

Decentralized 6G Business Models

The 1st 6G WIRELESS SUMMIT
Levi, Finland
Tuesday 26th of March, 2019

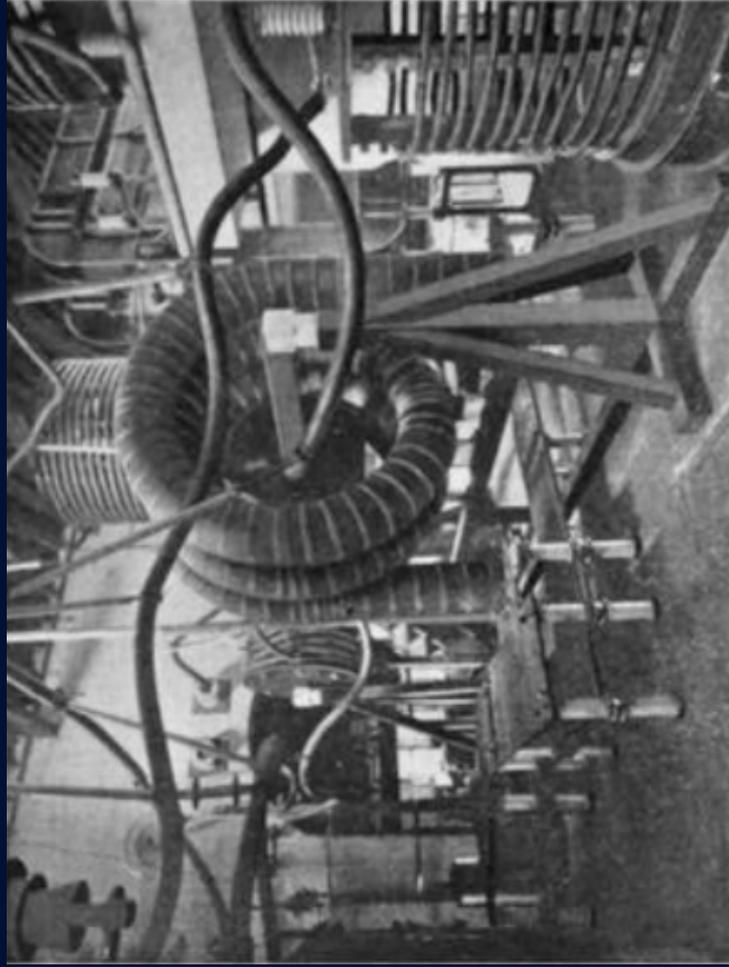
Dr. Seppo Yrjola, Nokia Enterprise

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Trends	4C	Resource configuration	Markets	Blockchain
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How could the evolution of future 6G business model unfold utilizing novel decentralized resource configuration?

100+ years of interference avoidance – from macro to micro operators



Wireless Station In Constant Operation Messages Cannot be Transmitted and Received at the Same Time, But Marconi Hopes to Overcome Difficulty by Additional Equipment

Special to The Morning Chronicle.
SYDNEY, N. S., Oct. 25.—The Marconi system of trans-Atlantic communication is now fairly well established, and with very few interruptions the station at Glace Bay has been in constant operation since its opening for commercial business on Thursday last. That Marconi himself is reasonably sure of the continued success of his improved system is best testified to by the fact of his leaving shortly for New York, thus leaving to his subordinates here the actual carrying on of the business.
The wireless wizard now claims that he has no intention whatever of competing with the cable companies for some time to come, until his trans-Atlantic stations, at all events, are better equipped to successfully handle the great amount of business they are constantly being deluged with. This will mean that until

such time as the Cape Cod and Poldhu plants are re-constructed with the unidirectional system and until the machinery of all stations is duplicated in every detail.
At present the most serious difficulty apparently being met with is the inability of the system to transmit and receive messages at the same time. This necessitates the moving of operators from one room to another at intervals of ten minutes and admits of some confusion arising in the operation of the two stations in communication. It is also somewhat of a bar-to-absolute-necessity for it, for any reason the receiving operator is unable to read the message being sent, it is impossible for him to acquaint the sender until his station is prepared to receive the message. The loss of time entailed because of this is manifest.

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Fleming's transmitter for Marconi's transatlantic transmission

The world's most valuable resource is no longer oil



4C typology classifies internet age business models

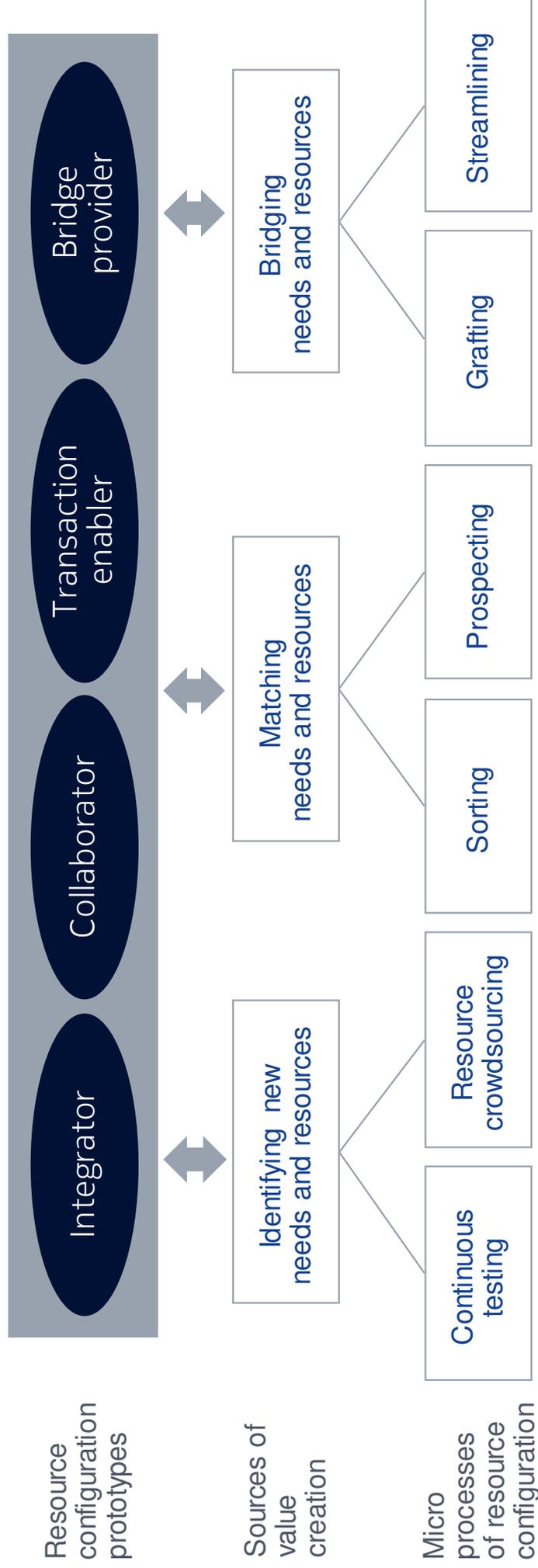
Commerce enables low transaction costs for buyers and sellers of goods and services

Context provides structure and navigation for users to increase transparency and reduce complexity

Content delivers consumer centered, personalized various types of content

Connection: network infrastructure and related services that enable exchange of information and users' participation

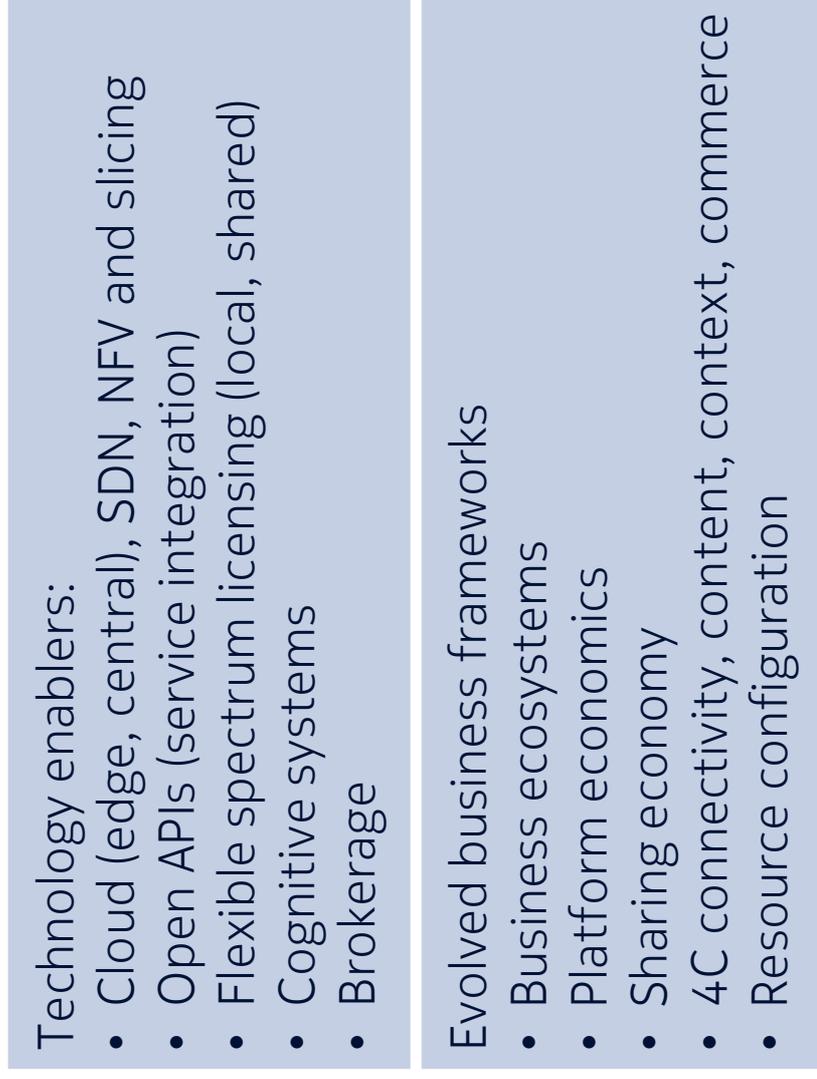
From pipelines towards platforms



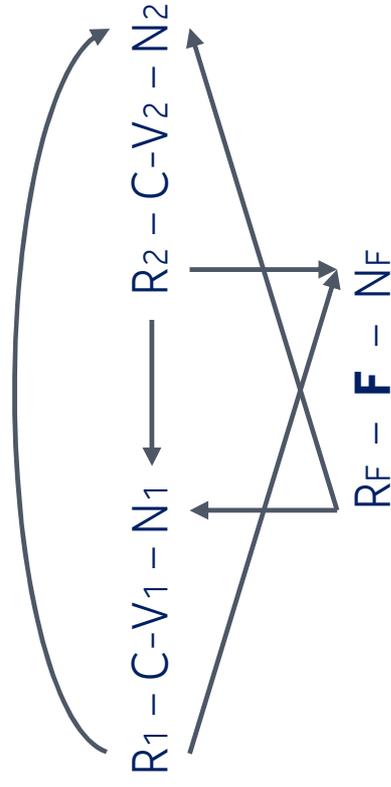
5G is evolving towards context and platform driven business models



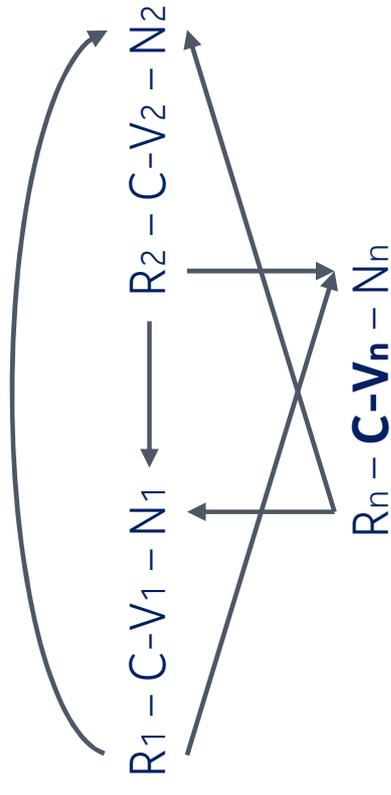
5G evolution enablers will lead to an overall shift towards markets



Conceptualization of the decentralized resource configuration prototypes without an orchestrator between the direct value co-creation and value co-capture



Centralized
transaction enabler platform



Decentralized
resource configuration prototypes

*F is focal firm, C-Vs are value co-creators, Rs resources and N needs.
The arrow denotes that certain resources are utilized to meet certain needs*

Blockchain assists the progression of value-creation microprocesses

With minimal value flowing out of the direct value co-creation

Promising characteristics

- Decentralized; eliminates need for trust
- Permanent, immutable and transparent records
- Low-latency transactions cost-effectively
- Secure information storage without a single point of failure
- Users in control of their own data



Uncertainties

- Costly and demanding process to migrate from current systems
- Uncertain regulatory and legal status in most countries
- Public acceptance requires addressing privacy and security concerns
- Public blockchain network consumes a significant amount of energy
- Partnerships and alliances are crucial
- Lack of concrete business models

First blockchain baby steps

?

Lightweight transactions:

- network sharing and (national) roaming
- (neutral) hosting
- network assets marketplace (Edge cloud resources, Network slices, Spectrum, vertical synergies)
- Data-as-a-Service (DaaS) marketplace
- Cloud, NFV and SDN transaction based networking and services

Provenance tracking:

- system tests, certification, and integrity checking (OPSEC)
- supply chain & asset tracking
- Identity-as-a-Service for IoT machines

Inter-organizational recordkeeping and integration:

- audit trail of critical inter-network element data exchange
- performance monitoring and fault detection
- official registry for government licensed assets, certified elements, and rules databases.

Conclusions

6G will only be as good as the business models it dovetails with

- Exploding number of cross-industry stakeholders in the ecosystem
- Evolution from centralized to distributed, and macro to local
- Evolution from pipelines & hierarchies towards platforms & markets
- Blockchain with ML is disruptive technology enabler important to scout

Research themes

- *Explore and understand how and why platform-based ecosystemic business models can emerge in the future wireless systems context?*
- *Research the dynamics of value creation, capture and sharing.*
- *Identify and categorize various emerging ecosystem roles, business model elements and their ecosystemic configurations?*