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Learning Initiatives on Reforms for Network Economies

# Foundational Characteristics of Information Economies

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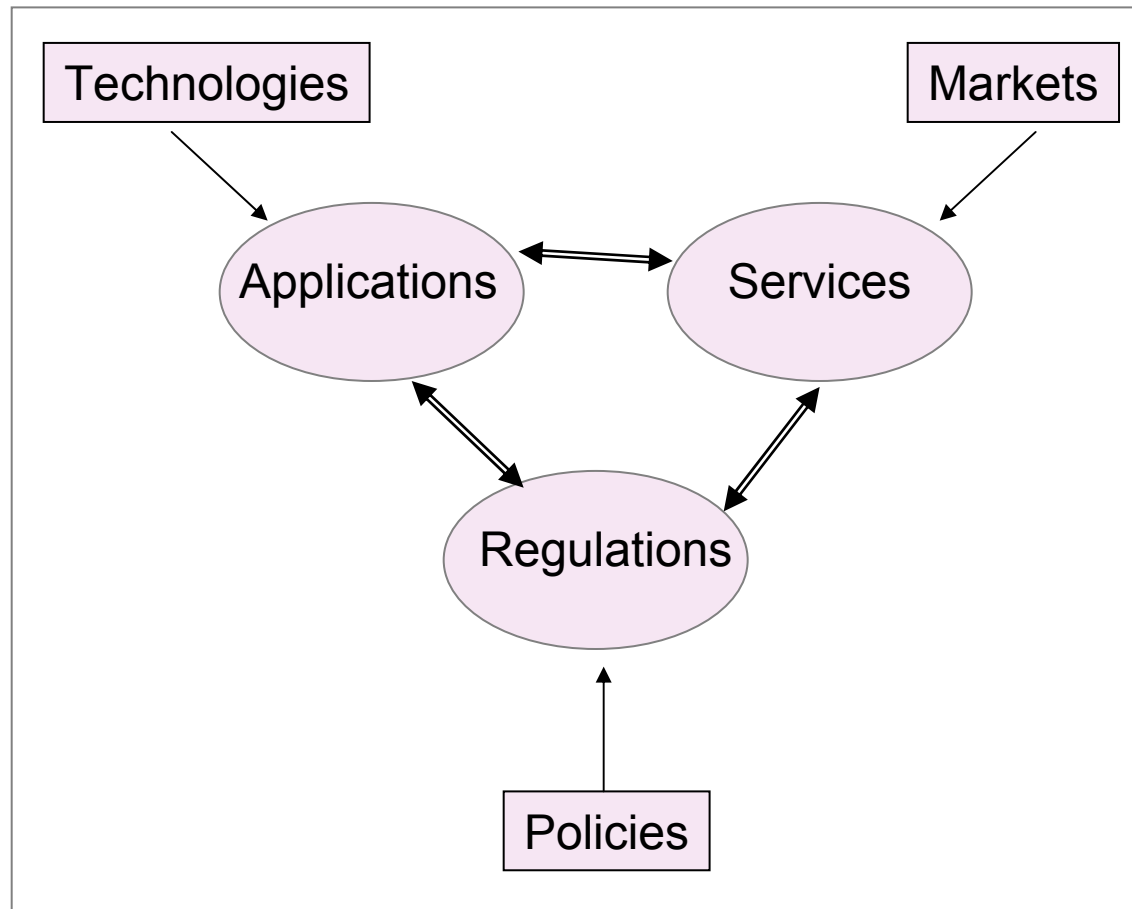
**CPR*south3***

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# Shaping the Internet Development Path





# Driving Forces and Interactions

- Technological determinism
  - engineers and technologists



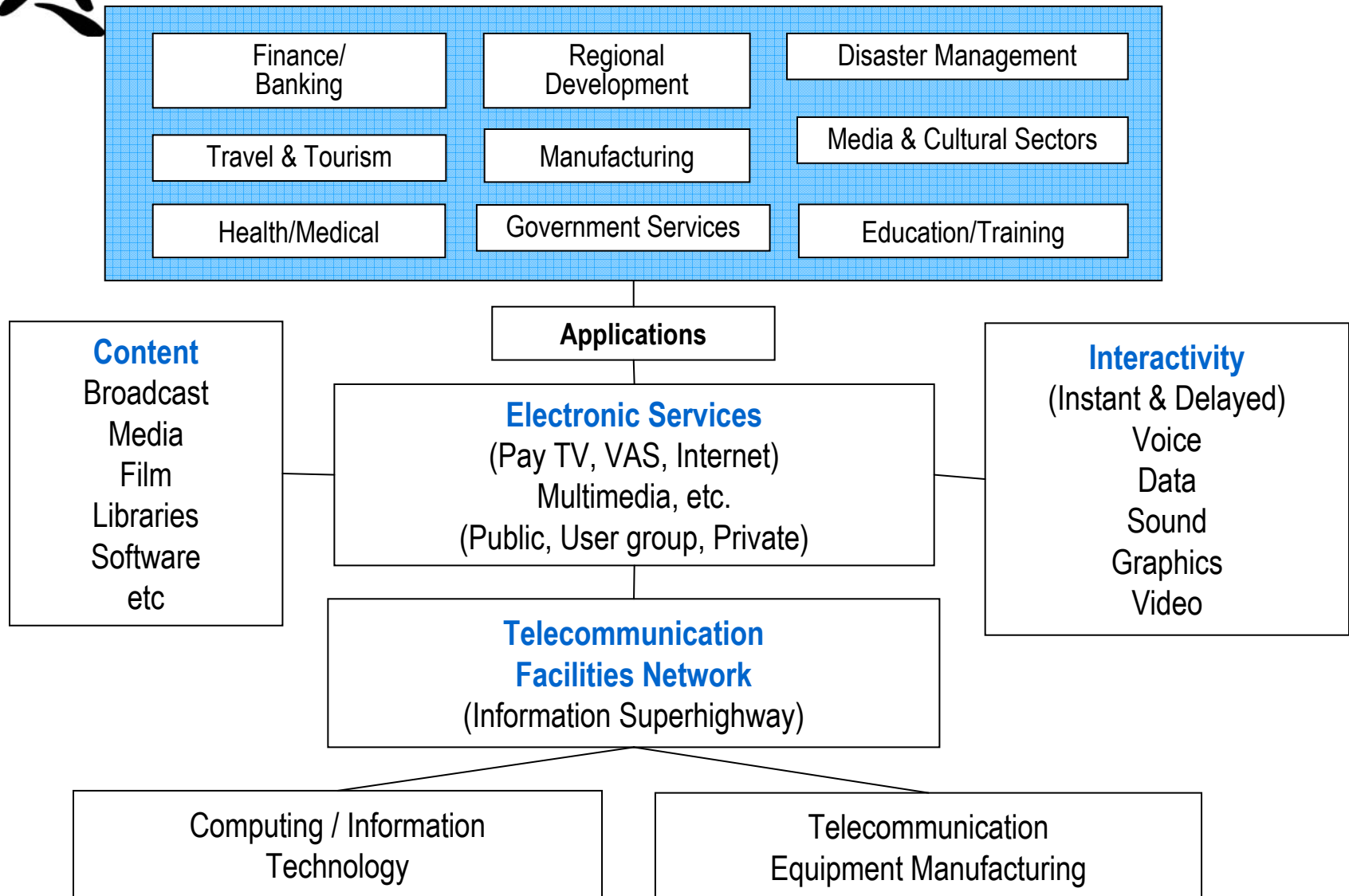
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# Driving Forces and Interactions

- Technological determinism
  - engineers and technologists
- Markets rule – follow the money
  - economists and finance
- Policy, law and regulation design the markets and determine the technological opportunities
  - politicians, bureaucrats and lawyers



## INFORMATION INFRASTRUCTURE, SERVICES, APPLICATIONS



# Illustration 1: Telephone

- Bell patents (1876)
- Bell & J.P Morgan – finance for investment
- Service model – content or communication
- Expiry of patents (1895) – expansion, innovation, destructive competition
- Monopoly – break-up or govt regulation
- Rights of Way: natural monopoly, public services, government needs, privacy, access



## Illustration 2: Internet

- Basic Research funded by US military, and the NSF at mostly public sector universities
- Made possible by FCC policy/regulation changes permitting unbundled access to telecom networks
- Global development driven by commercial applications
- Almost all current issues shaping NGN development are intersections of technology, economics(markets) and policy/regulation



## Illustration 3: Spectrum for Mobile

- Traditionally treated as a free resource managed (i.e. regulated) on issues of congestion & interference
- Explosion in demands for mobility driven by technological improvements, market developments and policy/regulatory changes re spectrum allocation & assignments
- Current debates: appropriate spectrum policy/regulation to support further development: e.g., market (auctions) v. commons approaches
- Future needs of mobile broadband for NGN are enormous!



# Unanticipated Feedback Effects

- Leading sector for applications of ICT has been banking and finance – SWIFT, Internet
- Instantaneous communication & information flows have improved efficiency of market transactions
- It has increased instability in the financial system
- Promoted casino capitalism – assumption of high risks, excessive leverage, exploitation of moral hazard and the current financial collapse
- Reduced future financing and investment for ICT sector
- Created need for policy and regulation for the new unstable global information economy – both for finance and the NGN

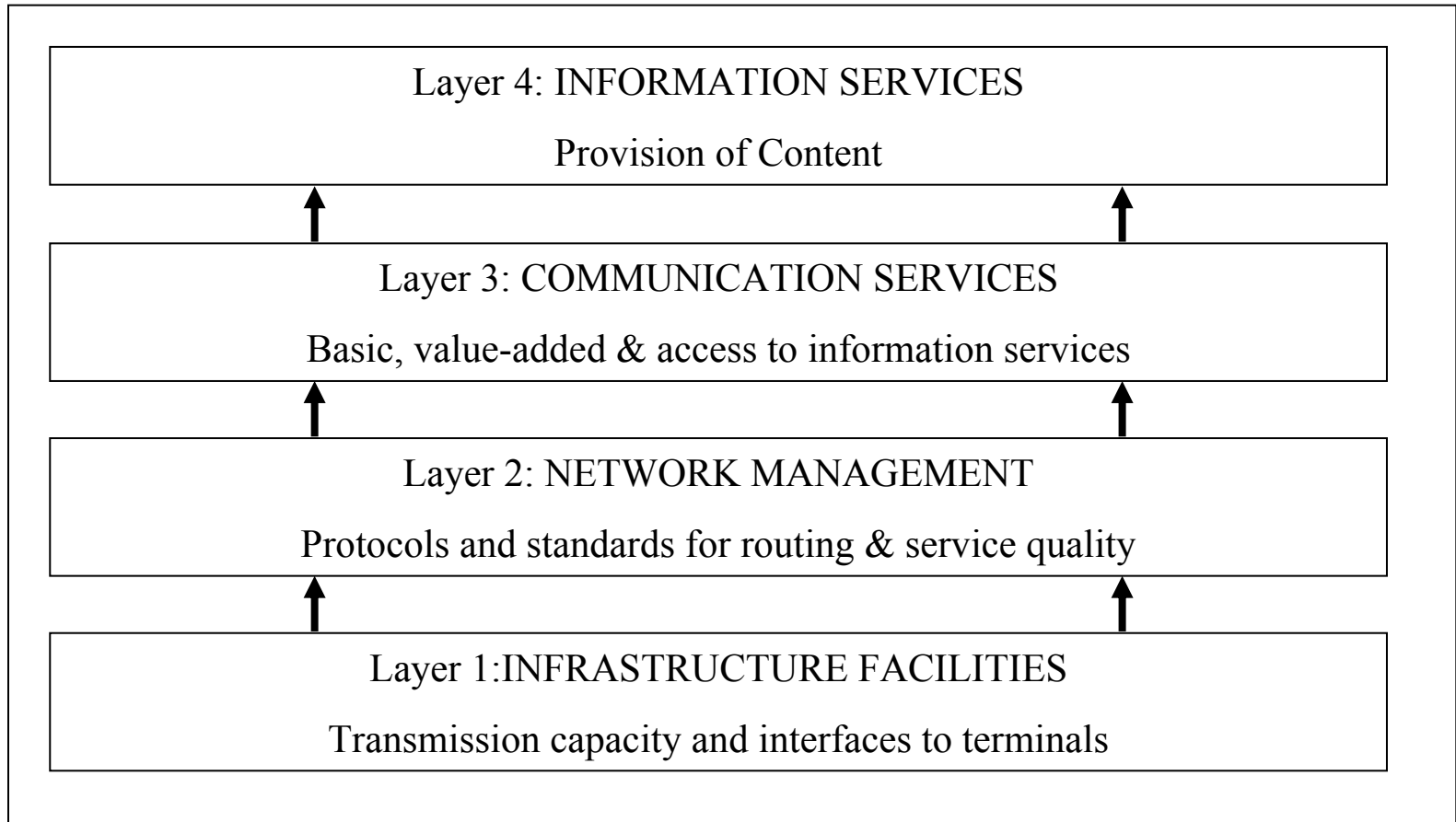


# **The Key Principle of Telecom Reform: Network Unbundling to Foster Access and Participation at all Levels**

- Industry Sectors - Equipment, Operator Networks, Services
- Fixed and Mobile
- Unbundling the Vertical Structure of Telecom Networks and Markets
  - \*Content
  - \*Communication Services
  - \*Network Protocols, OSS & Management
  - \*Equipment & Facility Capability



# From Vertical to Horizontal Markets





# **Significance of Network Bundling in Horizontal Network Services Markets**

- Content – diversity & variety in applications
- Services – specialized v. integrated (e.g., quadruple-play)
- Protocols & network mgmt – security, privacy, differentiated quality as services; open and closed access
- Equipment capability – expand or restrict specific capabilities



# Information Infrastructure: Investment 1990-2008

- Mobile - licenses - operating; spectrum
  - network development
- Privatising telecom incumbents
  - licenses – operating; IPO
  - network development obligations
- Competitive network operators
  - undersea & intercity fibre transmission
  - city / business LANs
- Software, services and content (e.g., Internet)



# **Information Infrastructure: Investment Priorities for the 21st Century Internet Economy**

- Local networks - broadband access
- Universal access – broadband
- Internet - local services and content
- Mobile network extensions
- Applications - e-economy,  
e-government, e-society



# The Next Phase of Network Development (NGN)

- Mobile broadband, cloud computing, networks of communicating devices, web 2.0, IPv6, more.....
- NGN provide technologies and services that support the redesign of production, administration and transaction processes throughout the economy
- NGN provide a foundation for new products and services and the restructuring of most institutions for information societies



## Primary Forces Shaping the Development of the NGN?

- *Technologies* – broadband mobility; internet of things; cloud computing, etc.
- *Economy* – new sector services and applications; diffusion; cultivation of BOP markets
- *Policies, Regulations* – to support, direct and constrain technological and economic opportunities in support of access and participation.



# Shifting Policy/Regulatory Priorities to Stimulate Investment

- From supply of network capabilities to stimulation of *demand* to justify investment in new services
- From physical capital to *human capital*
  - awareness, skill, capabilities
  - applications by individuals & organisations
- *Diverse sources* of private and public investment
  - operators, service providers
  - intermediaries (e.g., Tele-service centres)
  - user applications



# Capacity – building Activities

- Building new networks for mutual development – local to international
- Strategic management in a dynamic ICT environment
- Experimentation – the core of innovation
- Education and training for core and new skills



# Paths to Universal Access

- Voice - prepaid mobile
- Internet, e-economy, e-society
  - fixed & wireless network extensions
  - new operators – energy, transport
  - radio and TV distribution networks
  - retail service suppliers, ISPs, VANS
  - greater role for intermediaries
  - local participation (e.g., Wifi)



# Implications of Financial Crisis

- Less new innovation and more diffusion of products, services and applications
- Greater emphasis on operational efficiencies on a global basis
- Greater pursuit of markets at the margin, developing cos, BoP
- More attention to human capital, skills for efficiency



# Implications for Development

- Slower economic growth overall
- Developing countries that can avoid a currency crisis will benefit relatively from the austerity measures
- But developing countries will want to examine their telecom and Internet policies and regulations to ensure they support rather than restrict opportunities



# Some Unresolved ICT Issues at the Interface of Technologies, Markets & Policies - 1

- Public Resource Infrastructures for ICT Networks & Services - rights of way, spectrum, numbers, names
- Interconnection & access, e.g., unbundled local loop; open access; net neutrality
- Termination number monopolies in mobile
- Leverage opportunities for monopoly nodes in the network



## **Some Unresolved ICT Issues at the Interface of Technologies, Markets & Policies - 2**

- Intellectual property rights
- Standards battles
- Digital contract law
- Efficient micro payment system
- Applications of Competition Law in network industries (e.g., Microsoft) and new converged regulatory frameworks for telecom, IT and media



# Proactive Policy & Regulation

- Create a favourable investment environment for physical & human capital
- Minimize barriers to participation
- Facilitate demand as well as supply
- Apply skills and strategic management to achieve the spirit of the policy objectives
- Can only be done if regulatory structure is transparent and credible



**LIRNE.NET**, [www.lirne.net](http://www.lirne.net)

- A Strategic Collaboration for applied research, training, policy and regulation support, relating to information infrastructure and new network economy development
- Africa: LINK Centre, Wits University, South Africa, and Research ICT Africa Network (RIA!)
- Americas, DIRSI (Latin American & Caribbean Network). Montevideo, Uruguay
- Asia: LIRNEasia, Colombo, Sri Lanka, and Asian research network
- Europe: Center for Communication, Media & IT, Aalborg Univ., Denmark
- Economics of Infrastructures, TU Delft, Netherlands
- Dept of Media & Communication, LSE, UK

## **World Dialogue on Regulation for Network Economies (WDR)**

- Participate in the Dialogue; review and comment on the research, [www.regulateonline.org](http://www.regulateonline.org)