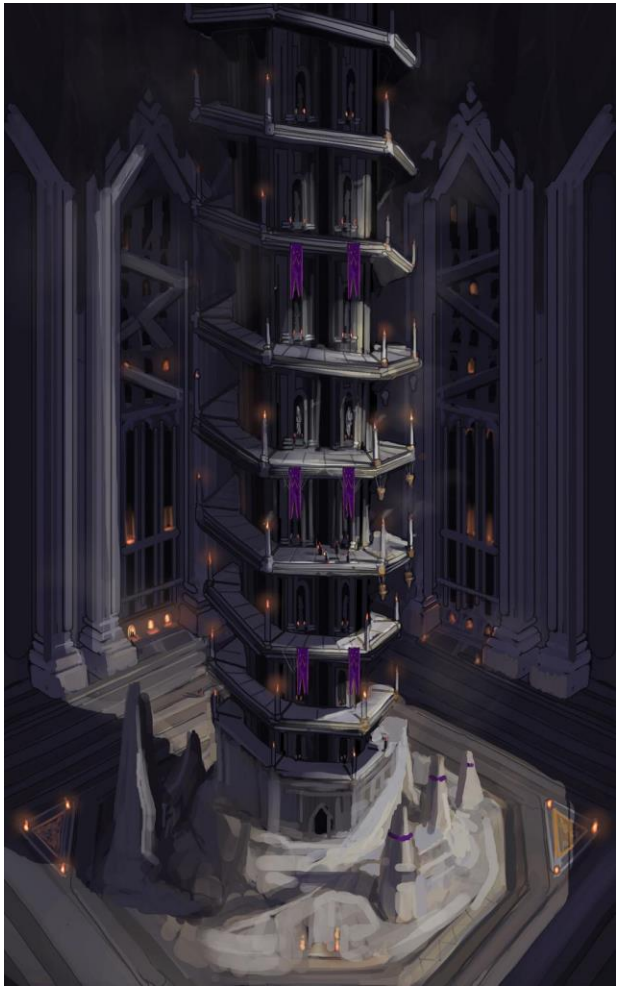
Blockchain: Energy transformed ?



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Gilles DELEUZE, EDF Lab Saclay

Project DURIN (Design & Use Reliable Blockchains)

28 June 2017 PALAISEAU

LEADING THE ENERGY CHANGE

CONTEXT

BLOCKCHAIN : A BUZZ

" The Blockchain is the most interesting thing as technology to come along maybe since the Internet first flowered. "

Reid HOFFMAN,
Co-founder and executive chairman of LinkedIn

" The blockchain is the biggest disrupting force in the financial sector; its success could potentially have far-reaching ramifications for banks, trading houses and others. "

Oliver BUSSMANN,
Chief Information Officer of UBS

" Bitcoin is a technological tour de force. "

Bill GATES,
Co-founder of Microsoft

" Force the first time in history, technology replaces institutions. "

Florian GRAILLOT
AXA Strategic Ventures,

" Personal computers in 1975, the Internet in 1993 and Bitcoin in 2014. "

Marc ANDREESSEN
Pionnier d'internet

LEADING THE ENERGY CHANGE


MINING: A RUSH FOR VIRTUAL GOLD
Knkminer

A DISRUPTIVE FINTECH

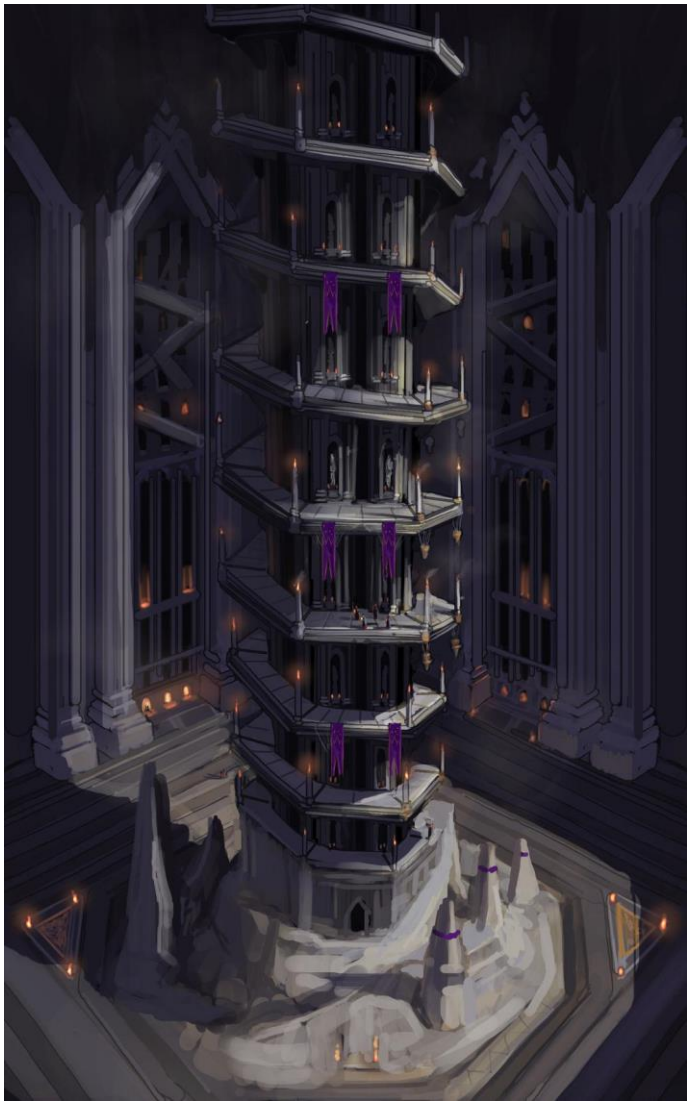
- Expected Benefits of BC:
  - Digitizing and displacing trusted third parties (not replacing them)
  - Reduced costs, simplicity
  - No vulnerable central node, Individual incentive to secure the network
  - **Condition: rules of governance and protocol adapted to the community of users**
- Unpredictable potential
  - First in financial domain, then other, e.g. energy.
  - Facilitating new transactive systms and marketplaces
- An immature technique, but adaptive with important resources for a fast evolution

STAKES FOR UTILITIES

- At Corporate level
  - Improve the productivity of technical, administrative, commercial and financial functions.

- For business branches
  - Experiencing and developing new services
  - Avoid intermediation by GAFA, NATU or other players

Design & Use Reliable blockchaINs (DURIN)



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Projet P11GC Design & Use Reliable Blockchains

Programme TI/NTIC

LEADING THE ENERGY CHANGE

THE CHALLENGES

Challenges

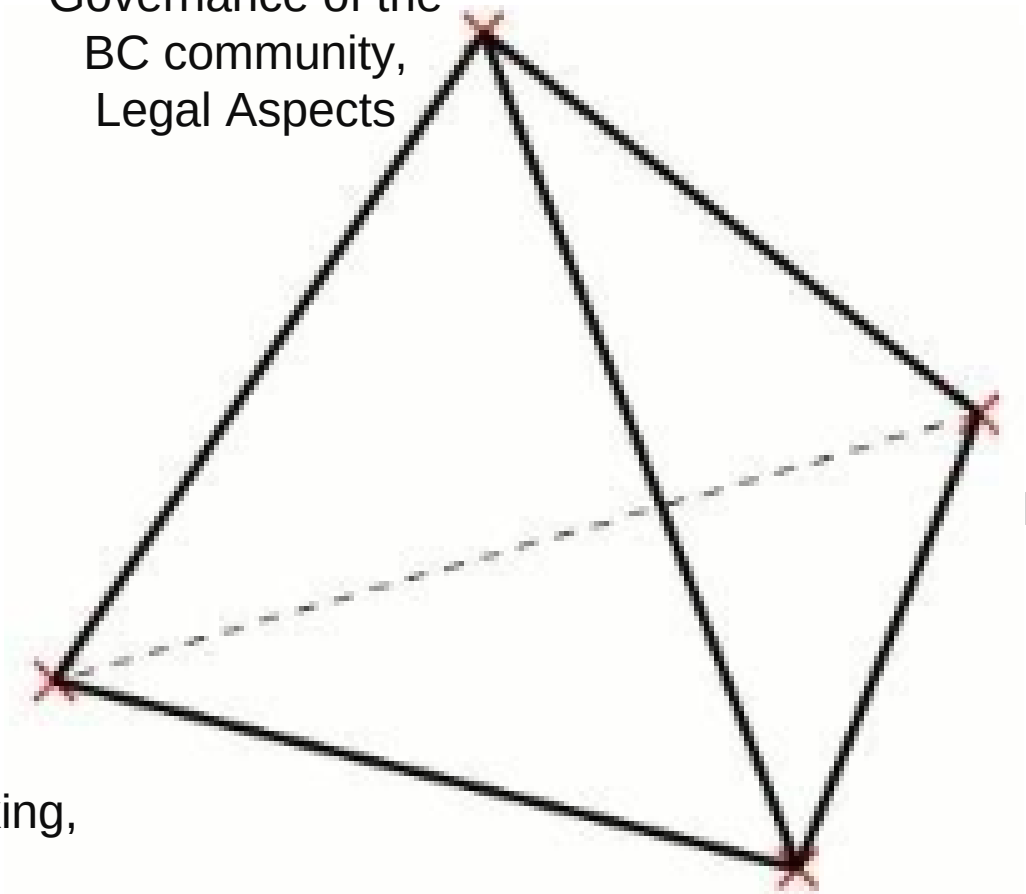
Blockchain technology in 2017 is mostly a serie of engineering challenges rather than a scientific issue

2017 – PoCs, EXPERIMENTATIONS IN EDF

- Digital Marketplaces (trading, crowdfunding..)
- Prosumers communities
- Reuse, Recycling
- Electrical Mobility
- Maintenance boooks
- Document certification
- …

FUNDAMENTAL ENGINEERING QUESTION ABOUT BLOCKCHAIN

Reliability (Trust)
Governance of the
BC community,
Legal Aspects



Performance
Latency Time,
File Size,
Mining CPU Cost

Incentive
Securing or hacking,
Pow or PoS

Security
Cryptographic difficulty,
Network size,
PoS vs PoW.

Technical Challenges

- **Consensus: Balance Security/Protocol Performance**
- **Software environment**
- **V&V of software and contracts specification**
- **System Simulation**

Non technical Challenges

- **Economic viability, New business models**
- **Survey of Legal and regulatory issues, standardization**
- **Incorporating BC technology into activities and organizations**
- **Societal aspects**