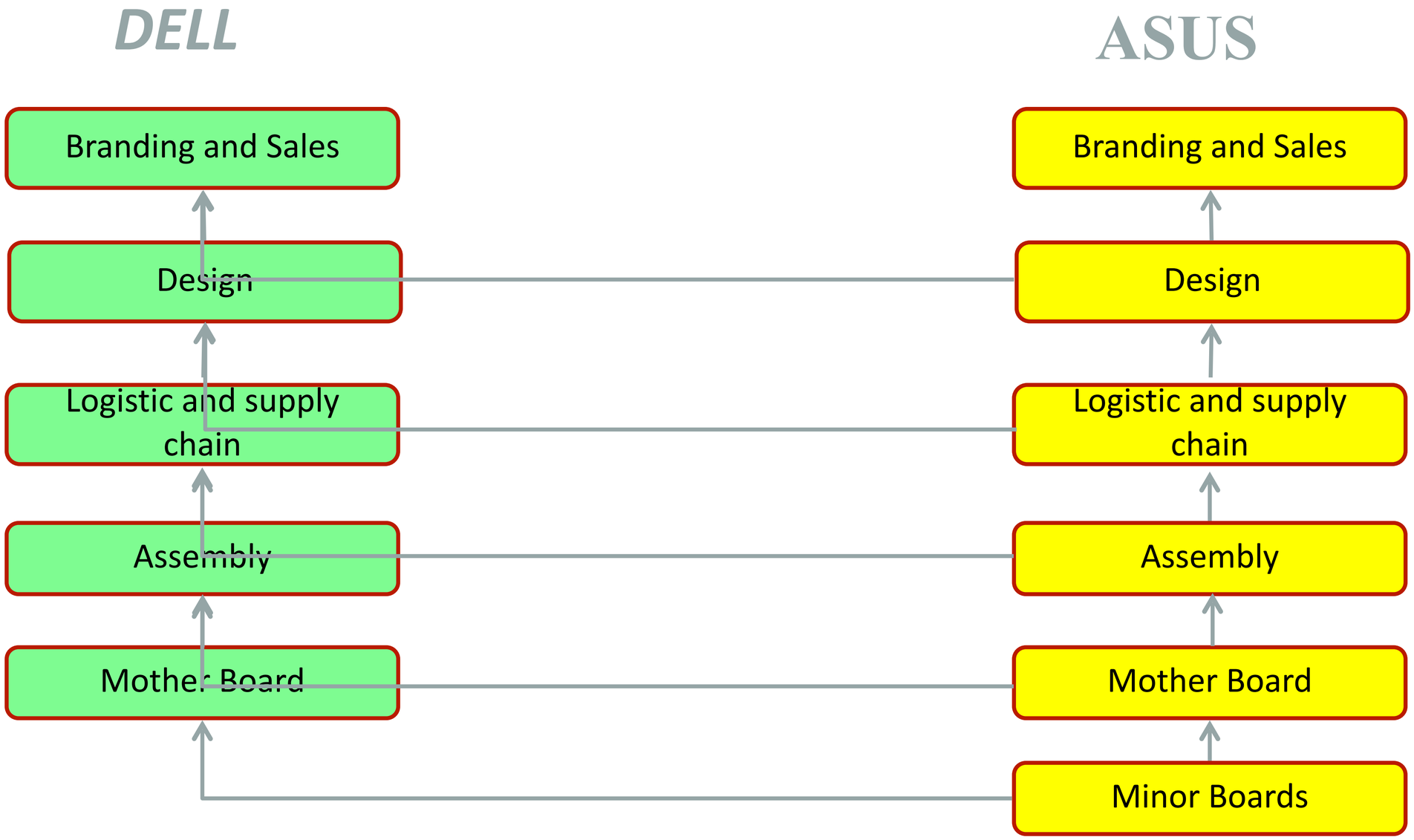
Why does the industry need products ?



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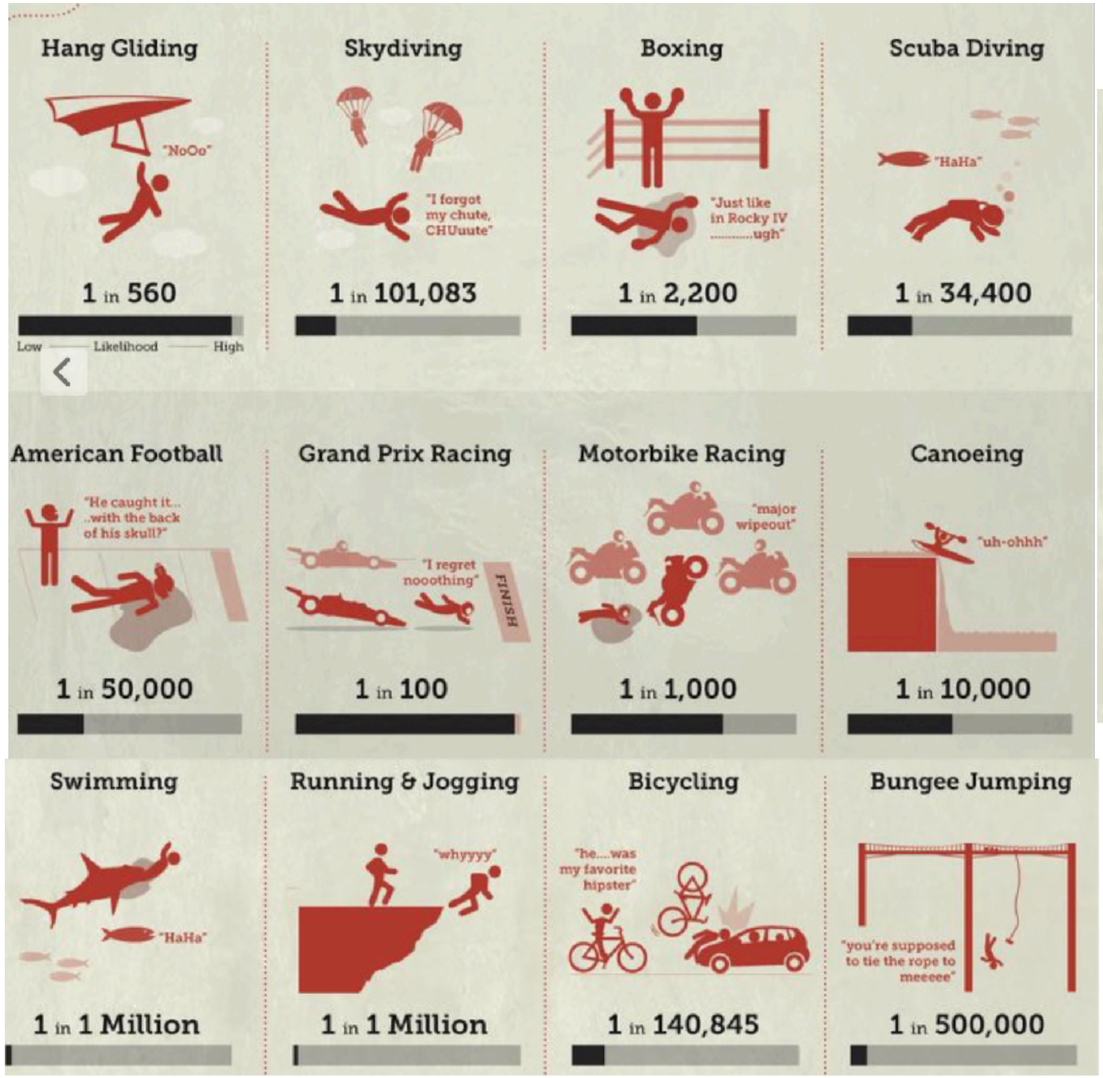
Risks : Nobody wants to die ! Is Sport healthy? (1)



Source : YOUR CHANCES OF DYING RANKED BY SPORT AND ACTIVITY;
https://www.tetongravity.com/story/adventure/your-chances-of-dying-ranked-by-sport-and-activity

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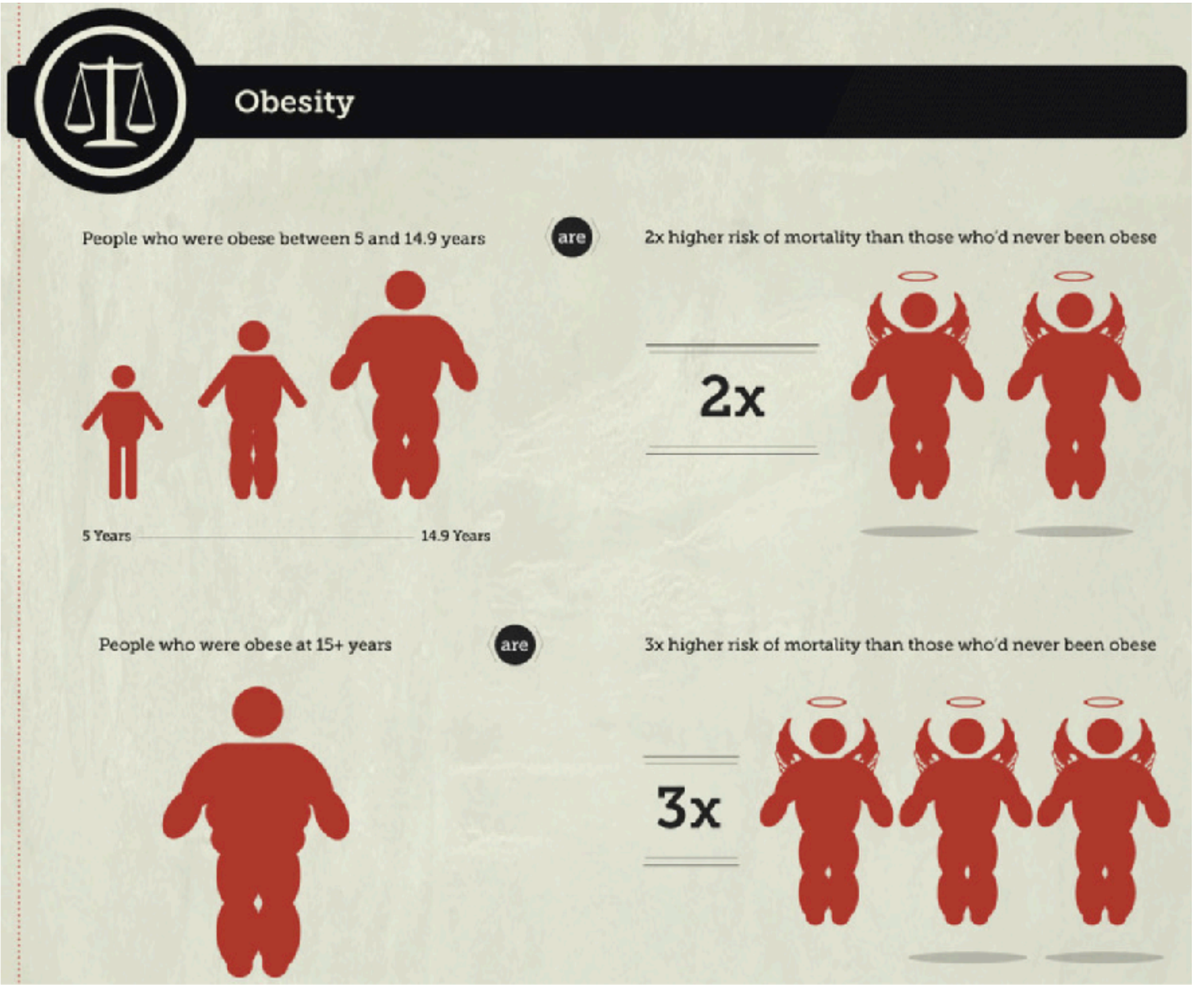
Risks : Nobody wants to die ! Is NO Sport healthy? (2)



Source : YOUR CHANCES OF DYING RANKED BY SPORT AND ACTIVITY;
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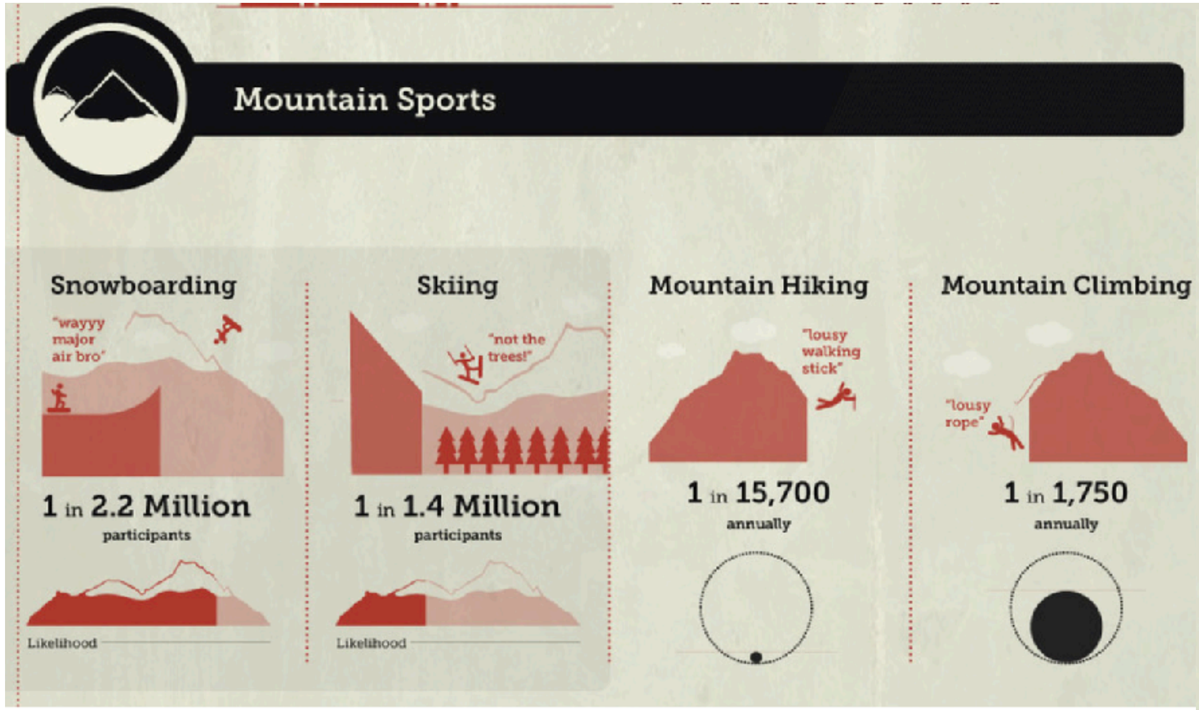
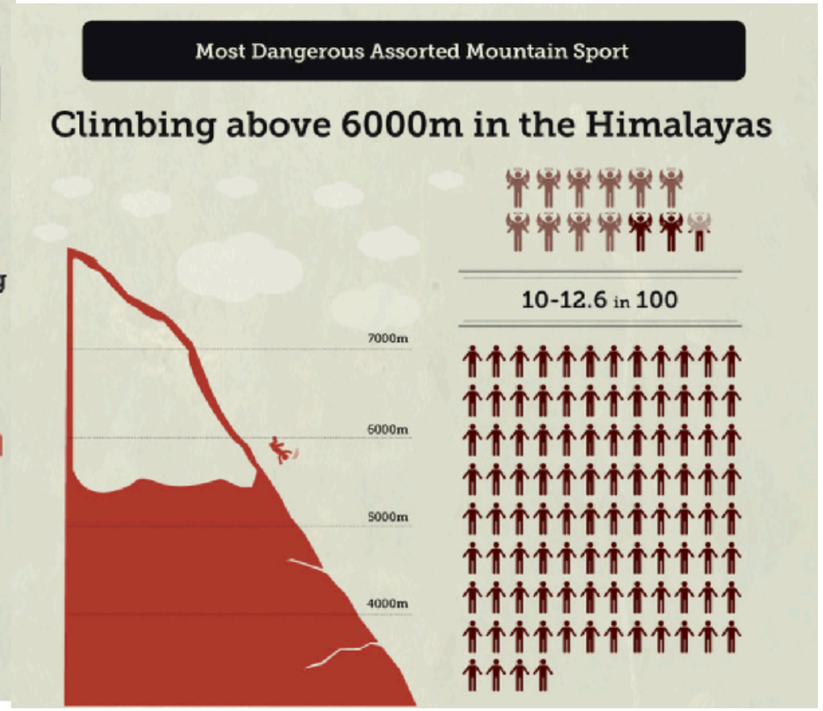
Risks : Nobody wants to die ! Health from the mountains? (3)





Source : YOUR CHANCES OF DYING RANKED BY SPORT AND ACTIVITY;
https://www.tetongravity.com/story/adventure/your-chances-of-dying-ranked-by-sport-and-activity

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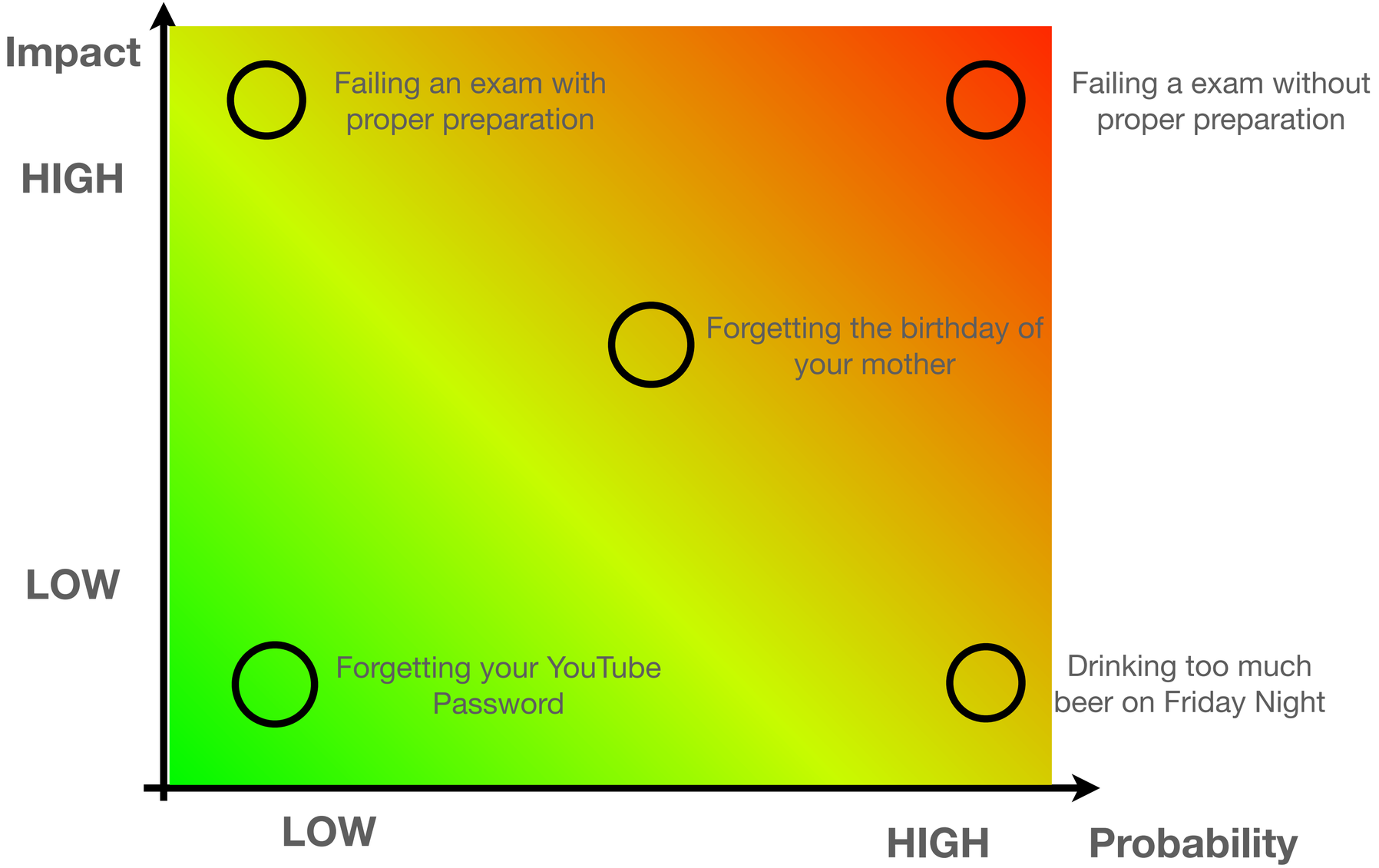
Risks and their Management (Risk Matrix 1)



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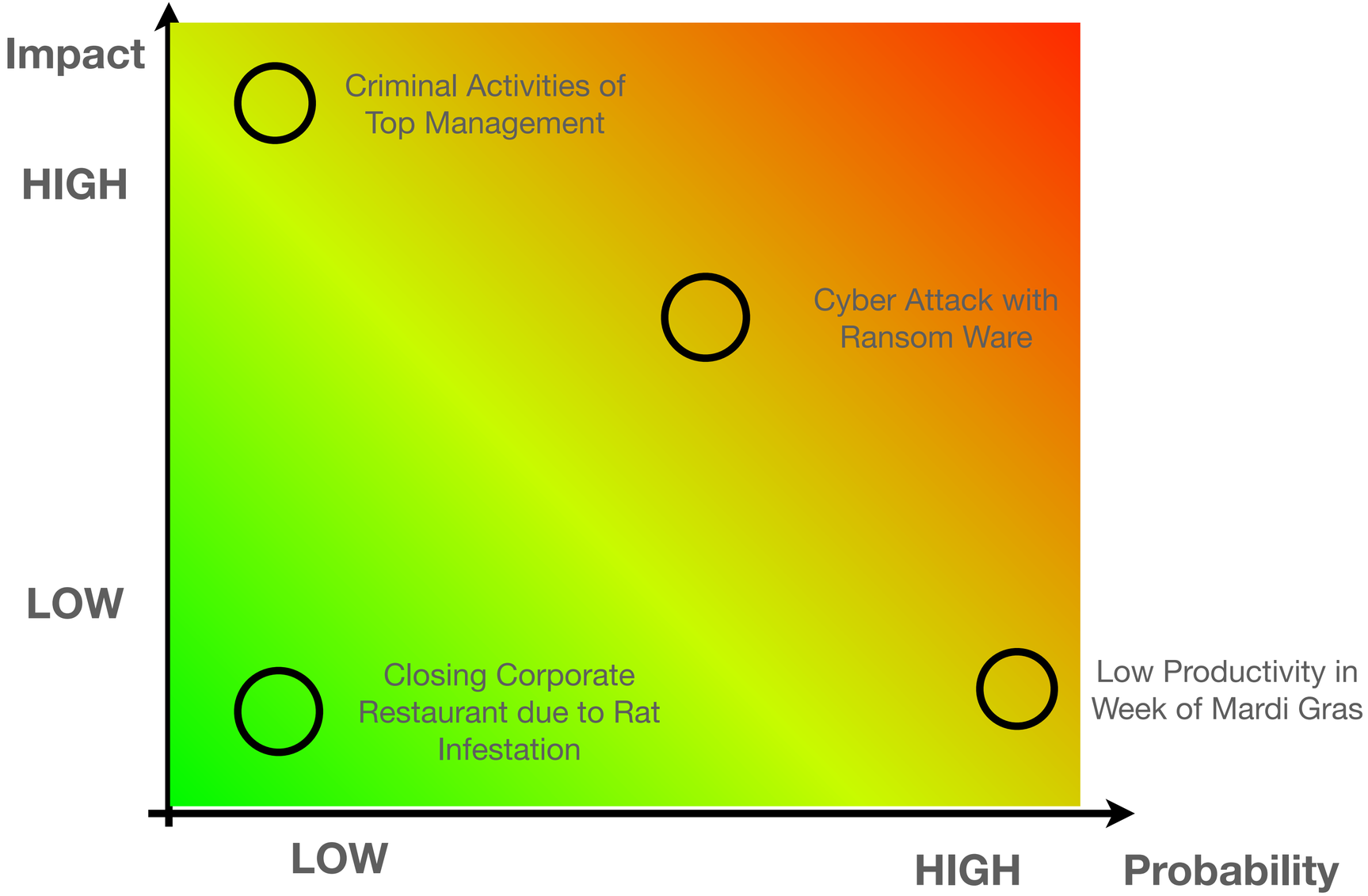
Risks and their Management (Risk Matrix 2)



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Risk Management in Practical Application

Cost to BP

- 4.5 Bio$ Fines
- 65.0 Bio$ Clean Up
- 20.8 Bio$ Settlment

90.3 Bio$ Total

Reputation Damage Non Measurable

Annual Report and Accounts 2009

bp

bp.com/annualreport

Our system of risk management identifies and provides the response to risks of group significance through the establishment of standards and other controls. Inability to identify, assess and respond to risks through this and other controls could lead to an inability to capture opportunities, threats materializing, inefficiency and non-compliance with laws and regulations.

- Deepwater Horizon OilSpill deployed : April 20th 2010
- Declared Sealed : Dec 19th 2010
- Largest Environment Disaster documented : ca. 780.000 m3 spilled
- ca. 780.000 km3 of water contaminated roughly double the water content of all large North American Lakes

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Governance in Theory and Practical Application

Preventive compliance management system

Compliance is an important part of the Governance, Risk and Compliance (GRC) organization in the Volkswagen Group (see the Report on Risks and Opportunities starting on page 160). As part of this, Volkswagen adopts a preventive compliance approach and aims to create a corporate culture that stops potential breaches before they occur by raising awareness and educating employees. Group Internal Audit and Group Security regularly perform the necessary investigative activities, systematically monitor compliance and perform random checks regardless of any suspicion of infringements, as well as investigating specific suspected breaches. Responses are implemented by the Human Resources and Group Legal departments. These processes are closely interrelated, in line with the concept of a comprehensive compliance management system. Nevertheless, we are aware that even the best compliance management system can never entirely prevent the criminal actions of individuals.

Source : annual report Volkswagen Group 2014;, March 12th 2015

NEWSPAPER OF THE YEAR

THE TIMES

Wednesday September 23 2015 | thetimes.co.uk | No 71710

Only 80p to print members £1.20

2 London fashion special
The shoes! The bags! The front row!

Plus Are you wearing the new midis?
The fashion editors' heels

Volkswagen in meltdown after faked diesel tests

Drivers face mass recall as share price crashes

Robert Lea Industrial Editor
Graeme Paton
Transport Correspondent

Hundreds of thousands of Volkswagen drivers in Britain are facing a mass recall of their vehicles after the scandal

rence". He added: "Public confidence is vital."

The commission said that it was waiting for the outcome of an investigation by the German government into VW and some of the country's other manufacturers. It confirmed, however,

WH Smith is forced to end hospital shop 'rip-off'

Lucy Bannerman, Neil Johnston

WH Smith will cut the cost of some goods in its hospital shops after it emerged that patients and visitors were often charged more than on the high street.

Get-well-soon cards were sold at the retailer's branch at Bristol Royal Infirmary for nearly twice as much as a high street outlet nearby, an investigation by The Times found last month.

A packet of Maltesers chocolates cost £2.99 in WH Smith at Morriston hospital in Swansea compared with £2 at the nearest high street branch; a can of Coca-Cola was 99p in the same hospital but 65p elsewhere.

The revelations led to claims that customers in hospitals — many of them sick or under strain — were being "ripped off", despite having little choice

Source: The Times, London ; Sept 21st 2015

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Why are engineers needed ?

Svante Arrhenius,
Nobel Laureate Chemistry 1903

absorbed by the oceans. In view of this, a doubling of CO_2 that would have taken 3000 years if the earth was a single land-mass would occur in 500 years. During this latter period, temperatures would increase by 3–4°C. Arrhenius saw nothing adverse in such a development. It will "allow our descendants," he said, "even if they only be those of a distant future, to live under a warmer sky and in a less harsh environment than we were granted"(11). Such a view is consonant with the ideology of "optimistic evolutionism" embraced by Arrhenius and many of his contemporaries (22).

Source : Arrhenius' 1896 Model of the Greenhouse Effect in Context
Author(s): Elisabeth Crawford

1. CO2 will create a «greenhouse» effect
2. Average Temperature will raise 3-4°C
3. Positive Effect for Scandinavia

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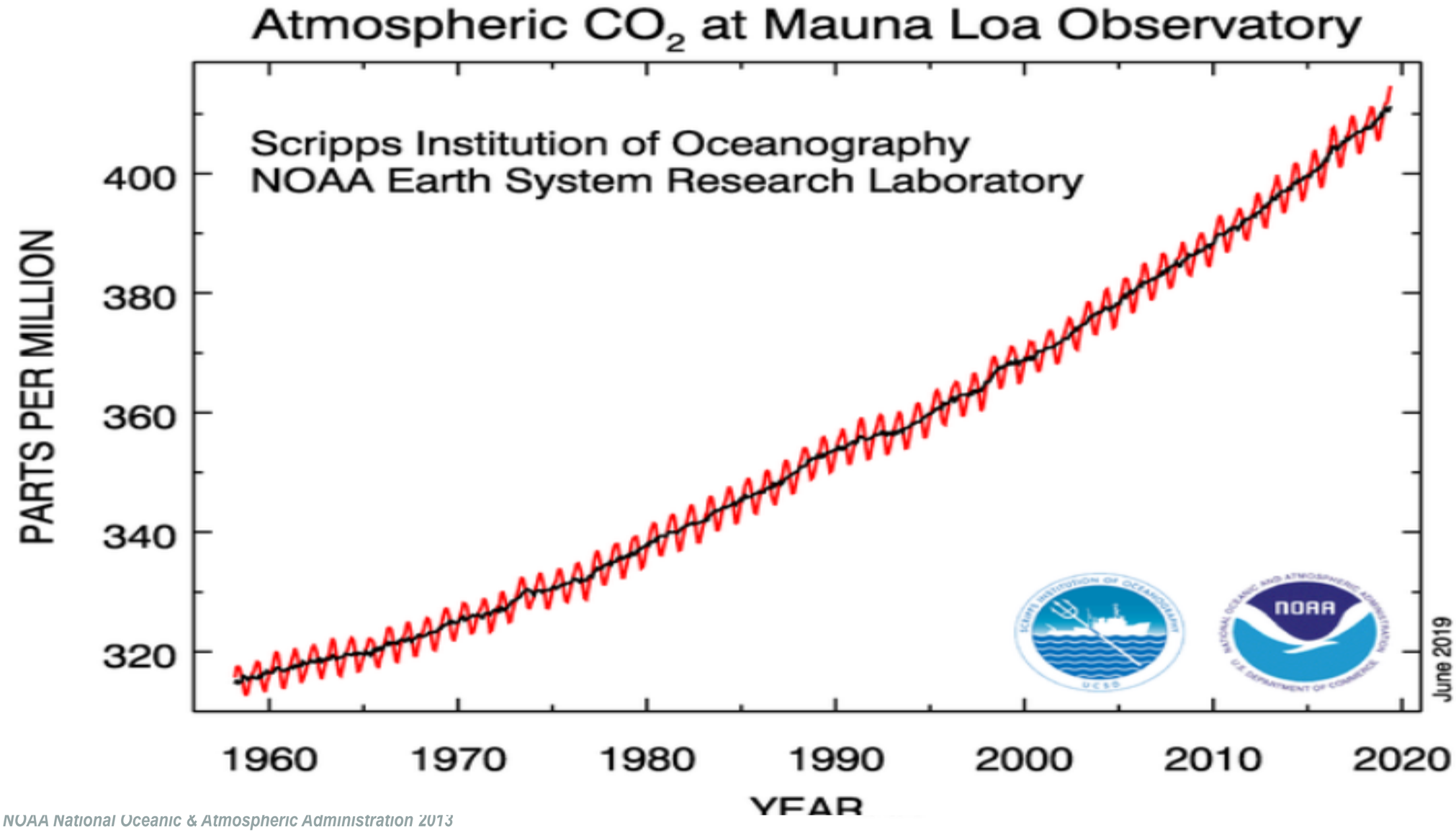
Why are engineers needed ?



Source : NOAA National Oceanic & Atmospheric Administration 2013

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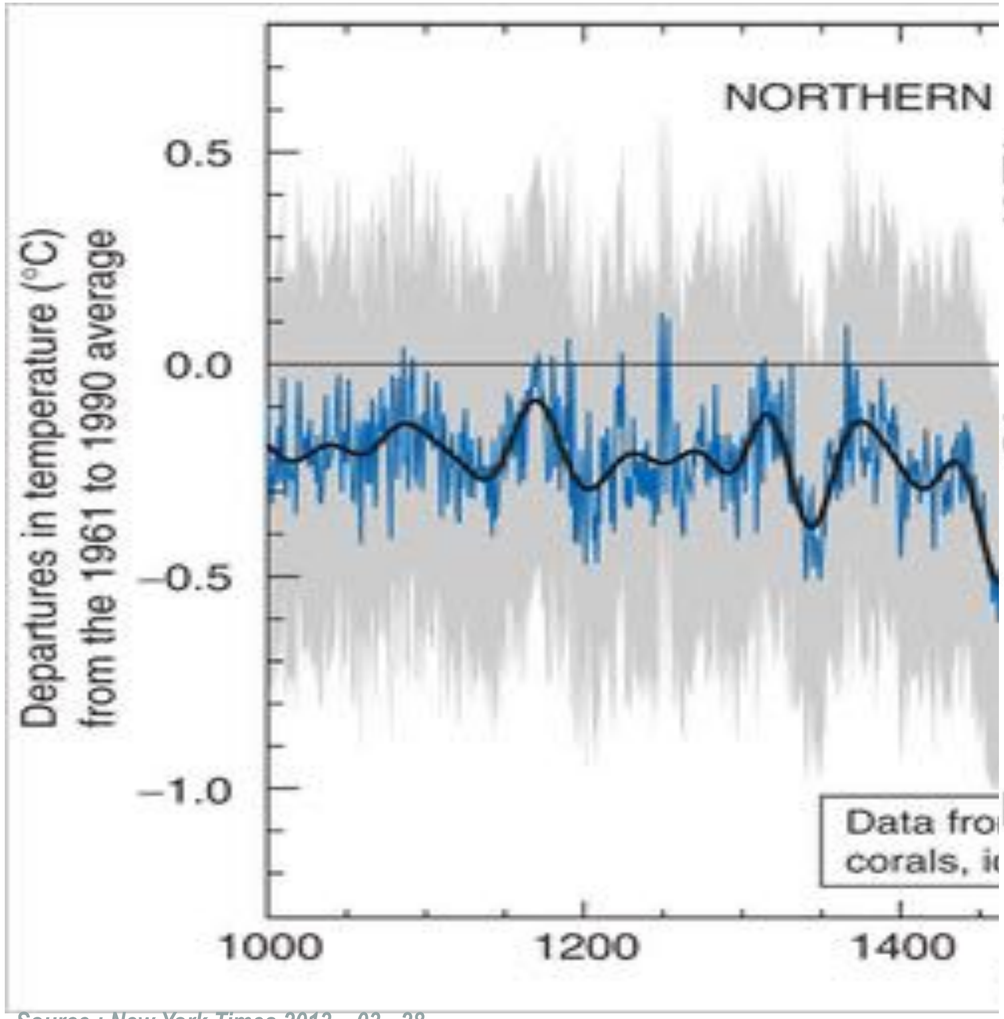
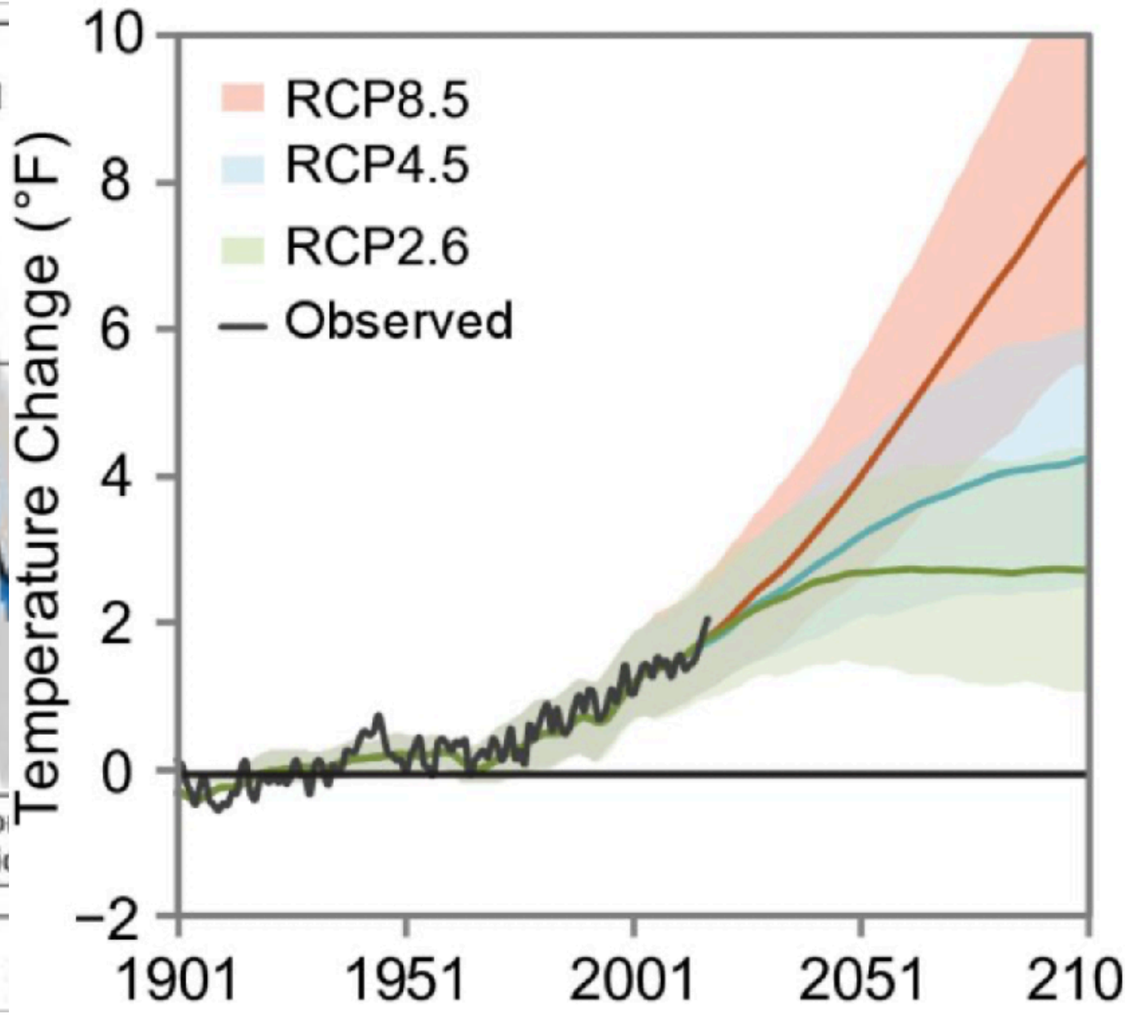
Why are engineers needed ?



Source : New York Times 2013 – 03 - 28



Source : https://www.researchgate.net/publication/320820633_Our_globally_changing_climate/figures?lo=1

Remarks from the wooden siege

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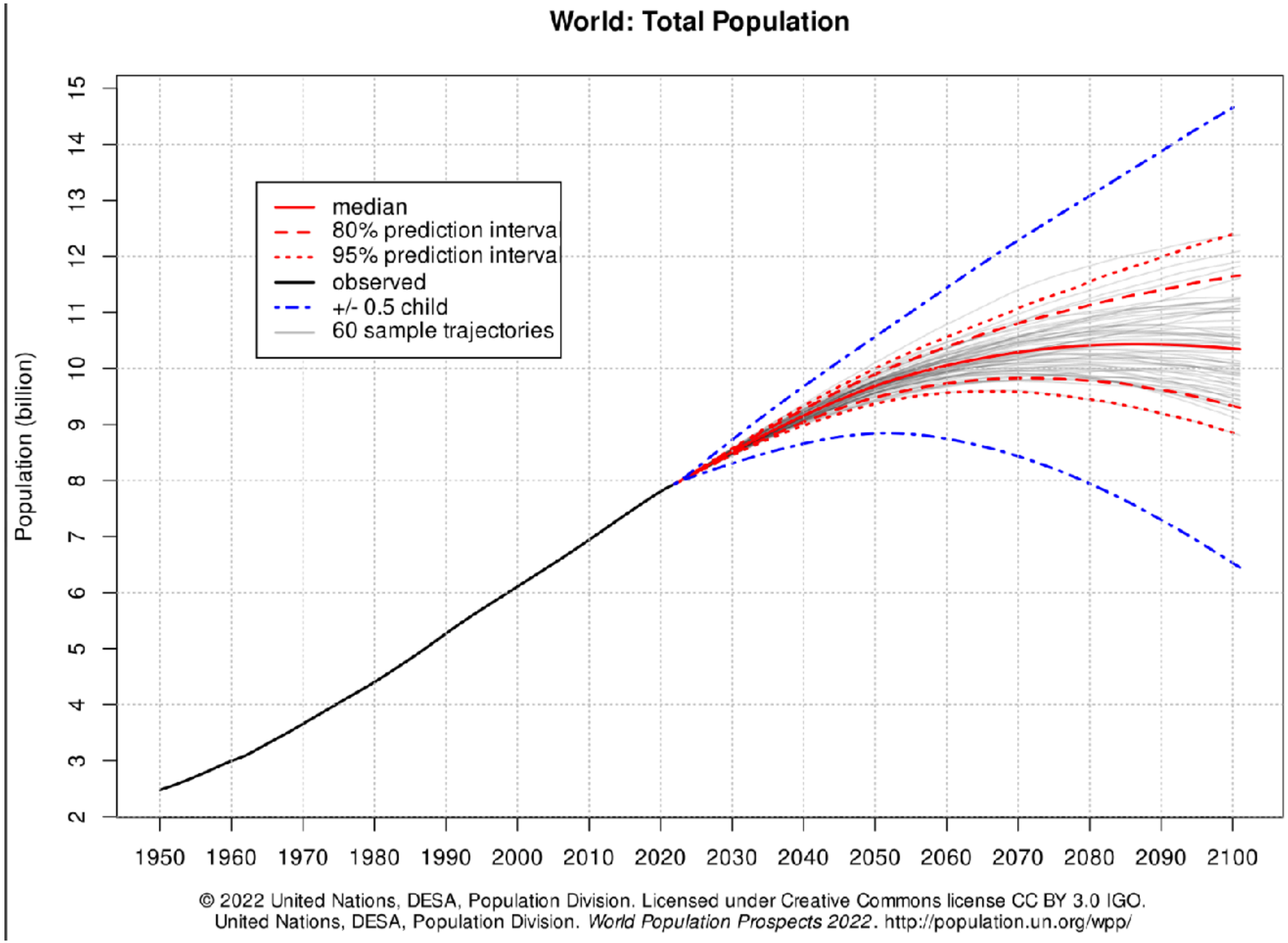
Why are engineers needed ?



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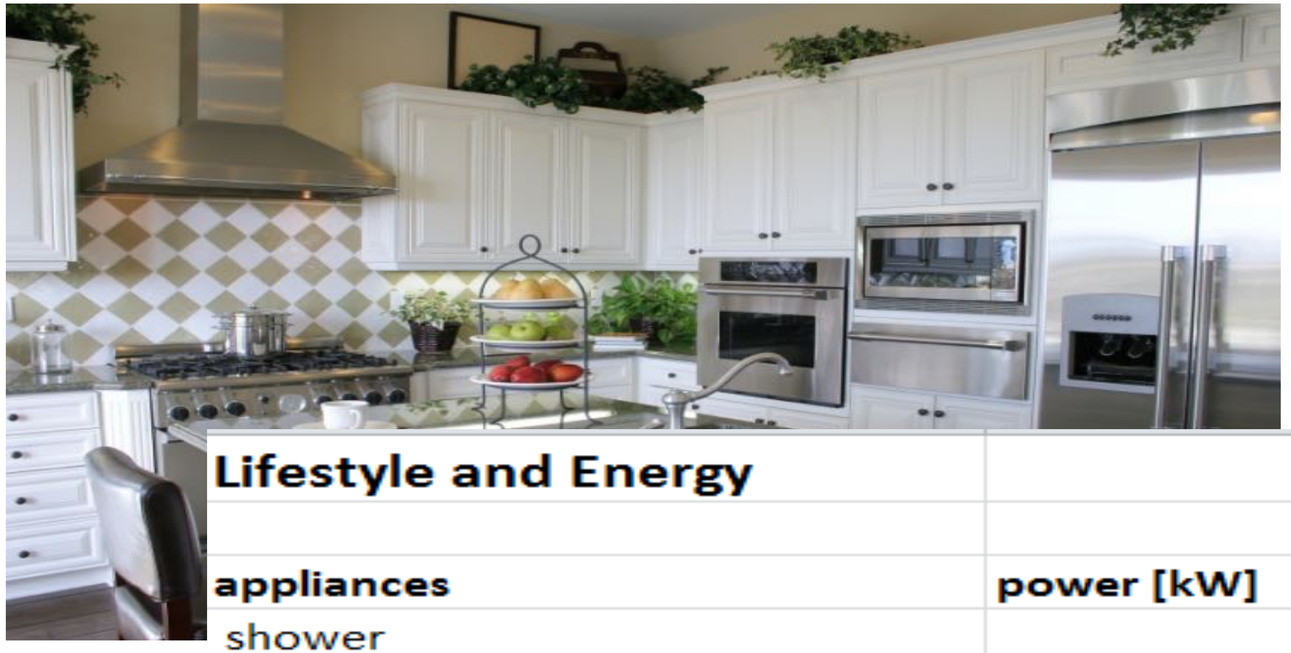
Why are engineers needed ?



Lifestyle and Energy			
appliances	**power [kW]**	**usage/(weekxp) [hrs]**	**kwh/week**
shower	5.00	1.00	5.00
washing machine	1.50	1.00	1.50
dryer	2.50	1.00	2.50
dishwasher	1.80	0.40	0.72
refrigerator	0.18	168.00	30.24
internet	0.25	60.00	15.00
television	0.20	14.00	2.80
light	0.45	42.00	18.90
Total			**76.66**
source : http://energy.gov/energysaver/articles/estimating-appliance-and-home-electronic-energy-use			

Remarks from the wooden siege

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Facts and Alternatives

Neuzugang: Hochleistungslaser Vega

Vega pulst mit 1,4 Billionen Watt Leistung – das entspricht in etwa der Hälfte des durchschnittlichen weltweiten Stromverbrauchs.* Er tut dies 1.000-mal pro Sekunde für 30 Femtosekunden (0,000 000 000 000 03 Sekunden).

Im Durchschnitt entspricht seine Leistung daher der einer 40-Watt-Glühbirne.

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Why are engineers needed ?

Frankfurter Allgemeine | 21.04.2022 - Aktualisiert: 25.04.2022, 07:10 Uhr
https://www.faz.net/-gqe-ap8rn

Ernährung ohne Tier

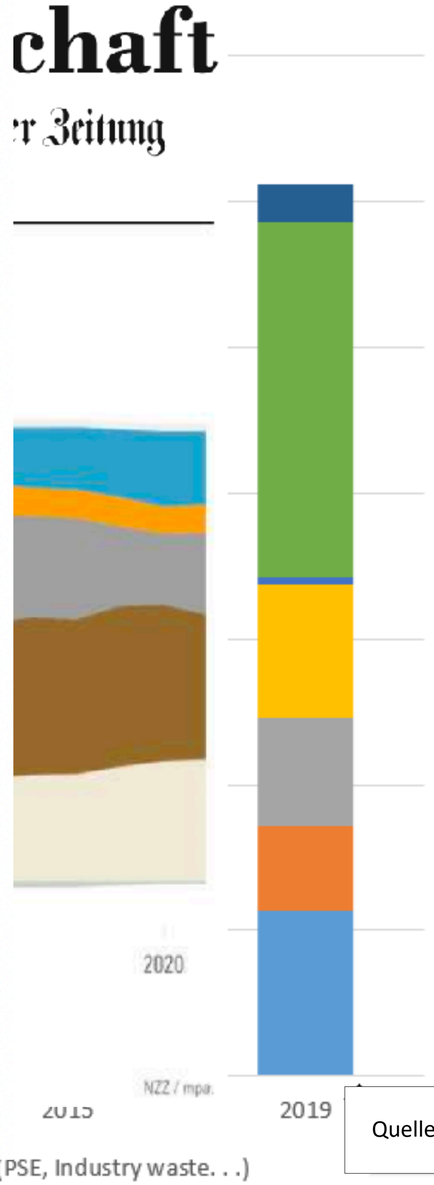
„Hafermilch ist keine Lösung“

Kann Hafermilch gegen die Klimakrise helfen? Der Agrarwissenschaftler Wilhelm Windisch über verschwenderische Veganer, effiziente Kühe und den Irrsinn mit dem Laborfleisch.

Von SEBASTIAN BALZTER

© Wildlife

Muh!



Quelle: AG Energiebilanzen e.V.

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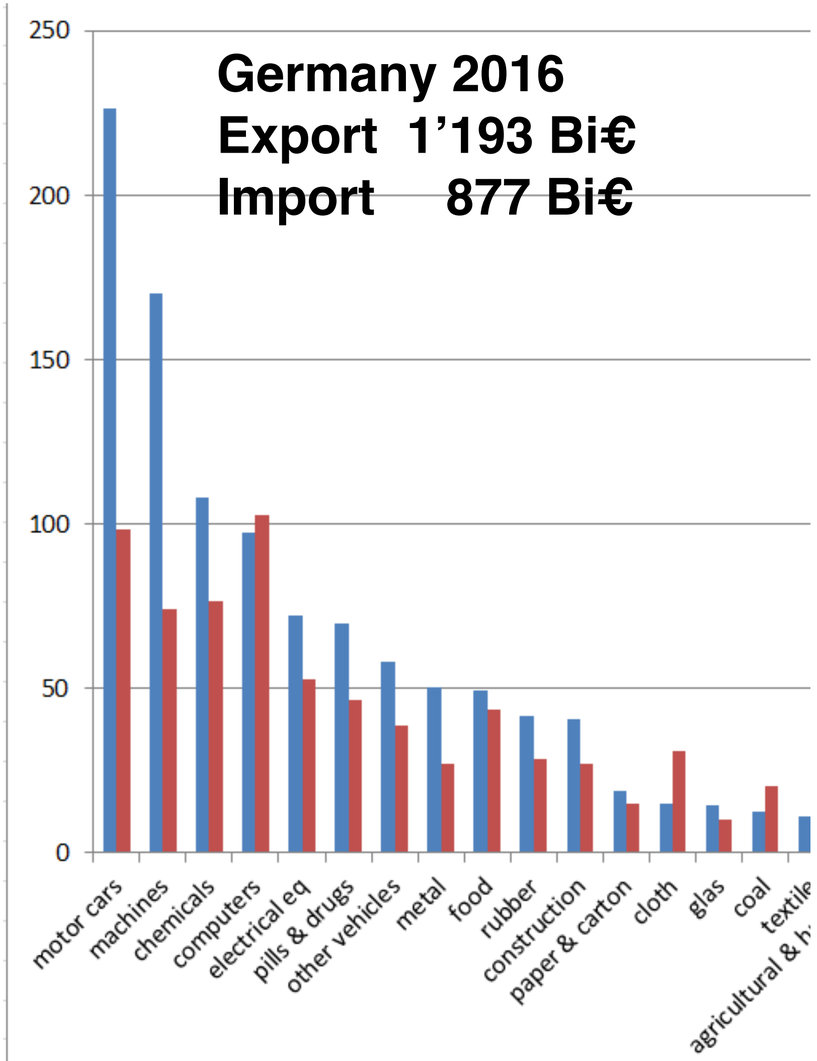
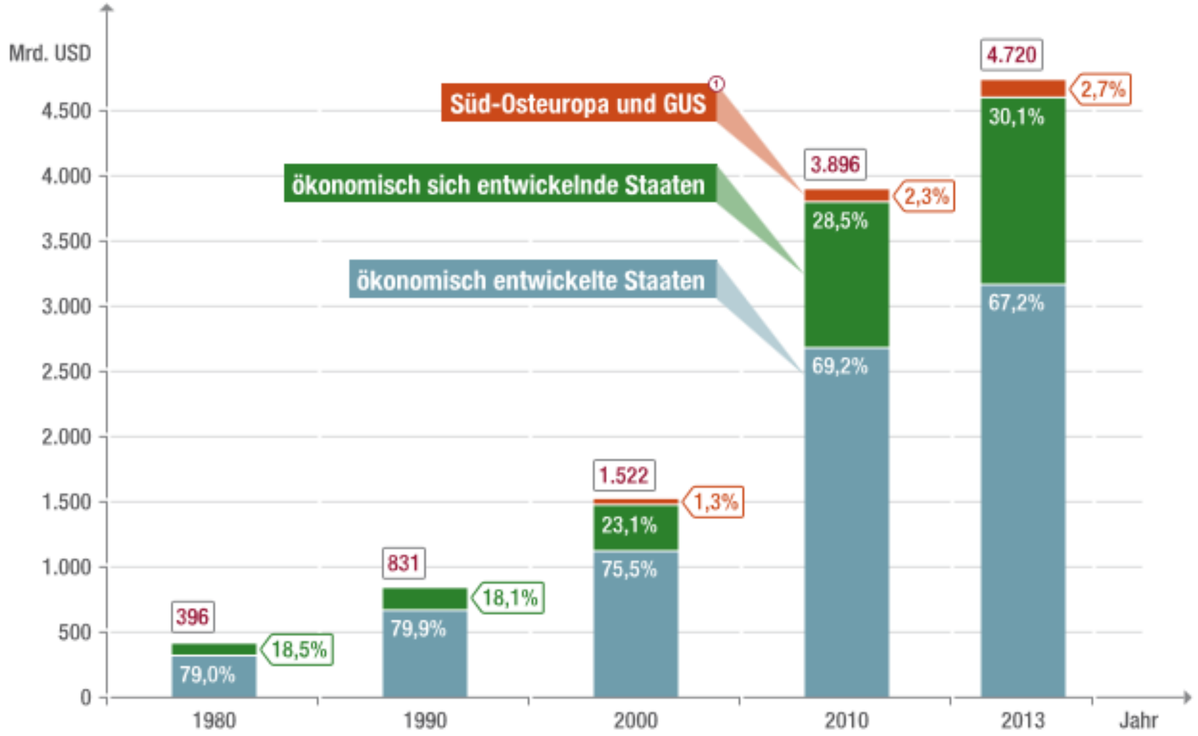
Growing focus on “old” economy ?



20.4.2016

Dienstleistungsexport

In absoluten Zahlen und Anteile in Prozent, 1980 bis 2013



Quelle: United Nations Conference on Trade and Development (UNCTAD): Online-Datenbank: UNCTADstat (Stand: August 2015)
Lizenz: cc by-nc-nd/3.0/de/

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Dreams

Hopes and Disappointments

- CAD
- Expert Systems
- Autonomous Systems
- AI
- Chat GPT

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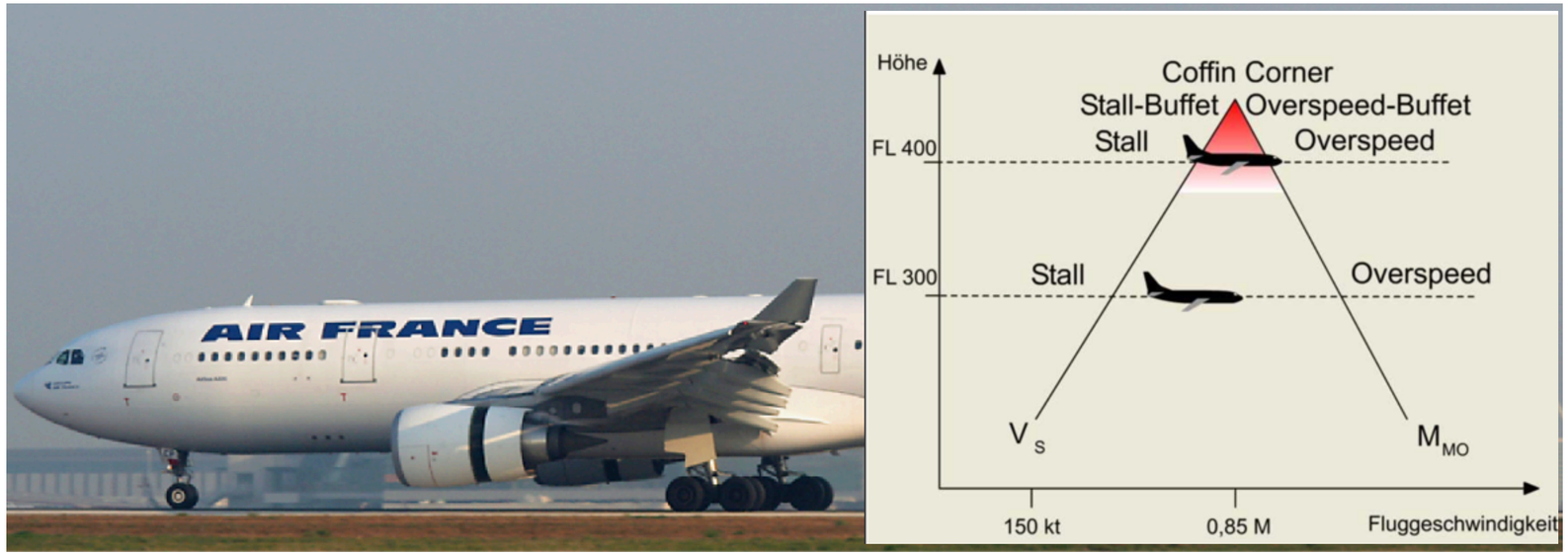
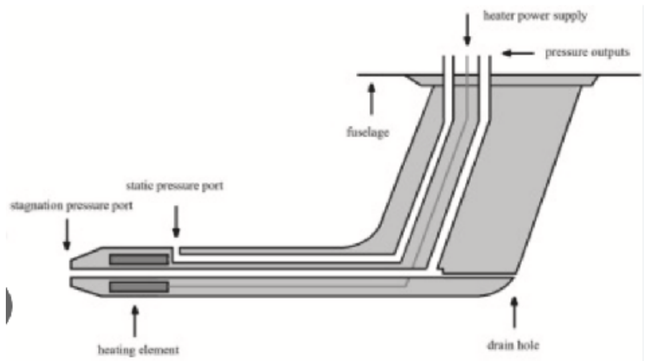
Example for your Consideration



Flight AF 447 Rio to Paris; 1 June 2009,

- inconsistent airspeed indications stalling the Airbus A330
- crash into the Atlantic Ocean at 02:14 UTC,
- 228 passengers and crew deceased



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The Power of Money The Persian - Attica Stand-Off 500 - 450 AC

Source: Historischer Atlas der antiken Welt; J.B. Metzler Stuttgart, Weimar; 2012

Money and Identity

KBA NotaSys
VALUE BEYOND TECHNOLOGY

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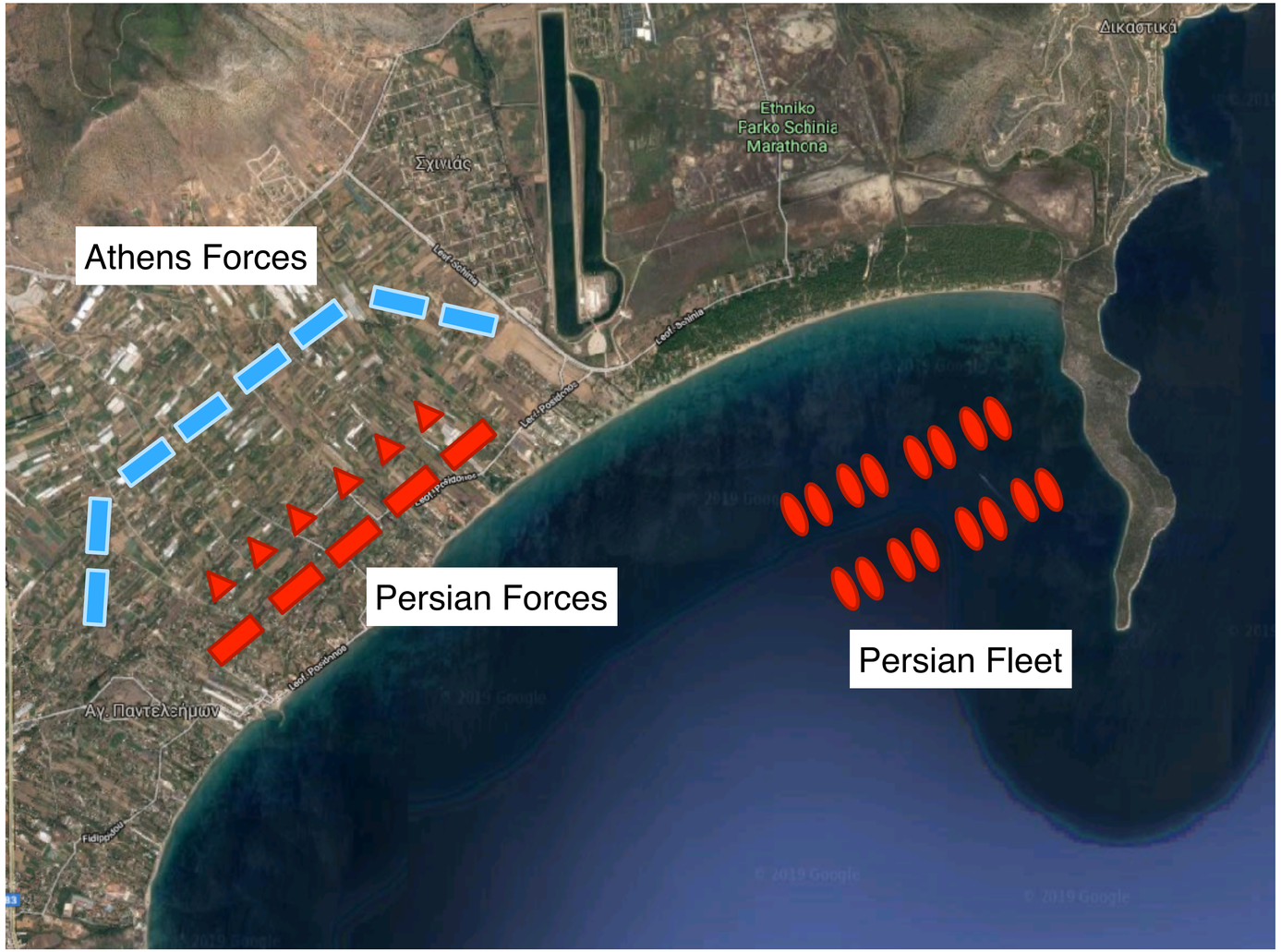
Battle of Marathon 12.9.490 A.C.



Source: GOOGLE Maps 2019

Skull and helmet found on battlefield Marathon
Source: Royal Ontario Museum

Money and Identity

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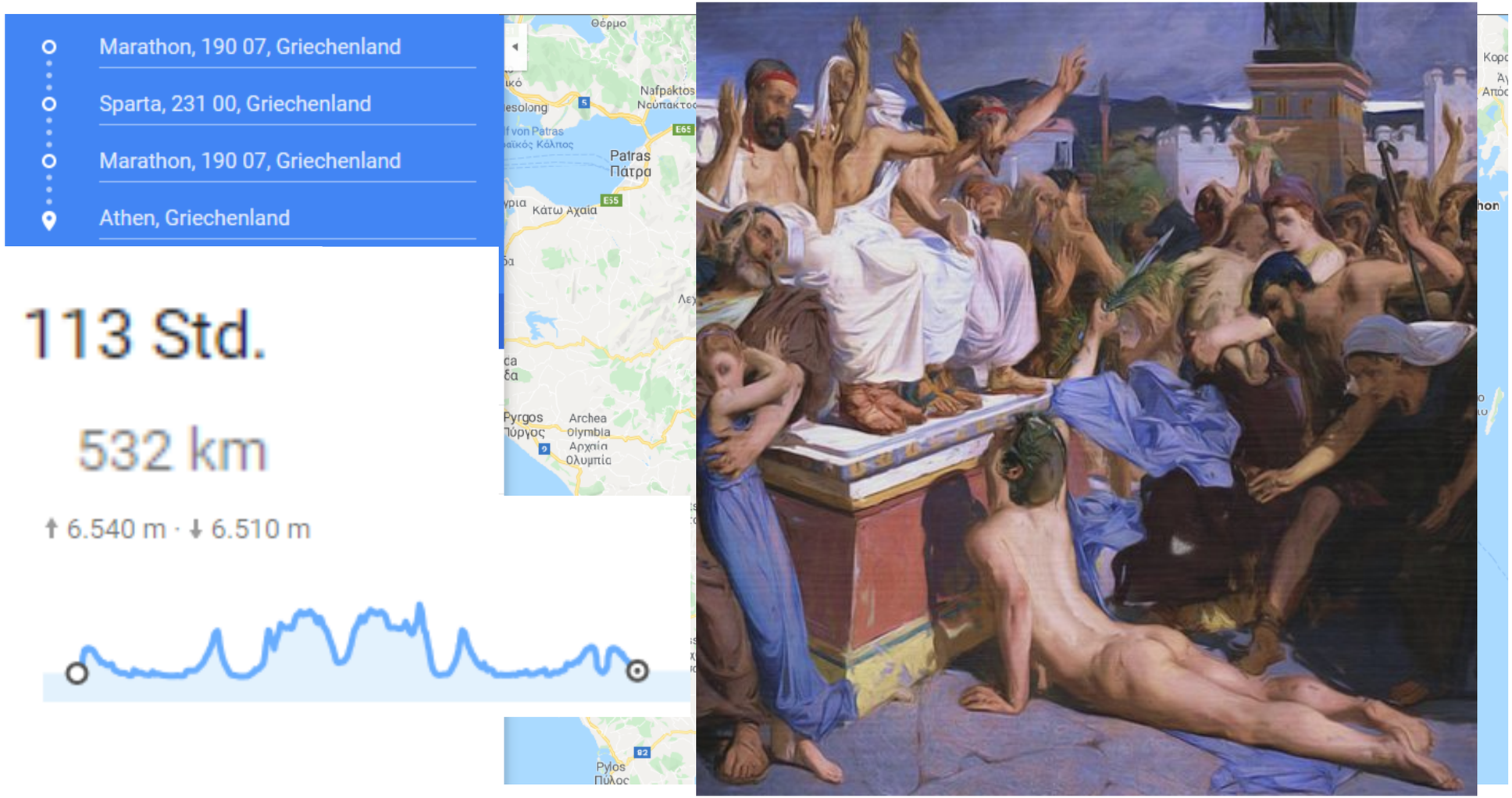
Marathon historic jog



Source: GOOGLE Maps 2019

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Attic-Delian Alliance 478- 404 AC

Source coin images : The digital Coin Cabinet of Würzburg University © 2019
Source Map: Historischer Atlas der antiken Welt; J.B. Metzler Stuttgart, Weimar; © 2012

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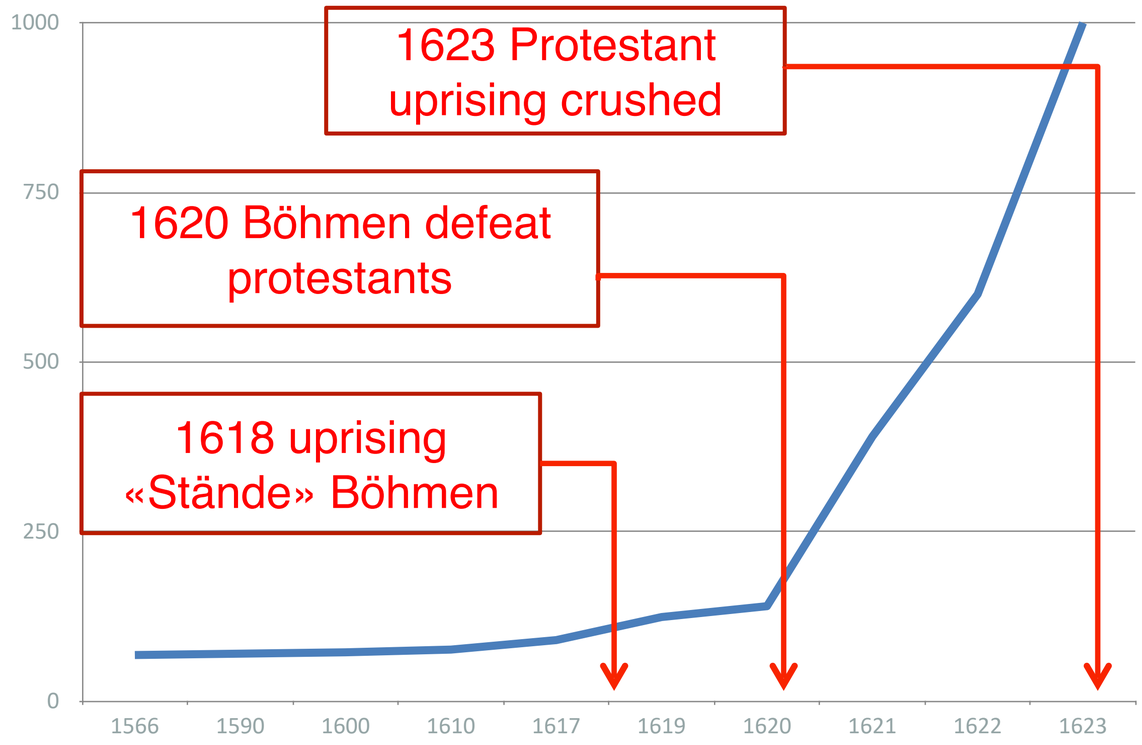
Kreuzer for Reichsthaler Weimar



1620 Kipper 12 Kreuzer ~2.3 gr

1620 Reichstaler ~14.9 gr

evolution of central bank money

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Kipper and Wipper

evolution of central bank money

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The ambivalence of early paper money

Bank of England ONE Pound Note 1797

Identity and paper money

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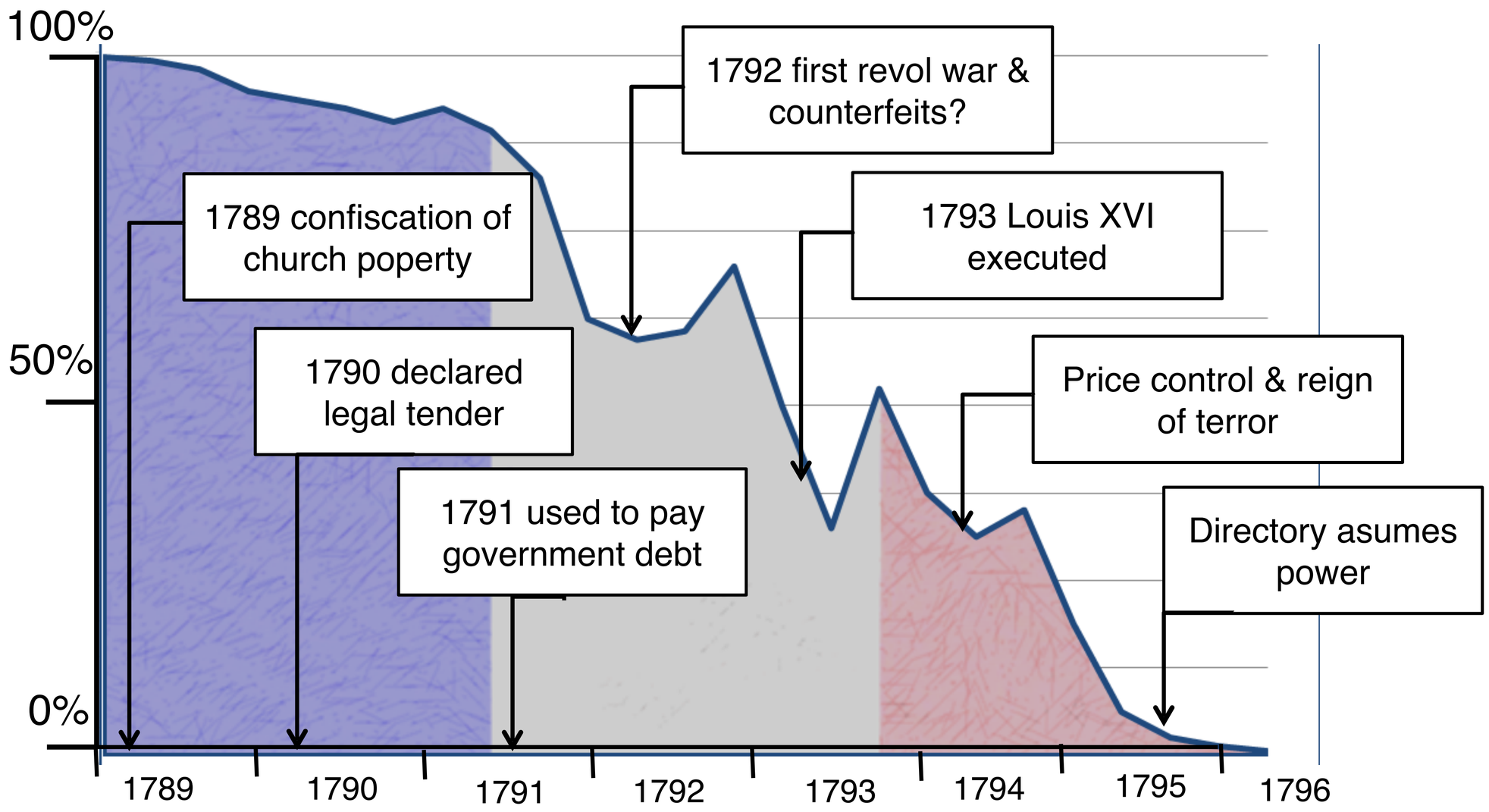
Inflation of Assignats



economy and paper

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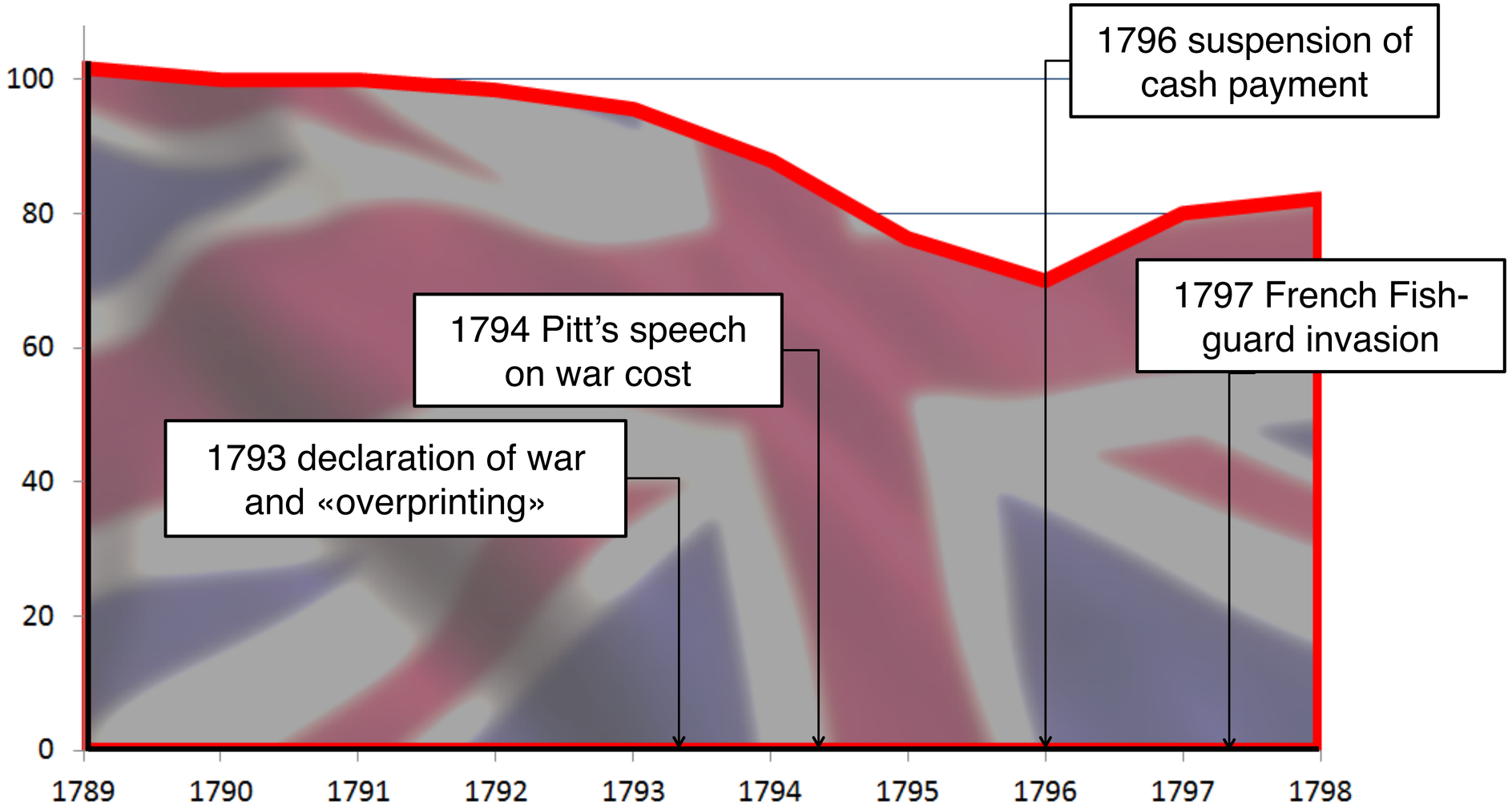
Inflation of British £



economy and paper money

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Bank of England creates paper money

James Gilray: Transmuting all into gold paper March 9th 1797 ; *Source: British Museum*

James Gilray: Polititcal Ravishment the Old Lady of Threadneedle Street in danger, May 22nd 1797; *Source: British Museum*

economy and paper money

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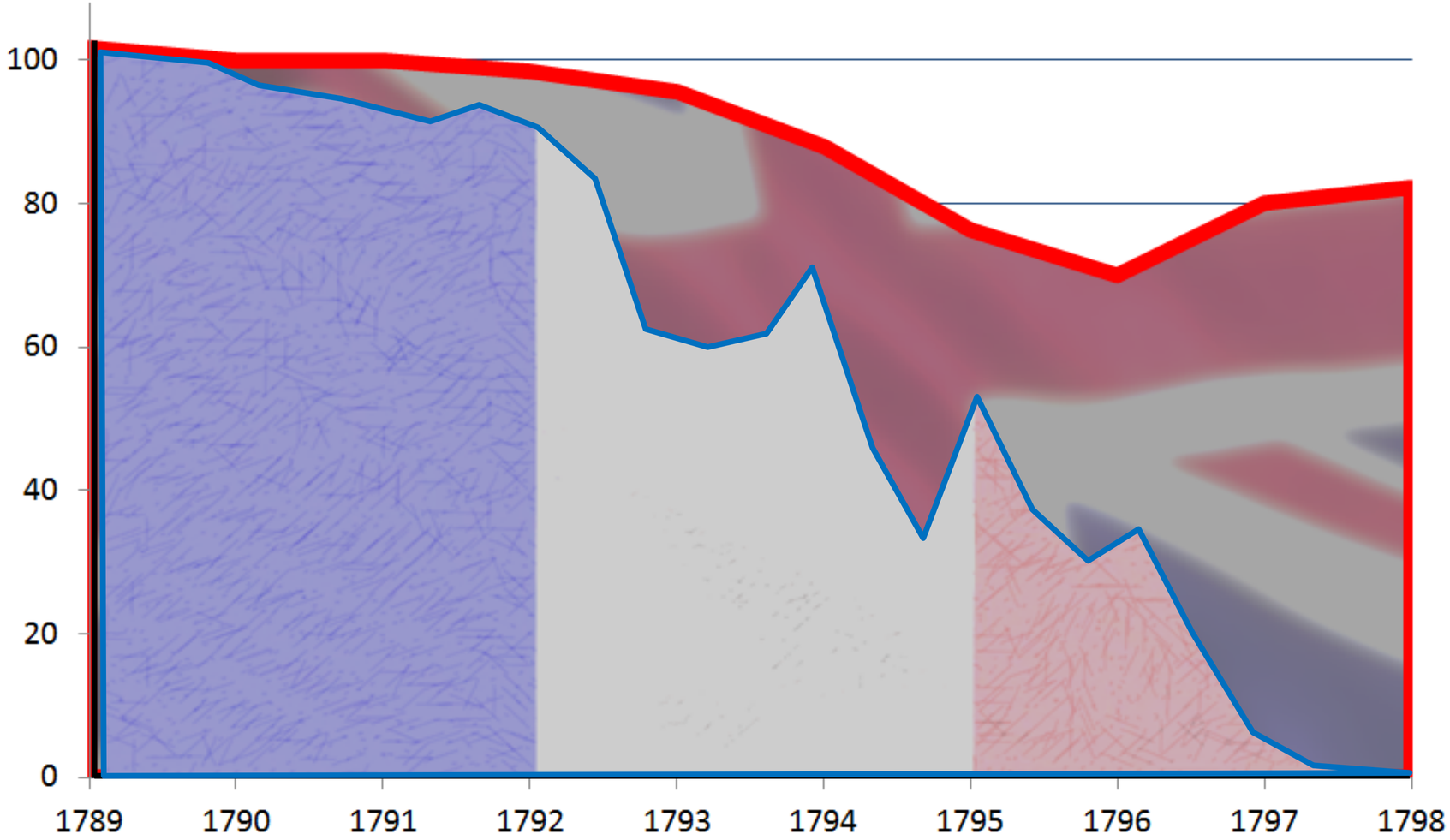
Inflation of British £ vs Assignats 1789 - 1798



economy and paper money

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closing remark

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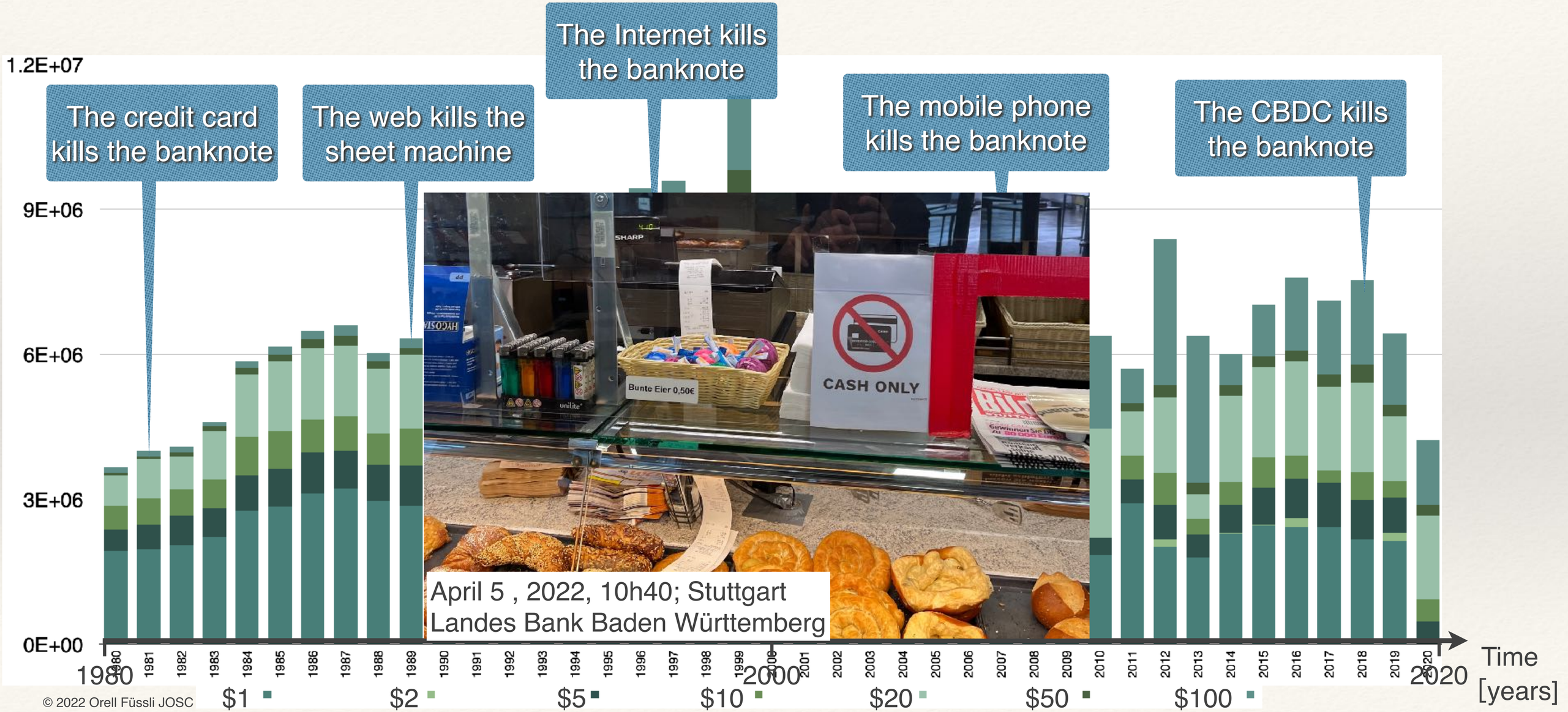
2010 - 2020 Future of Cash ?

"The vehemence of the argument is inverse proportional to the competence" *Chr. Fischer*



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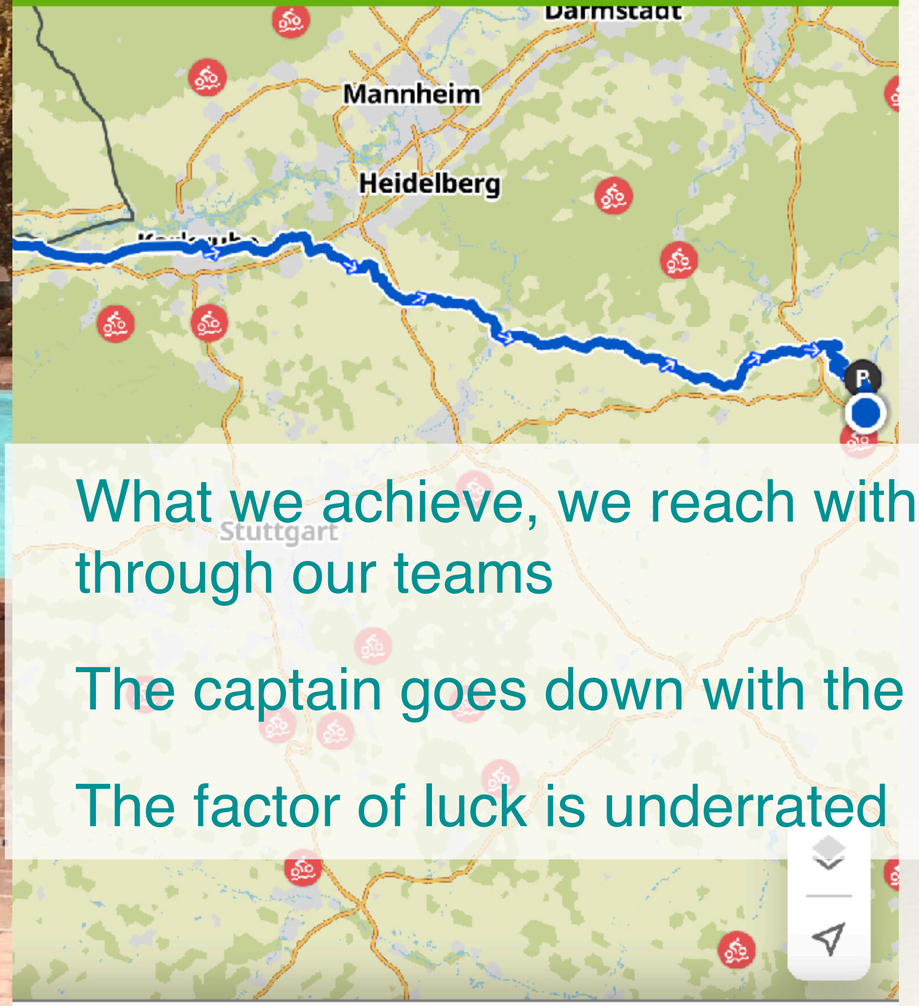
It is always the People (1)

Avenue du Grey 55, 1018, Lausanne → Friedrich-Koenig-Straße 4, 97080, Würzburg



What we achieve, we reach with and through our teams

The captain goes down with the ship

The factor of luck is underrated

41 h 1 | 614 km | 5,120 m | 5,560 m

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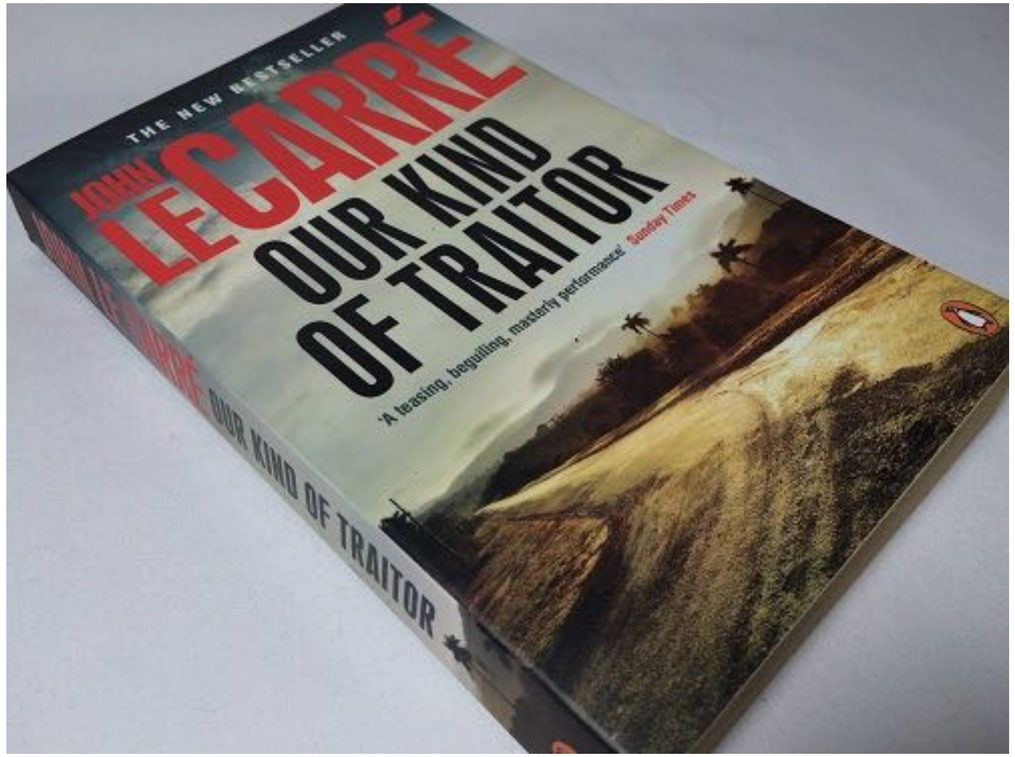
A reading recommendation



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A small little exercise L4

1. A small little exercise for you :
2. You have learned about the importance to understand the market of your company.
3. Select your favorite company where you want to develop your career
4. Develop the food chain model for this company
5. Make and assessment of the future of this company based on their Governance (risk and ethics)
6. 5 min presentation

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Thank you, and

have fun !

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