Cybersicherheit in der digitalen Transformation

Jahrestagung Cybersecurity

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Topic

Secure Digital
Transformation

Objective

Knowledge
Exchange

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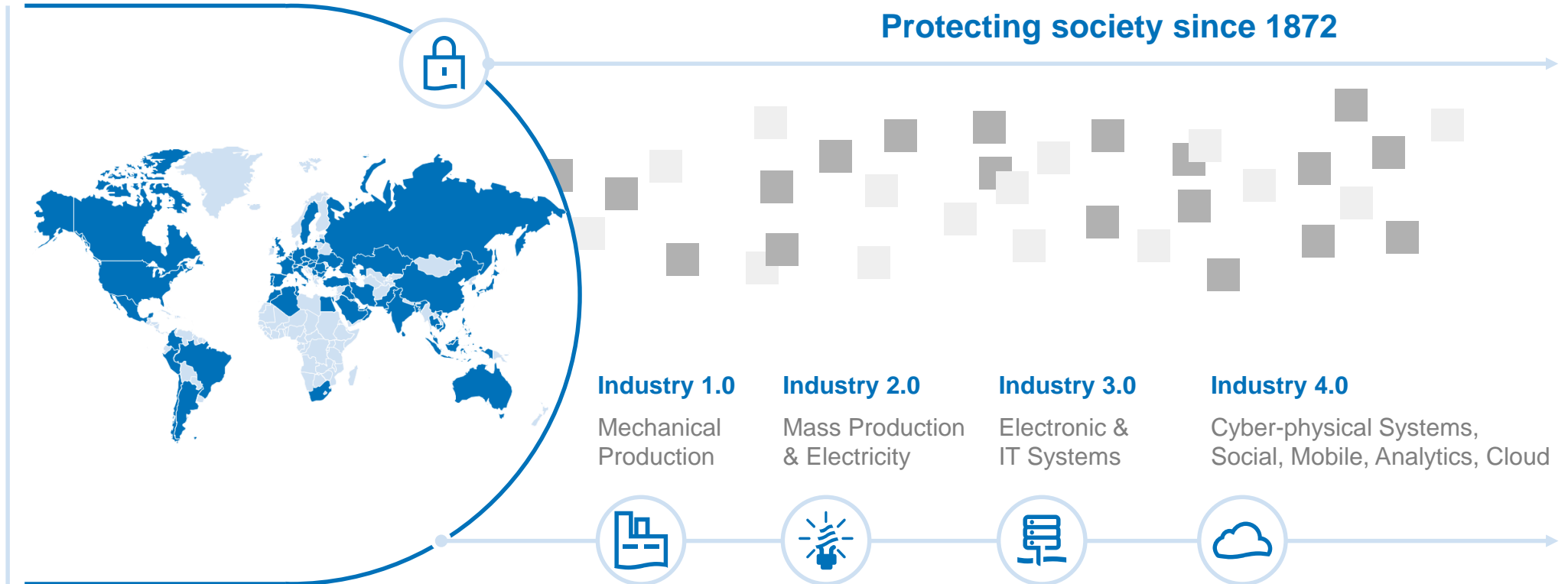# Topics

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TÜV Rheinland. Another Industrial Revolution?

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- $2.3 Billion
- Privately Held
- 144 Years Old
- 500 Locations
- 69 Countries
- 19,320 people

Protecting society since 1872

Industry 1.0
Mechanical Production

Industry 2.0
Mass Production & Electricity

Industry 3.0
Electronic & IT Systems

Industry 4.0
Cyber-physical Systems, Social, Mobile, Analytics, Cloud

! **The 4th Industrial Revolution will be defined by the use of "cyber-physical" systems.**

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TÜV Rheinland. Another Industrial Revolution?

From a simple Product to Cyber Physical Systems and IoT.

Products

- Mechanical & Software components are not deeply intertwined
- Not connected and "zero" intelligence

Cyber Physical Systems (CPS)

- Combination of mechanical and software components
- Connected System (wired or wireless)
- Intelligent embedded System

Internet of Things (IoT)

- Combination of mechanical and software components
- Network of physical devices, vehicles, …
- Intelligent embedded System
- Collect and exchange information

INTEGRITY

AVAILABILITY

CONFIDENTIALITY

Physical World & Computing

Identifiable & Internet Connected

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TÜV Rheinland. Another Industrial Revolution?

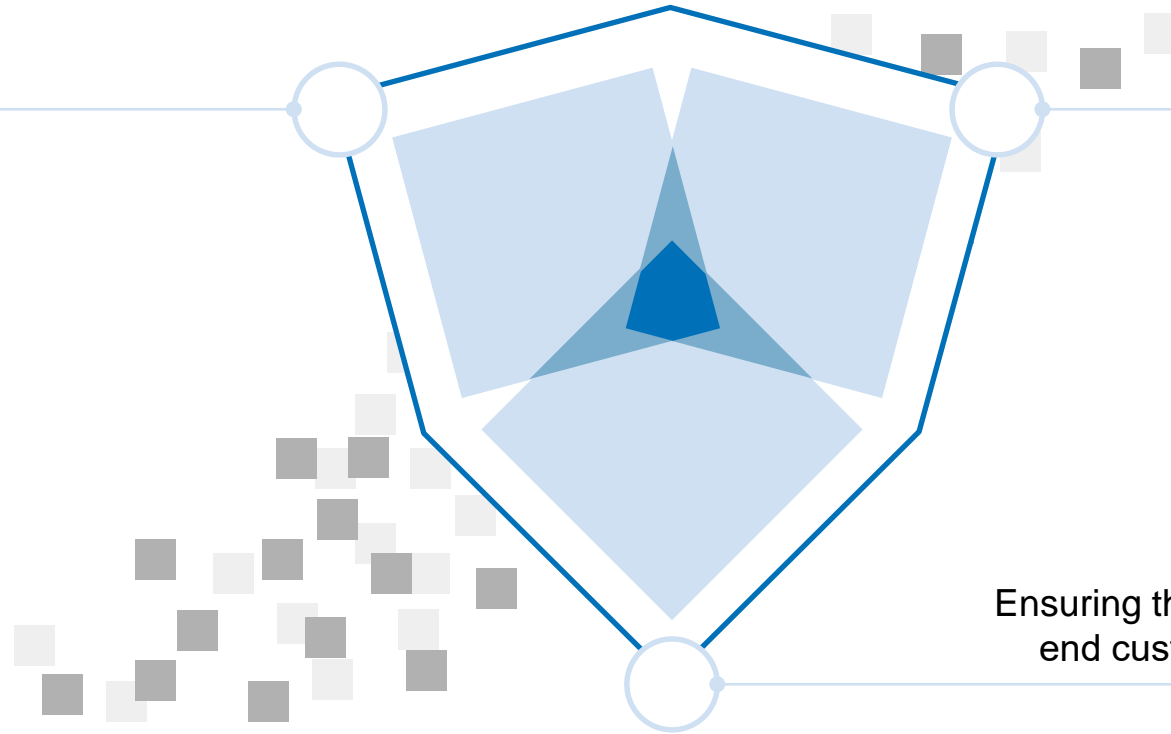## Cybersecurity as a baseline for safety and privacy

Safety

Protection of the environment against the IoT product.

Cybersecurity

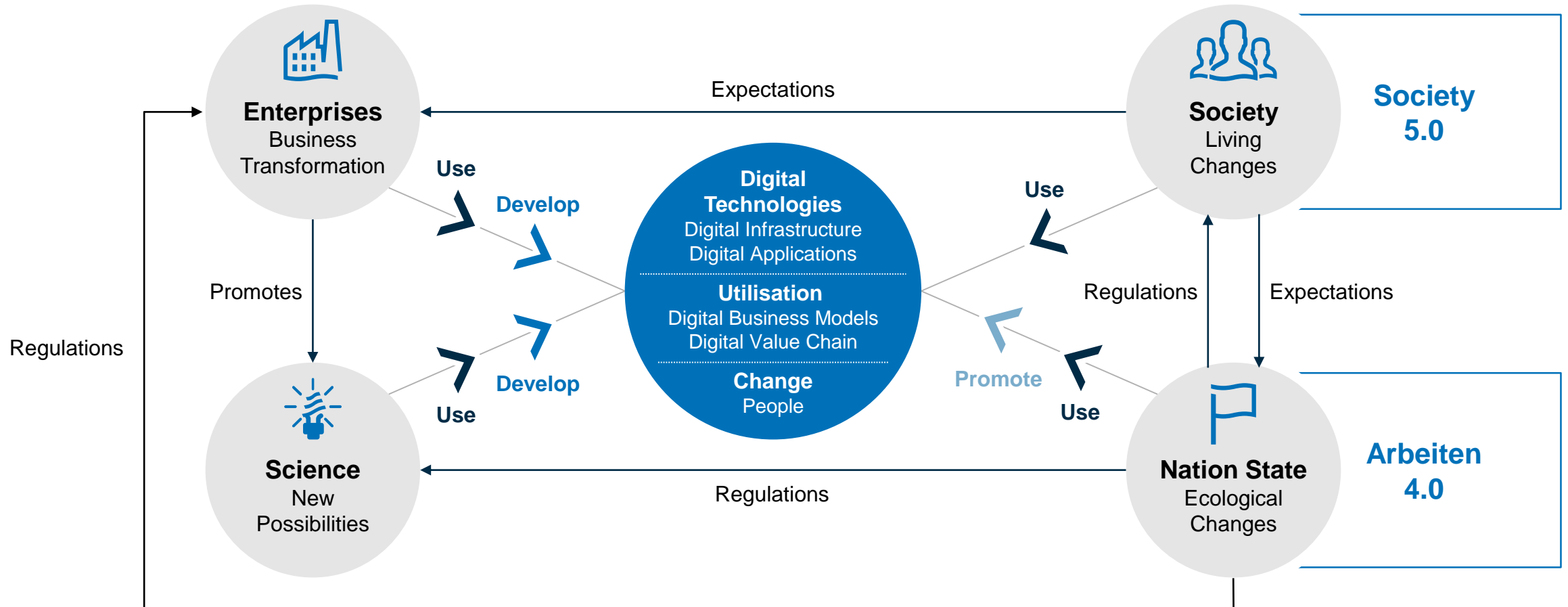Protection of the IoT product against cybercriminals.

Privacy

Ensuring the informational self-determination of the end customer and protection of customer's data.

> **!** **Testing IoT Products and Systems comprehensively needs a highly diverse knowledge.**
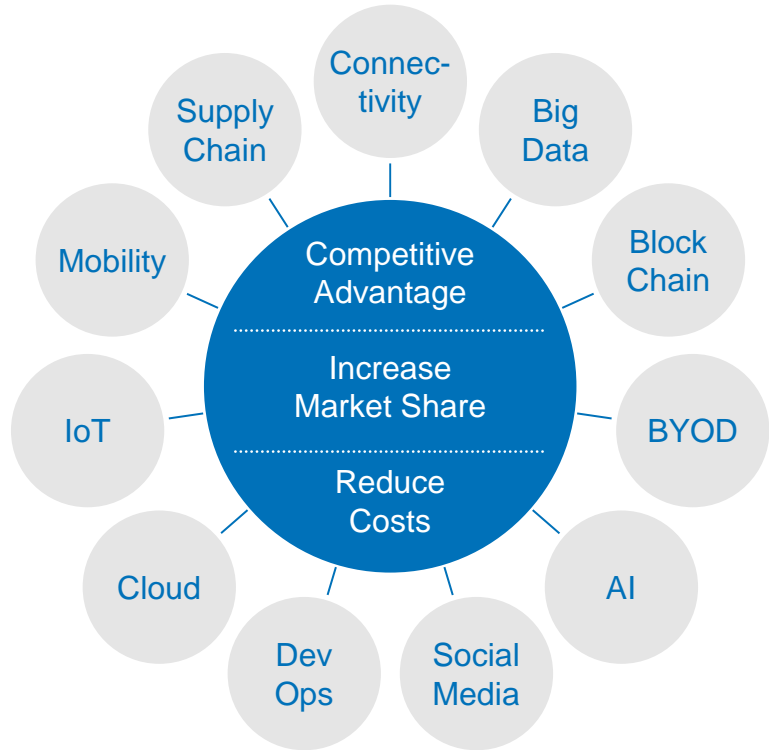
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What is Digital Transformation?

It goes beyond Industry 4.0!

Enterprises
Business Transformation

Society
Living Changes

Society 5.0

Expectations

Use
Develop

Digital Technologies
Digital Infrastructure
Digital Applications
- - - - - - - - - - -
Utilisation
Digital Business Models
Digital Value Chain
- - - - - - - - - - -
Change
People

Use

Promotes

Regulations

Expectations

Regulations

Develop

Promote

Use

Use

Science
New Possibilities

Nation State
Ecological Changes

Arbeiten 4.0

Regulations

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What is Business Transformation?

Central diagram — Competitive Advantage, Increase Market Share, Reduce Costs — surrounded by: Supply Chain, Connectivity, Big Data, Block Chain, BYOD, AI, Social Media, Dev Ops, Cloud, IoT, Mobility

DRIVERS OR REQUIRED

New Technology & Innovation	Continues Change	New customers and interaction
Digital Processes	Organisational Change	New partners and interaction
Data Driven	Way of Working	Cultural Change

! **Digital Transformation means most of all continues change, now and in future.**

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Cyber Risk in Digital Transformation.

A Brief History on recent Attacks

Small Selection of Examples

TRENDnet Webcam Hack

- 1.5 million connected cameras hacked

Mirai botnet

- Botnet of ~ 500,000 IoT products

Toy-Hacking (Barbie and Furby)

- Hackers control Furbies and hijack Barbie dolls to act as a spy instrument

WannaCry

- Crypto worm that infected >300,000
- Even large companies and govern-mental agencies were successfully attacked

Vibratissimo

- Amor Gummiwaren
- Device remote access
- Access to >100,000 users' data

2014

2015

2016

2017

2018

- Researcher managed to completely control a Jeep SUV by hacking the vehicle's CAN bus

Jeep SUV Hack

- Evolution of WannaCry
- Botnet with about >2 million infected systems

IoTroop (current!)

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Example: How to do it right?

Source: heise.de, 2016

! **It is important being able to bring a system in an insecure state back to a secure state.**

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Digitalisation is Progressing. Unstoppable.

Risks develop exponential as well.

£ 2,631,684

The Great Train
Robbery, 1963

Royal Mail

$ 951,000,000

Bangladesh Bank/
Swift Heist, 2016

Risk Gap

——— Technical Development   ‐ ‐ ‐ Know-How
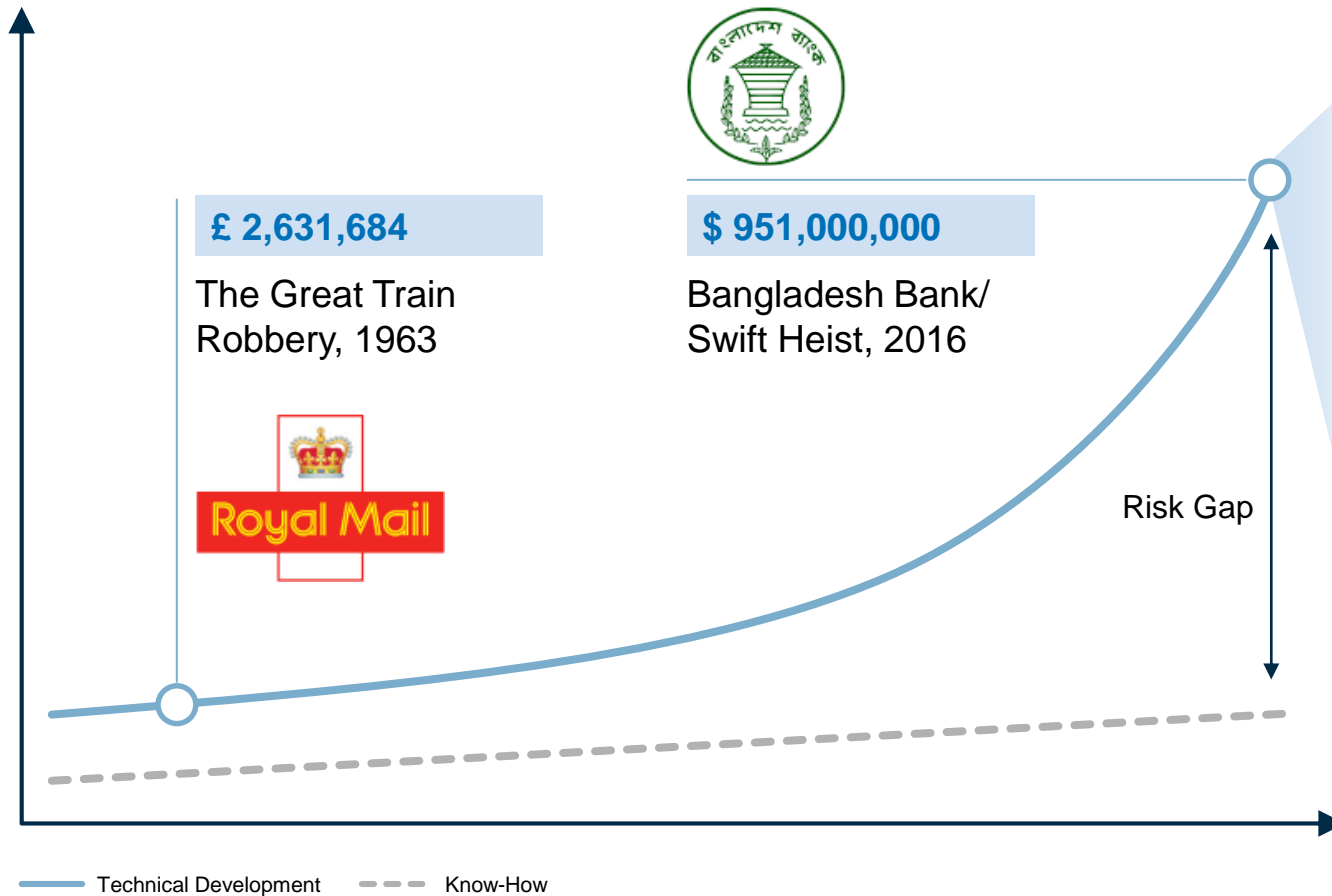
INDUSTRY 4.0

- Automation
- Scalability and Interconnectivity
- AI and Machine Learning
- Agility

CYBER RISK 4.0

- Attack automation
- AI and Machine Learning
- Attackers are agile
- Complexity increases attack surface
- Vulnerabilities are hardly to avoid

Cyber Risk = Business Risk

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Cyber Risk in Digital Transformation

DIGITAL TRANSFORMATION	CYBERSECURITY VS. INNOVATION	MOST IMPORTANT ASSETS TO PRO-TECT AGAINST A SECURITY BREACH

DIGITAL TRANSFORMATION

- Change
- Agility
- Connectivity
- Mobility
- Expectations (customers, employees)
- Competitive advantage
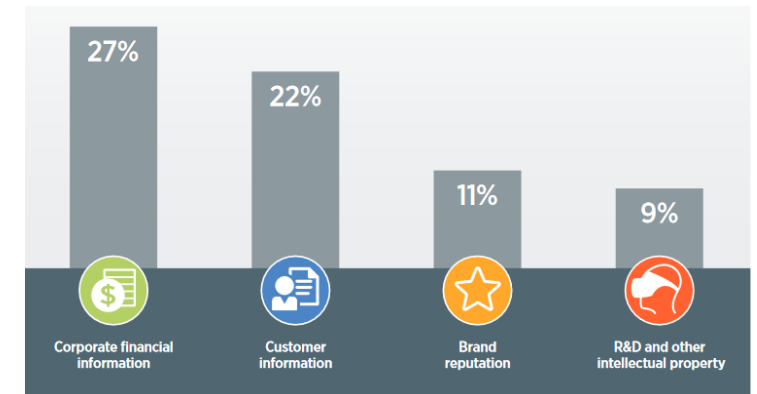- Gain market share
- Operational efficiency

CYBERSECURITY VS. INNOVATION

- Lack of Innovation
- Skill Gap
- Gets involved to late
- Maintaining the old environment
- Point Solutions
- Cost factor instead of investment

MOST IMPORTANT ASSETS TO PROTECT AGAINST A SECURITY BREACH

27% — Corporate financial information
22% — Customer information
11% — Brand reputation
9% — R&D and other intellectual property

Source: Enterprises re-engineer security in the age of digital transformation, Forbes, 2017

Source: Ponemon Institute

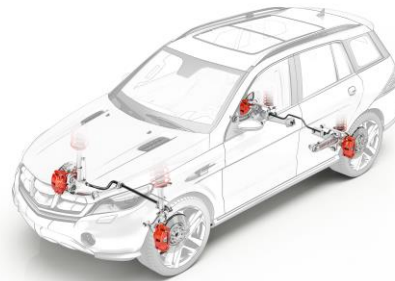| Average total cost of a data breach	Average cost per stolen record	Cost increase per record
$4.31M	**$225**	**25%**

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Cybersecurity in Digital Transformation

Cybersecurity as Enabler and Innovator

Why do we need car brakes?		Why do we need ABS, ESP, EBD, …?

BUSINESS ENABLER

- Cybersecurity is not just about cost and risk
- Cybersecurity is more than a compulsory program
- Cybersecurity increases efficiency and productivity
- Cybersecurity supports the enterprise objectives
- Example: Open and hybrid secure infrastructure

BUSINESS INNOVATOR

- Cybersecurity requires shifting to be business driven
- Cybersecurity can be more than a business enabler
- Innovate cyber security culture enables faster growth
- Support and adapt new technologies e.g. block chain
- Example: Secure Digital Identity

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Cybersecurity as Enabler and Innovator – Innovation Gap
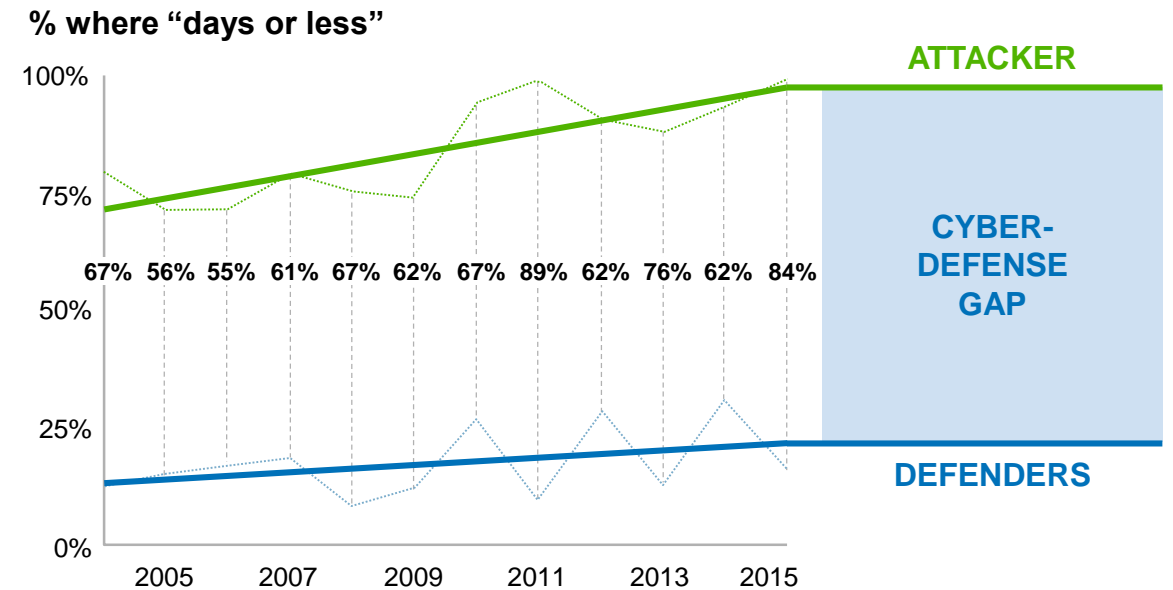
COST AND TIME FOR REMEDIATION IS HIGH AND RISING[2]

- ■ MTTI   ■ MTTC
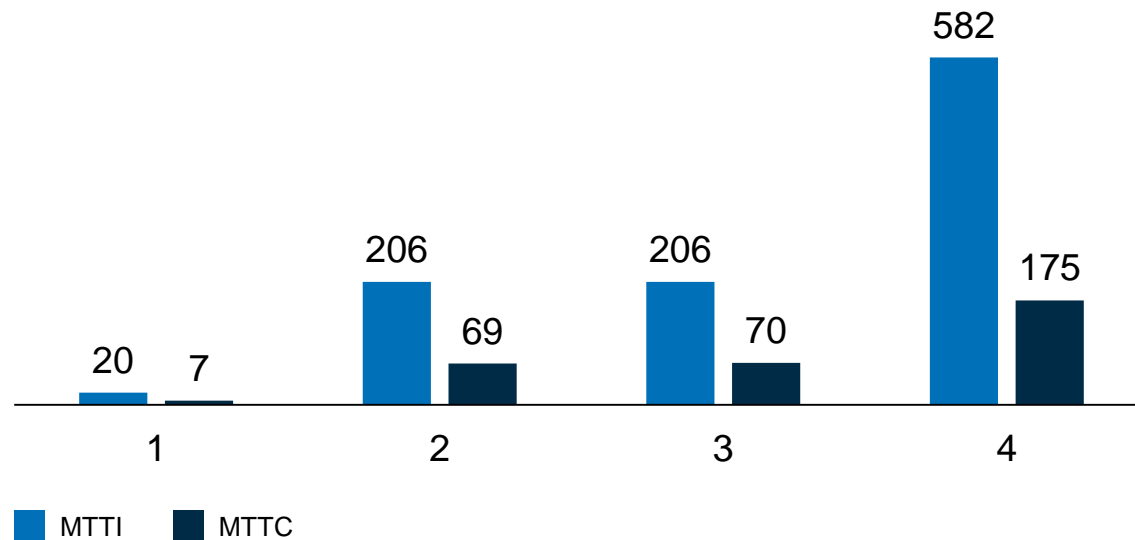
2016: On average, it took respondents 242 days to spot a breach caused by a malicious attacker, and further 99 days to contain it.

[1] Verizon DBIR | [2] Ponemon Institute

DEFENDERS LOSING THE INNOVATION BATTLE[1]

% where "days or less"

Average total cost of a data breach	Average cost per stolen record	Cost increase per record
$4.31M	**$225**	**25%**

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Cybersecurity as Enabler and Innovator

CYBERSECURITY RISKS AND THREATS HINDER INNOVATION IN MY ORGANISATION	**MY ORGANISATION HALTED A MISSION-CRITICAL INITIATIVE DUE TO CYBER-SECURITY CONCERNS**	**BEFORE MAKING A CYBERSECURITY INVESTMENT, HOW HEAVILY DO THE FOLLOWING WEIGH ON THE DECISION?**	**MANUFACTURING: POTENTIAL DELAY IN ADOPTION OF DIGITAL USE CASES**

Ability to satisfy regulations

Ability to defend against threats

71%
Agree

39%
Agree

68%
Defensive: protect and preserve

32%
Ability to enable business growth

Predictive Maintenance (Analytics)
Quality and Defect Control Automation
Energy Management
Connected Products Maintenance
Assembly Line Changeover
Remote Maintenance
Visual Factory

Time to adoption

Adoption lag
1 – 2 years
2 – 3 years
3 – 5 years

Source: Cybersecurity as a growth advantage, Cisco, 2016

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Cybersecurity in Digital Transformation

Tie cyber-security strategy to digital transformation goals

Cybersecurity as Enabler and Innovator (differentiator)

Cybersecurity is the backbone of the digital Transformation

Cybersecurity as a baseline for safety and data privacy

Metrics to measure success of security strategy should encompass every aspect of the digital processes.
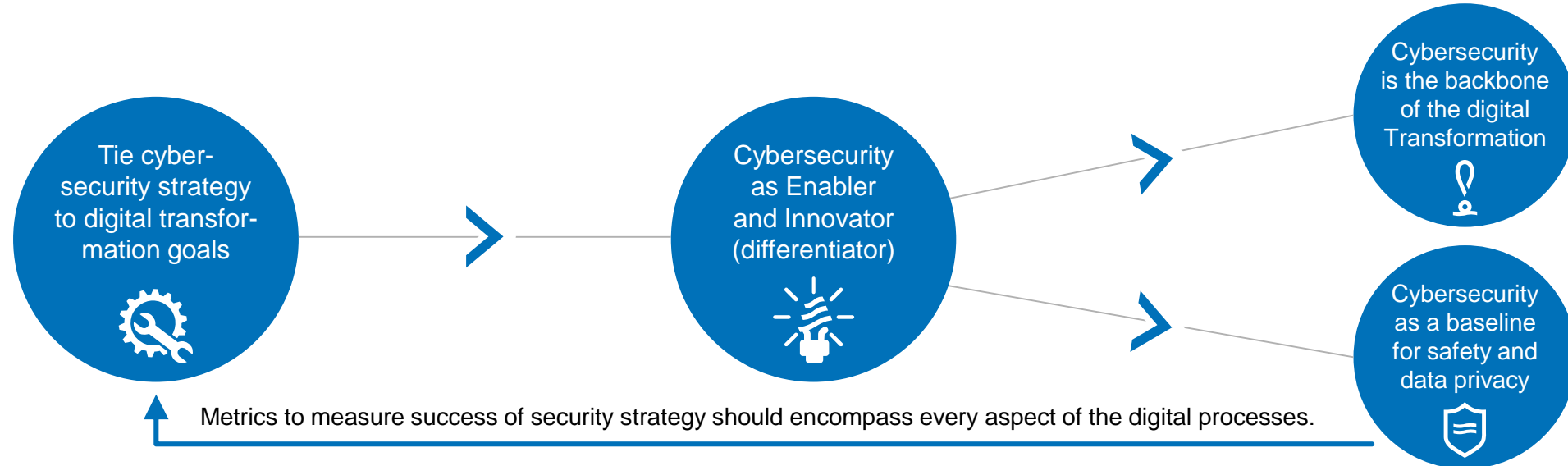
By 2025 Europe can achieve 1.25 Trillion Euro industrial added value. Cybersecurity makes up over one quarter (Source: BDI, Cisco)

.
Ability of senior leadership to assess risks, calculate and articulate ROI.

Digital transformation should be driven by a clear and focused strategy. With cybersecurity at the heart of everything.

Digital transformation never stops changing. Neither should cybersecurity.

Only 21 percent of CISOs (Chief Information Security Officers) report to the CEO or board.

Cybersecurity professionals must become risk management advisers.

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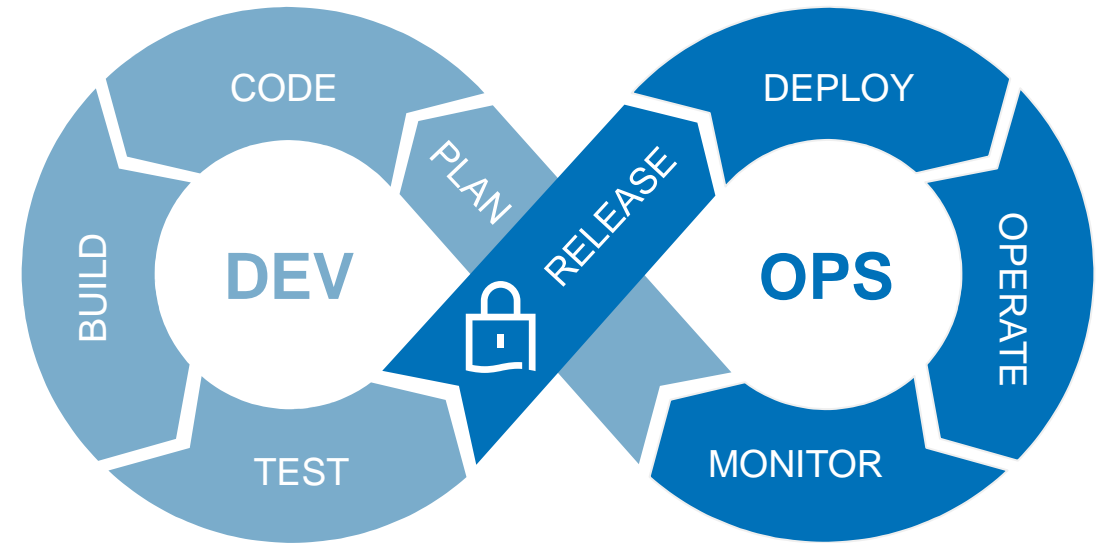
Cybersecurity in Digital Transformation

Example: DevSecOps

SECURITY IS AN INHIBITOR TO DEVOPS AGILITY

- Shifting cybersecurity to the left
- Automate security assessments as part of your workflow
- Automate everything e.g. automated security testing in unit tests
- Securing Product Infrastructure
- Securing DevOps Infrastructure
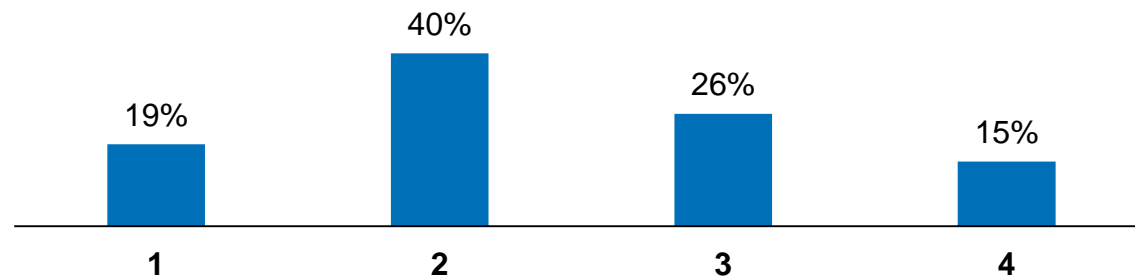
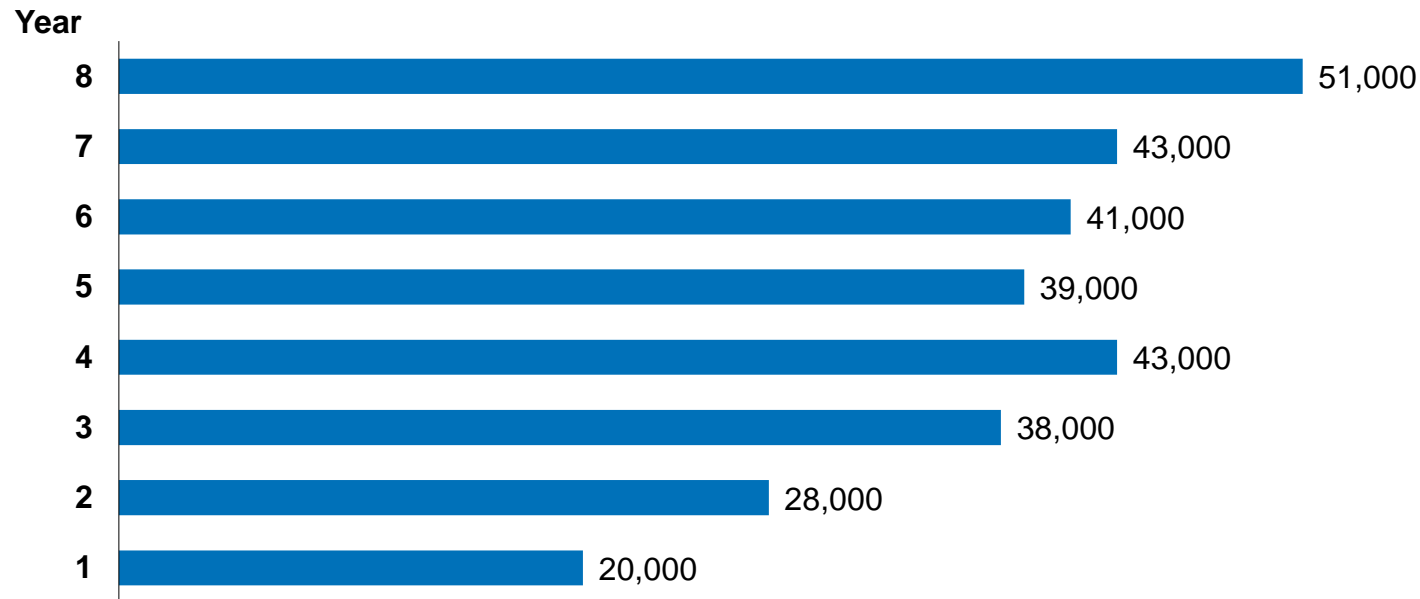Source: 2017 DevSecOps Community Survey

Source: tripwire.com

! **Break down silos to improve efficiency, visibility, compliance, and speed.**

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Cyber Risk in Digital Transformation

The resource gap in cybersecurity is increasing

OPEN IT POSITIONS IN GERMANY

Year

Year	Value
8	51,000
7	43,000
6	41,000
5	39,000
4	43,000
3	38,000
2	28,000
1	20,000

Source: Bitkom Research 2016

One million cybersecurity job openings in 2016 … projected shortfall of 1.5 million by 2019.

Source: Cisco and Symantec

Cybersecurity market grows from $75 billion in 2015 to $170 billion by 2020.

Source: Gartner.Inc

Cybersecurity salaries for senior engineers are at $180k to $220k in 2017 (USA).

Source: CSOonline.com

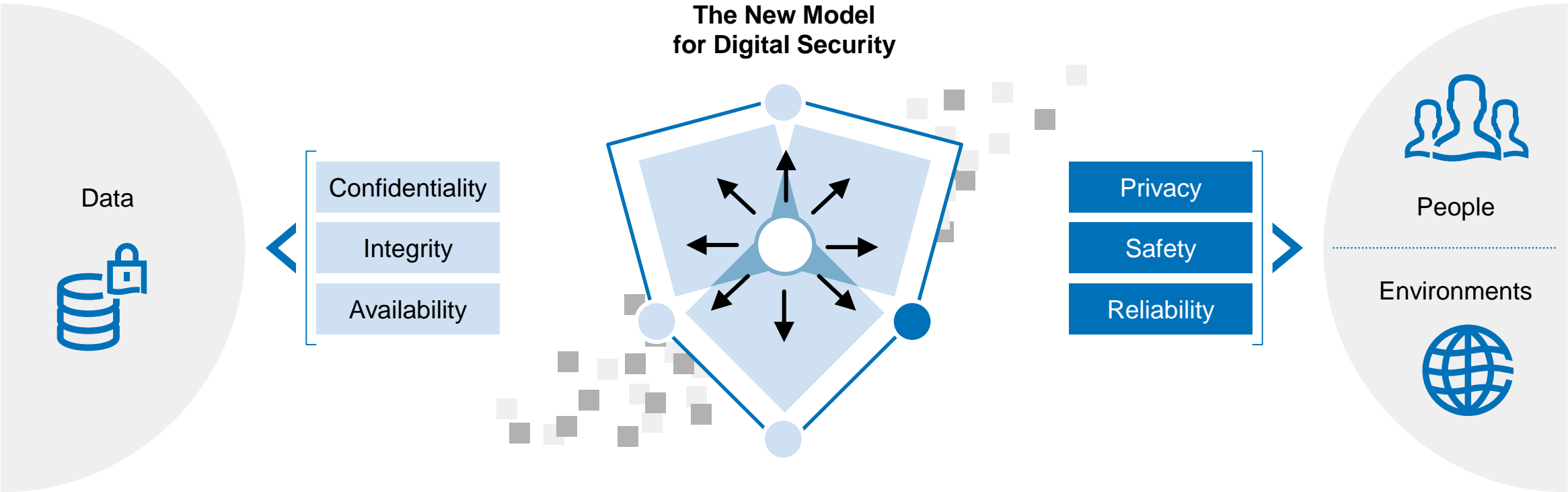**! The Resource Gap is the biggest challenge in Cybersecurity right now and in future.**

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Cybersecurity in digital Transformation

Tie cybersecurity strategy to digital transformation goals and make it visible

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Cybersecurity in Digital Transformation

**The New Model
for Digital Security**

Data

Confidentiality

Integrity

Availability
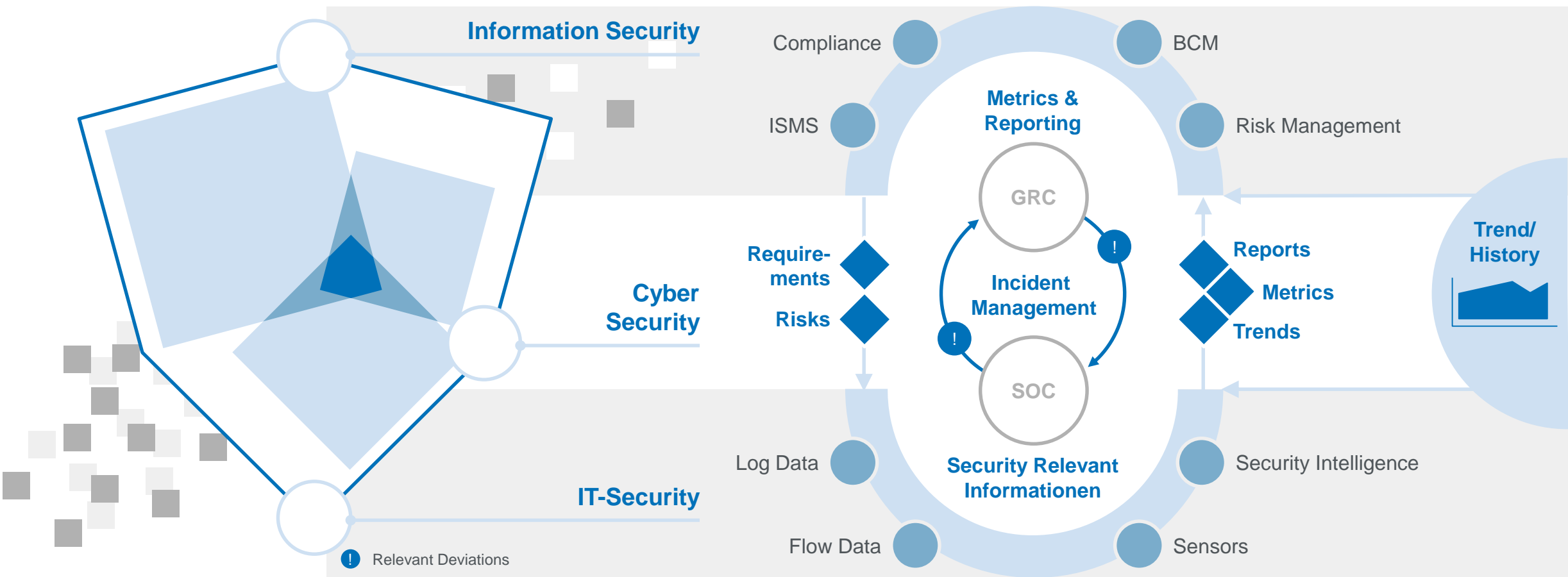
Privacy

Safety

Reliability

People

Environments

Source: Gartner Security & Risk Management Summit: „Tutorial: Gartner Essentials: Top Cybersecurity Trends for 2016 – 2017"; Earl Perkins, 12 – 13 Sept. 2016

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Summary. Key Takeaways.

Digital transformation never stops changing. Neither should Cybersecurity.

Include Cybersecurity in the Digital Transformation Strategy and get Leadership Commitment.

Think about being faster **and** saver than others.

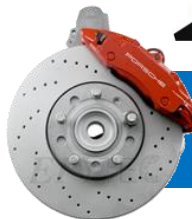Stop thinking about security as a defence-centric approach that is sold by fear.

Think of cybersecurity as an innovation enabler, helping business go forward.

Cybersecurity is the Backbone of the Digital Transformation.

Cultural Change is required to enable innovation in Cybersecurity.

You do need brakes to drive faster and save!

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Thank you.

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https://tuv.com/informationsecurity

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