Impact of Coip on Operator Business

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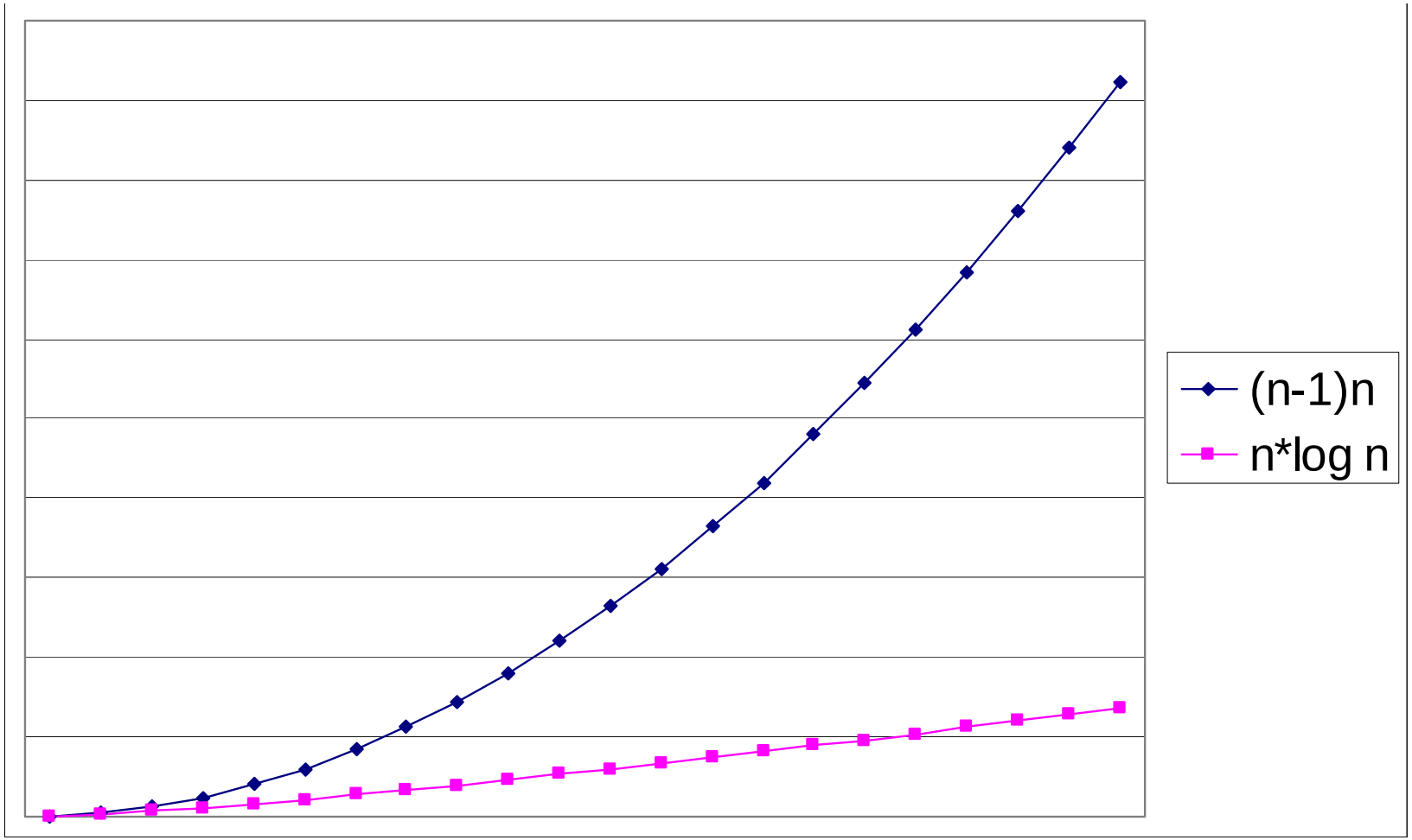
Agenda

- Metcalfe’s law revisited
- Network service as goods
- Ideal model of the environment
- Arguments for consolidation

Communications over IP

- All services: data, video and voice over IP = All IP = Triple-Play etc – at different times the same idea has been labeled with different acronyms.
- Dedicated networks for Video and voice are immersed into the Internet
- What comes Next?
  - All services Ethernet?

Network Value – Metcalfe's Law



Notes on Metcalfe's law

- Original version: n**2
  - value is proportional to the number of possible connections between users
  - Each connection is of equal value
  - Creates extremely high pressure for interconnection and consolidation
- Critic – recent e.g. IEEE Spectrum: n*log n
  - Value of a possible connection is power law distributed across connections
  - Pressure for interconnection and consolidation is still high but significantly less than in the original version

Value forming - service by service

- Few to Many service (Broadcasting, web): value is linear (Sarnoff's law)
- VOIP, e-mail: original or revised law applies
- Group forming services: Reed's Law: 2^N?
  - Critique by Kilkki and Kalervo

Critique: Network laws have been exaggerated!

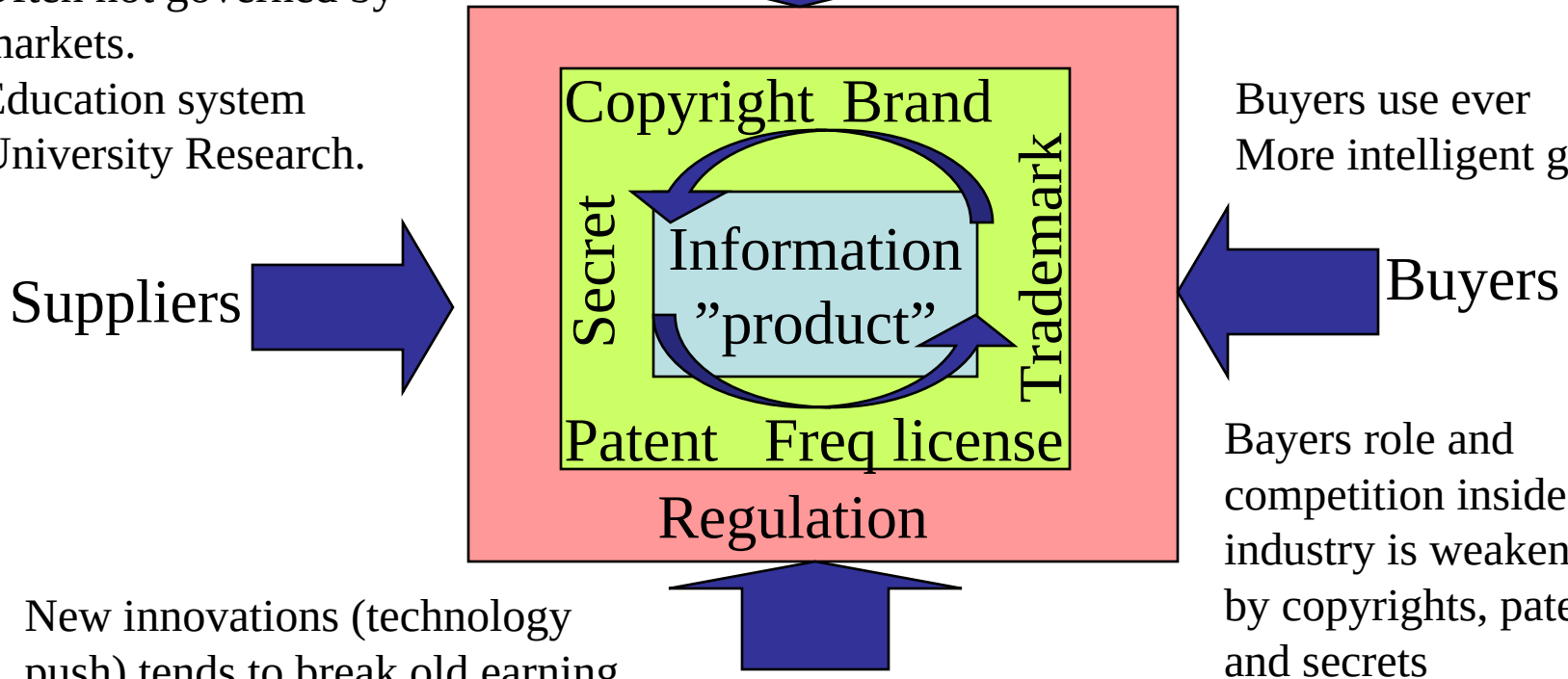
Competition in Information Economy

Porter's 5-forces model

Suppliers role is often non-existent or weak.
Often not governed by markets.
Education system
University Research.

New Entrants

New entrants are a constant threat to imcumbents.



Buyers use ever
More intelligent gadgets

Bayers role and competition inside the industry is weakened by copyrights, patents and secrets

New innovations (technology push) tends to break old earning methods.

Replacements

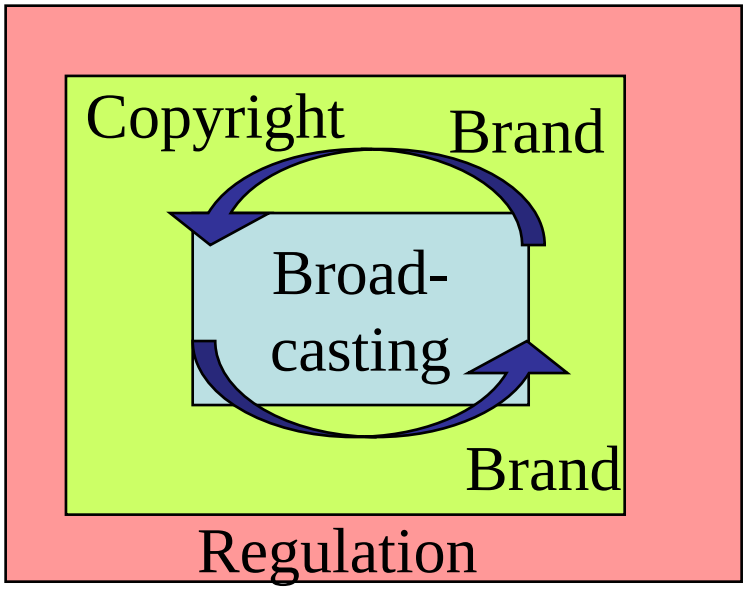
Competition inside an Industry

- Information creation often happens inside companies
- Competition is limited by
  - Copyright: a product is available from a single source
  - Patent: a problem can often be solved in many ways. A Group of patents, often cross-licenced by key players, may create a new market creating entry barriers for new entrants
  - Frequency licenses. E.g. Cellular.
- The key question is granularity: how big an area is coverned by the monopoly right. The bigger the area, the more inefficiencies it can contain.

Price = 0 (Flat rate is economically efficient)

- Information is non-depletable: you give it to somebody, you still have it
  - Under free market conditions, supply is infinite
  - Copy cost approaches zero
  - According to law of demand and supply, price approaches marginal cost → price of information approaches zero.
- Free market does not support a price that makes creation of information sustainable economically.
- Copyrights, patents, (frequency) licenses and secrets are fundamental for earning money using information.

Broadcasting – the future?



From 2 years back

Customer = advertiser.

Long term trend: fragmentation.

Digitalization speeds up fragmentation.

➔Less money to produce programs for smaller audiences.

➔ Everbody is after larger customer segments.

➔Maybe majority does not fit into any of the segments, because taste varies greatly. People do not get what they want.

➔ Price competition vs. idealism.

➔ Competition does not increase quality =/= Markets of most physical goods create quality.

Challenge of Information Economy is to lower costs of creation, delivery and storage so low that every customer gets what she/he wants with fine grained definition.

How this could happen

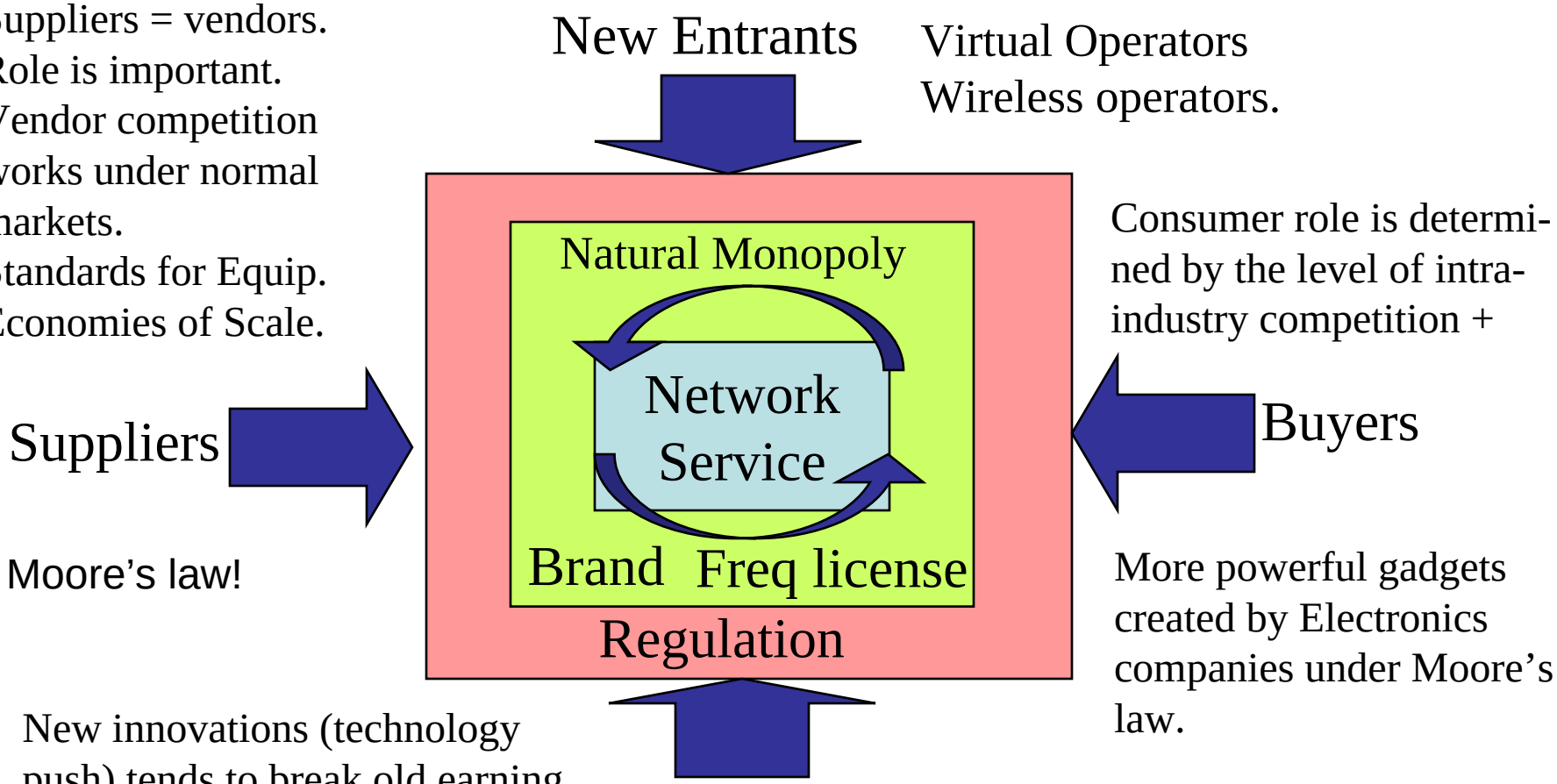
- YouTube – combine
  - p2p delivery → cost of storage is moved to customers
  - Self created content can be fun
  - global brands → cost of creation is split over large market
- Leverage economies of scale on 1B accessible market (English speaking)
  - Ironically, finally, plays into the hands of copyright owners.
- Operator will have to build BB networks to accommodate the delivery

Dismantling PSTN is imminent

- Technology push
- SKYPE, GoogleTalk, Mese
- Operator VOIP
  - IMS service over mobile + fixed
  - Operator and Emergency call requirements
- Mobile will become (is already) the primary phone, Fixed service is entertainment
- Flat rate rules!

Competition in Operator Business

Suppliers = vendors.
Role is important.
Vendor competition works under normal markets.
Standards for Equip.
Economies of Scale.



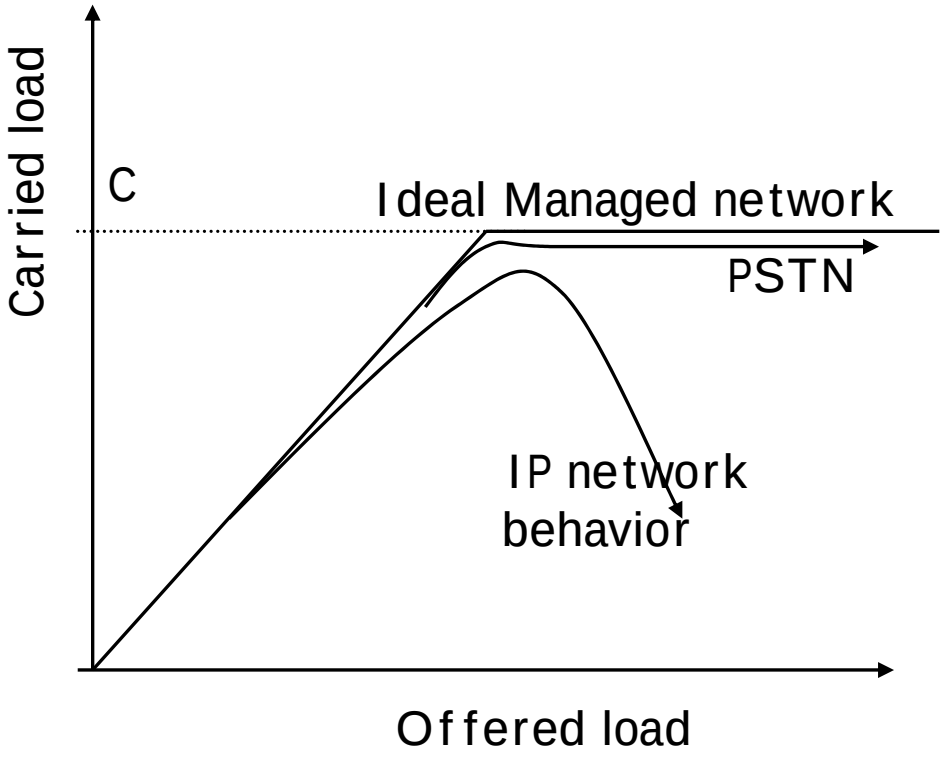
Consumer role is determined by the level of intra-industry competition +

Moore's law!

More powerful gadgets created by Electronics companies under Moore's law.

New innovations (technology push) tends to break old earning methods.

Congestion collapse



Under congestion
+ loss increases
+ reattempts increase
+ packets that are part of flows with loss and thus will be useless to users fill the network
+ even TCP requires a minimum capacity to work

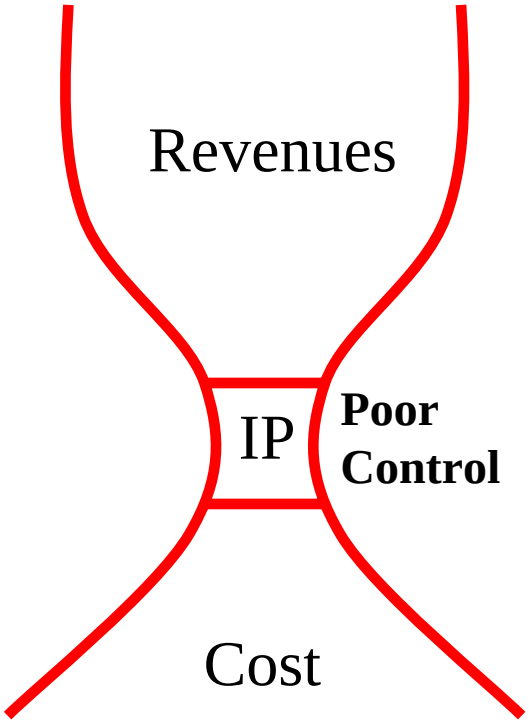
Result is that network MUST be over-provisioned at all times

With the increase of N over a threshold, network value goes down!

Is Wireless capacity constrained?

- New radios are being created:
  - WCDMA, HSDPA, HSUPA, LTE, 4G, WiMax, WLAN, BT, other PANs
- High capacity is needed where people can sit down and use eyes to consume data
  - most data services are nomadic not mobile
  - PAN and LAN, indoors, hotspots, public transport
  - Wide area capacity bottleneck is not a problem
- Technology push will relieve or remove capacity constraints – with the cost of a lot of complexity!

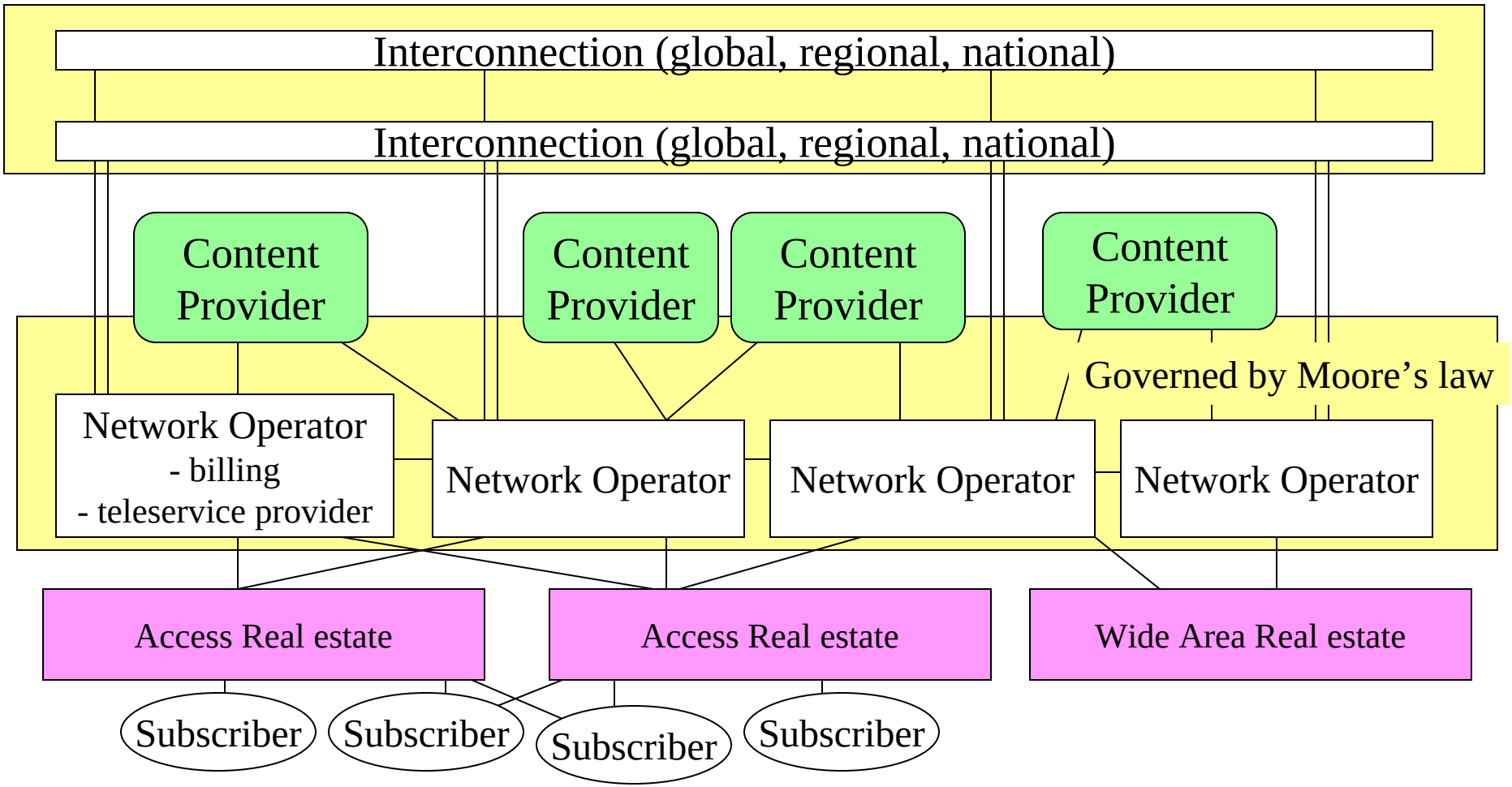
CoIP dilemma for Operators



- Cost is in coverage and access
- Revenues are in services over IP
- IP provides poor means of controlling network usage
  - Best effort is a commodity service
- Result is that users reap the benefits rather than operators
  - = IP destroys value.
- Flat rates → Increased traffic → operators are forced to invest in new capacity.

Solutions: IMS? New Stack?

Ideal model of the Environment



Compare Telecoms to other infrastructure businesses

- Power
  - Generation and transmission have been separated
- Railways
  - VR: tracks and traffic carriers are separated
- Road networks
  - Usually maintened by the public sector while transport and logistics companies are separate and private enterprises
- Telecoms: Roads and Tracks = pipes, wells, masts etc.

The outcome is consolidation

- Network laws
- Low margins and un-profitability
- Global aggregator brands + Global content brands → must create bargaining power towards these global players
- Regulators push for competition → low margins
  - Europeanization of regulation
- Technology push
  - creates abundant supply of capacity and complexity that requires competence such that small players are in difficulty to create and maintain
  - Global technology standards

Case: Europe

- Europe vs. US vs. Japan vs China
  - Europe must have big operators that can compete with US, Japanese etc operators
  - EU is consolidating regulation – same rules across Europe
  - Way for Commission to earn political points while pushing for the goal
- Still strong in mobile: Nokia and LME
- Playing catch-up in broadband