Technology in Corporate Governance

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An overview

- Corporate Governance, Stakeholders, and CSR Responsibility
- Gatekeepers & Corporate Scandals
- Technology
Key words

• Determinants of Corporate Governance
• Disruptive Technologies
• Economic and Social Evolutions
• Roles and structures within Corporations
• Directors’ Accountability
• Corporate Democracy
• RegTech
Roadmap

• The importance of the context
  • Narratives underlying disruptive technologies
  • Economic transformations

• What are disruptive technologies
  • Artificial Intelligence & Machine Learning
  • Big Data
  • Distributed Ledger Technology (DLT) & Blockchain

• Disruptive Technologies’ Impact on Corporate Governance
  • Board of Directors & Gatekeepers
  • Corporate Structure, Voting & Corporate Democracy
  • RegTech
The drivers of Corporate Governance

Technology

Politics

Finance

Economics

Sustainability

Law
Narratives of Disruptive Technologies

Shadow banking → Financial Crisis → Regulatory reaction

Tech. reaction
Subprime Mortgage Crisis of 2007-2009

Subprime Mortgages

MBSs, CDOs, Securitizations

Institutional Inv. (MMFs, Pension funds...)

Investors
Narratives of Disruptive Technologies

Shadow banking → Financial Crisis

Regulatory reaction → Tech. reaction

ICO → Multiplication of Cryptocurrencies

ICO → Corporate Governance

ICO → Artificial Intelligence

ICO → Big Data

ICO → DLT Blockchain

Stablecoins → CBDCs
Multidimensionality in Technology
Disruptive Technologies

• Disruptive Technologies vs Sustaining technologies
  • Sustaining Technologies:
    • Contribute to improve product performances
  • Disruptive Technologies:
    • Produce significant changes

  Market Actors can cope with them
  a threat for established actors
  New entrants outperform established actors

• Disruptive Technologies as Regulatory Disruptive
  • A Critical challenge for existing regulatory frameworks and legal categories
    • Internet
    • Financial Innovations 1990s-2008
    • Artificial Intelligence (AI) and Machine Learning, Blockchain, Big-Data
How to deal with Regulatory Disruption

• New rules vs. Existing rules

• Self-regulation vs Public regulation

• Wait and see

• Regulatory Sandboxes and Innovation Hubs
The context of Disruptive Technologies: New Economic Paradigms

• Emergence economics
  • individual agents act through interconnected networks.
  • By operating in significant networks, individuals are engaged in the evolutionary market processes of differentiating, selecting, and amplifying certain business plans and technologies, which in turn generate a host of emergent economic phenomena.

• Network economics
  • bottom-up path of development: free and unpredictable, as a result of the numerous interactions between people in a highly connected marketplace.
  • Innovation as a central mechanisms for generating value.
  • Traditional economic paradigms rely on static and linear forms of growth moving towards equilibrium. Instead network growth economies are self-reinforcing with the potential to multiply their effects in unexpected ways.
Sharing Economy and Platform Economy

• Sharing Economy
  • Anything that is not being used can be rented out.
Decentralized (disintermediated) Economy
Disruptive Technologies

- Big Data
- Artificial Intelligence & Machine Learning
- Distributed Ledger Technology (DLT) - Blockchain
Big Data

• 3Vs: volume, velocity and variety (Doug Laney).

• Big data originates from different channels
  • business transactions
  • smart devices
  • social media

Growth of channels
Growth of data flow
Real time management

Extreme Heterogeneity
Artificial Intelligence
Artificial Intelligence (AI)

- AI and machine learning (a branch of artificial intelligence) are functional to the analysis of complex, fast and heterogeneous big data sets via complex mathematical algorithms and calculations.

- Machines learn from experience, adjust to new inputs and perform human-like tasks.

- AI examples
  - chess-playing computers
  - self-driving cars
  - Rely on deep learning and natural language processing.
  - Computers can be trained to accomplish specific tasks by processing large amounts of data and recognizing patterns in the data.

- AI:
  - 1956: term coined
  - 1970s: Defence Advanced Research Projects Agency (DARPA) street mapping project
  - More recent examples: SIRI, Alexa, Cortana
The Evolution of Artificial Intelligence

1950s–1970s
Neural Networks

1980s–2010s
Machine Learning

Present Day
Deep Learning
Blockchain

- **Blockchain:**
  - A distributed database capable of holding a secure and immutable record of past transactions that is quickly adaptable to a broad range of activities and objectives.
  - Structure: a series of blocks securely chained together (each block contains transactions).

- **Consensus (or why blockchain is decentralized):**
  - “distributed consensus” replaces the trusted central validation system.
  - Rules and procedures regulating the process by which the majority or the totality, of the networks validators reach an agreement on the state of a ledger, to maintain “coherent set of facts between multiple nodes”

- **Digital Signature Technology:**
  - To verify the authenticity of transactions over the network and to further increase its security.
  - Derivation of public-key-cryptography, an asymmetric key cryptography (certify authenticity).

- **Smart Contracts:**
  - Pre-written logic computer programs that can be impartially executed by DLT itself, e.g. by DLT validating nodes.
  - A set of pre-defined (coded) terms and execution conditions that are agreed upon ex-ante by all relevant parties.
Initial Coin Offerings (ICOs)

- **A revolutionary tool for entrepreneurial finance:**
  - Facilitate and accelerate the critical phase of capital formation.
  - Involve the sale of a stake in a project to raise funds at an early stage of development.
  - Token (Security) & Cryptocurrency (Commodity)

- **ICOs vs IPOs**
  - Non-regulated platforms
  - Tokens sold in the form of an organization's cryptocurrency
  - Tokens do not generally confer ownership rights, but
    - A discount on cryptocurrency before it hits the exchanges
    - A right to vote on future decisions

- **ICOs vs crowdfunding**
  - They are not donations
  - A clear speculative purpose
ICO Sequence

**Structural pattern:**
- Pre-launch: announcement on cryptocurrency forums
  - Executive summary to present the project to investors
  - Whitepaper & Yellowpaper
  - Preliminary offer to selected investors
  - PR campaign targeting a broader segment of investors
- Launch of the ICO and collection of funds
  - Generally one round of fund raising that may have a variable duration
- Digital tokens listed on cryptocurrency exchanges for trading
  - Pre-ICO price: arbitrarily determined
  - Post-ICO price: market supply and demand

**Evolutions:**
- Security Token Offering (STO), Initial Exchange Offering (IEO)
What Disrupts What

• Artificial Intelligence & Blockchain
  • Board of Directors & Gatekeepers

• Blockchain Technology
  • Structure of the corporate form
  • Specific tasks:
    • Issuance of stocks and bonds in a different format
    • Voting system
      • Proxy Voting

• Big-Data:
  • Compliance: Anti-Money Laundering/Know Your Customer
Technology Disrupting Board of Directors

• Current Model:
  • Monitoring Board: The corporation is managed by its executive officers, and the board dominated by outside directors monitors management's performance.

• Tech Solution:
  • Shareholders empowered to monitoring managers themselves
What Could Change in the Board Functions

• Real-Time Accounting & Full Transparency:
  • Shareholders could access the company’s entire ledger of transactions.
  • “[a]nyone could aggregate the firm’s transactions into the form of an income statement and balance sheet at any time, and investors would no longer need to rely on quarterly financial statements prepared by the firm and its auditors.”

• More Direct Shareholder influence
  • Transparency of ownership
    DLT-induced transparency could replace mandatory disclosure of beneficial ownership and prevent empty voting
  • Greater transparency reduces profit opportunities for active traders, shareholders and raiders: the board will no longer need to mediate between different constituencies
  • Increased Speed and accuracy of shareholder voting
Algo-Boards

• 2 assumptions:
  • Board functions increasingly challenging for humans
    • Humans less fit to serve as board members than machines
    • Humans less willing to do so
  • Technology performs better than humans:
    • “AI algorithms may become better on average at making governance decisions than individuals due to their superior ability to process information, freedom from biases, and lack of side interests.”
Legal Problems

• Humans are agents with legal capacity, AI machines are agents without legal capacity, and corporations have legal capacity, but depend on human agents.

• 3 questions:
  • Can legal persons (i.e. Business corporations) serve as directors?
  • Can agents without legal capacity serve as directors?
  • Can AI machines serve as board directors?
Legal Questions

• Can Legal Persons serve as Board Directors?
• Could AI Machines serve as board directors?

• Delaware Law:
  • “The board of directors of a corporation shall consist of 1 or more members, each of whom shall be a natural person”.

• Other jurisdictions:
  • Yes, however even in such jurisdictions the board is made up of natural persons.
Blockchain in Corporate Governance: The DAO

• The Distributed Autonomous Organization
  • An Entity Operating through smart contracts.
  • Financial Transactions and rules are encoded on a blockchain, removing the need for a central governing authority.
  • Therefore: Decentralized & Autonomous
One of the first ICOs of investment funds on Ethereum

Collected 11,5 mln ethers (now it is ~ $1 bln)

Smart contract wasn’t properly audited by Slock.it team (the creators), as a result, there was a critical money-draining bug.

The smart contract checked balance after sending coins, this lead to the DAO failure.

A lot of Ethereum tokens were under the control of hackers, which could be a problem for the community

In order to save investors and punish hackers, Ethereum foundation made a hardfork. Ethereum classic was created.
Blockchain in Corporate Governance: Solving Proxy Voting Issues

Recent Cases

- In re Appraisal of Dell. Inc.
- In re Dole Fodd Co.
- P&G Proxy Fight
  - Nelson Peltz
  - 2 billion votes
  - 0,00016 or 42000 votes
RegTech

• Corporations grew and became more global
• Operational and regulatory challenges

Growth of Legal and risk Management departments in the 1990s and 2000s

• The increasing role of Financial Technology
  • Financial Engineering and quantitative systems, IT Systems

• Nowadays:
  • Big Data Approaches
  • Strengthening of Cybersecurity