

Foundational Characteristics of Information Economies

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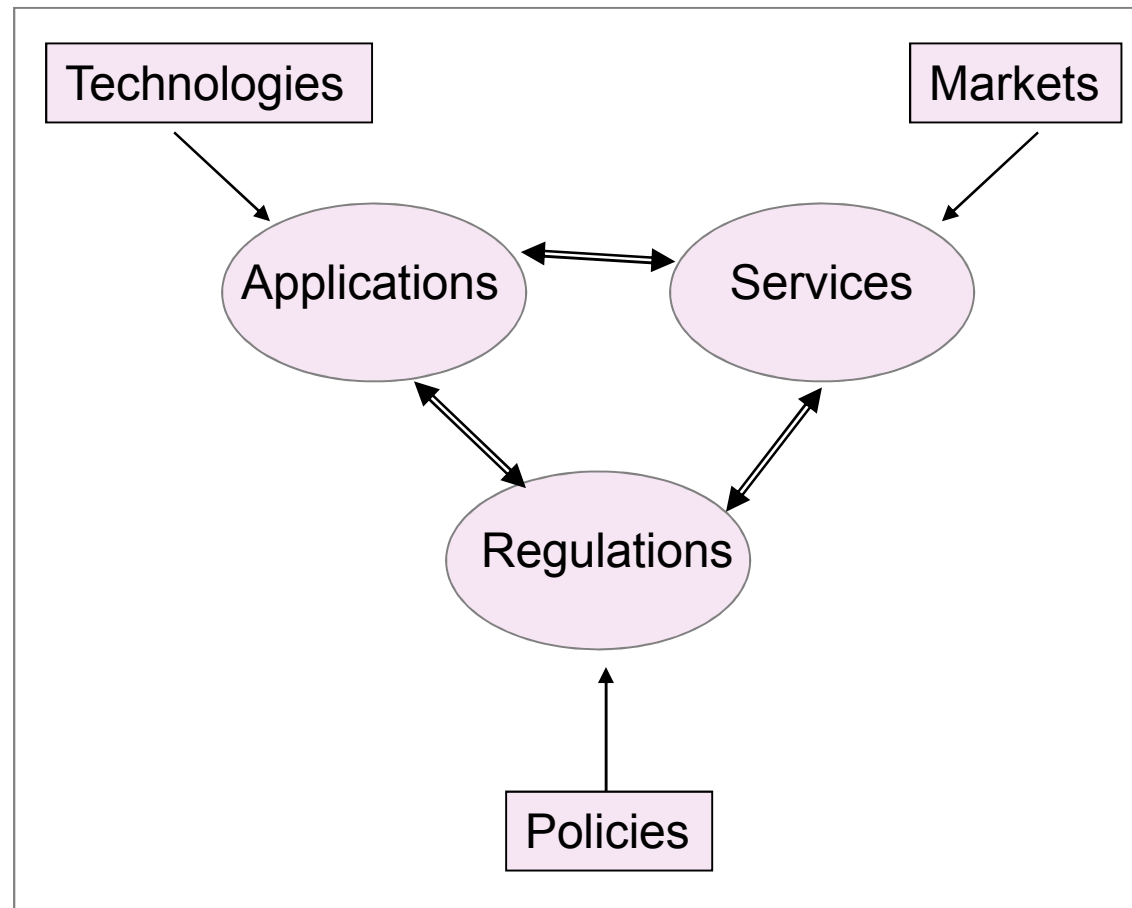
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SPEAKING TRUTH TO POWER

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Shaping the Internet Development Path





Driving Forces and Interactions

- Technological determinism
 - engineers and technologists



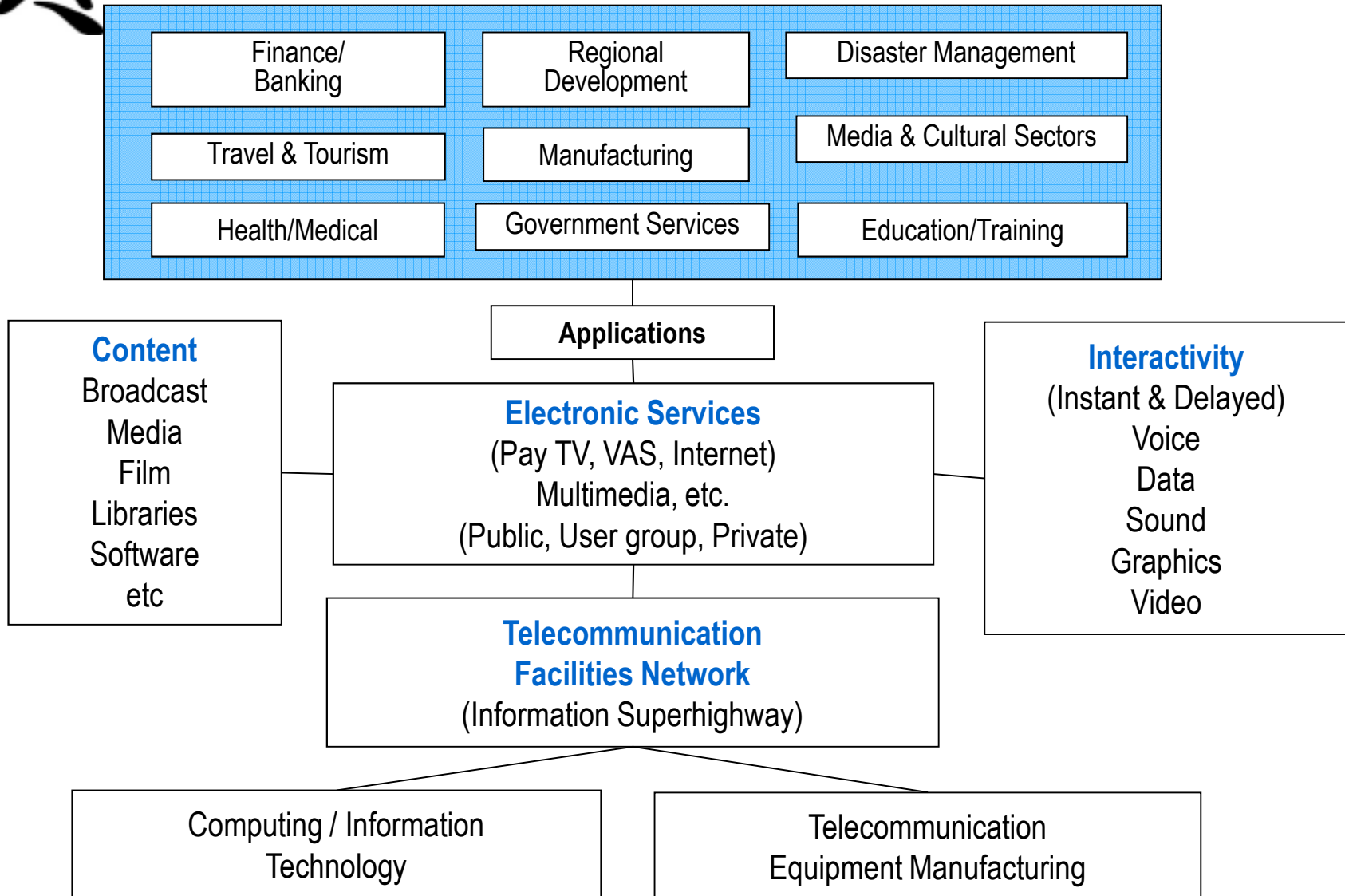
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- Markets rule – follow the money
 - economists and finance



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

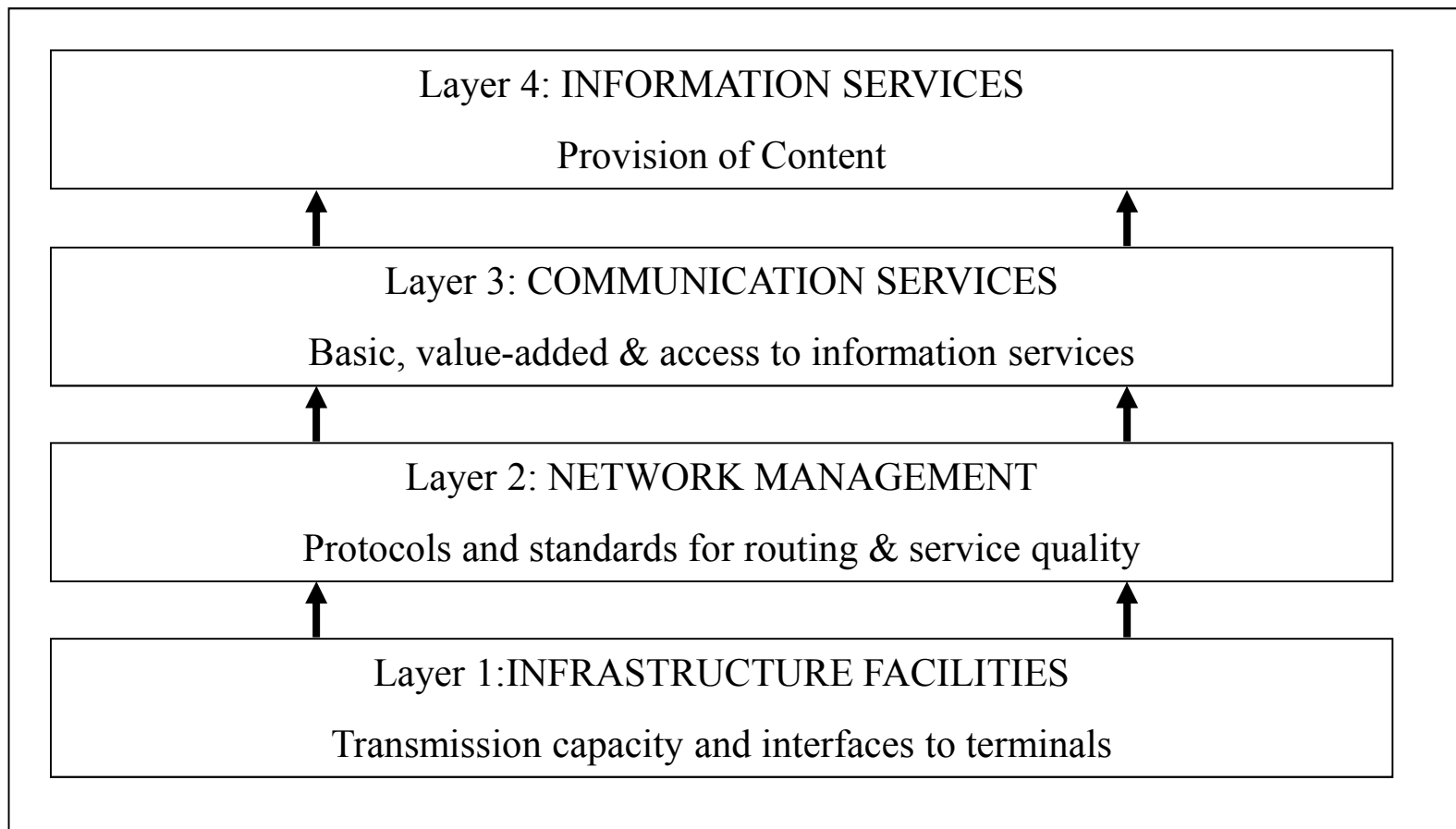


The Key Principle of Telecom Reform: Network Unbundling to Foster Access and Participation at all Levels

- 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



- 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 CPR South network
- Europe: Center for Communication, Media & IT, Aalborg Univ., Denmark
- Economics of Infrastructures, TU Delft, Netherlands
- Dept of Media & Communication, LSE, UK