Academic Insights

Securing the Digital Frontier

Seizing Opportunities and Managing Risks in a Volatile World

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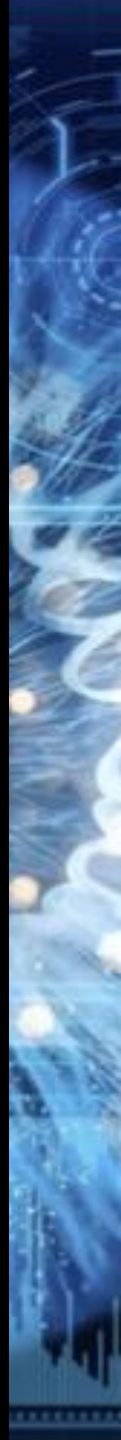
University of Manchester / Alliance Manchester Business School
Digital Knowledge Institute

ISACA RiskEvent'25
Bussem – The Netherlands
12 November 2025



Agenda

1. Innovation & Opportunities
2. Going Concern versus Disruption
3. Geopolitical Risks & Digital Sovereignty
4. Resilience through Cooperation

5. Corporate Governance

1. Innovation & Opportunities

- Innovation is all about portfolio management
  - Business driven, not technology drive
  - Technology push
  - Focus on corporate development and able change

- Data sharing
- Multi Party Computation

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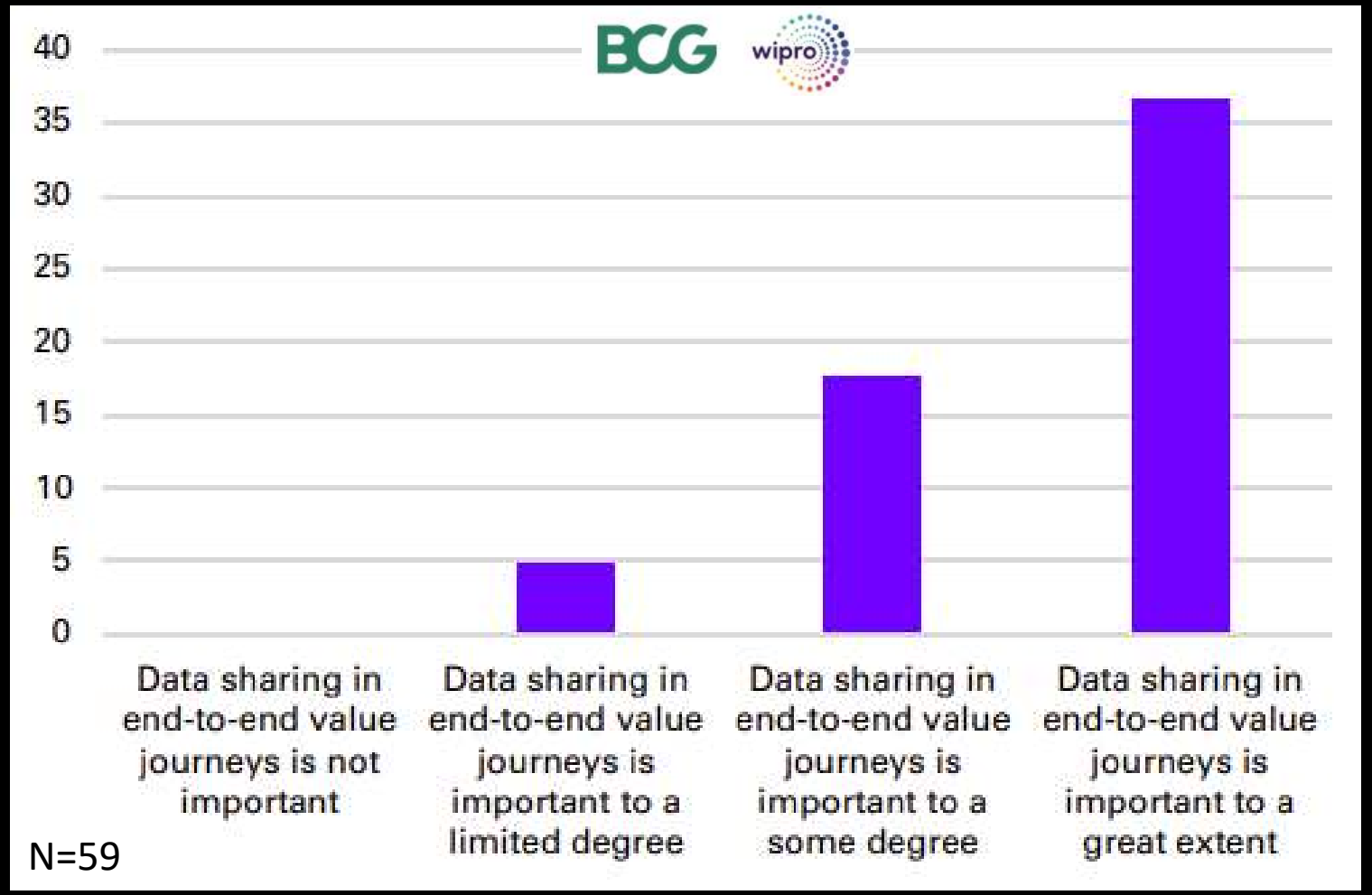
Data sharing

- Data volumes are exponentially increasing for decades
- Data sharing in value chains and ecosystems is rapidly growing – facilitated by predominantly seamless electronic data transfer (M2M)

- Data sharing is important in value creation



Beulen, E. (2025, March). Sharing Data in Ecosystems. In *International Workshop on Digital Sourcing, Platforms and Ecosystems* (pp. 99-125). Cham: Springer Nature Switzerland

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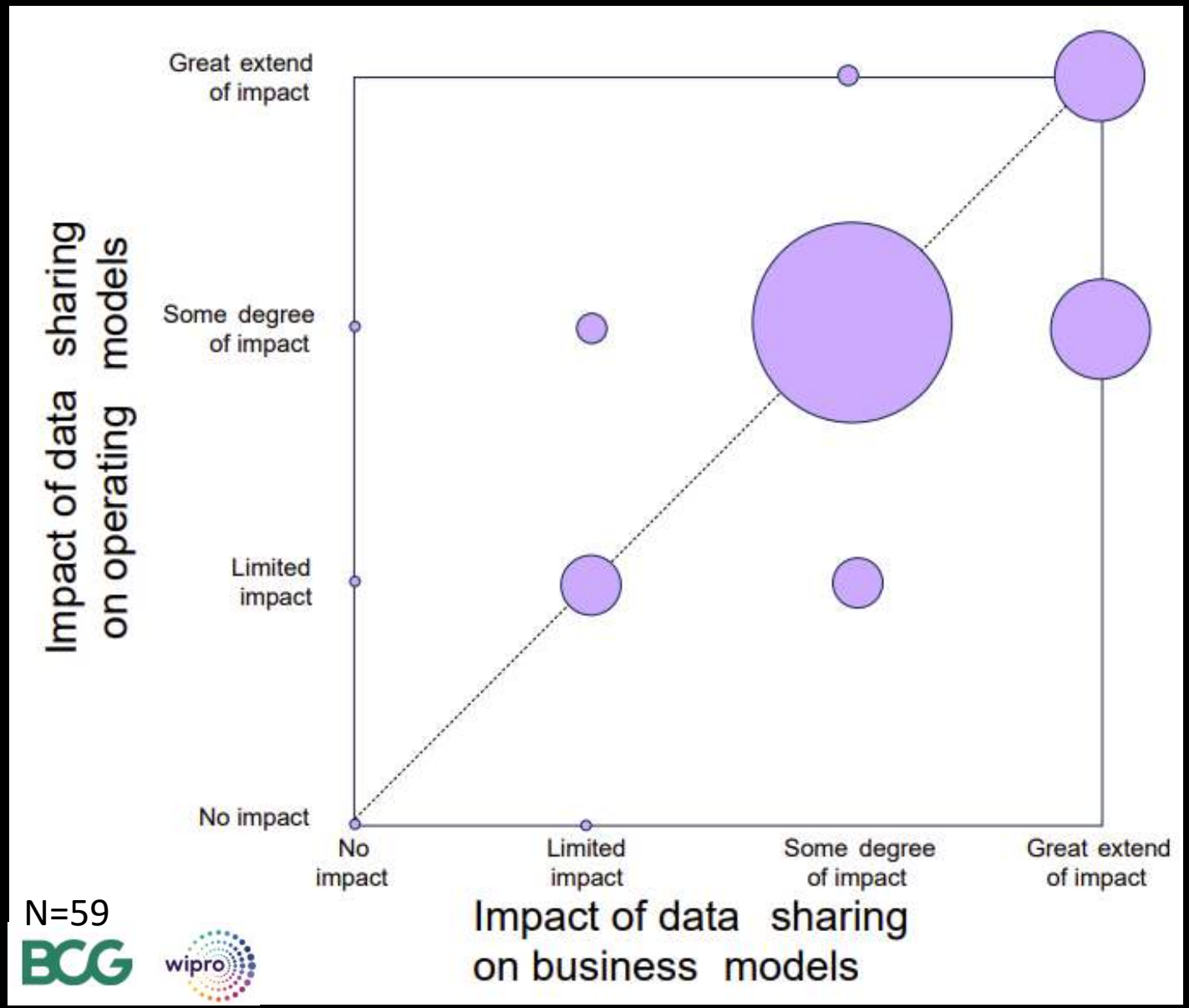
Data sharing

- Data sharing is impacting both the operating model and the business model
- 75% of the surveyed organisations the impact of data sharing is ‘some degree of impact’ or beyond
- Impact is not strongly related to size, sector or geography



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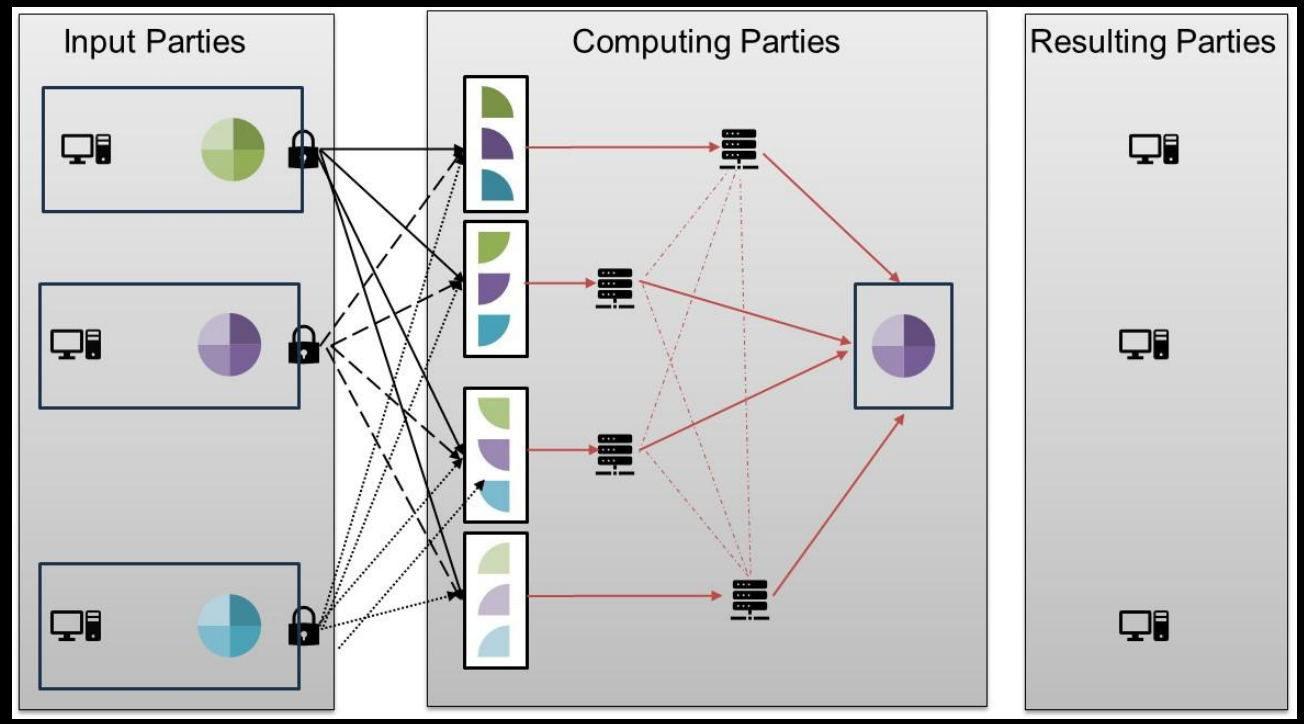
Multi Party Computation



- Parties have a problem to solve but are not willing to share sensitive information

- MPC can be of help by three concepts
  1. Secret sharing: each party private input is split into multiple “shares” using cryptographic techniques
  2. Distributed computation by an independent platform: the computation is performed on these shares across multiple nods
  3. Result reconstruction: the final result (the answer to the problem to be solved) is reconstructed from the calculated output shares on the different notes

The above avoid the need of a trusted party -> the MPC platform is the trusted party

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Multi Party Computation

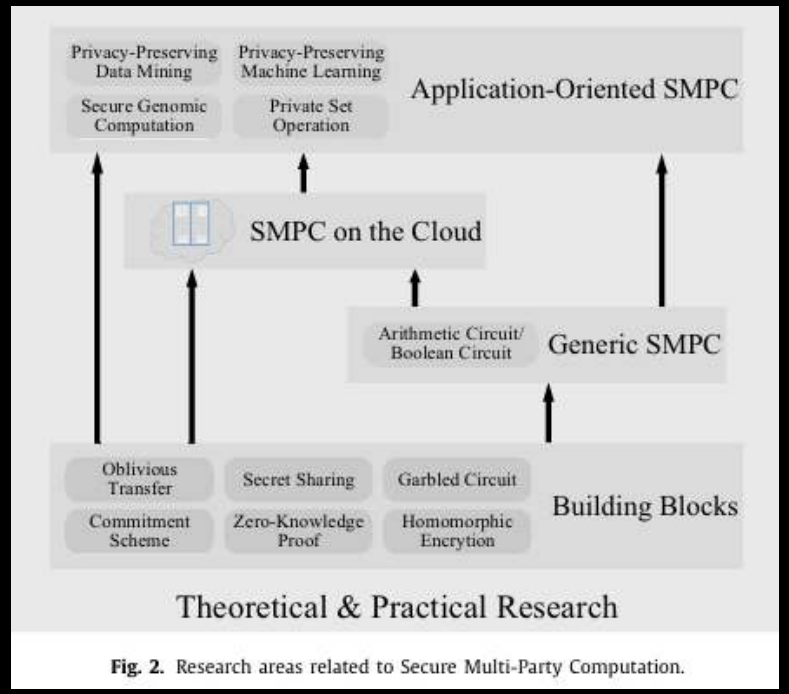


Fig. 2. Research areas related to Secure Multi-Party Computation.

Zhao, C., Zhao, S., Zhao, M., Chen, Z., Gao, C. Z., Li, H., & Tan, Y. A. (2019). Secure multi-party computation: theory, practice and applications. *Information Sciences*, *476*, 357-372.

Use cases MPC

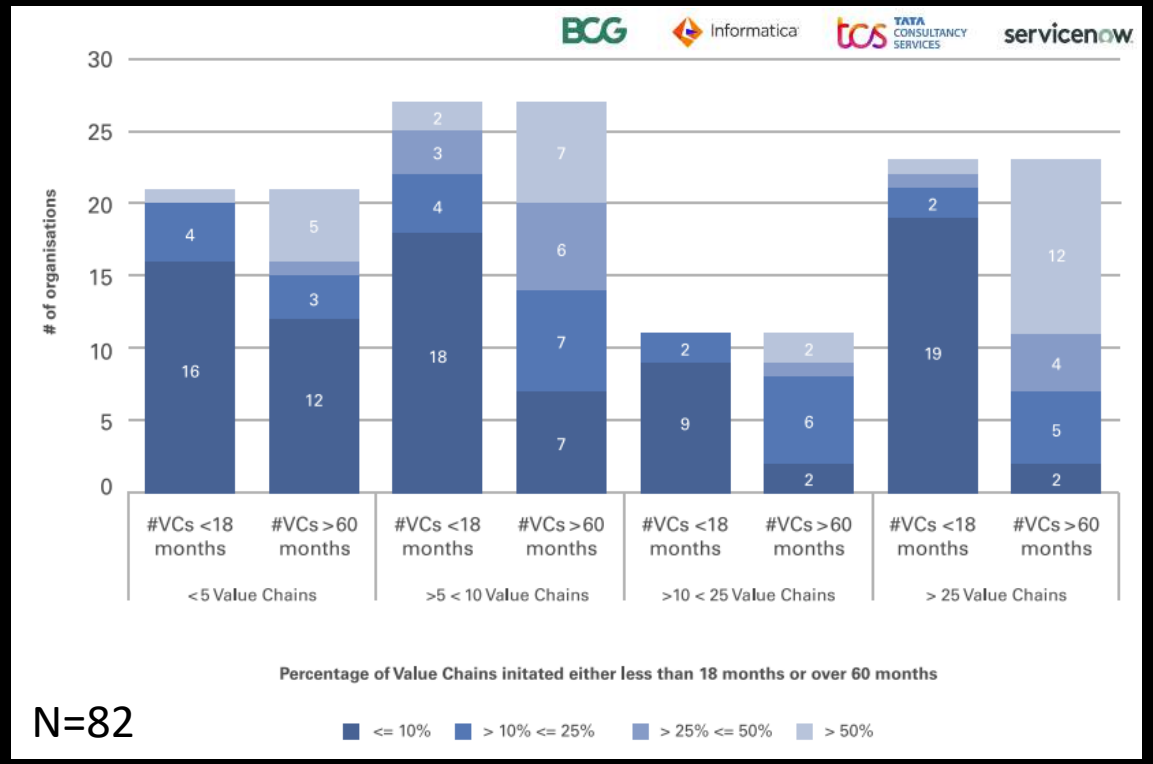
- **Oblivious Transfer (OT)**: sealed-bid auction
- **Commitment Scheme**: fair multi-party voting or bidding
- **Secret Sharing**: collaborative data analytics, such as multiple hospitals can jointly compute disease statistics (like averages or correlations) by splitting patient data into shares across servers
- **Zero-Knowledge Proof (ZKP)**: identity verification without data exposure, users can prove they are over 18 or possess a valid credential without revealing their birth date or other personal data
- **Garbled Circuit**: privacy-preserving decision-making, two companies can compare sensitive financial metrics (e.g., credit risk, pricing) to decide on a partnership without revealing their private figures
- **Homomorphic Encryption**: encrypted data processing in the cloud, banks can send encrypted transaction data to a cloud service that computes risk scores directly on ciphertexts, producing encrypted results. This enables privacy-preserving outsourcing

2. Going Concern versus Disruption

- (Cyber resilience – security by design and focus on recovery)

- How does good look like – portfolio perspective
  - 80/15/5 — 80% going concern / 15% updates - minimal new functionality / 5% innovations – new functionality
  - 100/20/1 — select 100 innovation projects / 20 successful innovation projects / 1 successful SCALED innovation project

Going Concern versus Disruption



N=82

2022 : https://itexecutive.nl/data-governance/hpdo-paper-value-creation-by-improved-ecosystem-partnering/

Reconsider your partnering strategy

- Assess your current revenue stream
- Increase innovation and avoid being disrupted by actively manage value chain participation

- Increase your disruptor profile by focusing on:
  1. high revenue generating established partnerships (>60 months and >=25% revenue)
  2. Initiating new partnerships

3. Geopolitical Risks & Digital Sovereignty

- **Europe has missed the boat (and will struggle to catch up….)**
  - **GAIA-X failure (2019)**
  - **ASML investment Mistral AI – only 1.3b Euro (compared Google 49.3b USD – predominantly AI in FY24)**

- **Global hyperscalers and cloud providers are stuck in the middle**

CISODAY 2025 (left-to-right) Joris Schoonis (Microsoft - CEO NL), **Charlie Bell (Microsoft - EVP Security)** and Erik Beulen (interviewer)

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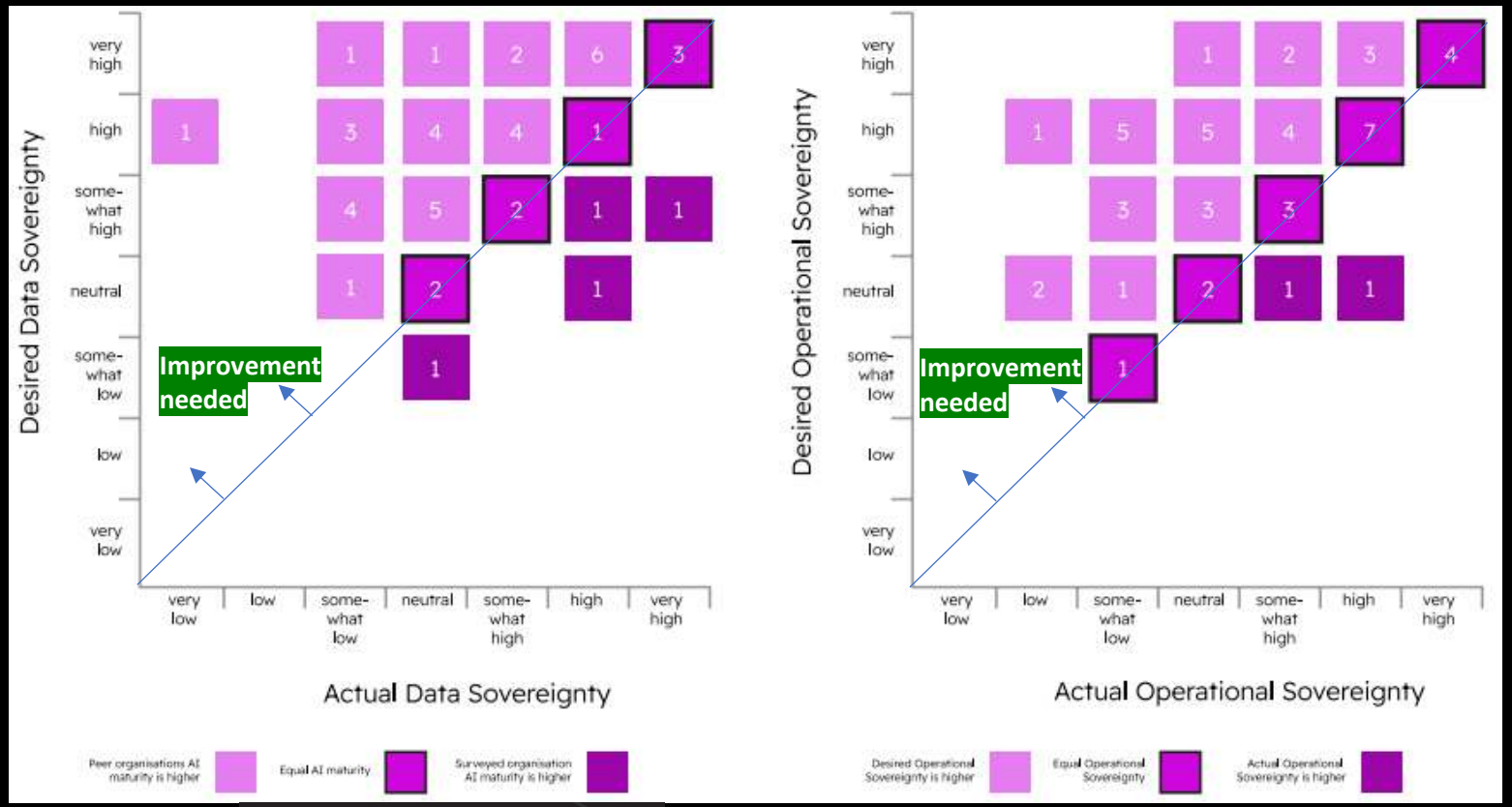
Data sovereignty : ensuring that data used for training, interference and storage, is compliant with laws, regulations, and governance of the relevant jurisdictions

Operational sovereignty : retaining full control over how and where your data, systems, and digital operations are managed, protected, and accessed without being dependent on or exposed to foreign jurisdictions or external entities

Geopolitical Risks & Digital Sovereignty

N=49 (2025)



- **Most organisations are not as sovereign as they would like to be**
- **The operational sovereignty is higher than the data sovereignty**
- **Most of the organisations with a high and very high desired data & operational sovereignty are large and international organisations**

HPE | NVIDIA

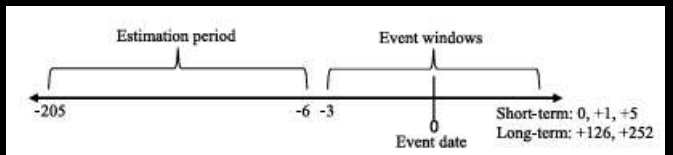


Fig. 2. Estimation period, event date, and event windows in days.

4. Resilience through Cooperation

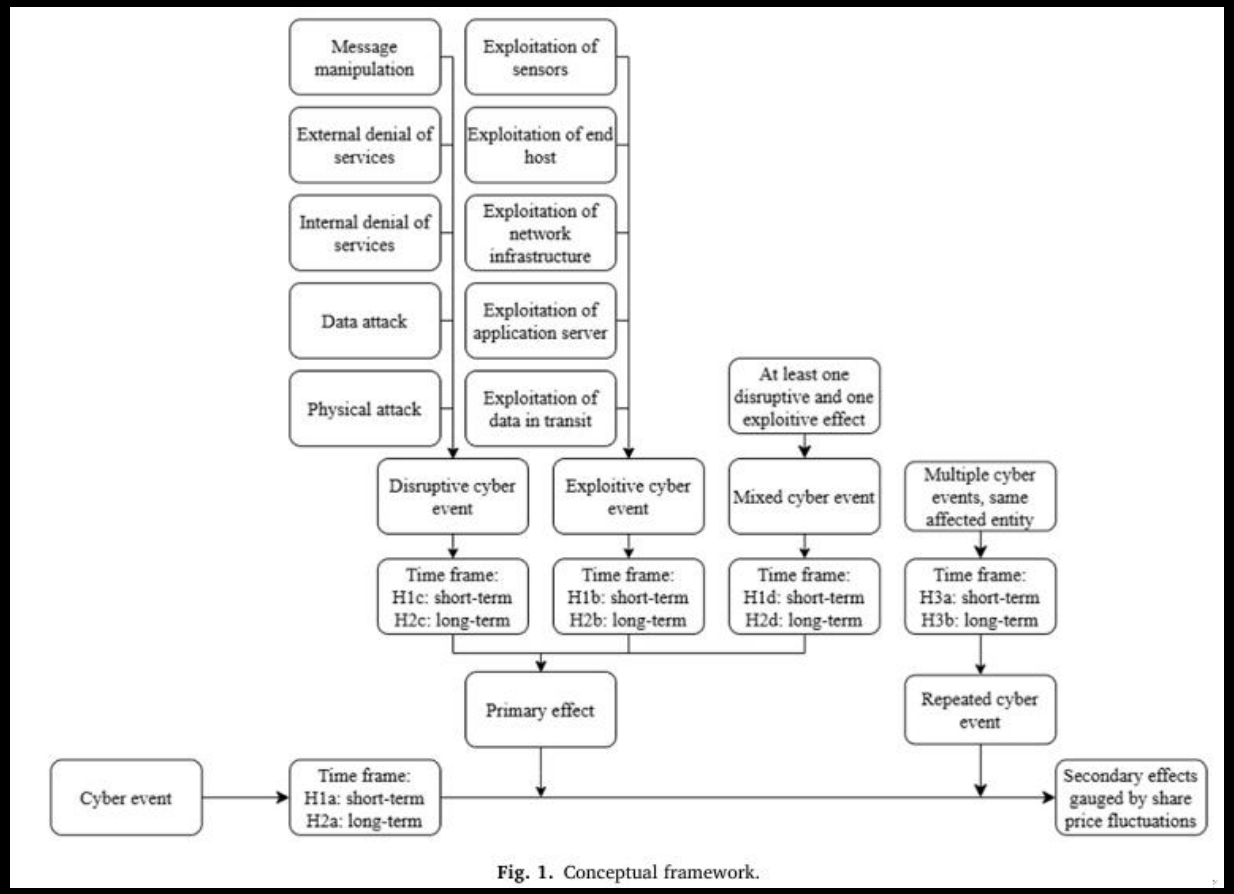


Fig. 1. Conceptual framework.

Market value is negatively impacted by a hack

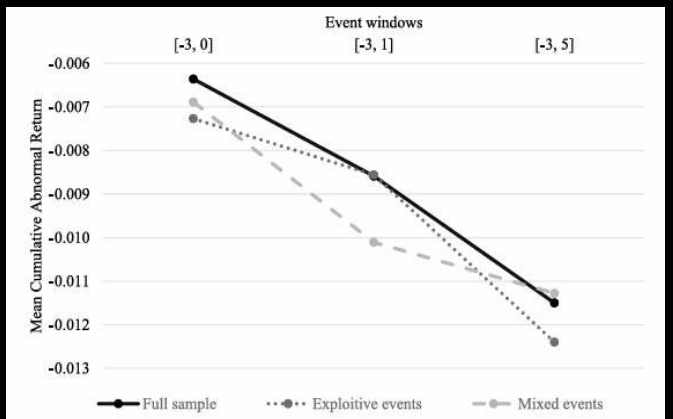


Fig. 3. Short-term cumulative abnormal returns.

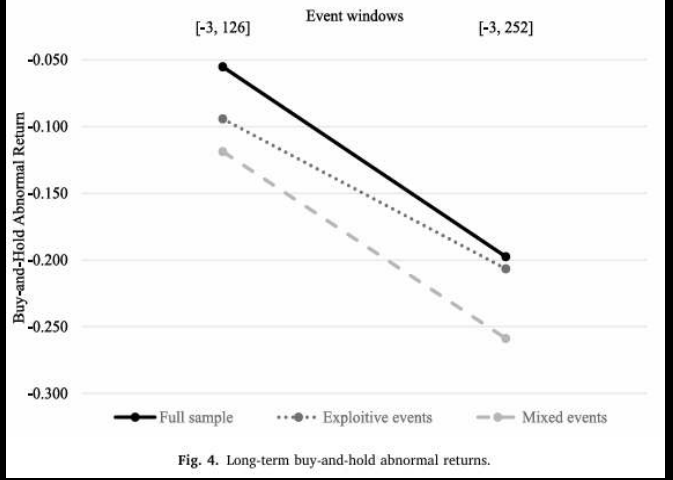


Fig. 4. Long-term buy-and-hold abnormal returns.

Huygen, L., & Beulen, E. (2025). Cyber shocks: The financial impact of cyber events. *Social Sciences & Humanities Open*, *12*, 101770.

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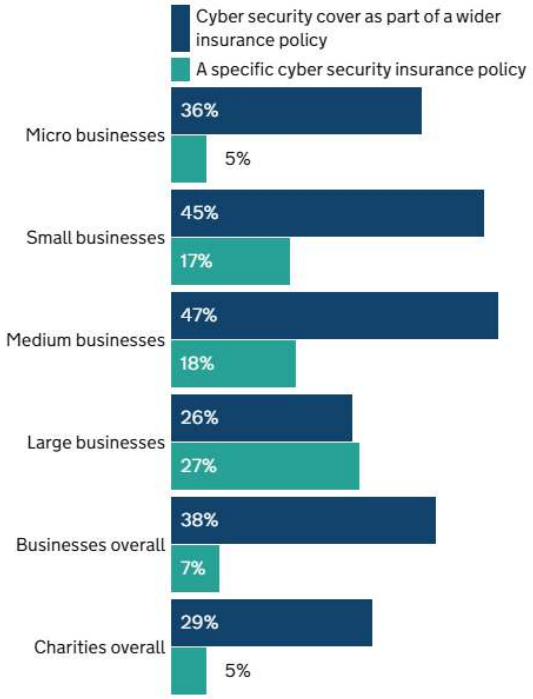
Resilience through Cooperation

Figure 3.6: Percentage of organisations that have the following types of insurance against cyber security risks

Change to table and accessible view

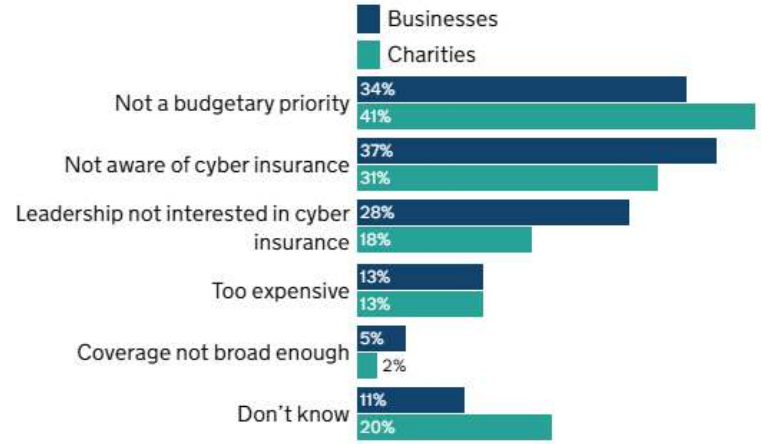


Bases: Split-sample half A: 491 micro businesses; 269 small businesses; 189 medium businesses; 97 large businesses; 1,046 businesses overall; 558 charities overall

Many organisations don't have a cyber security insurance policy

Figure 3.7: Reasons why organisations are not covered by a cyber insurance policy

Change to table and accessible view



Bases: Those that don't have a cyber insurance policy: 273 businesses; 213 charities

https://www.gov.uk/government/statistics/cyber-security-breaches-survey-2025/cyber-security-breaches-survey-2025#chapter-6-cyber-crime

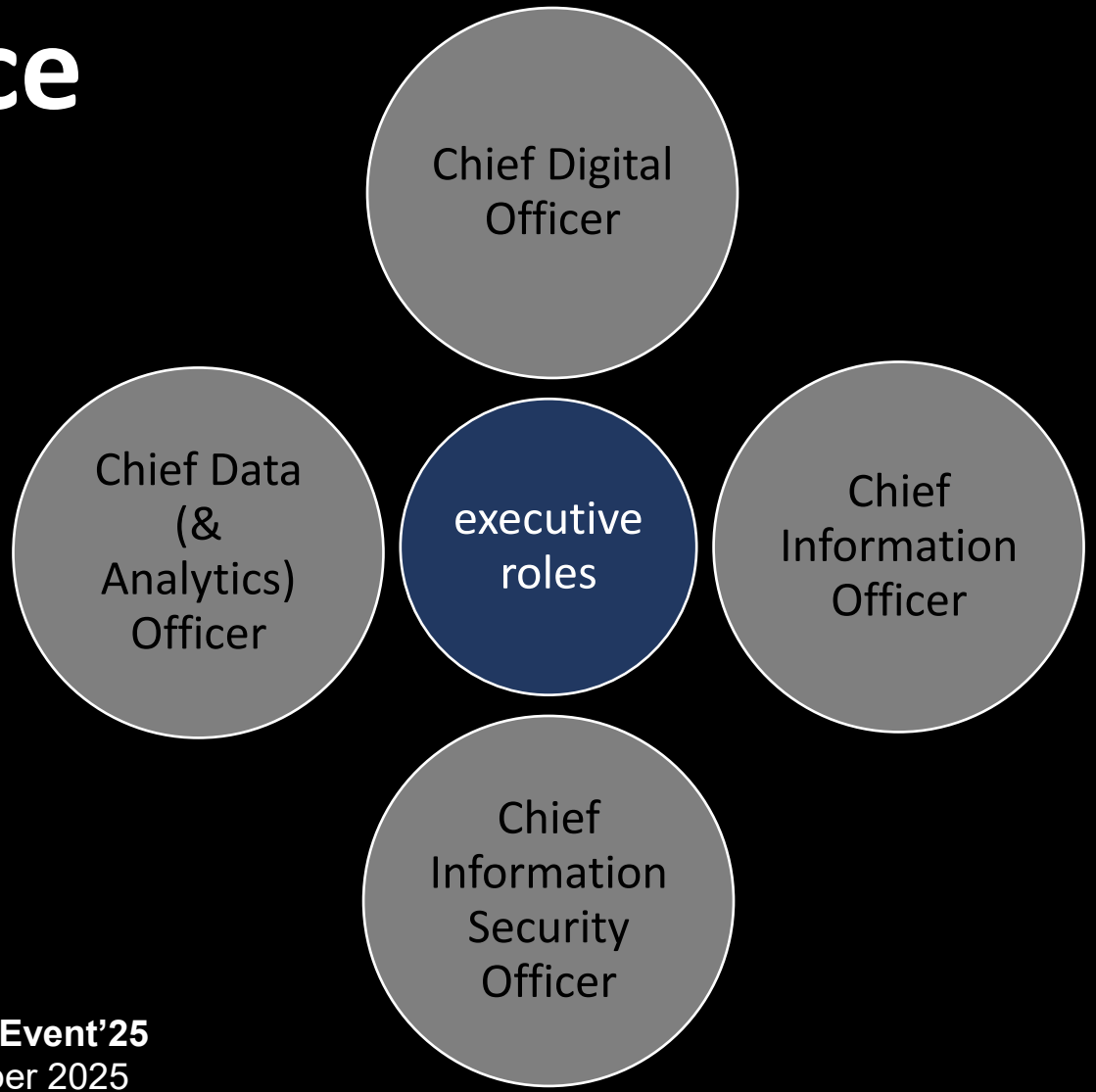
Beulen, E., & Bode, R. (2021). An information technology and innovation committee to guide digital transformations. *Corporate Board: Role, Duties and Composition*, *17*(2), 38-53

5. Corporate Governance

- **Digital Transformations and cyber security risks are typically addressed in the Audit Committee**

- **Challenges in Corporate Governance**
  1. **Limited focus & time available** to address digital transformations and cyber security risks
  2. Focus on **risks** instead of on risks & opportunities
  3. Digital transformations and cyber security **experience & knowledge** of executives and non-executives is typically limited but improving

- **Executive roles in digital transformations and cyber security in addition to business executives**
  - Note : profile of non-executives is typically a broader profile



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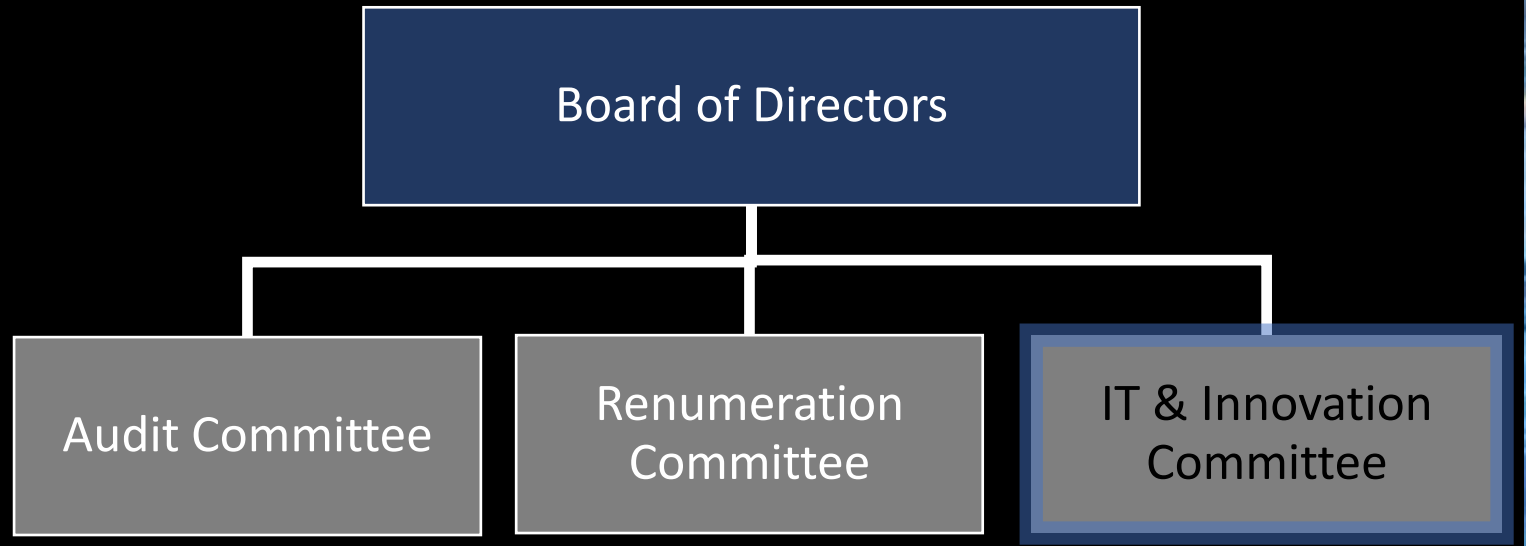
Corporate Governance

- **Information Technology & Innovation Committee - an additional subcommittee – typically four meetings per annum**

ASML P&G Santander Walmart

- **Risk register remains the responsibility of the audit committee**
- **Limitation** – size of the Board of Directors – not sufficient non-executives
- **Alternative** – deep dives with the full Board of Directors



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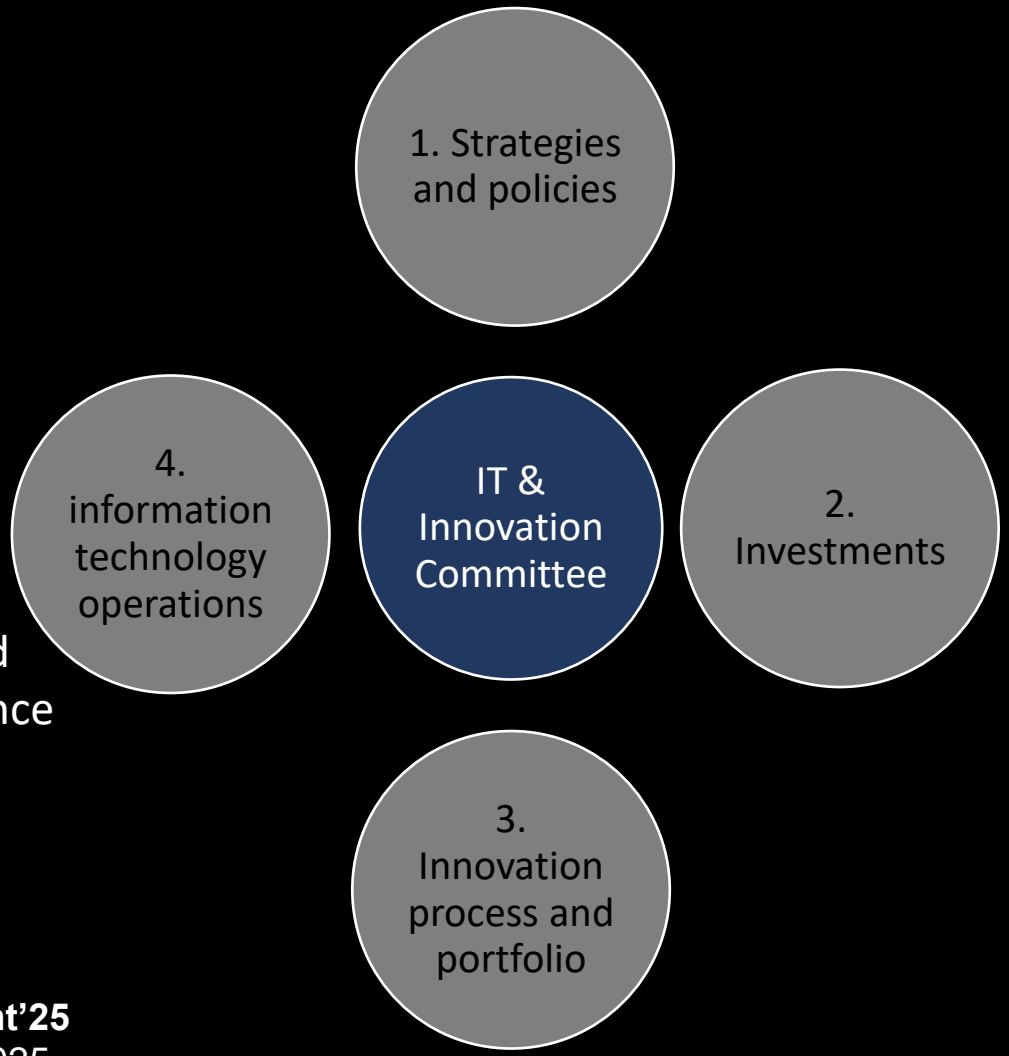
Corporate Governance

IT & Innovation Committee

1. **Strategies and policies** regarding information technology, digital transformations, technology innovations, and adoption of new business models supporting the strategic business intent.
2. Major information technology and technology innovation **investments** (including acquisitions and significant system development and software maintenance projects).
3. Evaluate the information technology and technology **innovation process and portfolio** including the projected budget, forecasted expenditures, risk profile and review of their financial performance and post-project implementation results.
4. Evaluate **information technology operations** including cyber security, compliance and business continuity, the projected budget, forecasted expenditures and risk profile.



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Thank you!