How Technology Impacts to Currency
From Bitcoin to Flexible Ecosystem

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About me

- Research Professor at Georgetown University
- Initiating Blockchain Technology and Ecosystem Design (B-TED) Research Center
- Director’s Liaison for Financial Cryptography at MIT Media Lab
- Co-Founder of Bsafe.network (Blockchain Research)
- ISO TC307 Committee member
- Program committee and editor: Scaling Bitcoin, IEEE, ACM conferences, Ledger Journal and more…
- Ph.D. from Tokyo Institute of Technology
Revisit what Satoshi proposed

An electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party.

In this paper, we propose a solution to the double-spending problem using a peer-to-peer distributed timestamp server to generate computational proof of the chronological order of transactions.
Gaps between Satoshi’s paper and real

- There is no exchange to Fiat Currency in the ecosystem
- Everything is closed inside Bitcoin ecosystem
- All participant has equal computational power
- Lack of consideration of Governance
Functions of currency, what Satoshi proposed and the reality

<table>
<thead>
<tr>
<th>What Satoshi Says</th>
<th>Reality of use</th>
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</thead>
<tbody>
<tr>
<td>Medium of Exchange</td>
<td></td>
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<tr>
<td>Measure of Value</td>
<td></td>
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<tr>
<td>Standard of deferred payment</td>
<td>✓</td>
</tr>
<tr>
<td>Store of Value</td>
<td>Mainly ✓</td>
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</tbody>
</table>
Governance and regulation issues

• Bitcoin = New economical nation
  • Mathematics of Bitcoin = (economical) Constitution of the nation
  • Current chaos of governance: Lack of procedure of amendment of constitution
  • Branching of Bitcoin: independence with new constitution
• How do we think the new economical nation?
  • Decentralized Virtual Currency (for greater innovation) vs. stable virtual currency
Source of technology related immaturity

Unproven technology
Security
Scalability
Trust model

Community Risk and Quality assurance
Need healthy community and ecosystem

Lack of evaluation criteria toward technological due-diligence
Standardization

Gap between
- What original Satoshi paper proposes and
- Expectation to Blockchain technology and its application
Technology Trade-offs in Blockchain technology

- Security
- Privacy
- Operational Cost
- Usability
- Performance/Scalability

Find Good Balance

How Decentralized?
Needs for multi-disciplinary research

The Security of Bitcoin/Cryptocurrency/Public Blockchain relies not only on technology but also on incentive design.

Some flaws in the current design of Bitcoin ecosystem are the cause of debates and chaos.
Possibility of another ATARI shock

- Video Game Crash of 1983
- Too many “Junk Games” discounted the value of game platform.
  - Lack of control of quality
- Nintendo started control of quality of each game.

- In the case of current many Virtual Currency and ICO projects?
- How can we control the quality in the era of decentralization?
What the exchange rate to fiat says: Similarity to Japanese telephone registration fee

• In Japan, users of telephone paid “registration fee” as a initial cost for facilities of telephone network.
  • 80K JPY in 1976
  • The registration was transferable: traded like “a right.”
  • Currently, the registration fee (as a right) is not needed: The market value of “the right” become almost zero.
  • The cost for each communication became near zero: source of tons of merits of internet ecosystem
• Similarity to the exchange rate of Bitcoin to fiat currency
  • Mining cost as an initial cost of initiating network
  • Bitcoin as a medium of exchange something: Do we need to pay expensive cost to obtain it?
Competition among Blockchain technologies/services

Common to Internet-like innovation

Fail Fast
Horizontal and Vertical

Difference to Internet-like innovation

Experiment using consumers money/asset
Lack of Due-diligence: Need to have good way to realize it
Ecosystem for innovation: competition among blockchain projects
BSafe.network: Plays the same role as NSFNet and BSD

- A **neutral, stable and sustainable** research test network for Blockchain technology by international universities.
- Founded by me and Pindar Wong in March 2016. Each university becomes a blockchain node.
- Research on Blockchain and its applications
  - Not limited to Security. All aspects will be researched.

• Neutral platform
• de-anchored trust of Blockchain network
• More nodes (with Neutrality)
• Testbed for academic research
24 International Universities Already Join and We Add More...

- MIT
- Boston Univ
- Georgetown Univ
- Univ. of Illinois
- St. Mary's Law
- Univ. of Tokyo
- Keio Univ.
- Toho Univ.
- Ritsumeikan Univ.
- SIM Univ.
- Newcastle Univ.
- Imperial College London
- Cambridge
- ETHZurich
- EPFL
- Univ. of Nicosia
- Indian Statistical Institute
- University of Cape Coast
- Telecom Sud Paris
- King Mongkut's University of Technology North Bangkok
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Thank you!