The economic outlook will force companies to re-focus on the bottom-line – digitization intensifies the pressure but also offers the solution.

**Current Situation and Challenge – Recession & need to act**

**Economic outlook**
- Trade uncertainty dragging down global growth
  - German recession fears after big decline in industrial production
  - Scary German output figures raise recession fears
  - Is a US recession coming? Yield curve flashes dire warning

**Digitization**
- Challenge - to continuously reinvest in competitive business models during the recession period with reduced budgets
- Solution - to improve operational efficiency with the means of digital technologies > Digital Efficiency
Overview: Digitization opens opportunities in every industry to increase efficiency and support competitive advantages

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Digital Efficiency Index

Customer

Strategy

Technology

Operations

Organization/Culture

Digital Efficiency Index
The rightsizing and prioritization of the digital efficiency initiatives per focus area considers available budgets and expected return on invest.
# Industry Overview: Digital efficiency is a key topic in all industries with different profiles in our index categories

## Digital Efficiency Index

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Banking: Banks still suffer from unsatisfactory cost/income ratio

Digital Efficiency Index

Total index score: 2.38

Key Trends

- **Alternative Solutions**
  Market entry of numerous alternatives to classic payment, lending services, e.g. mobile wallets/cards

- **Enhanced Services**
  New, e.g. mobile or voice-operated services, smart home and video supported advisory, chatbots

- **Digital Ecosystems**
  Build an Open Banking platform and connect with partners via standardized interfaces, e.g. PSD2

- **Technology Driver**
  Blockchain is supporting banking services like smart contracts, payments, fraud detection, crypto custody

Key Challenges

- **Competitive Landscape**
  New players are entering the market (e.g. GAFA, FinTechs) and address the digital-oriented clients

- **IT-Transformation**
  Replacement of legacy IT systems by modern applications and move from on-premises to cloud

- **Regulation**
  Increased regulatory requirements of BaFin and ECB limit the investment capacities

- **Customer Loyalty**
  Provide a positive Customer Experience to increase customer loyalty and reduce the churn rate
Insurance: Fields of efficiency identified but implementation still poor

Digital Efficiency Index:

- **Total index score:** 1.96

#### Key Trends

1. **From Product to Service**
   - Change of mindset from "insured" to "protected" using Smart Home, Smart Mobility or eHealth

2. **Digital Ecosystems**
   - Build an open insurance platform and connect with partners via standardized interfaces

3. **Data Analytics**
   - Collection of data and data analytics, e.g. to optimize pricing or fraud detection

4. **New Products**
   - Develop on-demand insurance, micro insurance products or parametric insurance

5. **Operational Excellence**
   - Process optimization via standardization automation to reduce costs

6. **IT-Transformation**
   - Replacement of legacy IT systems by modern applications and move from on-premises to cloud.

7. **Agile Organization**
   - Transformation of business and IT organization towards agility and better time-to-market

8. **Customer Loyalty**
   - Provide a positive customer experience and ensure a seamless customer journey

#### Source

- DTC Digital Efficiency Database

- Dr. Matthias Gröbner
Transportation: Potential of “Digital” widely understood, application getting traction with challenges in culture and skills

**Digital Efficiency Index**

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**Key Trends**

- **Contribution to CO2 - goals**
  Rail/public transport is seen as an ecological means of transportation, thus contributing to CO2 reduction goals

- **MaaS & Connected Customer**
  Completely digitally organized journey for travelers from door to door: trip search, booking, travelling, after care

- **Digital Assets & Maintenance**
  Digital assets as prerequisite for efficiency through predictive maintenance capabilities in infrastructure and rolling stock

- **End-to-end Processes**
  End-to-end processes across all corporate units to drastically increase service quality and efficiency

- **Key Challenges**

  - **Capacity**
    „Rail system“ is at the limit of its hardware-defined capacity. New hardware requires lots of money and time

  - **Profitability in Cargo**
    Rail cargo businesses are currently not or hardly profitable. Large restructuring efforts under way

  - **Transformation to agile Org.**
    Large Rail operators have decided to become agile/flexible organizations and started their journeys. Both business and IT functions struggle with progress and (lack of) direction

  - **Skills & Resources**
    In order to implement the digital strategy and to become a flexible organization, new skill sets are required on a large scale. Not enough supply on the market

**Total index score: 2.10**

**Source:** DTC Digital Efficiency Database
Logistics: In the fragmented market of low margin business, a digital leader has not yet been established

Digital Efficiency Index

Total index score: 1.90

Key Trends

- **End-to-end transport**
  An increasing number of players try to manage end-to-end transport chains

- **Rise of trading platforms**
  Platforms to exchange transport demand and supply are getting more and are growing

- **Digital transport chain**
  Transport operations are increasingly organized digitally

Key Challenges

- **Fragmented carrier landscape**
  Especially the carrier business is very fragmented, thus standardization in any meaningful way has not yet been successful

- **Excess capacity**
  Up to 40% of trips are without freight

- **Little digital skill**
  Small companies are focused on operations, hardly any skill, nor capacity for digital innovation present

- **Low margin business**
  Extreme price pressure leads to very low margins. Innovation budgets rarely large enough for disruptive approaches
**Health: The most challenging issue is the interconnection of market participants**

**Digital Efficiency Index**

- **Total index score: 2.18**

**Key Trends**

- **Ecosystem Health**
  Connecting the health partners in the ecosystem on platforms in the field of telematics

- **E2E Processes**
  Automation and remodeling of process landscapes

- **Improvement of healthcare**
  Digital health applications and wearables improve the diagnosis and the medical care processes

- **Big Data and AI**
  Health data predict diseases and provide for target-oriented therapies

**Key Challenges**

- **Regulation**
  Implementation of the new legal framework in Germany, globally very heterogeneous regulatory landscape

- **Integrated strategy**
  Strategic development considers the needs of a connected ecosystem

- **Business transformation**
  Prioritization and acceleration through agile methods and innovation management

- **Data security**
  Patient data in the application and during operation must be specially protected

*Source: DTC Digital Efficiency Database*
Utilities/Energy: Digitization and renewables transformation require a realignment of the utilities industry – towards an Energy Services Provider

Digital Efficiency Index

Key Trends

- **Digitization**
  Customer-specific solutions and operational innovations such as cloud services, smart grid and e-mobility pave the way to "Utilities 4.0"

- **Decentralization**
  Increasing share of not centrally generated renewable energy

- **Energy Efficiency**
  Energy reduction and conservation by applying more efficient technology

- **Renewable Energy**
  Growing efforts to reduce carbon emissions lead to an increase in renewable energy sources

Key Challenges

- **Prosumer – the new client**
  New services and means of interaction for increasing number of active market participants – the prosumer

- **Infrastructure connectivity**
  Advanced grid monitoring and control of connected assets by communication technology

- **Digital operational excellence**
  Creating value by adopting sophisticated technology to increase operational efficiency

- **Threat of cyber-attacks**
  Orchestration of increasing security requirements and cyber defense

Total index score: 1.90

Source: DTC Digital Efficiency Database
Public: In the new digital era the German public sector adapts, extends and further develops the services for its citizens and companies too slowly

### Digital Efficiency Index

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**Source:** DTC Digital Efficiency Database

**Total index score:** 2.20

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### Key Trends

- **Smart Government / OZG**
  - The OZG obliges the federal and state governments to offer their administrative services “online” by 2022 at the latest.

- **Digital Ecosystems**
  - Public ICT providers & IT departments must consolidate the IT, modernize their portfolio & adapt to new standards e.g. fiware, UI, xÖV …

- **Smart City**
  - New technologies like IoT enable cities to optimize operations and services and connect closer with its citizens

- **Technology Drivers & Risks**
  - Hyperscaler, innovative SaaS, PaaS and IaaS solutions, IoT, AI, AR/VR, RPA, Drohnes, Cyber Defense Technology …

---

### Key Challenges

- **Immature Solutions/Standards**
  - Especially for smart cities there is a lot of hype, but standards and comprehensive solutions are rare or do not fit to public req’s

- **Speed & Agility**
  - Department-thinking, fragmented responsibilities instead of agile organizations and open culture; slow & inflexible tendering

- **Regulation & compliance**
  - Often a adaption in legislation / regulation is necessary in order to establish “truly” lean and citizen-focused processes

- **Demographics/lack of resources**
  - The “war for talent” is especially difficult for the public sector; lack of key skills e.g. in the IT area e.g. “agile skills”, DevOps, IT architects, AI, RPA …
Telecommunication: fields of actions identified and addressed, way forward defined but implementation still ongoing

Digital Efficiency Index

- **Technological breakthrough**
  - Explosion of computing powers, cloudification, ubiquitous connectivity, advanced analytics and AI, VR, blockchain, RPA and machine learning

- **Regulation and industrial politics**
  - From vertical to horizontal regulation, level playing field in the digital competition arena for all players, globalization vs. protectionism

- **Network Capacity & Coverage**
  - Fulfil 5G requirements, accelerate FTTH rollout, reduce capex burden through innovative corporation models

- **Cloudification & Softwarization**
  - Realize flexibility and efficiency through automation and virtualized as well as open production models

- **Key Challenges**
  - Building digital ecosystems
  - Building up orchestrated partnering landscape over the whole value chain from network over IT to Marketing, Sales and Service

- **Safeguarding customer relationship**
  - Optimize customer interfaces CEX, realize balance between own focused innovation and intelligent and flexible partnering models, segment of one

- **Platform economy under pressure**
  - Fake news, hate speech, manipulation, monopolization, data security, privacy, tax avoidance strategies, competition law

- **Market Consolidation**
  - High debt burdens of Telcos, high investment requirements in infrastructure, increasing competition from hyperscalers, shrinking margins

Key Trends

- **Customer Strategy**
- **Technology**
- **Operations**
- **Organization & Culture**

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Total index score: 2.41

Source: DTC Digital Efficiency Database
Automotive: The industry is pressured by disruption through data-driven business, alternative MaaS* offers and environmental regulations

Key Trends

- **Connectivity and Digitalization**
  The connectivity of vehicles lays the foundation for new service offerings and data-driven business models in the future of the automotive sector.

- **Regional shift towards east**
  China is leading the future mobility market — more than ever before. Executives agree that China will leapfrog the market (e.g. with its battery industry).

- **Autonomous, shared vehicles**
  Owning, sharing or renting - the mobility of the future offers more flexibility. Even more so with the introduction of self driving cars.

- **Electric and alternative drives**
  Electrification of vehicles is a mayor step towards carbon neutral mobility. Multiple drivetrain technologies (BEV, PHEV, FCEV) gain market shares.

Key Challenges

- **Becoming data driven**
  Data is the new oil* - car makers need to shift their value creation in order not to be disrupted by IT-*native* Companies.

- **Shift away from car ownership**
  A shift away from privately owned vehicles towards a service orientated mobility ecosystem strains automotive sale figures.

- **Choosing the right powertrain technology**
  Investments in new powertrain technologies are extremely high. Decisions in favor of a technology entail correspondingly high risks.

- **Intense governmental pressure on pollution**
  Environmental initiatives and regulations are putting pressure on the cash cows (diesel and petrol vehicles) of OEMs.

Digital Efficiency Index

- **Customer**
- **Strategy**
- **Technology**
- **Operations**
- **Organization & Culture**

Initiating 1  Emerging 2  Performing 3  Advancing 4  Leading 5

Total index score: 2.05

Mark Heinrich

Source: DTC Digital Efficiency Database
Manufacturing: Most German companies drive efficiency with automation of processes, mainly in production and logistics

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Customer

- Condition Monitoring / AI
  - Data analytics, error detection and machine learning within engineering, production and supply processes

- Smart Planning & Production
  - Digital production architecture, process automation, 4.0 usages and monitoring based on IoT, 5G, BIM models

- Operations & Processes / ERP
  - Optimization and simplification of operations / O2C processes driven by ERP / SAP Introduction

- Digital Products / Digital Twin
  - PLM strategy includes all digital models to be traced e.g. in the production / usage phase as “digital twins”

Strategy

- Eco-Systems (new) challenger
  - Big / small (IT) players aim to take over classic value chain parts, e.g. with new platform services

- Data ownership
  - Data analytics and usage for digital business require clear legal rules within partner / eco system

Technology

- Hybrid Skills Engineers & IT
  - Classic mechanical engineers require both IT and mechanical skills including agile methodologies (system engineering)

- Innovation culture & Agility
  - Manufactures often are still driven by family owned cultures, classical steering, processes and line-organization

Source: DTC Digital Efficiency Database

Total index score: 2.48

Dr. Olaf Sieg