Office of the Director of Telecommunications Regulation

SPEECH

Forward-looking Programme

Symposium – Seminar Presentation

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Innovation in Communications – Planning for the Future

Introduction

Etain Doyle

Director of Telecommunications Regulation

Thursday 27th June 2002

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ODTR – Getting to the Leading Edge

- Ireland needs the best in communications –

  Price /Choice/Quality
- Dynamic sector – commercial, economic and technical developments
- Anticipate new issues – appropriate & timely regulation
- Forward-looking Programme – today's event

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Moving forward

- '3G'
- Spectrum Strategy – July 18th
- New EU regulatory framework
- Market conditions
- 'Briefing notes – Optical, Wireless, Network, Applications
- 'Radar screen' – looking for your inputs

Innovation in Communications – Planning for the Future

Future Trends & New Issues

Richard Horton

Market Development

Thursday 27th June 2002

Agenda

- **Future Trends & New Issues** – Technological innovation; Forward-looking Programme; Future trends
- **New & Developing Technologies** – Briefing notes to date & proposals for new topics

  - Coffee/networking –
- **Discussion/workshop** – focus on technology/market developments and policy/regulatory issues arising

=> influence direction of FLP (& ODTR work programme)

Technological conservatism - a challenge for innovators:

"Nothing is more difficult than to introduce a new order. Because the innovator has for enemies all those who have done well under the old conditions and lukewarm defenders in those who may do well under the new"

Nicolai Machiavelli, 1513 A.D.

Predicting technological innovation

1. Rutherford's nuclear research – "no military, economic, political value"
2. Lord Kelvin – "Radio has no future"
3. SMS

Technological innovation & regulation – where's the connection?

Question: Isn't telecoms regulation about:

- Transposing Directives
- Licensing
- Running competitions for licences
- Monitoring and enforcing licence conditions
- Resolving disputes
- Spectrum management, etc?

Technological innovation & regulation – where's the connection?

Answer: Yes – and much more!

- Price, choice & quality objectives
- Market development => vibrant industry
- Highlight opportunities presented by technological innovation
- Help overcome misplaced technological conservatism

Technological innovation & regulation – where's the connection?

- Technological innovation helps us meet our 'price, choice and quality' objectives
- Competing technologies help stimulate market competition
- Regulation – managed path to liberalisation and competition (B. Carsberg – mid 1980s)
- Regulation – managed path towards technological, commercial and economic progress

Technological innovation & competition

Technological innovation – a source of healthy competition

- New entrants compete – innovate to fill market voids
- Established players innovate – to head off or respond to competition from new entrants
- Technological innovation – threat of competition ever present
- (Disruption – implications for investment & standards)

⇒ Technological innovation – overall, an ally of regulators

Forward-looking Programme

Objectives: anticipate, understand and contribute towards meeting national needs

- "Minimum lag" approach to regulation inadequate - anticipate market developments and new issues

  => timely regulation

- Encourage technological & commercial innovation – leads to deployment of new & efficient infrastructure & services

  => PCQ benefits

- Raise awareness & encourage industry to consider new & developing technologies

  => vibrant industry

Market development & regulation

Market Development Forces:

- Technological (T)
- Commercial & economic (E)
- Political & legal (L)

Market Development (M) = f{T,E,L}

(Regulation - proxy for market forces)

=> Regulation (R) = *f*{T,E,L}

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Regulatory development

Regulation (R) = *f*{T,E,L}

⇒ Regulation must evolve

How will it evolve?

(Regulation – maximise consumer benefits & encourage vibrant industry)

R -> max{P,C,Q}

R = *f*{T,E,L} -> max{P,C,Q}

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Forward-looking Programme

Activities:

- 'Radar screen' – awareness of future developments (e.g. SDR, VoIP, nanotechnology)
- Medium-term outlook – scenario analyses (e.g. spectrum review, future delivery of broadband)
- Assessment of new issues – Briefing Note Series (JE)

Resources:

RH, JE, (expertise in-house; external experts and sources of information; workshops)

Forward-looking Programme - scope

Technology emphasis – primary focus

- Infrastructure: global, national, local; fixed, wireless
- Access technologies (e.g. optical access, 'wireless tails', xDSL)
- Network technologies (e.g. 'next generation', components, protocols, reliability & resilience, security)
- Applications (e.g. 'next generation', demands on networks, human/information & 'machine'/information interfaces)

What we don't do…

- Pick technology winners
- Recommend, endorse or underwrite technologies, products or technical approaches
- Market forecasts
- Investment advice

Links to other ODTR activities

- ODTR strategy & work programmes
- Spectrum management
- Licensing framework
- New EU Directives
- International bodies (e.g. ITU)
- External relations – industry & other bodies

New Issues Conference

Issues identified:

- Infrastructure & access to it - (LLU, optical access, etc.)
- Power of incumbency – (Market Operations and Regulatory Accounts Divisions)
- Quality & continuity of service – (SLAs, NGN, Resilience)
- Scarcity of resources – (Spectrum review & strategy, numbering, IPv6)
- Convergence, divergence & bundling (NGN, NGA)
- Universal service – (Future delivery of broadband)
- Maturing of the sector – (ODTR strategy, NGN, NGA)

Some future trends

- Convergence of multiple independent networks
- Resilience, reliability, ease of use, flexibility (self-provisioning of bandwidth & 'quality')
- IPVPN, VoIP, 'Videoconferencing' – growth areas
- Machine-to-machine communications – rapid growth
- Bandwidth -> free; distance -> irrelevant
- Internet & mobile devices growing faster than fixed phone lines
- Competition from ad hoc/parasitic networks
- Optical -> closer to end users; wireless tails
- Continuing technological diversity in network provision

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New and Developing Technologies

Jonathan Evans

Market Development

Thursday 27th June 2002

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Contents

- Wireless Access Technologies
- Wireless Technology
- Telecommunication Networks and Applications
- Current work & future topics

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Wireless Access Technologies (1)

– shorter range

Optical Wireless Technology (ODTR doc. 01/59)

- Lasers used to transmit information through the air
- Point to point & mesh, line of sight
- Typical range: 0.5 - 6km
- High capacity (typically up to 1Gbit/s)
- Un-regulated spectrum
- Simple and quick installation

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Wireless Access Technologies (2)

– shorter range

Wireless Local Area Networks (WLAN) – ODTR doc. 02/16

- Indoor office & 'hot spot' applications: hotels, shopping centres, train stations, airports, conference centres etc.
- Outdoor broadband access
- Readily available and relatively inexpensive equipment
- Licence exempt spectrum


Source: Cisco


Source: Telex Communications


Source: Telex Communications

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Wireless Access Technologies (3)

- wide coverage area (ODTR doc. 01/59)

- Broadband Satellite Access (VSATs)
  - Regional/nationwide coverage
  - Typically asymmetrical (2Mbit/s down, 100s kbit/s up)

- High Altitude Platform Stations (HAPS)
  - Metropolitan/regional coverage
  - Large aerostats/balloons or light aircraft at altitude of 20km
  - Comparatively low cost

Wireless Technology (1)

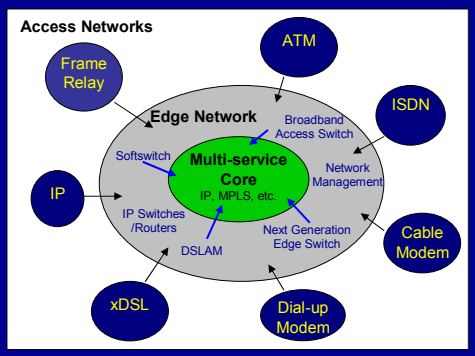
- Software Defined Radio (SDR) – ODTR doc. 01/59
  - More versatile terminals that could operate different services (e.g. GSM, GPRS, 3G, WLAN)
  - New services could be 'downloaded' by users
  - More cost-effective equipment for operators who provide multiple services
  - Elimination of 'fork lift' upgrades for operators as equipment is re-programmable

Wireless Technology (2)

- Ultrawideband (UWB) Communications – ODTR doc. 01/59
  - Developing wireless transmission technology
  - Potential for high capacity short range (10s of metres) mobile communications
  - Short range radar and imaging applications (e.g. automotive applications)

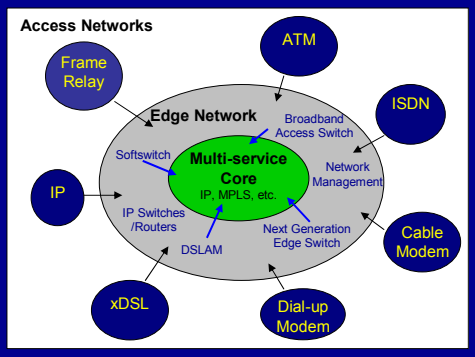
Telecommunications Networks and Applications (1)

- Next Generation Networks (NGN) - ODTR doc. 01/88
  - High capacity, flexible networks that are capable of supporting multiple different services (Multi Service)



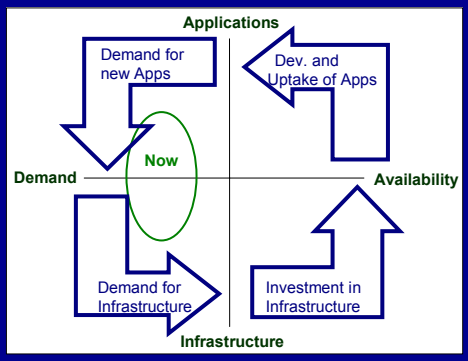
Telecommunications Networks and Applications (2)

- Primarily Packet Switched (Internet Protocol)
- Other Characteristics:
  - Secure, Reliable and Resilient
  - Dynamic and Controllable
  - Scalable
  - Protocol Independence



Telecommunications Networks and Applications (3)

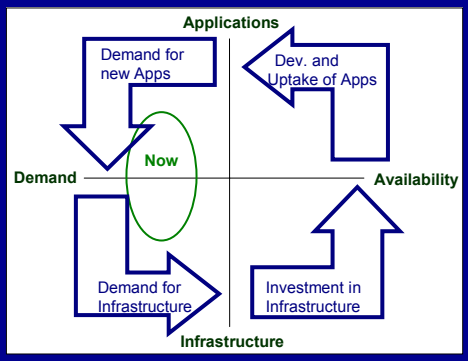
- Potential Applications for Next Generation Networks (ODTR doc. 02/45)
- Applications in two main categories:
  - Widespread mass market
  - Large business applications



Telecommunications Networks and Applications (4)

Applications in areas such as:

- Business
- Education
- Medical
- Home care
- Entertainment
- Domestic and retail markets
- Government
- Scientific research



Telecommunications Networks and Applications (5)

- Optical Access (ODTR doc. 02/29)
  - Use of optical technology in 'last mile' access
  - Fixed Line/fibre and wireless
  - High capacity solutions
  - Passive Optical Network (PON)

Current Work

- Internet Protocol version 6 (IPv6)
  - New version of Internet protocol which helps overcome many of the shortcomings of the current Internet:
    - Address shortages, security, class of service, end to end communication
  - Important for mobile Internet (e.g. 3G, WLANs):
    - Abundant Internet addresses (i.e. roaming)
  - European Commission has called upon member states and the telecommunications industry to support IPv6

Future Topics (1)

- Potential topics for further Briefing Notes:
  - Web Services
    - Using the Internet to carry out tasks
    - E-commerce
  - Next Generation Mobile Applications
    - Multimedia Messaging Services
    - 3G and beyond
  - Mesh & Ad-Hoc wireless networks
    - WLAN, Bluetooth, PANs
    - 'Freenets', parasitic networks

Future Topics (2)

- Wireless access security
  - WLANs, other technologies
- All Optical Networks
  - Optical switching/routing
- Peer to peer & grid computing
  - Implications for communications networks
- Voice over IP & other IP issues
  - Interconnection, numbering
- Future DSL technologies
  - VDSL, wavelet packet modulation