

 ADULT
LEARNING
SYMPOSIUM

Performing in Uncharted Waters

Re-learning with Disruptive Technologies

Klaus Wittkuhn
November 01, 2018

Supported by

 INSTITUTE FOR
ADULT LEARNING
SINGAPORE

AN INSTITUTE OF SKILLS *future* SG



Part 1

- Where do we come from
- Where do we go to

Part 2

- What are the consequences

Part 3

- How does it change learning

Part 4:

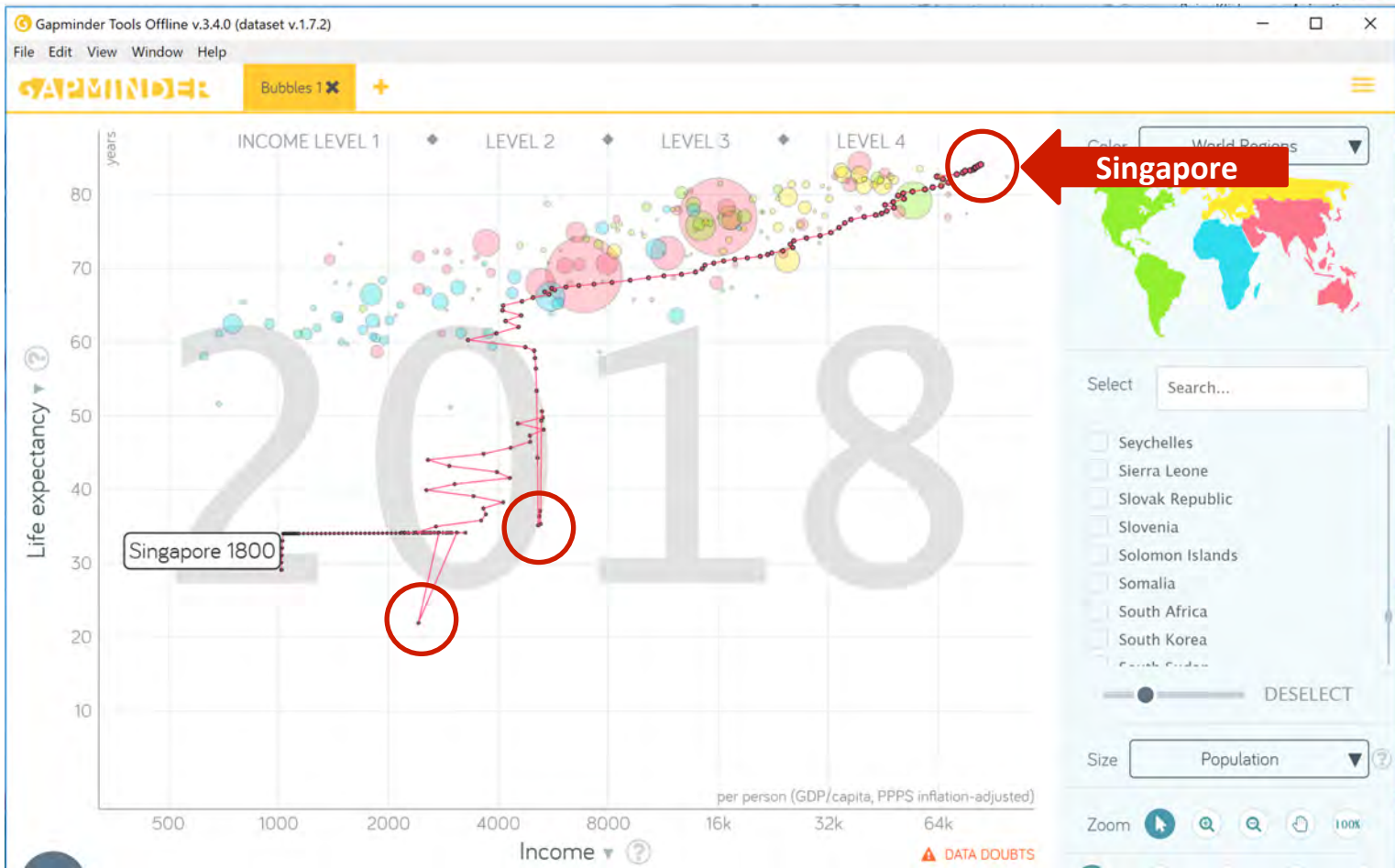
- What is the current situation in learning

Overview



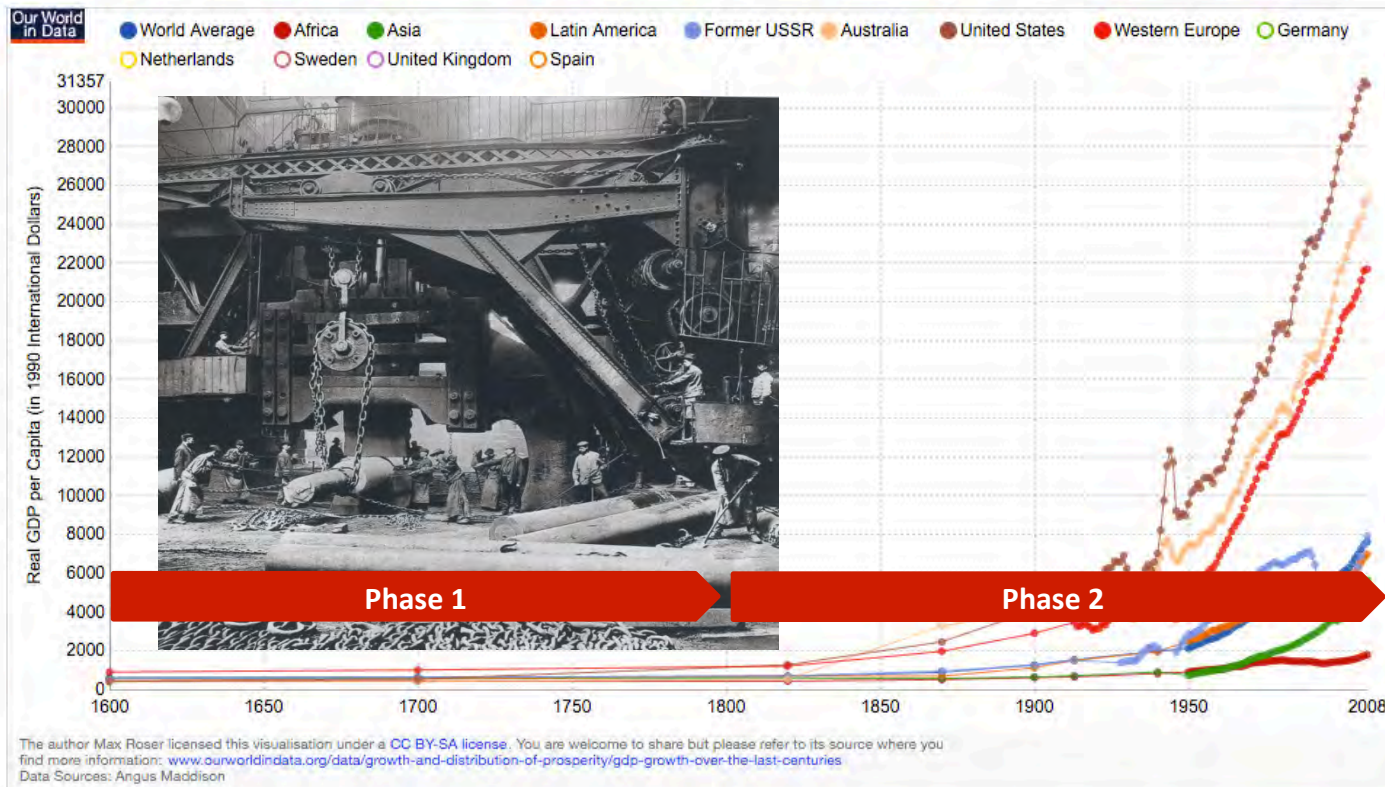
Part 1

**Where do we
come from**



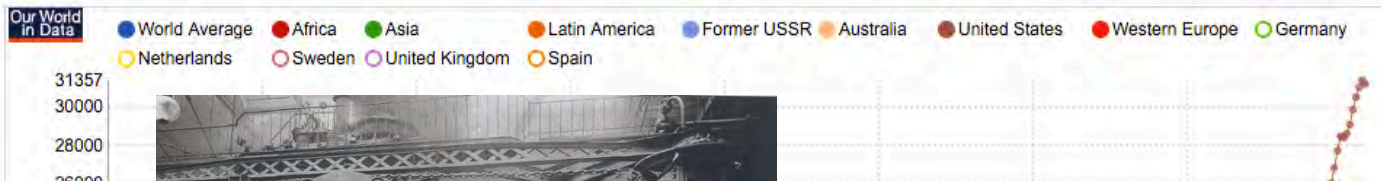


Real GDP per capita around the world (PPP adjusted), since 1600 – Max Roser⁴



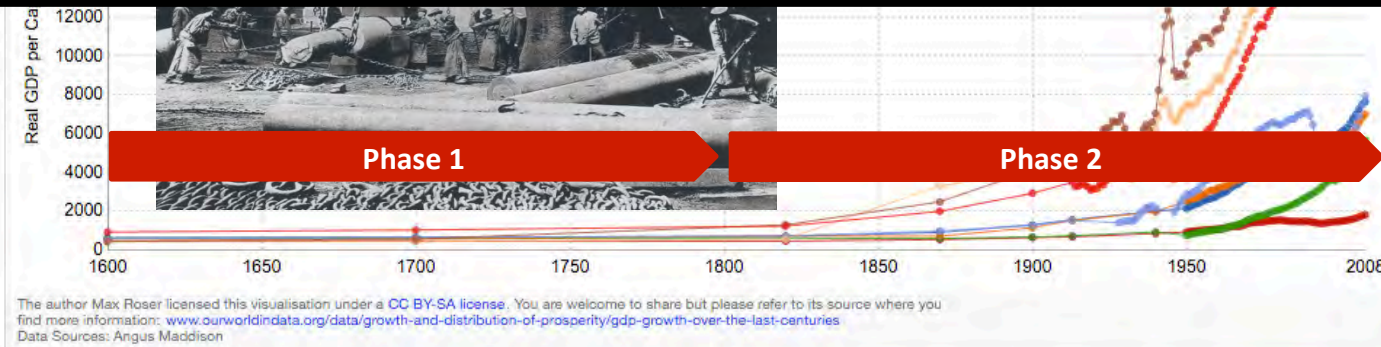


Real GDP per capita around the world (PPP adjusted), since 1600 – Max Roser⁴

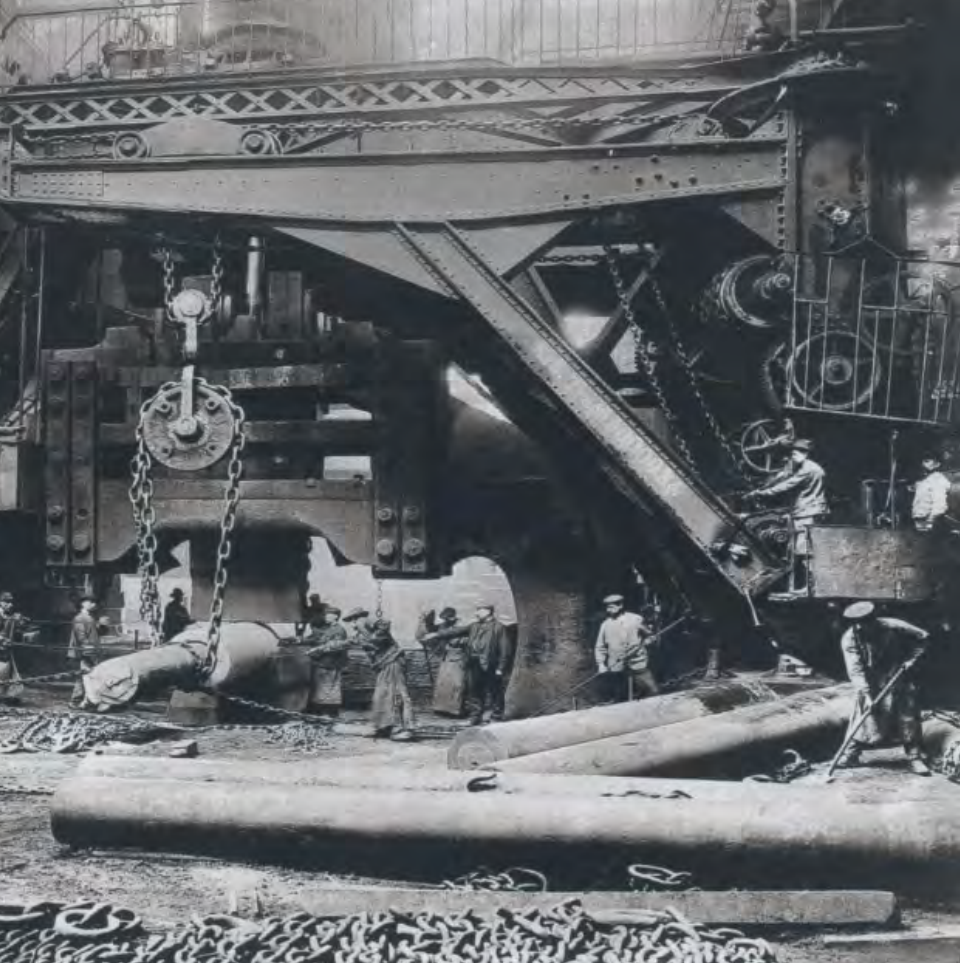


The main drivers behind this progress were

- Technology
- Organization



Take Away



Our **education, employment, health care, unemployment, and retirement systems** are all based on the assumption of stable jobs and uninterrupted employment.

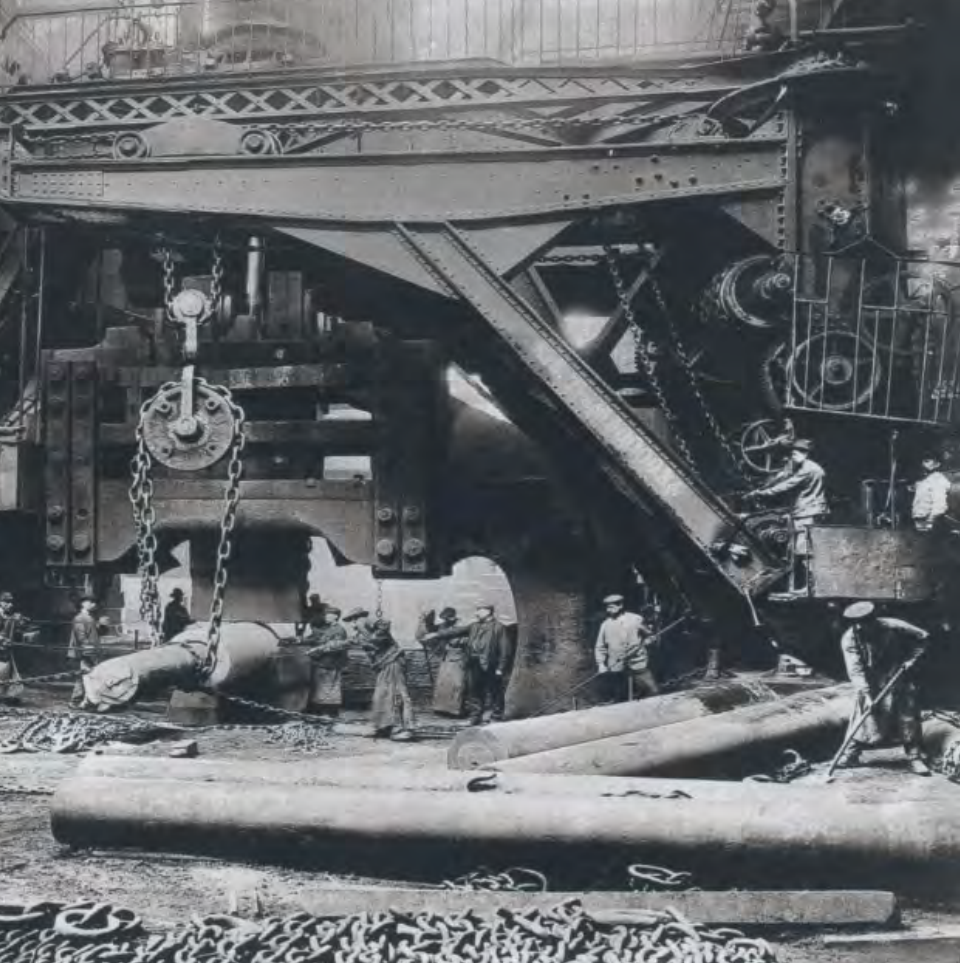


That does not hold for the future!

Take Away



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Take Away:

To understand and co-design
the future one has to
understand

- Technology development
- Industry development
- Politics



Part 1

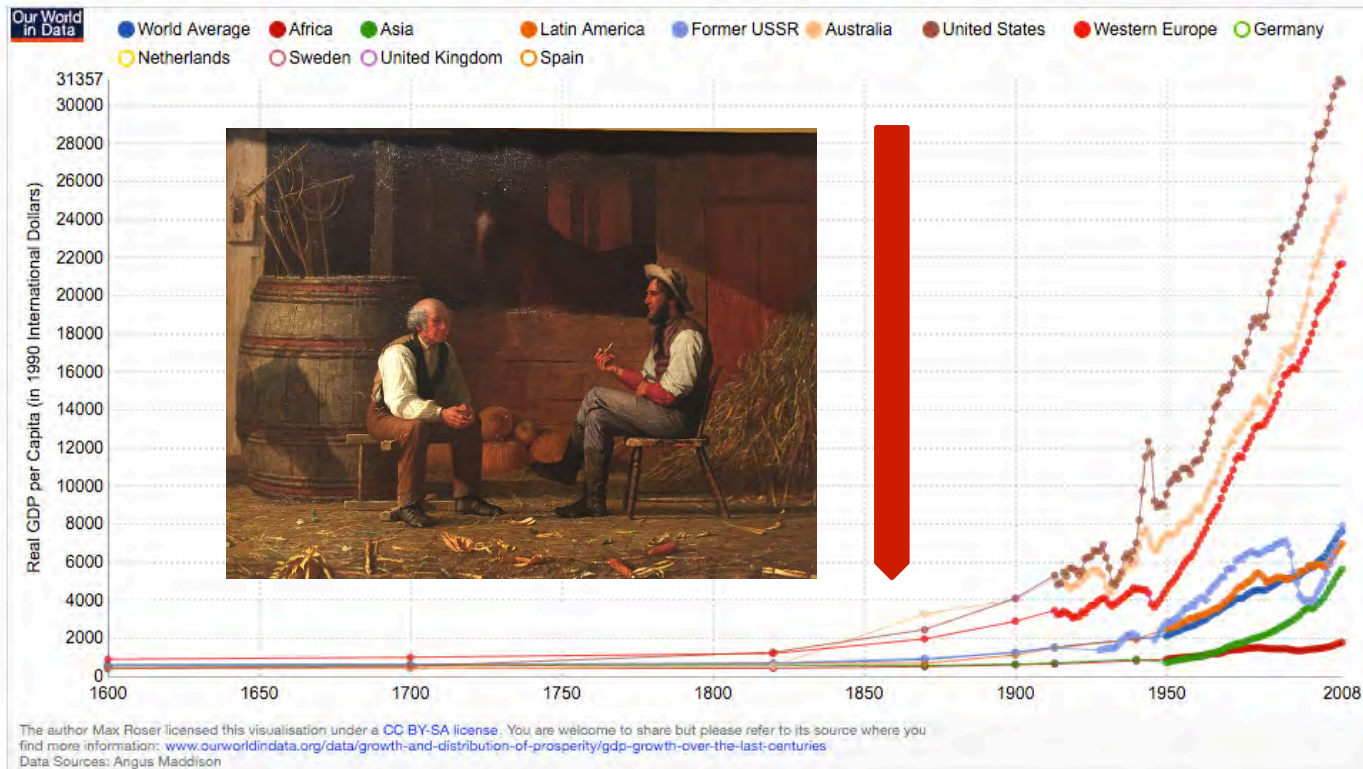


**Where do
we go to**



Real GDP per capita around the world (PPP adjusted), since 1600 – Max Roser⁴

Change has always been an issue





Change today differs in fundamental ways:

The 3 Vs of today's change:

- **Variety**
- **Velocity**
- **Volume**





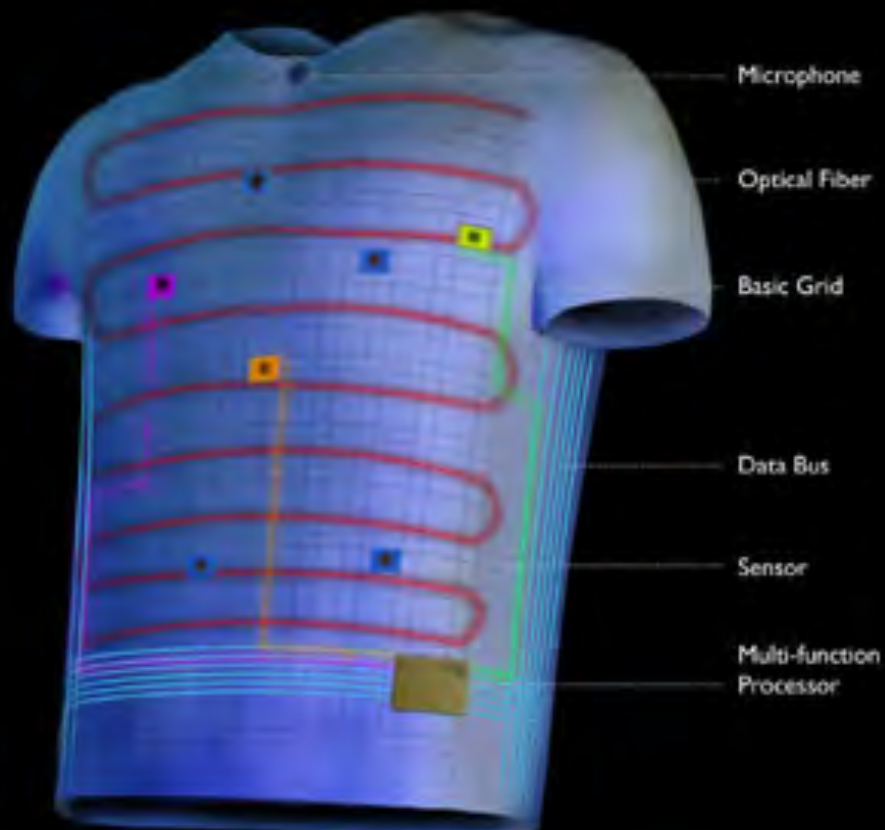
! **Variety**

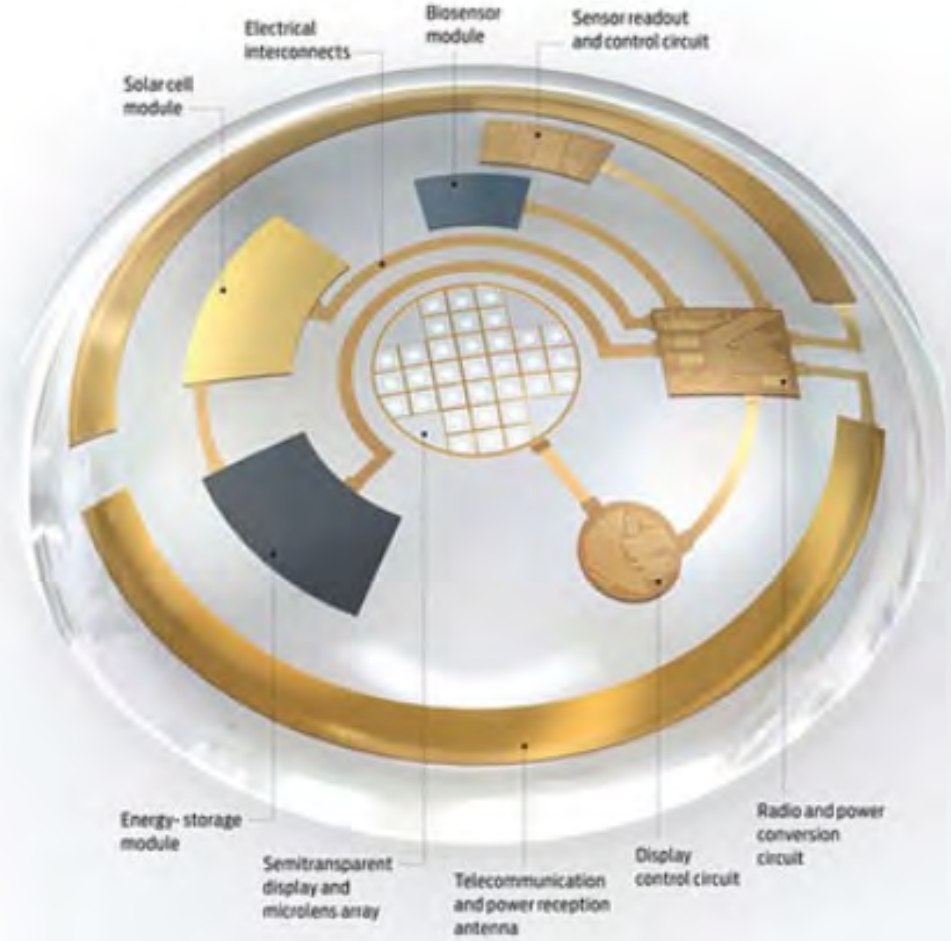


- **Digitization**
 - More data
 - Different data (sensors)
 - Networked data (IoT)
- **Technological developments**
 - Cost and computing power of chips
 - Chips as sensors
 - Networks and cloud computing
 - Internet of Things
 - New materials
 - New production techniques
 - Deep Learning
 - Artificial Intelligence
 - Robotics
- **Fusion of physical, biological, and virtual**



Smart Shirt Sensory Architecture





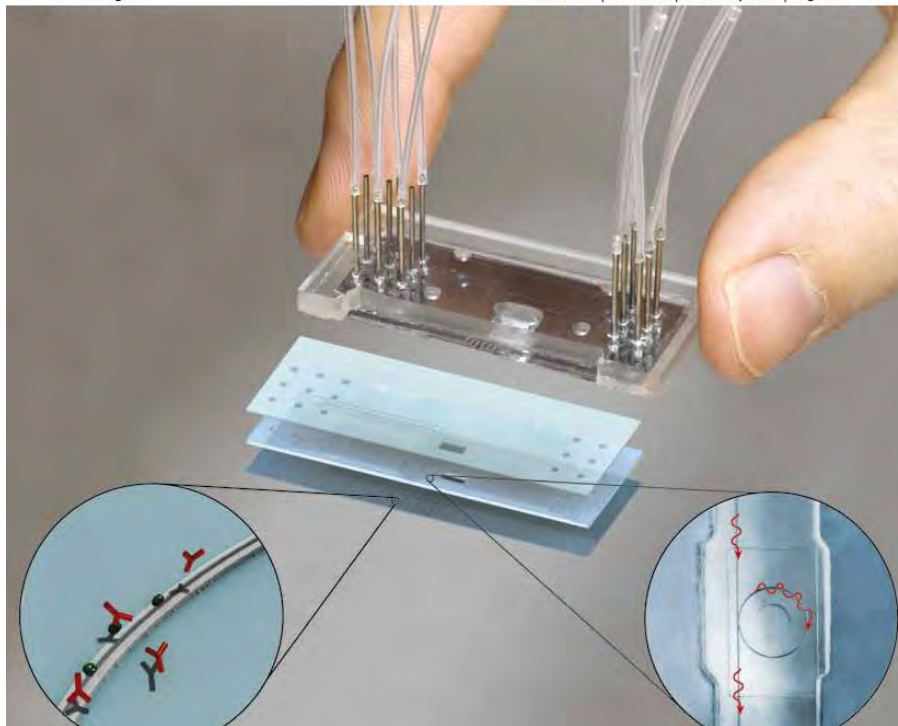


Lab on a Chip

Micro- & nano- fluidic research for chemistry, physics, biology, & bioengineering

www.rsc.org/loc

Volume 10 | Number 3 | 7 February 2010 | Pages 257-396



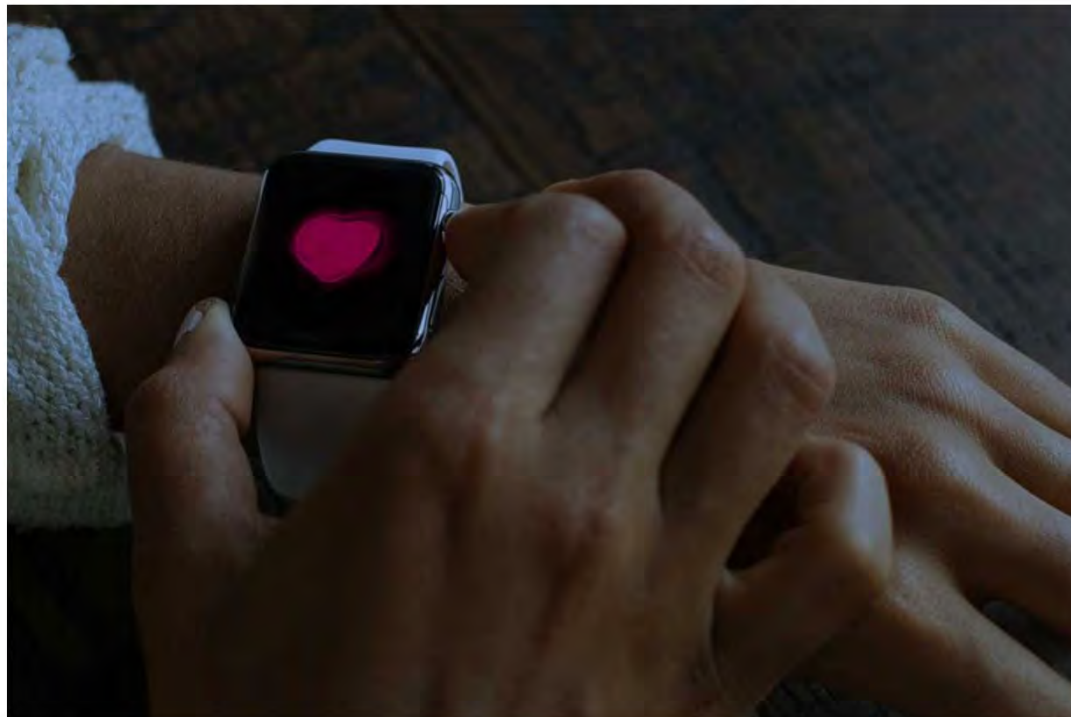






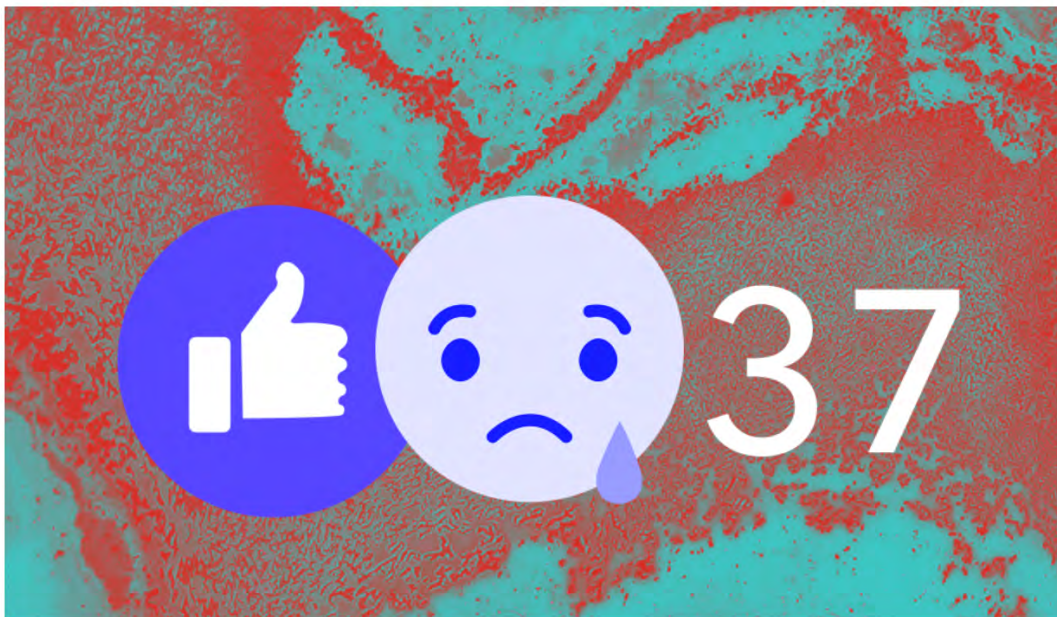


BIG TECH COMPANIES WANT TO HACK YOUR HEART HEALTH





AI CAN TELL IF YOU'RE DEPRESSED BY READING YOUR FACEBOOK POSTS









A CHINESE CITY PLANS TO REPLACE ITS STREETLIGHTS WITH AN ARTIFICIAL MOON



Chengdu









A TOY-SIZED, LASER-WELDING ROBOT IS HERE TO KILL MOSQUITOES







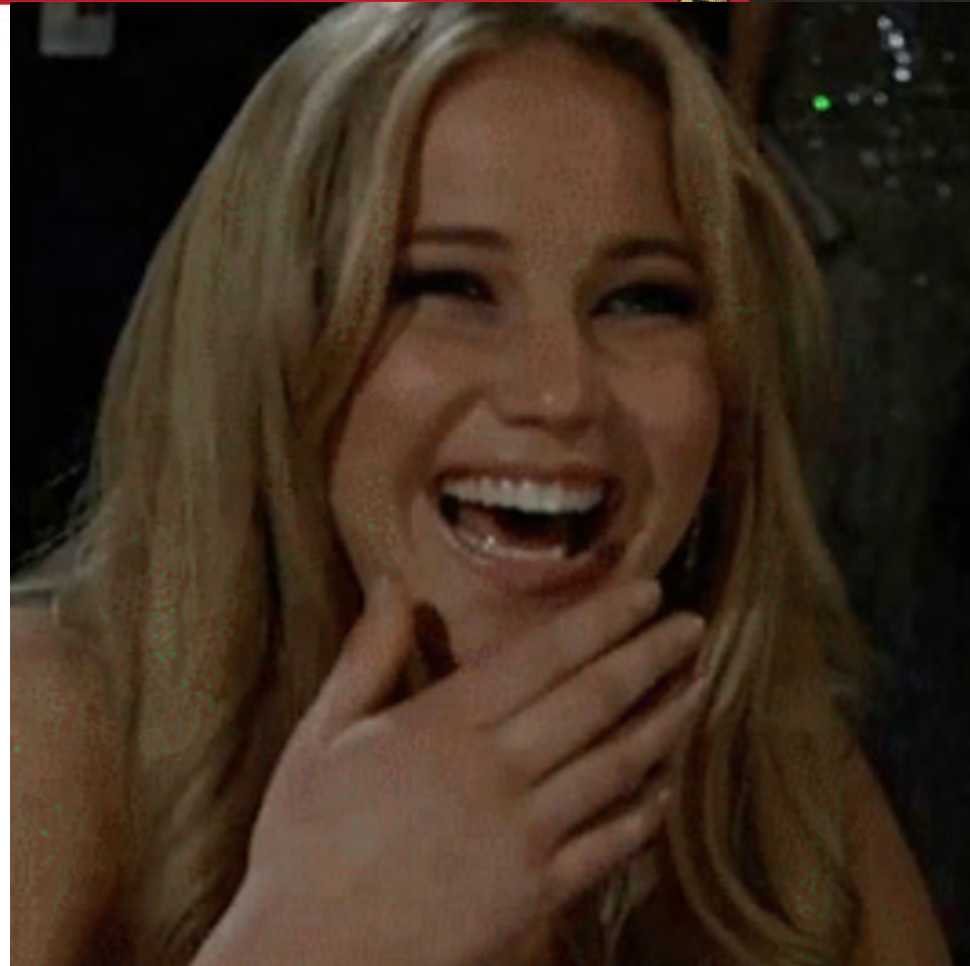






Teatreneu in Barcelona is experimenting with using facial recognition to charge people per the laugh.

Entry to the club is free, but each chortle comes with a price tag of €0.30 (24p). The PayPer Laugh software is installed on tablets attached to the back of seats.





A HUMANOID ROBOT GAVE A LECTURE IN A WEST POINT PHILOSOPHY COURSE





FAKE FACEBOOK PAGES SPURRED GENOCIDE IN MYANMAR





Vector

The Good Robot

Smart enough to
take over the world.
Nice enough not to.

Order Now





Vehicle, asset, person & pet monitoring & controlling



Agriculture automation



Energy consumption



Security & surveillance



Building management

Internet of things



Embedded Mobile

Everyday things get connected  for smarter tomorrow



M2M & wireless sensor network



Everyday things



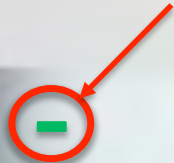
Smart homes & cities



Telemedicine & healthcare



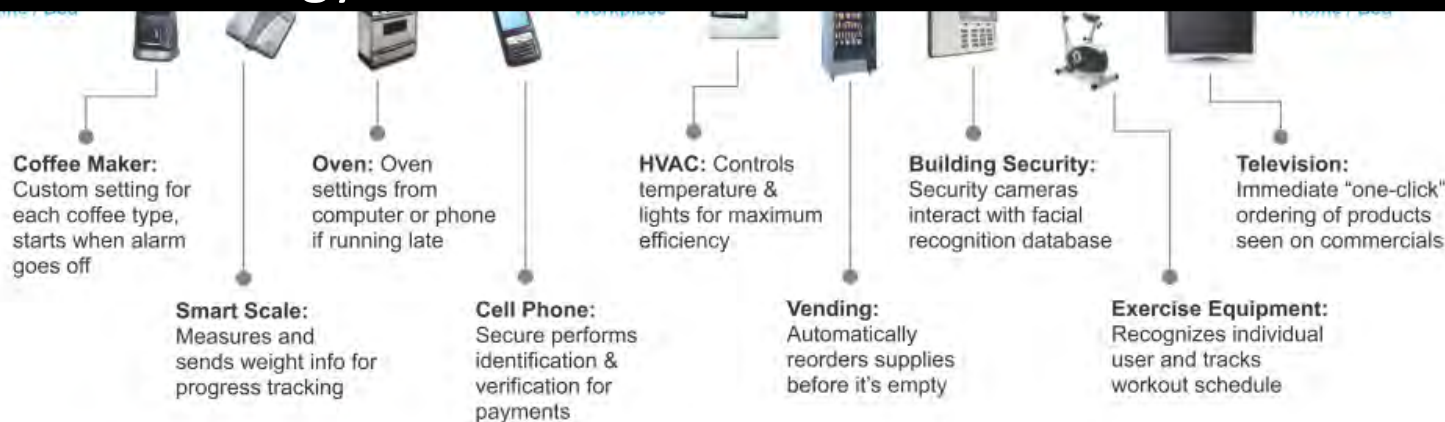
Amazon Dash Button







Technology View: No humas and no education







If technology is advanced enough it looks like magic.



Take Away



Certainties:

- Real life is digital life
- Automation

Uncertainties:

- Future Uncertainty



! Velocity



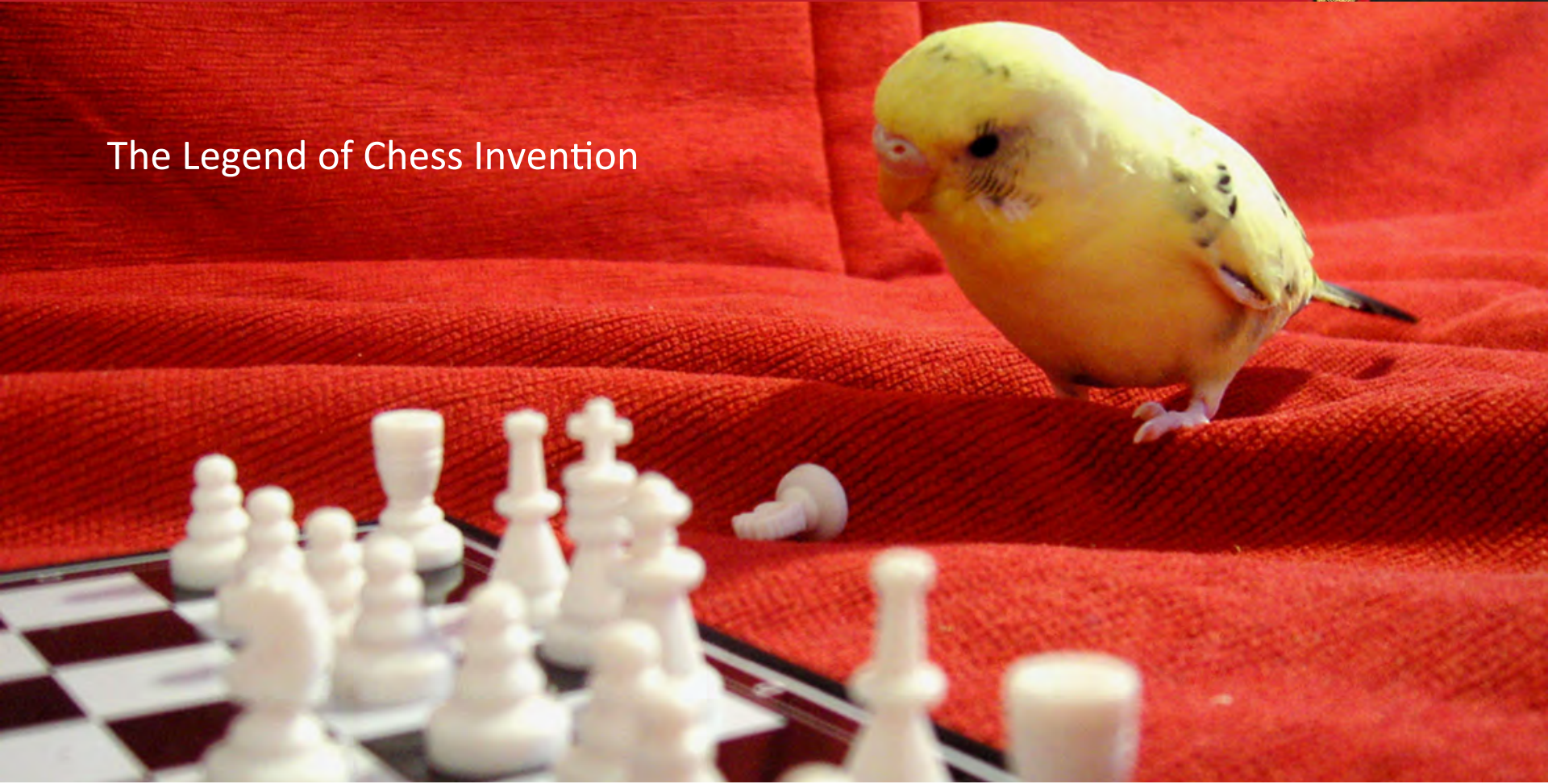
What Do You Assume Is Our Greatest Shortcoming As Humans?

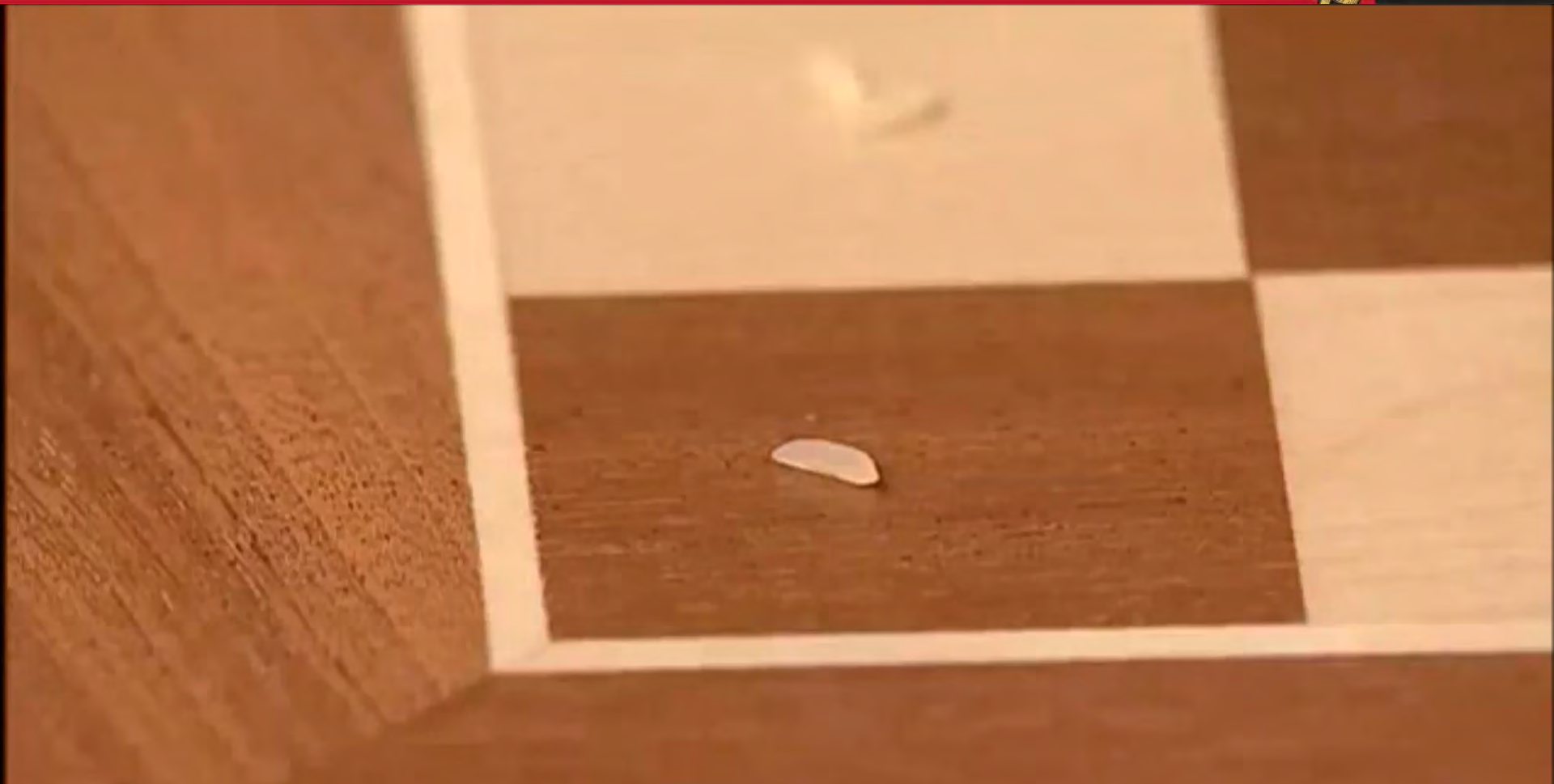
„The greatest shortcoming of the human race is our inability to understand the exponential function.“

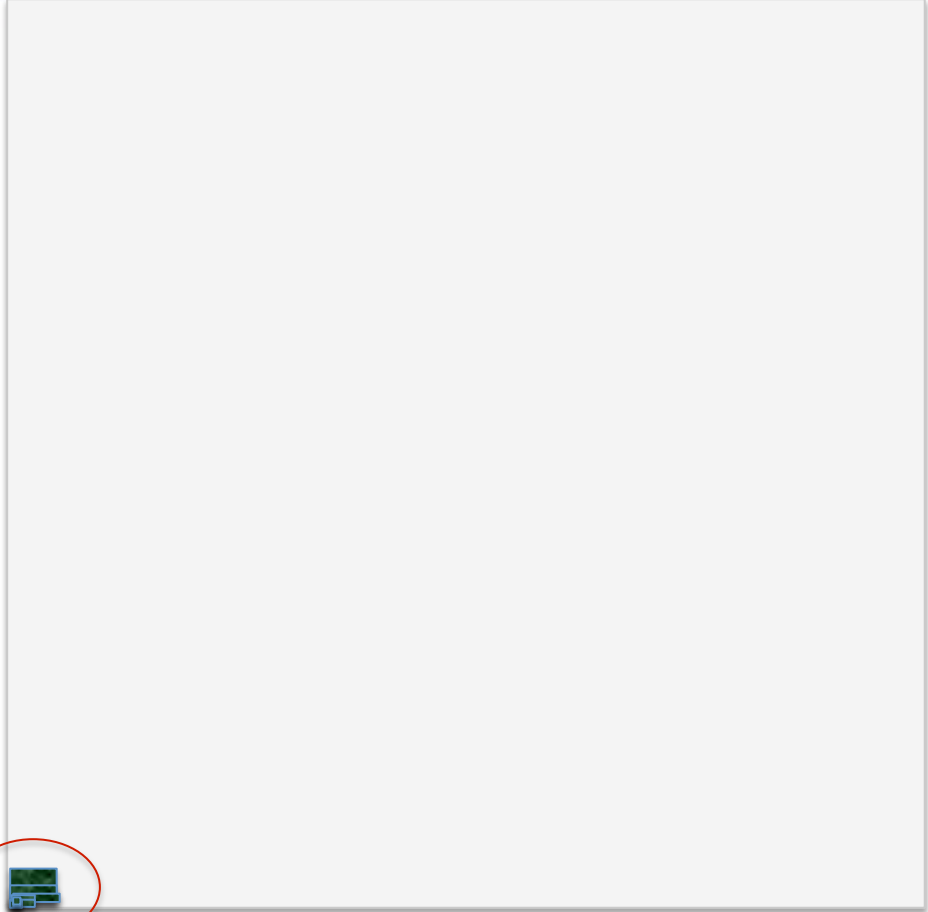
Albert A. Bartlett



The Legend of Chess Invention

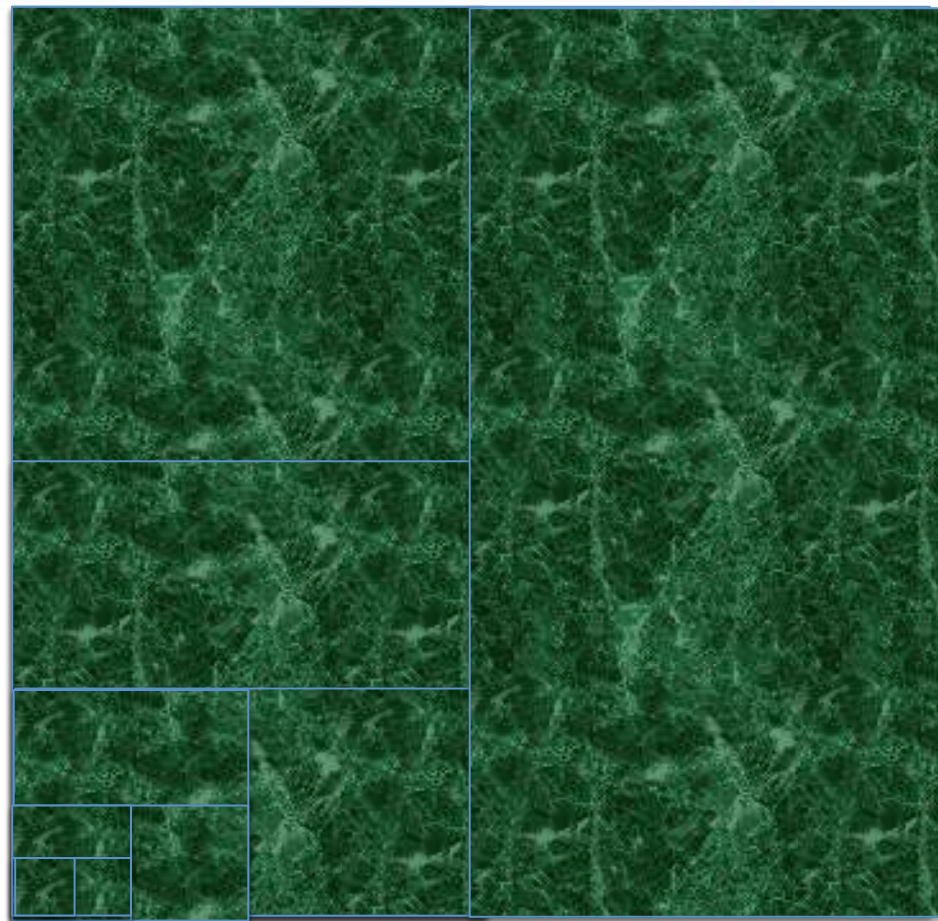






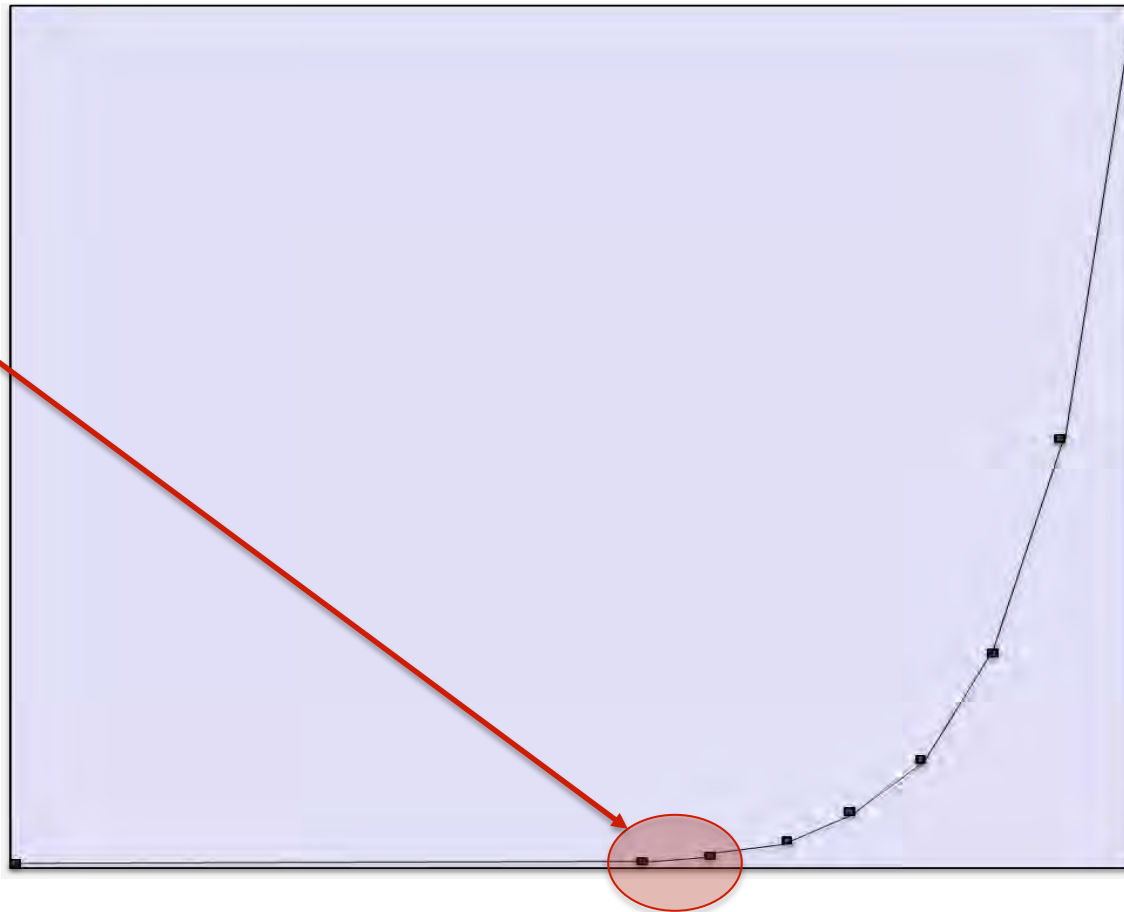


The second half of
the chess board





We enter the
second half
of the
digitization
chess board



Take Away



Certainties:

- Real life is digital life
- Automation
- Fast Transformation

Uncertainties:

- Future Uncertainty



! Volume



how many startups are there?



472 Million
entrepreneurs worldwide



305 Million
total startups annually



100 Million
startups opening each year



1.35 Million
tech startups



3,173
companies accelerated (ever)
from 185 accelerator programs



182
exits (of companies accelerated)

Exponential
combinatorial
possibilities

Take Away



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Certainties:

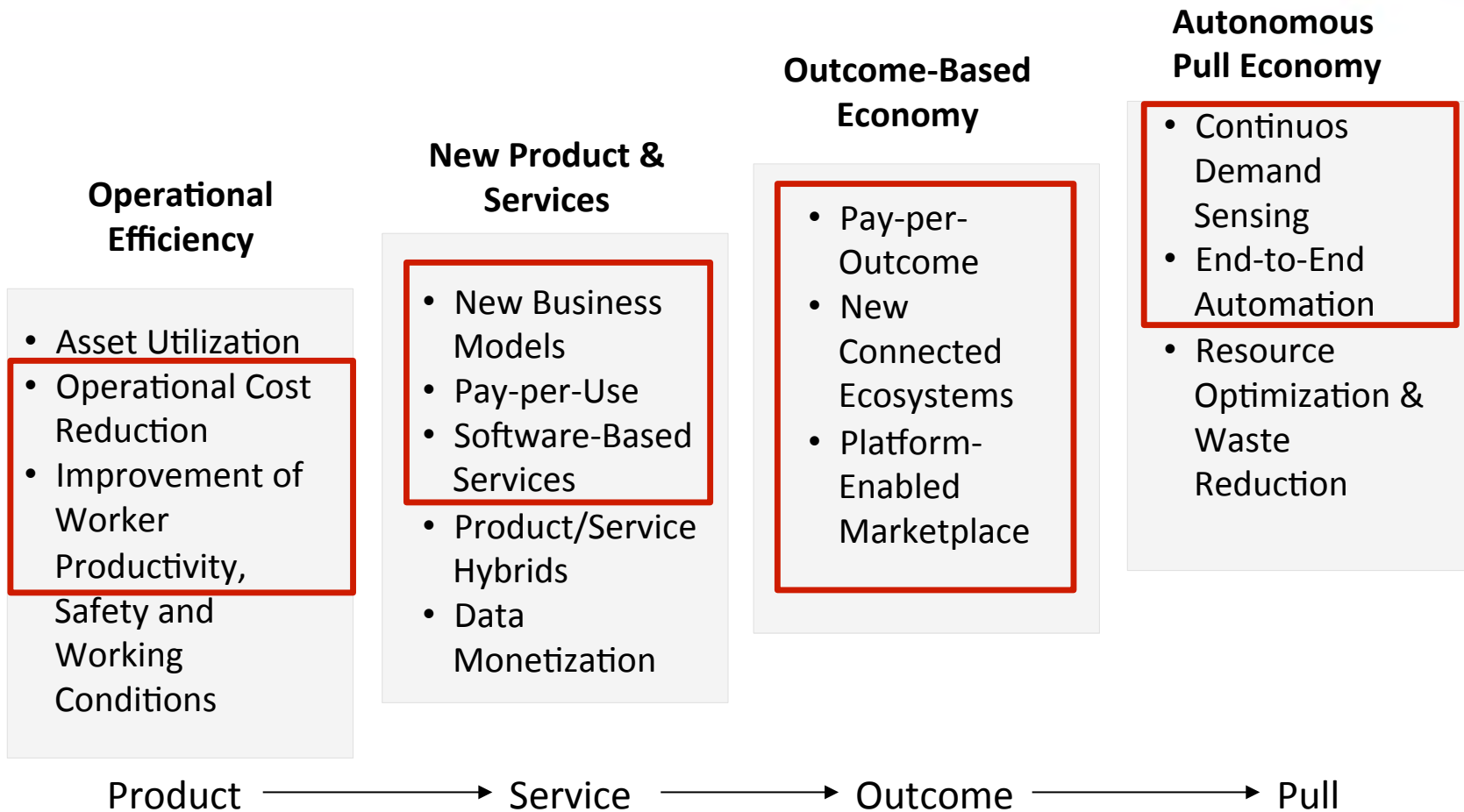
- Real life is digital life
- Automation
- Fast Transformation

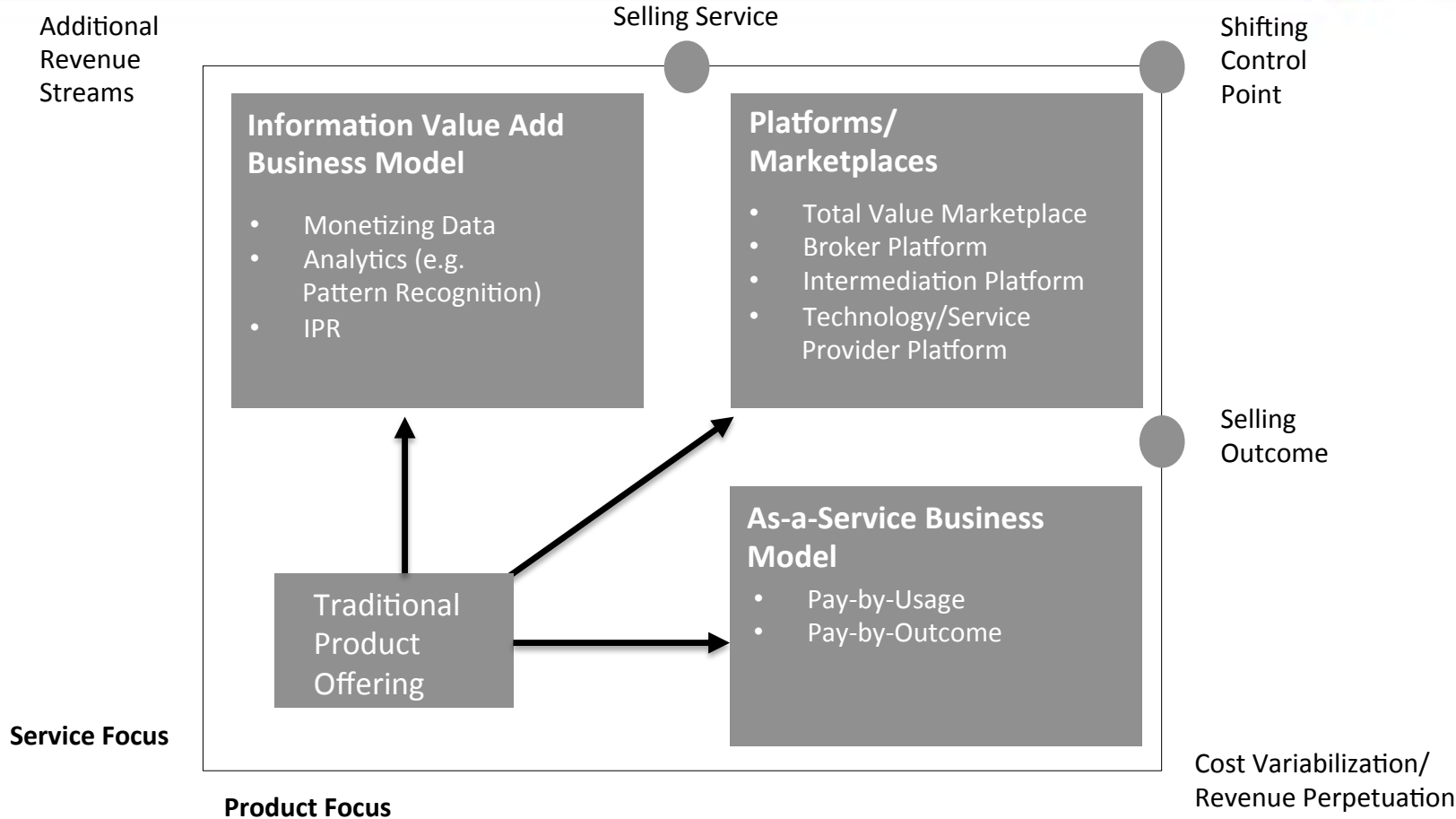
Uncertainties:

- Future Uncertainty
- Skill Uncertainty



! Industry Development







Me

- Appreciation
- Personalization
- Customization
- Contact with permission

Everything

- Huge Variety
- High Quality
- Low Prices
- Good Service

Consumer Expectations

Everywhere

- Independent from Time
- Independent from Space
- Independent from Technology/ Device
- Independent from Channel

Immediately

- Instantaneous Contact
- Short Reaction Time
- Fast Transaction

© 2016 neuland / q1

In times of fast changing jobs this might be a necessity in education



- Skills market place
- Career matchmaking
- Quantified employee/
contractor
- Social workflow
- Visual collaboration
- Telepresence
- Learning Eco Systems

Take Away



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Think in end-to-end on demand products being technology enabled and based on platforms.



Part 2

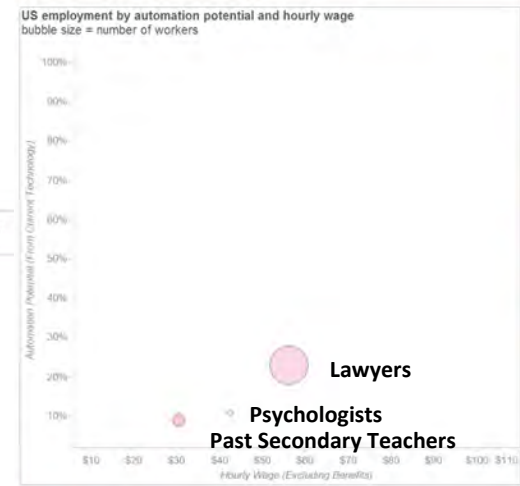
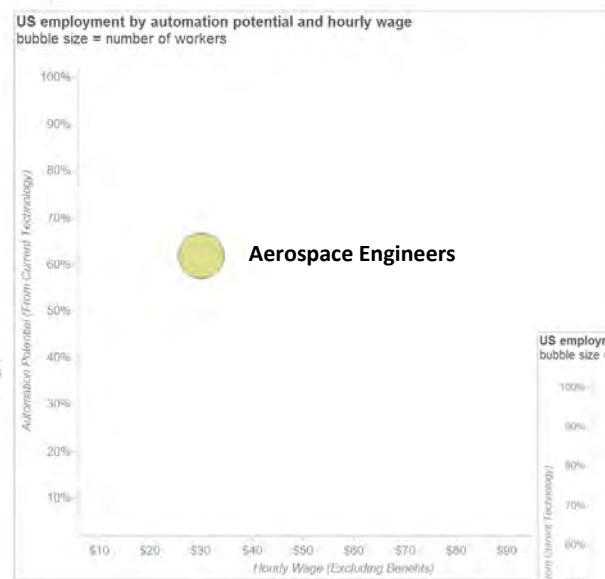
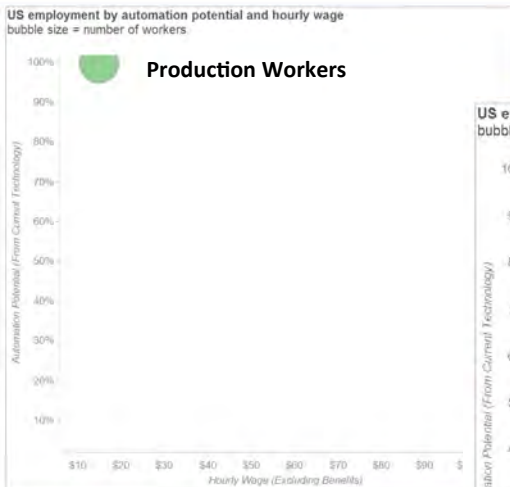
**What are the
consequences**

The background image shows a close-up of several hands wearing bright yellow nitrile gloves. The hands are positioned over a wooden surface, likely a conveyor belt or a sorting table, where numerous raspberries are scattered. The lighting is warm, highlighting the texture of the gloves and the vibrant red of the raspberries. The text is overlaid in the center-right of the image.

Consequence:
Due to AI, Deep Learning,
and Robotics we will lose
many jobs



You might consider some of these jobs unnecessary anyhow



„Up 30% of current employees in the banking industry may lose thier jobs to new technologies in the next 10 years“

New York Times, April 01, 2016

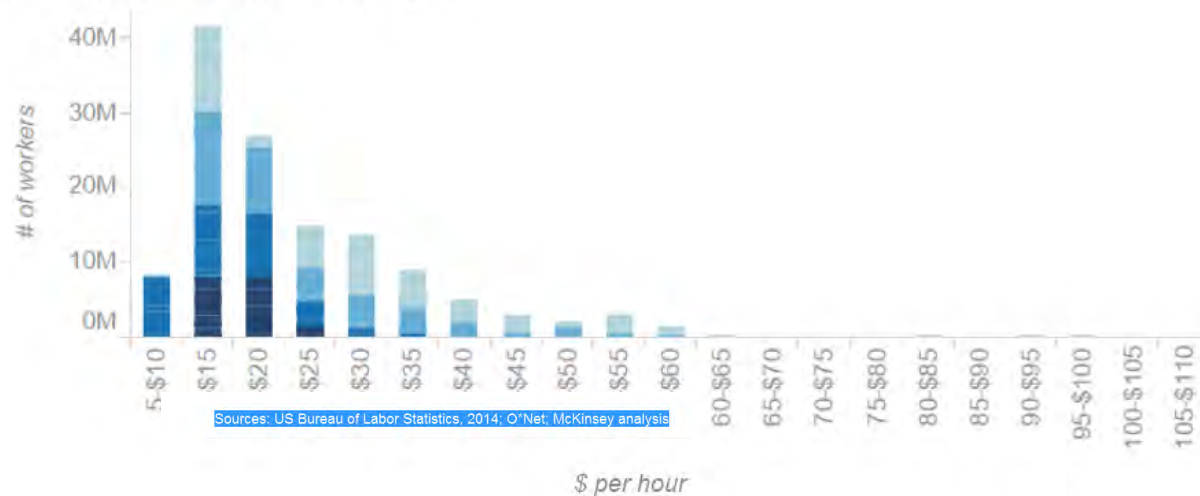
Citing a Citigroup

report “Digital Disruption”



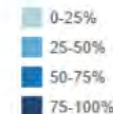
Who will be hit most

US employment by hourly wage



Sources: US Bureau of Labor Statistics, 2014; O'Net; McKinsey analysis

Automation Potential



McKinsey analysis

Read our article at <https://shar.es/1G3Ua5>

Usually they are not that much into learning either



Consequence:
We will develop many new jobs

How many?
How fast?





Consequence: Employment will change

US Department of Labor:
Today's learner will have 10-14 jobs

- We don't even know what will be the most sought after jobs in 10 years from now
 - They most probably are based on technologies that are not invented yet
- We'll have to solve problems that we don't even know of either





Consequence

On Demand Staffing/ Improvised Workplace will grow

- Percentage of workers in „alternative work arrangements“
 - Working for temporary help agencies
 - Independent contractors up from 10.1% ten years ago to 15.8%



Consequence:
We will need new skills





Foundational Literacies:

- Literacy
- Numeracy
- Cultural and Civic Literacy
- ICT Literacy
 - Programming
 - Security
 - Search and filter
- Business / Financial Literacy



Competencies: **P + 4Cs**

Problem Solving +

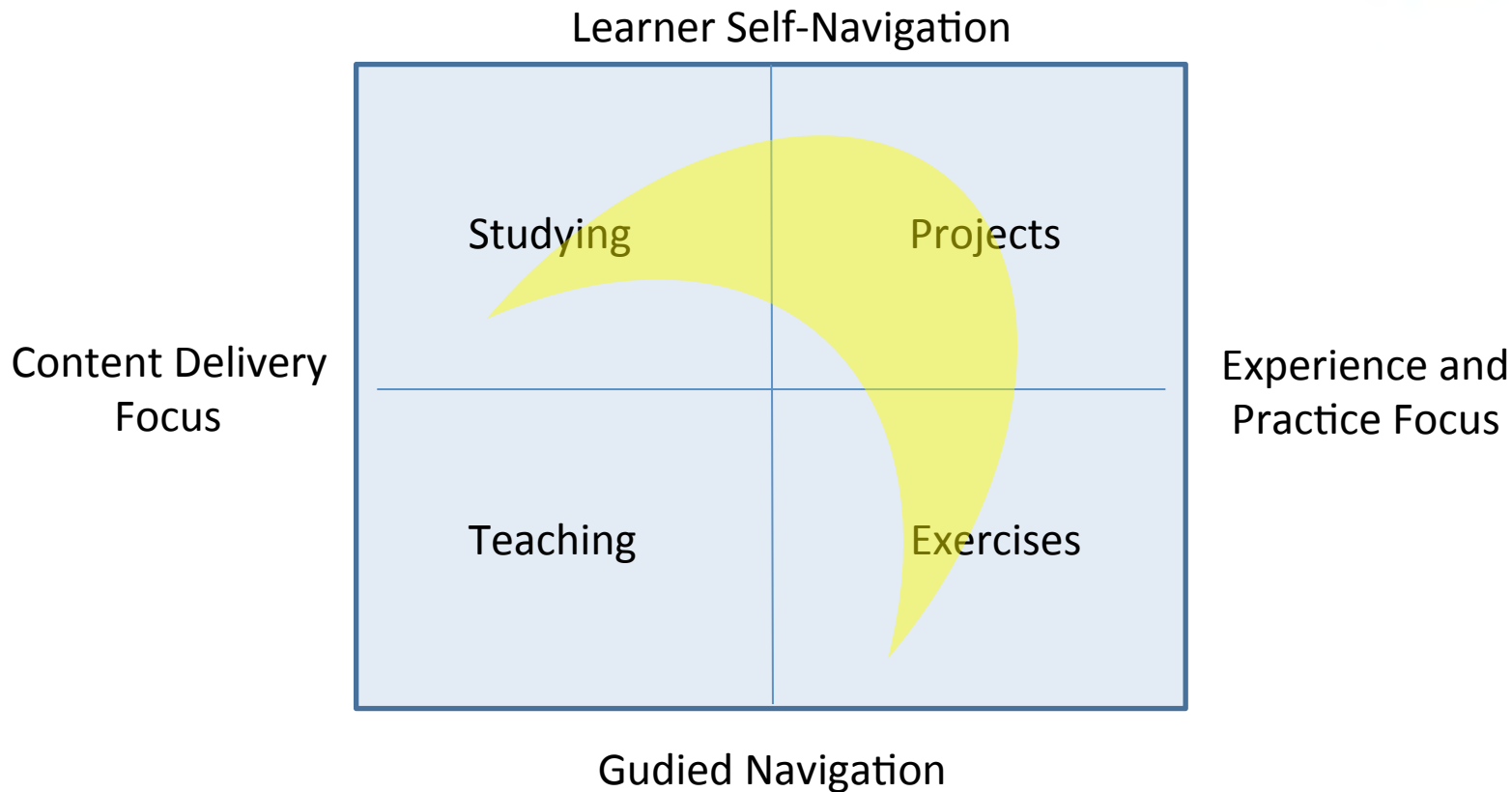
- **C**ritical Thinking
- **C**reativity
- **C**ommunication
- **C**ollaboration





Character Qualities: Resilience

- Tolerance (Ambiguity)
- Curiosity
- Initiative
- Persistence
- Adaptability



Take Away



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We have to understand
Life Long Learning
in a completely different way



! Politics



ROBOT ASSISTANTS

AI
ARTIFICIAL
INTELLIGENCE

MACHINE
LEARNING

CRYPTOCURRENCY

BLOCK
CHAIN

FUTURISTIC

BIG
DATA

CLOUD
COMPUTING

DEEP
LEARNING

CYBER
SECURITY

CHATBOT

The transformation today is not purely technological, it is an economic and most importantly a social one as well



Find homes on Airbnb

Discover entire homes and private rooms perfect for any trip.

WHERE

Anywhere

CHECK IN

mm/dd/yyyy

CHECK OUT

mm/dd/yyyy

ADULTS

1 adult

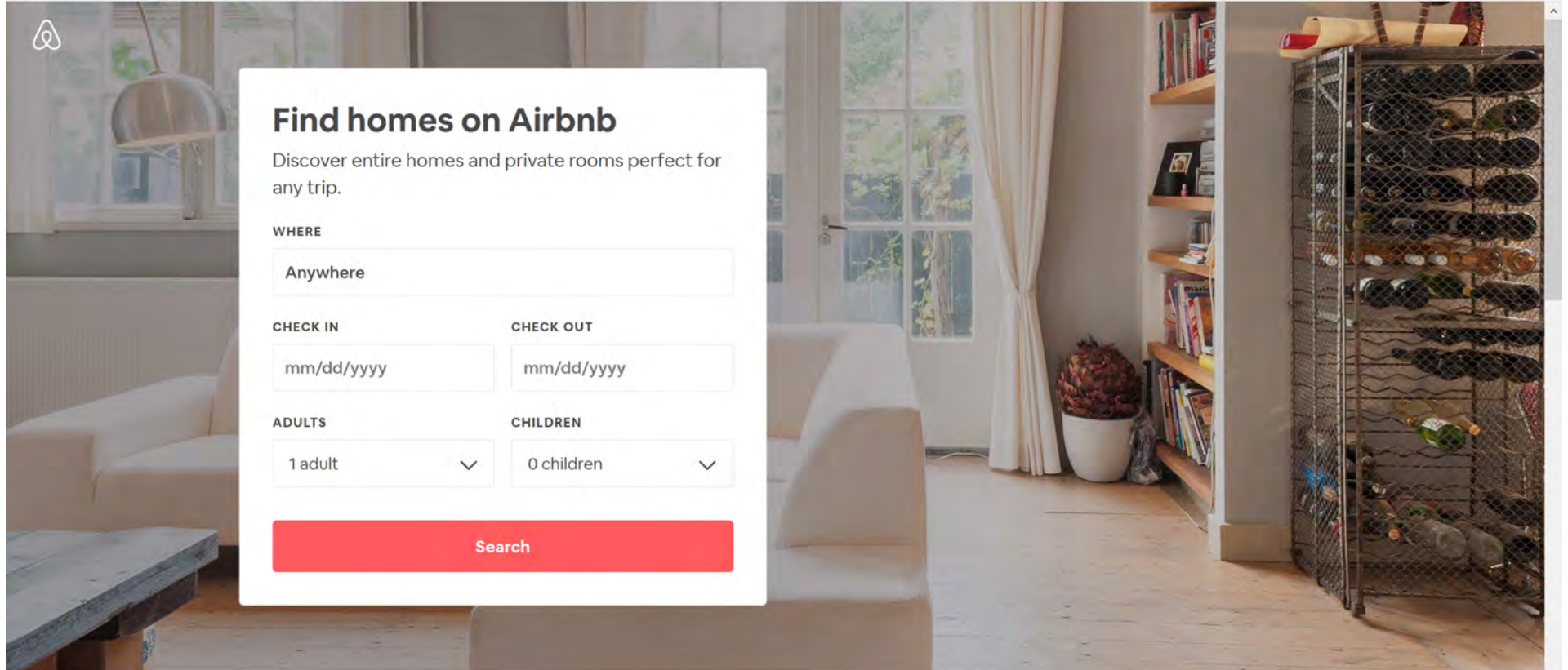


CHILDREN

0 children



Search





Find homes on Airbnb

Discover entire homes and private rooms perfect for any trip.

WHERE

Anywhere

CHECK IN

mm/dd/yyyy

CHECK OUT

mm/dd/yyyy

ADULTS

1 adult

CHILDREN

0 children

Search

NEW YORK POST



<https://nypost.com/2018/10/06/this-van-in-soho-is-actually-an-airbnb/>

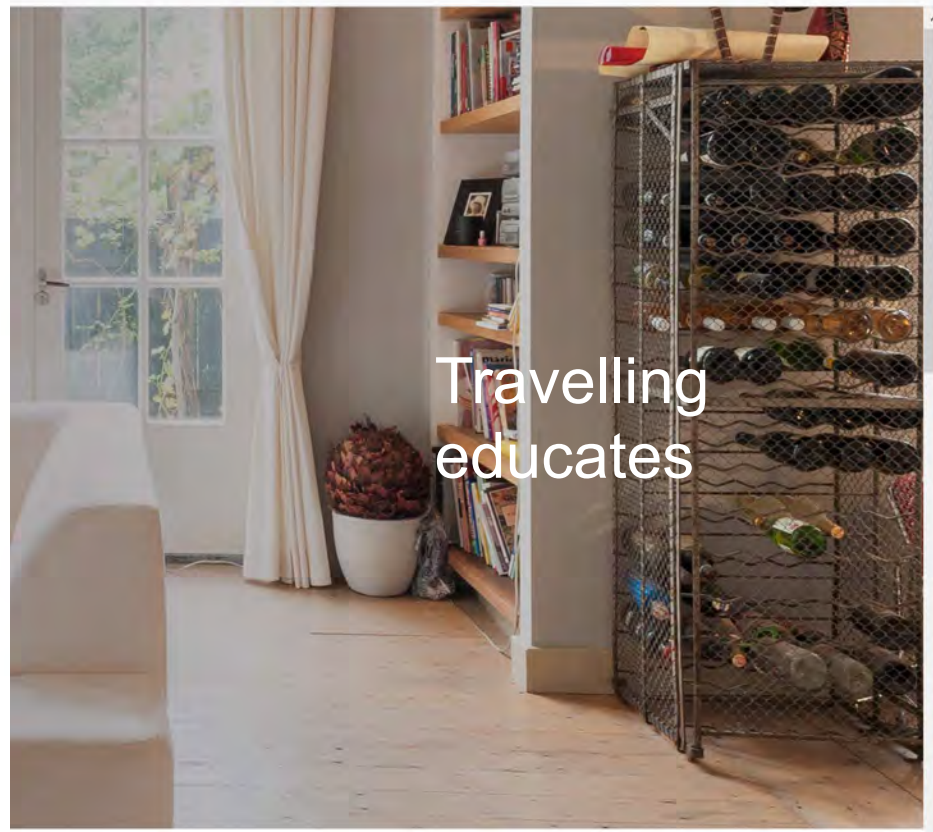
Retrieved Oct 11, 2018

A van in Soho that is listed as an Airbnb.
William Farrington



★★★★★

The hosts were really in communication with me, which was awesome. Directions are clear and clever, came with all the notes in the place



Travelling
educates



Changes in Cities

- More tourists
- Neighborhoods destroyed
- Rents too high for normal people
- Population structure changes

Politics 1.0 vs. Technology 4.0



Take Away



Think in end-to-end on demand products being technology enabled and based on platforms.

They will be embedded in a political and social system that has been adapted to a highly volatile environment.



Part 3

**How does this
change learning**



Learning is a means to an end:
Companies are interested in
performance.

End-to-end outcome (results)
oriented product:

1. Ensure that the right people at the right time learn “it”
2. Ensure that people master “it”
3. Ensure that people reach the desired level of job performance

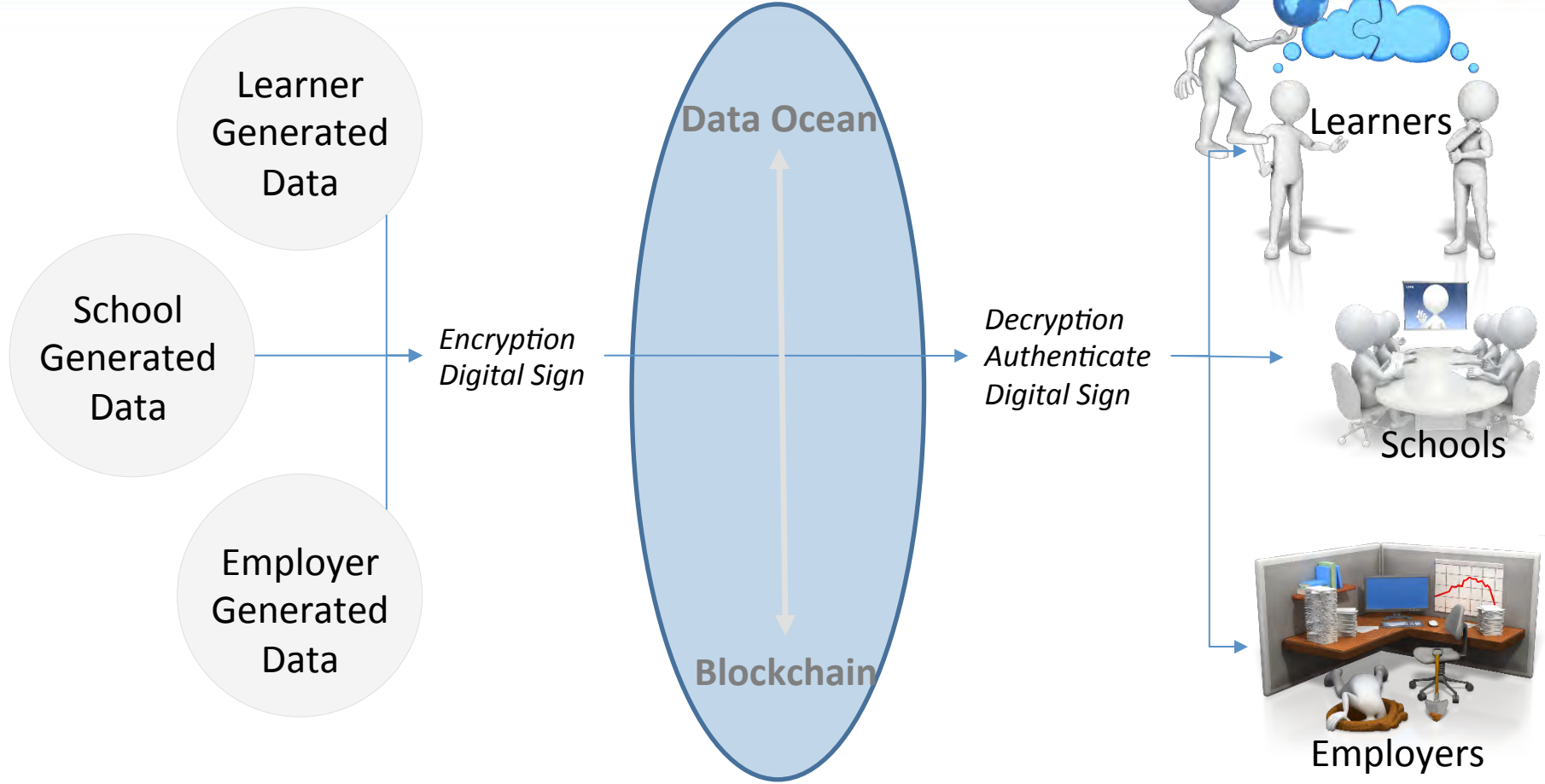




One has to know:

- Which jobs are endangered when, and how many
- Current jobs of people
- Which new jobs emerge and how many
- Current qualification of people
- Qualifications needed for the new job
- Potential of people
- Interests of people







Capabilities		Work Status		
		Not in work yet	Endangered Work	Not endangered
High				
Medium				
Low				




Capabilities	High	Resilience	High									
			Medium									
			Low									
	Medium	Resilience	High									
Medium												
Low												
Low	Resilience	High										
		Medium										
		Low										
			KG	School	Univ	Skill			Skill			
			Not in work yet			Endangered Work			Not endangered			



- Different Social Security Systems
 - Learning Fund (like unemployment support)
 - More support in job finding
- Internet access for everybody
- **Learning ecologies**
- coordination between government, industry, and learning providers



- 
- Just-in-time Learning
 - Personalized Learning
 - Customization in real time
 - Action-Learning (Projects)
 - 24/7 mobile access
 - Disintermediation / curated content
 - Social skills learning via disruptive e-learning
 - User generated content



The transforming role of trainers:

- Prepare yourself to teach new skills
- Become tech savy
- Help people identify what to learn
- Help people find content
- Help people how to learn
- Help people manage their learning
- Help people manage their learning history
(Badges, diploma, endorsements, etc.)

Take Away



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Part 3

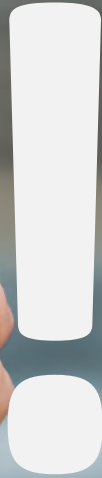


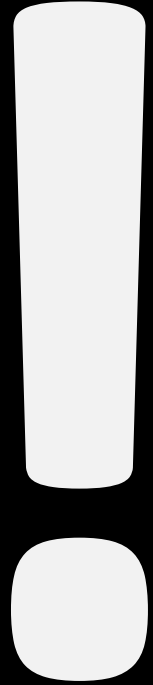
What is the
situation
in education



There is

- a plethora of new apps and portals
- tons of experiments





Apps



blink.it

Magency
magic at work

umu

klaxoon

Mentimeter

SwarmBox

Axonify

Fuel your people + Power your organization

askMe!

beekast

slido

thinkific

GLISSER

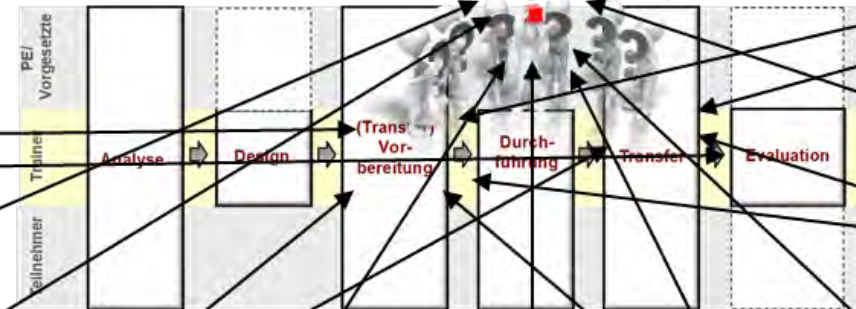
train by cell

BRIDGE2KNOW
KNOWLEDGE IN ITS BEST FORM

Poll Everywhere

moodle

Kahoot!





	Including Box-System			App/Cloud Solutions							Slide Streaming		
KRITERIEN \ ANBIETER	Swarm-Box	Klaxoon	Magen-ry	UMU	Beekast	Mentimeter	Leambits	Poll Everywhere	Kahoot	5th Steps	Trainby Cell	Blisser	Slido
BENUTZER-FREUNDLICHKEIT	4,5	4,7	3,5	3,6	3,5	4,8	2,7	4,5	4,7	4,3	2,5	4,5	4,2
FUNKTION	5	4,6	4	4,4	4,2	3,4	4,6	3,4	3,2	2,6	1,6	2,6	2,6
INDIVIDUALISIERUNG	4,5	4,3	3	4,3	3,7	3,3	4,3	3	3	2	2	2	2,7
INHALT	4,5	4,6	4	4,2	2,8	3	4,2	3,4	3,2	2,8	1,6	2,8	2
DESIGN	4,5	4,7	4,6	4	4	5	3	4	4	3,7	1,3	4	4
DATENSCHUTZ	DE	EU	EU	Hong Kong	EU	USA	DE	USA	EU	DE	USA	/	/
KOSTEN (Entry-Level)	350\$/Monat	656\$/Monat	140\$/Monat	49\$/Monat	39\$/Monat	6\$/Monat	51\$/Monat	19\$/Monat	Free	11€/Monat	/	/	50\$/Monat
PREIS-LEISTUNGS-VERHÄLTNIS													
KURZBESCHREIBUNG	Technologie zur Nutzung kollektiver Intelligenz	Technologie zur Nutzung kollektiver Intelligenz	Applikation für interaktive und kollaborative Trainings	Tool für ineinander greifende Lern-erfahrung	Web-App zur Kollaboration von Gruppen	Tool für Echtzeit Voting	Tool interaktiver Lösungen für Events	A-R-S zur Integration interaktiven Maßnahmen in Präsentationen	Game-Based Lern-plattform	Moderations-software für Online Meeting	Tool zur verbesserte n Komm. von Kunden, Partnern etc.	Präsentations-software mit integriertem A- R-S	Tool für interaktives Q&A und live Umfragen



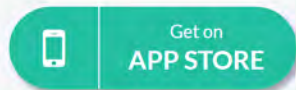
	LMS		Learning Platform			Micro Learning			Communication		Projectmanagement			Video Learning		
KRITERIEN \ ANBIETER	Blink-It	Madule	Avanity	Pre-mote	Thinkific	Bridge2 Know	Ask Me!	Go-Conqr	Slack	Yammer	Trello	Asana	Basecamp	Rehearsal	Video Scribe	Hilti-Ho
BENUTZER-FREUNDLICHKEIT	4,7	3,8	4,3	3,7	3,8	4,8	3,2	3,7	5	4,5	4,7	4	3	4,5	4	3,7
FUNKTION	4	4	4,6	4,6	4,4	4,2	4,6	2,6	4,6	4,6	3,8	4,6	3,2	4,4	3,6	2,6
INDIVIDUALISIERUNG	4	3,7	4,7	4,7	4	3,7	3,7	2	4	3,3	3,7	3,7	2,3	3,3	4,7	2,3
INHALT	3	3,8	4,2	4,2	4,2	4,5	4,2	2,6	3,6	3,6	3,3	3,2	3	4,2	3,5	1,6
DESIGN	4,3	3	4,7	3,3	3,3	5	4	2	3,7	4	4	4	2,3	4	3	3
DATENSCHUTZ	DE	DE	USA	EU	/	/	DE	EU	EU	EU	EU	/	/	/	/	/
KOSTEN (Entry-Level)	2045/ Monat	/	/	4175/ Monat	495/ Monat		6205/ Monat	35/ Monat	7,85/ p.P. pro Monat	8,35/ p.P. pro Monat	9,95/ p.P. pro Monat	12,35/ p.P. pro Monat	995/ Monat	/	145/ Monat	975/ Monat
PREIS-LEISTUNGS-VERHÄLTNIS																
KURZBESCHREIBUNG	LMS	LMS	LMS Kollaboration Plattform	LMS Kollaboration Plattform	LMS Kollaboration Plattform	Micro-Learning Anbieter	Assessment Tool	Lernnetzwerk	Team Kollaborations-Tool	Team Kollaborations-Tool	Projektmanagement Tool	Projektmanagement Tool	Projektmanagement Tool	Video-Role-Play Tool	Animation-Video Tool	Video Bearbeitungsprogramm



Augmented Reality Safety Education

The future of engaging safety education for children.

Using the power of augmented reality, Arility brings your road safety lessons to life with 360 degree visuals and sound effects - all on your student's desk!





! Portals



Digital Information

- Expensive to produce
- Inexpensive to reproduce (close to zero marginal cost)
- Easy to disseminate
- Is not used up when it gets used

IOT
www.ck12.org

Important
for
Education

Learning for free

The first MOOC 2011

Sebastian Thrun and Peter Norvig course

Introduction to Artificial Intelligence

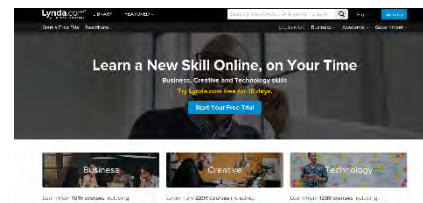
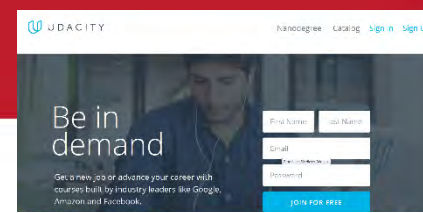
Available via Internet

5000 registrants per day

Platform closed when 160.000 people had registered

23.000 passed exam and got certificate

Best Stanford student ranked no. 413





Learning for free - MOOCs



Nanodegree Catalog [Sign In](#) [Sign Up](#)

The collage features several overlapping screenshots of MOOC platforms:

- Coursera:** Shows the top navigation bar with 'Institutions', 'Log In', and 'Sign Up' buttons.
- MIT OpenCourseWare:** Displays the 'MIT OPEN COURSEWARE' logo and 'MASSACHUSETTS INSTITUTE OF TECHNOLOGY' text, along with a '15 YEARS' anniversary badge.
- Udemy:** Shows the 'udemy teach' header and navigation links for 'Community News', 'Course Creation', 'Course Marketing', 'Trust & Safety', and 'FAQ'.
- Lynda.com:** Features the 'Lynda.com' logo (A LINKEDIN COMPANY), a search bar, and navigation options like 'LIBRARY', 'FEATURED', 'Start a Free Trial', and 'Reactivate'.
- FutureLearn:** Shows the 'Future Learn' logo, navigation tabs for 'Categories', 'Courses', 'Programs', and 'Degrees', and a search bar with the text 'Search online courses'.

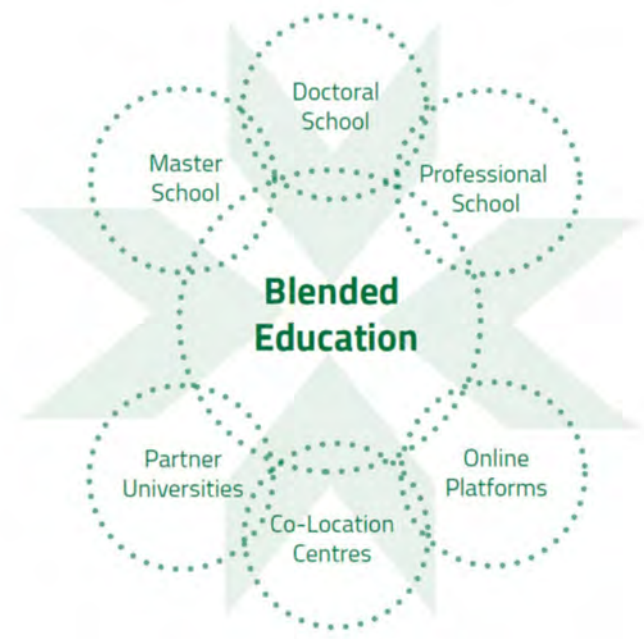
Other visible elements include a 'Penn' logo and a 'Supp' button.



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Learning for free - Khan Academy

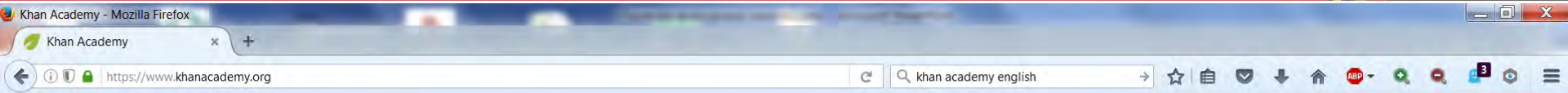
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✓ Watch Video

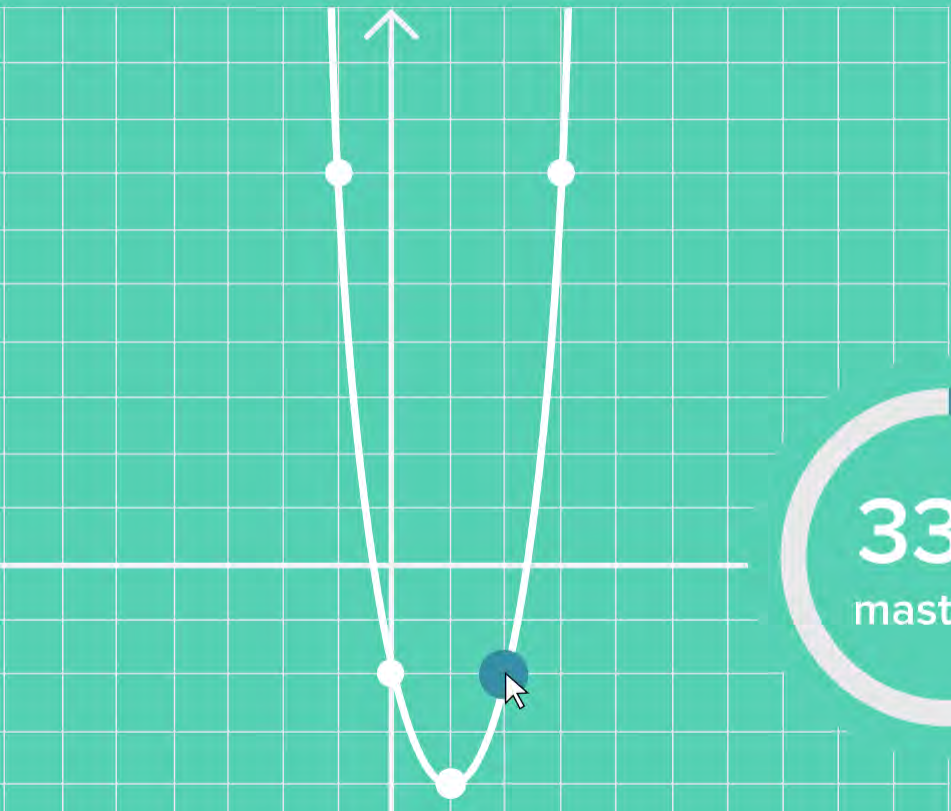
Algebra

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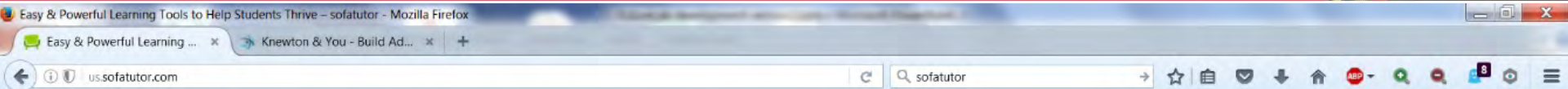
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10
thousand⁺

e-learning sessions
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FEATURED

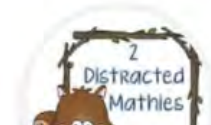
- Spring
- Women's History Month
- St. Patrick's Day
- Winter
- Math
- Science
- English Language Arts
- Tools for Common Core
- Not Grade Specific
- Free Downloads
- On Sale This Week



GRADES

- PreK - K ▶
- 1 - 2 ▶
- 3 - 5 ▶
- 6 - 8 ▶
- 9 - 12 ▶
- Other ▶

OUR TEACHER-AUTHORS See All ▶

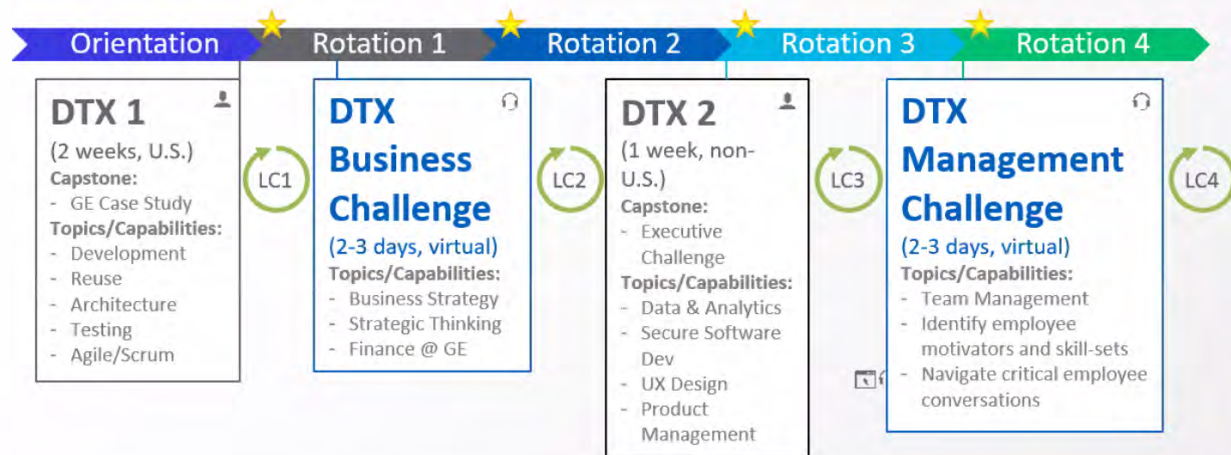




Experiments



The Redesigned DTLP Experience



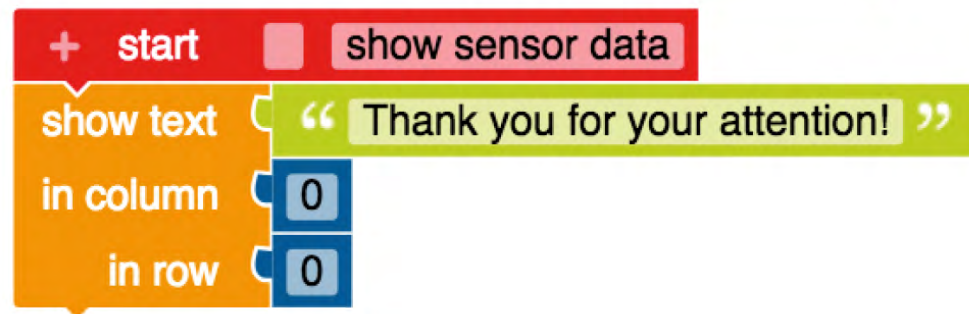
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Roberta – a story of success

Innovating to Learn, Learning to Innovate

The aim of the Roberta Initiative is to increase the interest and motivation especially of girls, but also of boys for computer science, technology and sustainable science.

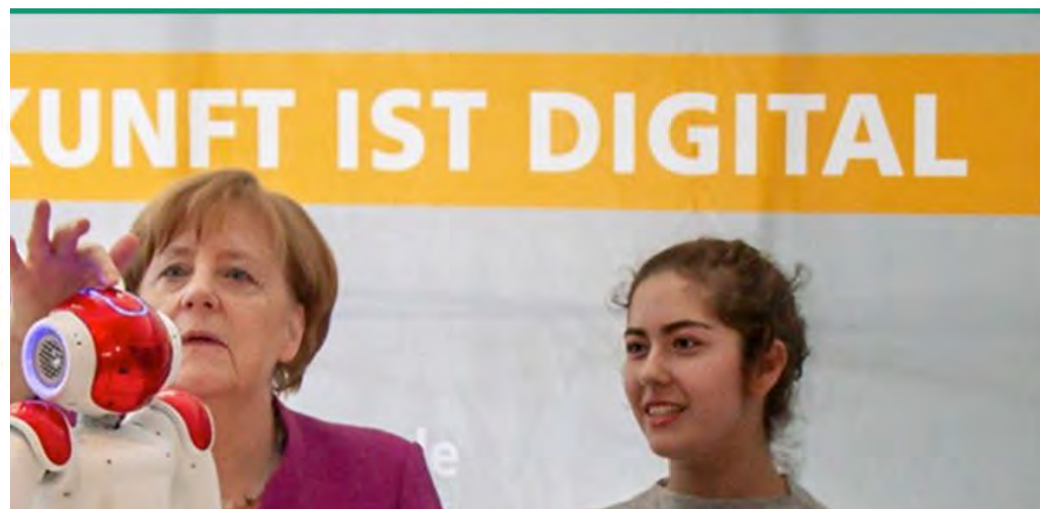
Roberta reaches since 2002 ...

- through more than 3000 teachers trained and certified
- more than 400,000 children!
- within more than 35,000 Roberta courses



+400.000

kids





Assets

Lets have a look



- Cost Effectiveness
- Excellent Customer Focus
- Quality Leadership
- Innovation



YOU

ARE ONE OF 200,000 REASONS WHY WE'RE THE BEST

PeP EXPERTS ARE POSITIVE THINKING GO-GETTERS!

- RESPONSIBILITY TAKERS
- SOLUTION FINDERS
- CHANGE CRAFTERS





- [› Unterricht](#)
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Orestad Gymnasium Danmark
No paper

I morgen - I dag

Vi skaber Changemakers



Global Learning Center

Using Emerging Technologies to Go Into Every Person's World



Infrastructure & Technology



Global Learning &
Teleportation Classroom



Studio Classroom



Virtual Reality Classroom



High Performance
Computing Research
Classroom



Global Innovation
Collaboration Classroom



Distance Education Lab
Classroom



Instructional Class for
Disabilities



Faculty Excellence and
Learning Classroom



Real life is digital life

- Automation
- Fast Transformation
- Future Uncertainty
- Skill Uncertainty

We have to design
Life Long Learning
in a completely different way



There is

- a plethora of new apps and portals
- tons of experiments



There is not

- an appropriate didactic yet
- an education ecosystem yet
- an appropriate political concept yet





Technology is not only an enabler – it is a driver.

But technology doesn't have any in-built ethics nor does it automatically serve human needs.

If we do not have the big picture in mind and try to actively design politics we might end up like the sorcerer's apprentice.



The future is
all about fair
participation

