Coordination of technology and diverse organizational actors during service innovation

The case of wireless data services in the United Kingdom

David Tilson, Kalle Lyytinen – Case Western Reserve Univ.

Carsten Sørensen, Jonathan Liebenau, London School of Economics

Mobility Roundtable, Helsinki

June 1, 2006

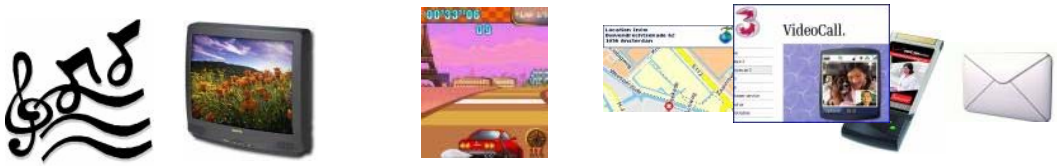
Introduction
- Research motivation/setting
- Research question

Theoretical perspective and methodology

Findings
- Walled gardens and internet services
- Video services
- Convergence with fixed services

Big changes in the wireless industry are leading to increasingly complicated coordination problems

Data transport mechanisms and improving handset capabilities support new services



Growing importance of computer, content and specialized players

Wider range of devices

Opportunity to examine reordering of a stable industry structure

- Major technological shifts — New interfaces to specify
- Industry convergence
- Entrance of new players

} More players to coordinate

Competi

Research Question

How is the coordination of the technical components, customers, network operators, content providers and other actors playing out in the deployment of 'mobile Internet' type services?

We explore

- Shaping and coordination of technologies by commercial and policy actors
- Shaping of relationships among actors (i.e. industry structure)

Actor-Network Theory (ANT) treats the social and the technological symmetrically

Main idea	Implications	Examples
Emphasis on links and networks	Person / actor is nothing without network	Dean without faculty, students, funds, university
Network nodes are human or non-human actors	• Non-human / human actors treated symmetrically • Non-human actors "act"	• Nature and artifacts • Projector light bulb "acts"
Actors have different values and interests	• **Translation** required to create links • On-going translation needed to maintain links	•Start a project •Keeping it moving
Actor-networks can become "**black boxed**"	• Becomes package for further network building • May be **irreversible**	• TCP/IP • Institutions
Human actors as "sociologists"	• Heterogeneous engineers act on theory of environment • Try to establish "**Obligatory Passage Points**" (OPP)	• Project managers • Windows API as OPP

Based on works from Callon, Latour and Law

Cross-sectional case study to explore question

Case study of wireless industry in the UK

- 17 in-depth interviews (used 7 here) of industry decision makers
- Executive level employees
- Anonymity promised and interviewees given chance to review findings
  - 3 of 5 UK network operators
  - Industry regulator
  - Device manufacturers
  - Media companies
  - Middleware vendor
  - Industry consortium

Interviews provide access to rationales, for ways coordination achieved

- How / why actors participate in deployment of mobile internet types services
- Build up picture of actor-network – talk about relationships and how they develop

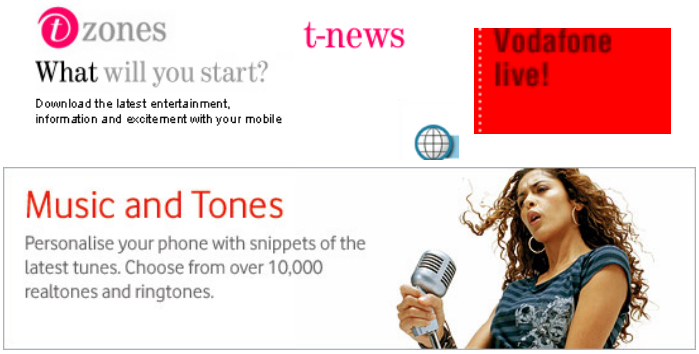
Analysis of interview data

- Listen to interviews and write detailed notes
- Identify themes around service deployment and coordination
- Write explanatory descriptions

Initial industry consensus around walled garden 'Internet'

Walled gardens
- Services tightly controlled by network operators (e.g. sports, news, basic entertainment – text, graphics, video, ring tones and wallpaper)
- Network operators retain 50-60% of service revenue
- Slow adoption by customers – voice and SMS still main revenue drivers

Use of wireless networks / walled gardens as OPP inhibited actor-network building
- Closed approach probably stifled innovation and actor-network building
- Kept out small (innovative) content / service providers
- Customers confused / not enrolled



More diverse service visions – relinquish some control

Realization that content is not operators' strength
- Role for strong content brands e.g. BBC News, Sky Sports
- More willingness to allow content providers to do what they are good at

Operators trying range of business models

- Web 'n' Walk true Internet access
  - Access to the 'Long Tail"
  - Pricing and screen/rendering
  - Need to establish 'real internet'
  - Enrolling in existing actor-networks

web 'n' walk

- O_2 introduced i-mode late 2005
  - About 100 sites
  - 90/10 revenue split to better align incentives

ebaY.co.uk

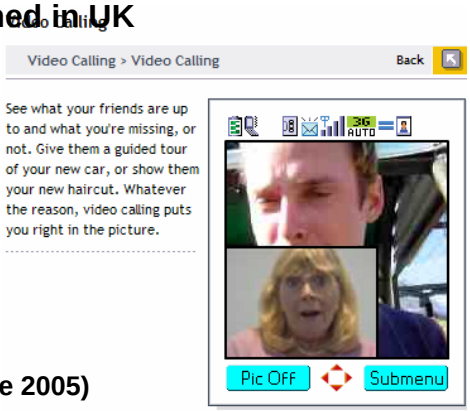
- Both still retaining walled gardens
  - Allowing strong brands
  - Content providers see as additional channel.

zones

Vodafone live!

Mobile video and TV services launched in UK

Video calling with 3's 3G launch in 2003
- Restricted to 3's customers
- Severe limitation during early network growth
- Access to other video conferencing might help



Vodafone and Orange offer TV on handsets (late 2005)
- Time-critical news / sport transmitted live
- Non time-critical content looped and updated periodically
- Uses unicast mechanisms – not scalable
- Leverage broadcaster brands e.g. Sky Mobile TV

Content brands important actors from launch of video services

Content providers keen to allow legitimate access to on-line video
- To forestall illegal sharing mechanisms
- PC as second screen / channel for VoD

Phone seen as "Third screen"
- Complement TV and PC screens
- Help with churn, ARPU, customer acquisition
- Access younger audience

Major video suppliers loathed to make exclusive (long-term) deals
- Customers not tied to one mobile network
- BBC's universal service obligation

Sky News, Sports and Factual Pack

Sky News (live), Sky Sports News (live), Discovery Factual; CNN (live), At the Races (live), Bloomberg (live), The History Channel, National Geographic Channel.

Sky Music & Entertainment Pack

Sky One, MTV, Cartoon Network, Bravo, Livingtv, Nickelodeon, Sky Movies, Discovery Lifestyle; Paramount Comedy Channel (1), The Biography Channel.*

Timeliness and breadth of content and time/location shifting features vary across technical options

Multiplicity of technical options – ambiguity about how actor-network will be built

- DTT battery consumption to heavy
- DVB-H trial in UK, but no spectrum allocation, new network required
- DAB has spectrum, existing transmission network,
- UMTS-MBMS would be more cost effective
- Different enrollments required for each

Wireless link not (absolutely) necessary for time and location-shifting

- Sync with web-based services e.g. iPod with PC/MAC, Google video and PSP
- Sync with broadcast video using DVR
- Slingbox – access your own services via data link

Opportunities for "iTunes" like services for mobile video?

Handset capabilities are emerge as significant actors

Ambivalence about breadth of handset portfolio

- Customer choose handsets first – so operator needs a wide range
- Diverse device characteristics (under-standardization) is an operational disadvantage
  - Bigger operators can drive reduction in range of device capabilities they support
  - Content providers have to support transcoding for 50-60 video formats

Three types of brands on (tier 1) handsets. . . . . many more content brands

Some operators taking more proactive role in handset specifica

- Tier 1 manufacturers for most devices
- Deal directly with ODMs to fill gaps

O2's X-series

Vodafone's Simply

Divergence of perspectives on how to enroll customers and technology around fixed-mobile convergence options

Fixed line substitution and migration of voice traffic – but wired broadband central
- Even HSDPA pale imitation of fixed broadband (getting faster) → DSL offer
- HSDPA may be a viable option to fixed broadband → no DSL offer

Mobile data services enable VoIP bypass
- Some operators block VoIP service providers (e.g. Vodafone)
- Others partner with them (e.g. 3 and Skype)
- Role of SIM card as OPP for operators (e.g. mobility management, authentication)

Multiple paths to network convergence – many actor-network configs explored
- France Telecom / Orange quad play include free fixed broadband
- NTL / Virgin Mobile - quad play
- BT is an MVNO, Fusion, and TV via 21CN network.
- BSkyB purchased ISP
- Carphone Warehouse will offer fixed telephony and broadband services

Wireless technologies have technical and economic constraints
- Building a new wireless network (in UK) doesn't make economic sense
- WiMax does not look economically viable (in UK)
- UK Broadband uses UMTS-TDD for fixed ISP services – but 50-70% LLU price

Both under and over standardization evident

Difficult to reach right level of standardization
- No dominant standards for 'mobile internet type services' or mobile video coding
- Difficulties for content providers and barriers to new entrants
- Confused customers
- Contrast with centralized coordination by dominant i-mode standard in Japan

More service experimentation needed
- Web 2.0 apps took years of experimentation
- Mutual enrollment requirement and cannibalizing concerns limits experimentation
- Experimentation and access to "long-tail" may aid identification of poorly understood requirements e.g. time/location shifting, location and context sensitive services

Final thoughts

Many more interests to be aligned than in 2G transition
- New organizational actors from content, computing and wider telecom industries
- Many new technical actors – and not enough 'black-boxes' to reduce ambiguity faced

Many intangible actors
- Regulatory actors e.g. local-loop unbundling and BBC charter
- Spectrum (non-)allocations for service types
- Brands important in "interent services", video, fixed/mobile offerings

Dynamic mutual shaping of technical and human actors challenges usefulness of factor models (e.g. TAM) for explaining of public computing service adoption
- Teenagers watching less TV shapes product and service strategies
- Product and service strategies (e.g. around TV, PCs, video games, mobile phones, IM…) shapes patterns of technology adoption

Limitations
- Only looks at one country
- Uses cross-sectional interview data