

# Technology, risk, and organisation

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UK Research and Innovation



# Key themes for today

Technology, and risk and NG-CDI - the opportunity to

1. build network capacity and reducing operational and process overhead
2. deliver large scale automation with ability to learn, innovate and respond rapidly
3. manage risk more effectively as CNI

Transitioning to the new state

4. The risk picture – a future story and transition
5. Architecture
6. Stories from industries

Implications for BT

7. Culture and training

# 1. An opportunity to build greater network capability and shed operational and process overhead

## The best converged network

We'll continue to invest in fibre, 5G, edge, core and extended access to build the best converged smart network so our customers can do more. Achieving the lowest throughput cost and delivering a smarter, software-defined network will be critical levers for our success.

### 5G by default

Make 5G the primary solution 'on the go'



### Extended access

Ensure rich customer experience everywhere



### Fibre by default

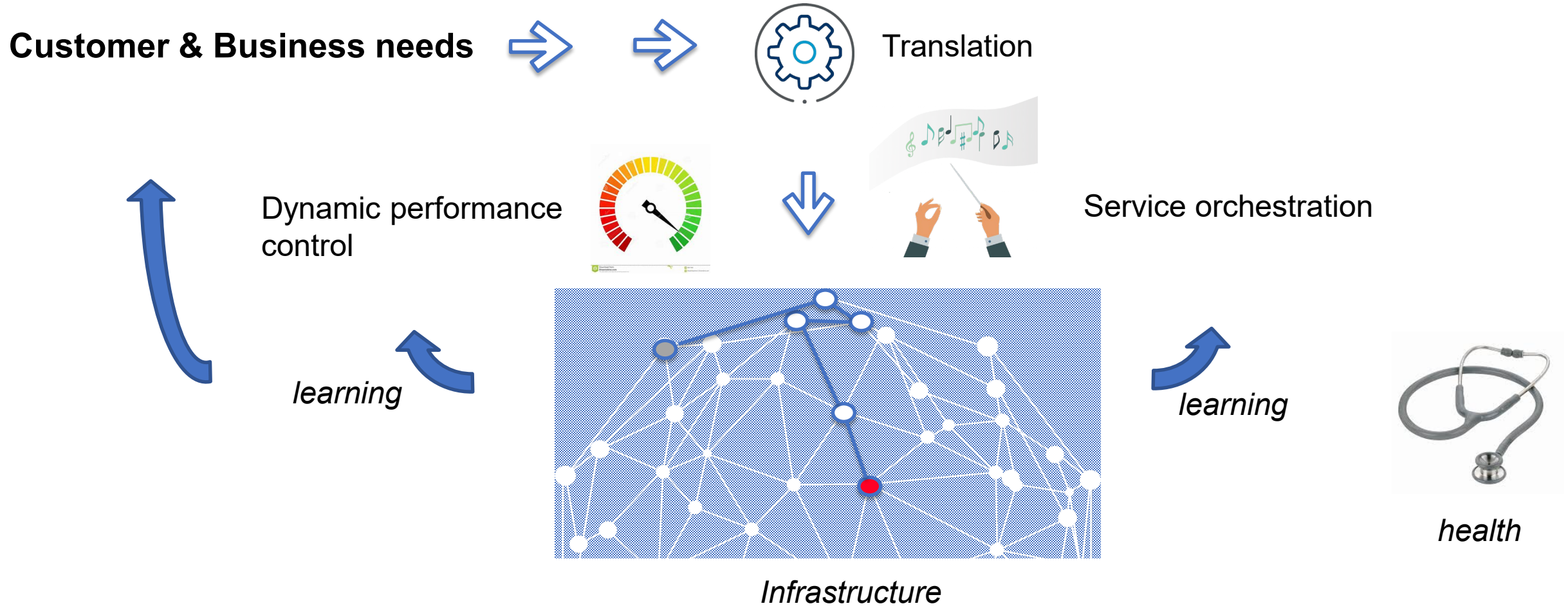
Make FTTP the backbone for all future applications



### Network capability

Build secure, flexible and robust edge computing and core capabilities

# Automation with ability to learn and respond



## 2. For NG-CDI, and its place in critical national infrastructure, risk is a major consideration

NG-CDI is a complex project with objectives to introduce a disruptive technology into critical national infrastructure.

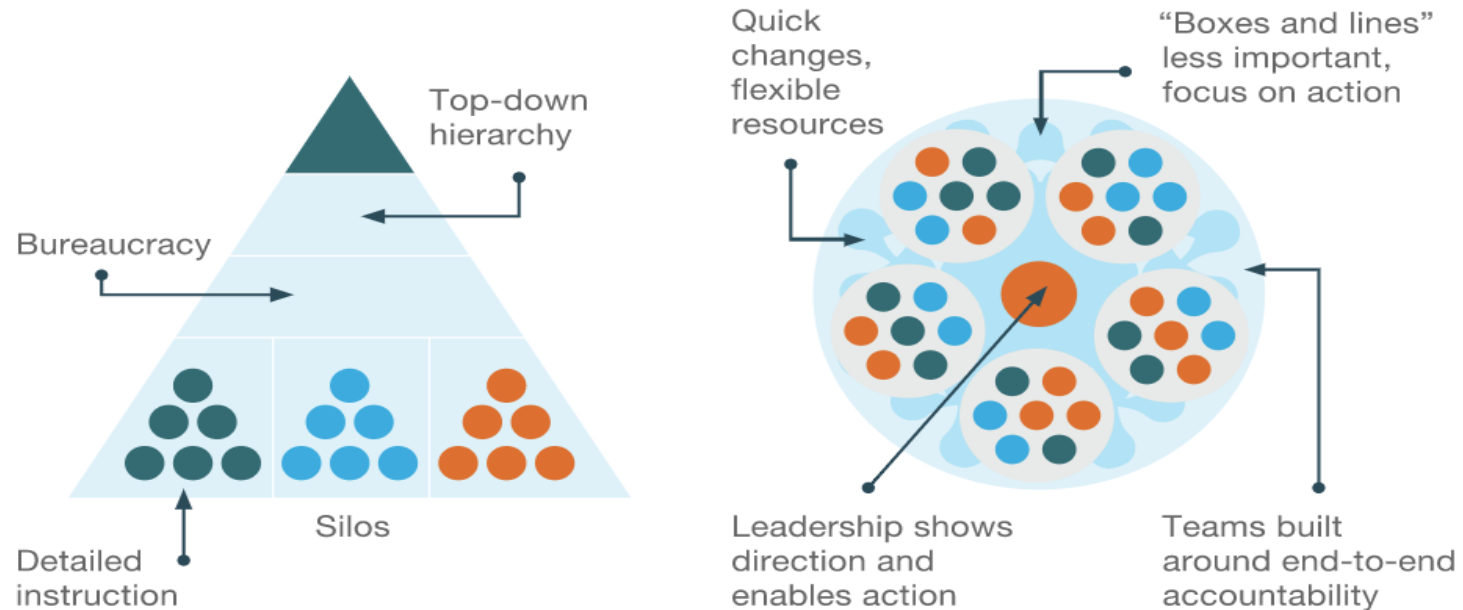
The UK government's official definition of CNI is:

*'Those critical elements of infrastructure (namely assets, facilities, systems, networks or processes and the essential workers that operate and facilitate them), the loss or compromise of which could result in major detrimental impact on the availability, integrity or delivery of essential services*



# Organisational aspects will be challenging as BT becomes a truly digital company

Rather than organization as machine, the agile organization is a living organism



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# Research methodology

## Literature review on technology and the future of work and technology and risk



- Examination of current literature on technology, organisations, motivation, culture
- Expanding to examine risk and risk measurement

## Project on technology and the future of work



- 30 technology key informants
- From industry, academia,, and consulting background
- Key trends and dimensions of the debates identified

## Project on technology and risk



- 30 interviews with risk and technology professionals (e.g. CROs and CFOs)
- Range of organisations from start-ups to major corporations. Also firms which design and sell systems, to firms which purchase systems

## Case studies on technology, risk and organisation



- Case studies on selected firms
- Range of industries, from banking, construction, energy, insurance, logistics

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### 3. The risk picture for the NG-CDI highlights both strategic and operational benefits for BT

	Current picture	Transition	Operation
Strategic issues	<ul style="list-style-type: none"> <li>• Changes in tech demand system change</li> <li>• Competitive landscape now requires major investment</li> <li>• Customer habits and taste radically altering</li> </ul>	<ul style="list-style-type: none"> <li>• Legacy transition</li> <li>• Gaining agreement across the firm on change</li> <li>• Trust in big bet appropriateness</li> <li>• Getting the culture right</li> <li>• Keeping the right staff</li> </ul>	<ul style="list-style-type: none"> <li>• A digital company</li> <li>• Stability and scalability</li> <li>• Culture of experiment</li> <li>• Review practices</li> <li>• Customer responsiveness</li> <li>• Delivery of new service offerings</li> </ul>
Challenges	<ul style="list-style-type: none"> <li>• Systems unable to scale</li> <li>• System lacks flexibility</li> <li>• Maintenance of system increasingly difficult and costly</li> </ul>	<ul style="list-style-type: none"> <li>• Migration toward new system</li> <li>• Misalignment between system and reality</li> <li>• Trust in the system particularly internally</li> </ul>	<ul style="list-style-type: none"> <li>• Identity change within BT</li> <li>• Increasing expectations</li> <li>• Big bet in a rapidly changing landscape</li> </ul>

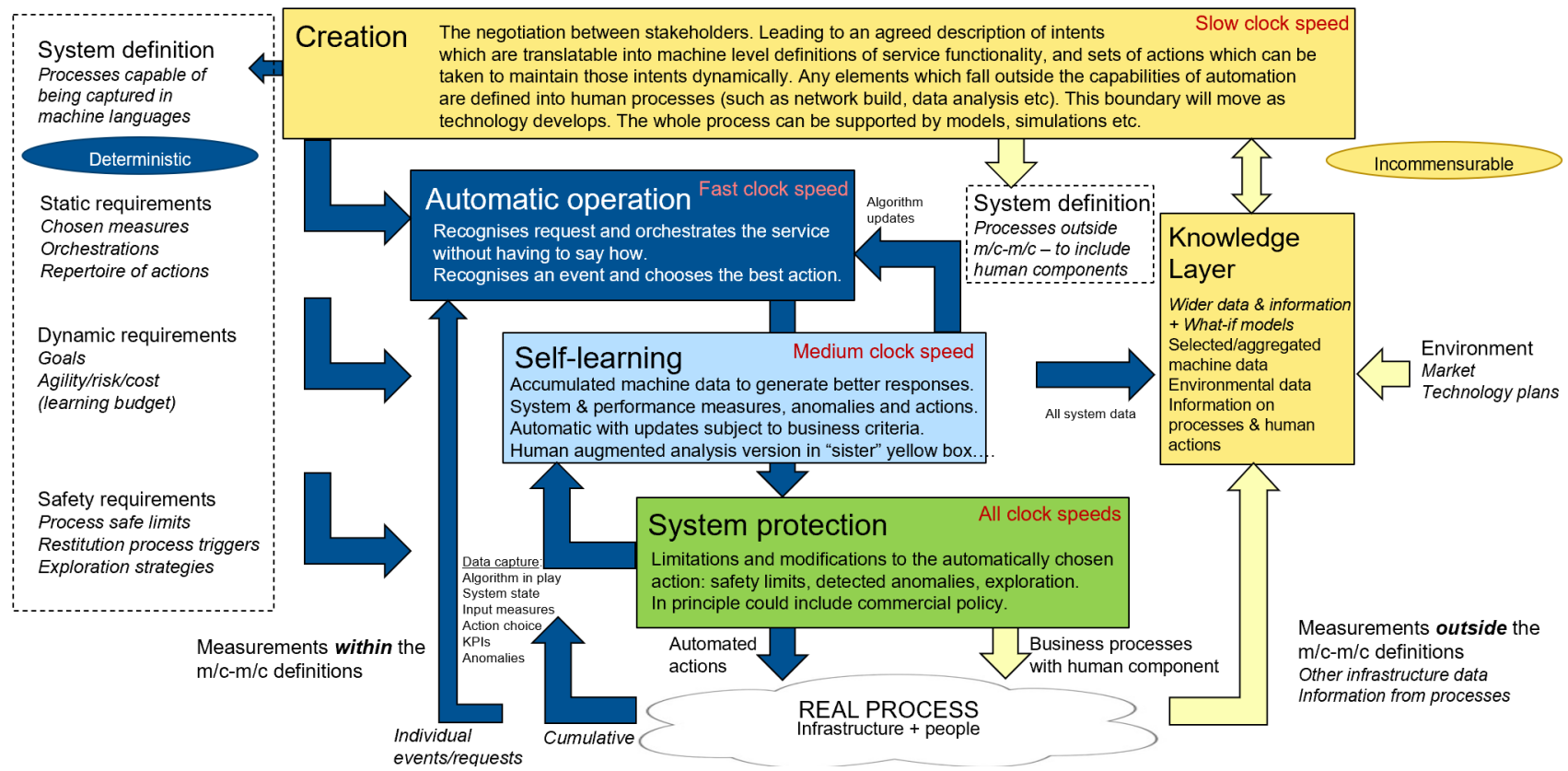
Creating a shared need

Shaping the story

Mobilizing commitment

# 4. Risks are present in all aspects of the architecture, and in the wider strategy, governance and culture of the organisation

## Organisation strategy and governance



## Enterprise culture and risk management



# The architectural elements (creation, automation, self-learning, and system regulation) are linked to intent, knowledge, and risk

	Intent	Knowledge requirements	Risks	Risk approaches
<b>Creation</b>	<ul style="list-style-type: none"> <li>• What are the trade-offs between cost, speed, innovation, quality?</li> </ul>	<ul style="list-style-type: none"> <li>• Awareness of customer intents (e.g. SLA requirements)</li> </ul>	<ul style="list-style-type: none"> <li>• Competing intents between customers</li> </ul>	<ul style="list-style-type: none"> <li>• Strategic priorities set to determine the delivery of customer intents</li> </ul>
<b>Automatic operation</b>	<ul style="list-style-type: none"> <li>• Does the intent align with the business intent</li> </ul>	<ul style="list-style-type: none"> <li>• On-line anomaly detection with alerts</li> </ul>	<ul style="list-style-type: none"> <li>• Incomplete or inaccurate data</li> </ul>	<ul style="list-style-type: none"> <li>• Data quality testing</li> <li>• Sensitivity analysis</li> </ul>
<b>Self Learning</b>	<ul style="list-style-type: none"> <li>• System &amp; performance measures</li> </ul>	<ul style="list-style-type: none"> <li>• Modelling techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Poor technology-environment design</li> </ul>	<ul style="list-style-type: none"> <li>• Proof concept testing</li> </ul>
<b>System regulation</b>	<ul style="list-style-type: none"> <li>• Is the model robust and fit for purpose?</li> </ul>	<ul style="list-style-type: none"> <li>• Assessments of performance and impact</li> </ul>	<ul style="list-style-type: none"> <li>• Failure at the human-machine interface</li> </ul>	<ul style="list-style-type: none"> <li>• Model performance monitoring</li> </ul>

# 5. Stories from industries – differing risk environments

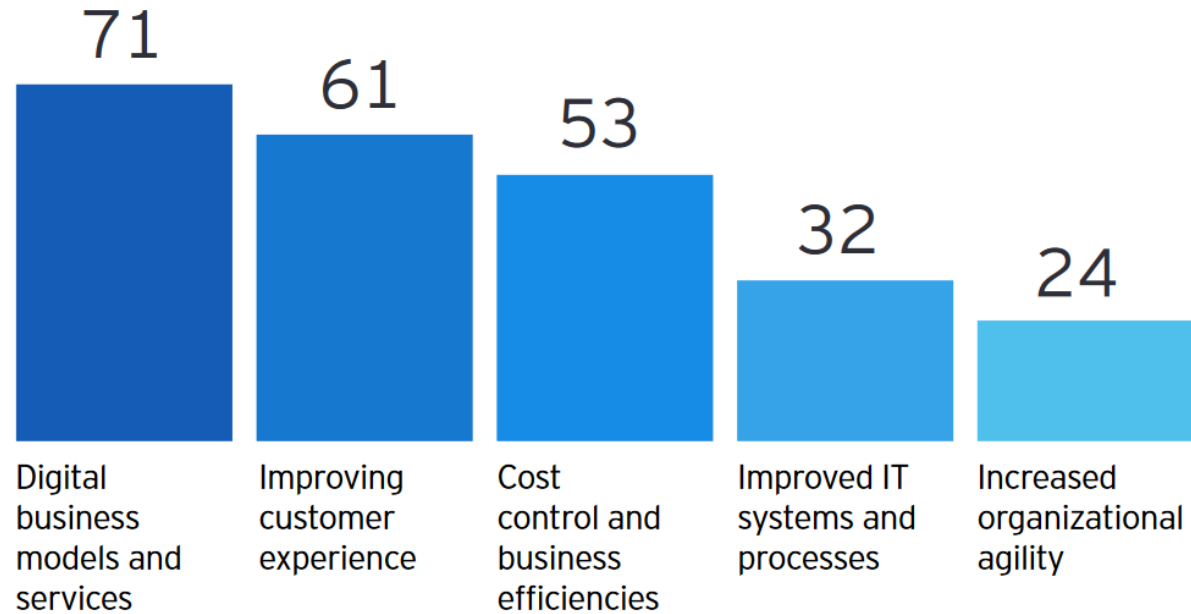
Sector	Key risk	Themes
Logistics	Supply chain	<ul style="list-style-type: none"><li>Companies are controlling supply-chain risks with sophisticated monitoring models that allow identification of potential risks upfront across the supply chain.</li></ul>
Construction	Project quality	<ul style="list-style-type: none"><li>Companies seek to manage the engineering and environmental risks, transforming approaches to approaches using digital twins and extensive use of AI to design and implement major construction / infrastructure projects</li></ul>
Oil and gas	Social demands	<ul style="list-style-type: none"><li>Companies apply advanced approaches to manage the negative effects of financial markets and commodity-price volatility. As social and political demands for cleaner energy are increasing, these companies are actively pursuing growth opportunities to shift their portfolios</li></ul>
Financial services	Security	<ul style="list-style-type: none"><li>Financial service companies managing with the open banking revolution face challenges both to protect their customer value proposition and also to maintain the integrity of their systems``</li></ul>



# For telecoms, what are the major perceived risks?

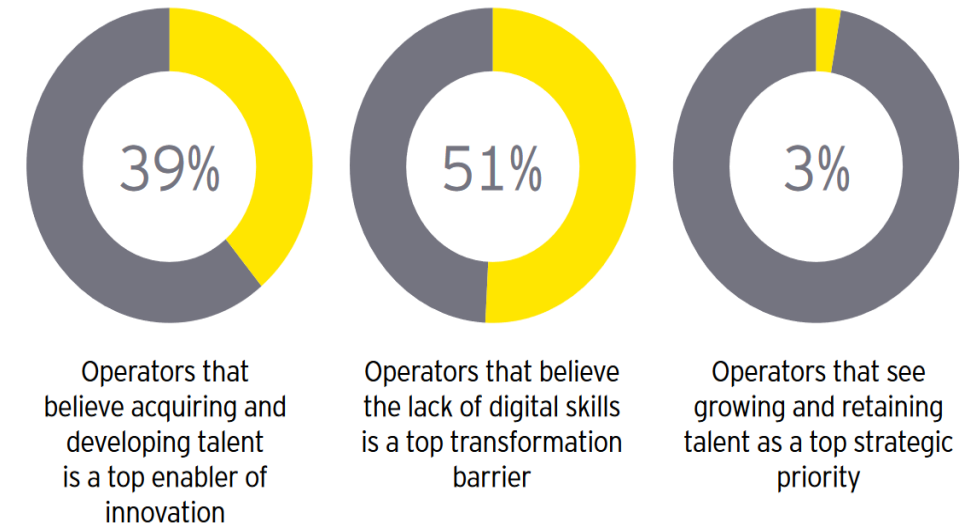
## Telco leading strategic priorities

% of respondents



## Telco attitudes to digital skills and talent

% of respondents



Source: EY, 2019 The top 10 risks in telecoms

# Example i. Wider organisational risk and transition at a construction company

## Previous model

Turnkey projects, commoditised (e.g. supermarket construction)

Low margin

Traditional skill base

### Pressures:

Clients increasingly wanting digitised solutions

Low margins highly susceptible to downturns

Lack of differentiation with competitors

## Transition

### Data

“Our industry has an abundance of data for us, effectively to local level, but we are highly ineffective at an organisation and industry scale to do anything worthwhile with that data.”

### Employee mindset

“A proportion of engineers just discard it right out, even though it’s a fantastic system for consulting challenges. It’s just a mental block, almost, They have to dismantle something, they have to understand it completely, before they’re willing to use it.”

## Strategy

- Move from an asset-based model to a service-based model - from delivering turnkey projects to long-term digital and consulting service platform
- Becoming a digital company
- Reducing from 2000 clients to 40

## Risks

- CNI
- Business model risk
- Design risk
- Technical model risk
- Insurance risk

# Example ii: Model risk - the “industrialised” process of review at a large financial services firm

## 2. Model-validation factory: Project-management office (PMO)

**PMO team develops and manages**

- Validation calendar
- Resource allocation
- Model submission standards
- Technology (work-flow system)

**Factory is supported by tools**

- Validation playbook
- Testing routines and code
- Documentation and reporting templates
- Benchmarks and other industry data

## 3. Onshore validation factory



## 4. Offshore validation factory

**Data validation**  
Data-source review and data-quality testing

**Testing and execution**  
Model replication, standard testing, and sensitivity analysis

**Initial documentation**  
Documentation testing and discussion of results

**Monitoring and reporting**  
Including review of monitoring plan, and monitoring and reporting performance

**1. Model prioritization**



## Dimensions

## Description

### Three lines of defence

- **Effective implementation of the three lines involves the sharp definition of lines one and two at all levels, from the group level through the lines of business, to the regional and legal entity levels. Accountabilities regarding risk and control management must be clear**

### Reviewing risk appetite & risk profile

- **Good governance means that risk decisions are considered within the existing divisional, regional, and senior-management governance structure of a company, supported by risk, compliance, and audit committees**

### Integrated risk & compliance governance

- **The integrated risk and compliance organisation provides for single ownership of the group-wide ERM framework and standards, appropriate clustering of second-line functions, a clear matrix between divisions and control functions, and centralised or local control as needed.**

### External regulators

- **Regular, frequent interactions with regulators. Adherence to standards on explainability and transparency. Regular “deep dives” from regulators augment the publication of codes of practice on AI use.**



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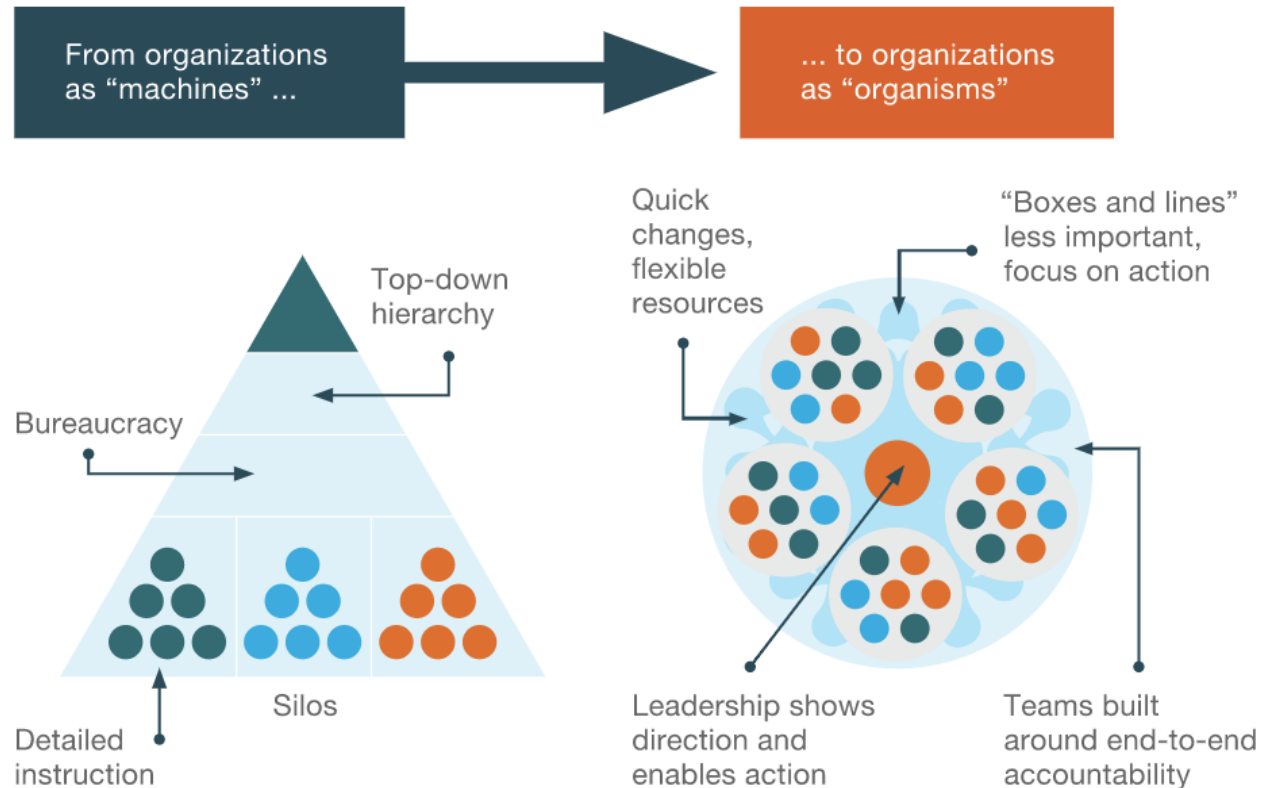
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## Where is BT on these dimensions?

- Quick changes / flexible resources
- Hierarchy less important - focus on action
- Teams built around end-to-end accountability
- Leadership enables action

# For HR what are some of the emerging issues?

1. Redefining individuals' roles and responsibilities to align with the transformation's objectives
2. Engaging the specific roles of integrators and technology-innovation managers, who bridge potential gaps between the traditional and digital parts of the business.
3. Reassuring employees about the about the overall narrative of the change and continuity in the identity of BT



# Thank You