1 - The Shock of the New

- Escalating uptake
- Disruptive impact on existing services
The Phases of Technology Adoption

2 - Market Saturation

- Uptake level slows as it maps changes population and relative wealth
The Phases of Technology Adoption

3 – Obsolescence

Technology is displaced by alternative offerings
The Internet Today

- Still in the mode of rapid uptake with disruptive external effects on related activities
- No visible sign of market saturation
- Continual expansion into new services and markets
- No fixed service model
- Changing supply models and supplier industries

You are here (somewhere)
The Internet Today

- No visible signs of demand saturation
- Current growth levels have been sustained for over two decades
WHY the Internet?

- A new network model: Dumb Network – Smart Devices
- The Internet is simply a collection of packet switches linked together by transmission elements:
  - Packets can be queued
  - Packets can be lost
  - There is no end-to-end time coupling and there is no end-to-end reliability coupling.
- This allows an Internet network to use basic and cheap transmission elements and basic and cheap packet switches.
WHY the Internet?

- **Cheap** to access and exploit
- **Adequate** service model
The Disruptive View of the Internet

- Legacy Technology Service Costs
- Internet-based Service Costs

Service
Transaction
Cost
Time
Displacement
Opportunity
The Disruptive View of the Internet

- **Adaptable services** quickly migrate to use a cheaper cost base
  - Personal and Group Messages
  - Data transfer
  - Information Services

- **Other services** migrate based on exposure of opportunity
  - Commerce transactions (X.25)
  - VOIP (PSTN)
  - Music distribution (media distribution)
  - Video distribution (media distribution)

Continually decreasing unit costs and increasing penetration of access devices work together to continually expose new applications and new markets for the Internet
Internet Drivers

- Expansion is continuing at an exponential growth rate.
- Growth of access channels:
  - Desktop services
  - Personal services – Laptops and PDAs
  - Mobile communications services
  - Appliances

- Use Drivers
  - Information
  - Commerce
  - Entertainment
Futures for the Internet

- Same basic model:
  - dumb network, smart devices
  - Packet-based model of network sharing
  - Packet reordering, loss and jitter to remain

- Same drivers:
  - Continued growth in users
  - Continued broadening of the utility model through growth in overlay applications
  - Continued unit price drop in service costs for Internet-based services
Futures for the Internet - Transmission

- Megabit Wireless Bandwidth
  - 802.11 wireless networks are gaining market share as a flexible solution for office and access

- Megabit Mobility
  - 3G wireless efforts gathering momentum as a wide area mobility solution for PDA devices

- Gigabit Fixed Bandwidth
  - Moving to a trunk and access architecture of packets placed directly into the optical plane
Futures for the Internet – Coping with Scale

- Billions of addressable devices
- Either: back to the multi-protocol world:
  - ‘Walled garden’ domains of rich functionality
  - Inter-domain basic functions undertaken with application-level boundary gateways
- Or: we get serious about coherency of communications
  - Adoption of IPv6-based architectures
  - Reduction of use of network boundary-ware in favour of end-to-end architectures
Futures: The Content Model

- Finding information is not the problem
  - Finding too much information of dubious relevance and dubious authority is the continuing problem
- An environment of Content Abundance
Futures: The Content Model

- Internet Content Abundance
  - Information publication will continue to be driven into cheaper and easier to use models
  - Single point content publication architectures will fade to be replaced by reference-driven distributed cache models
  - A content URL becomes in effect an index used to query a cache, not a lookup performed at a nominated unique location
    - This has implications for the DNS as know it today
Futures: The Content Model

The issues:

- Generating **information navigation models** that have tight focus properties in terms of relevance of outcomes
- Generating **mutual trust models** that can be used to create information filters that generate trustworthy outcomes
- Adopting a **content economy** that funds quality of content

- Lets look quickly at these three issues:...
Futures: Information Navigation

- Currently in the early stages in combining formal systems with natural language interpreters and generators and flexible format interfaces
- Will the storage structure of information need to change to aid effective content navigation?
  - Is XML a productive direction to make implicit structure of information explicit to the navigation system?
  - Are there other approaches with greater promise?
Futures: Trust Models

- What is the trust model of the Internet?
- What do end-consumers want the trust model of the Internet to be?
- What do media providers and media intermediaries want the trust model of the Internet to be?
- Are these three views consistent?

Trust is difficult to impose and difficult to sustain. If you want a peer-to-peer content publication model then it has to be accompanied with a peer-to-peer trust model to sustain trust in content.
What does a robust content economy look like?

- Pay-per view?
- Free – content provider funded?
- Free - third party funded?
- Bundled – access provider bundles content provision?
- How do cache intermediaries fit into the model?
Thank You

- Questions?