



Shaping the Networked World: Executive summary

1. Introduction

Technological developments, in particular the spread of the internet and mobile phones across the world, are having a profound impact on how people communicate with each other. The development of a networked communications environment has implications for the exercise of the right to freedom of expression. This paper examines the 'drivers of change' in the environment – the array of factors that interact with each other to influence its overall characteristics.

Part 1: The nature of the networked communications environment

2. A model for understanding the networked communications environment

The networked communications environment brings together a wide range of technologies, businesses, state institutions, individuals and organisations of civil society. It has created new relationships, both direct and indirect, between them. This disparate group of 'actors' are stakeholders in the environment, who seek to use its potential in different ways and for different ends.

This paper proposes a 'layer model' through which to discuss the networked communications environment and understand the implications of its development for freedom of expression. The model views the environment as four 'layers': physical network infrastructure; connectivity and code; user applications; and content. The paper discusses and analyses a range of factors that are driving change across these 'layers', grouping them into three broad areas:

- technology
- politics, regulation and governance
- economics and markets.

3. Evolution of the networked communications environment

Before the 1980s, the telecoms, mass media and computing industries operated largely separately from each other. 'Vertical integration' was a more appropriate model for understanding the communications environment. Communications technologies were costly and centralised; large companies – often state funded monopolies – tended to develop and provide a complete spectrum of services and equipment, from the user's telephone handset down to the physical network itself.

From the 1980s onwards, a combination of technological and regulatory changes began to dismantle the historical 'natural' monopolies in the telecoms industry. The industry saw **increasing specialisation and competition**, particularly from new operators in the connectivity layer, while trade agreements began to open up markets in developing countries. Although less marked in the mass media, a process of separation has also taken place between the production and distribution of content,

with increased competition in these areas. Evidence also points to deregulation of ownership controls in the mass media industry as a global trend, though this varies between countries.

The **dramatic growth of internet use** from the mid 1990s has helped to drive this restructuring of the telecoms and media industries. With its technology based on distributing rather than centralising the network's intelligence, the transmission and interpretation of content is controlled by terminals attached to the network rather than the network itself. The internet is also based around a universal protocol that can transmit any data on any network. This accelerated the process of specialisation and competition amongst communications companies into the 'horizontal' sections of the layer model. Because of its flexibility and universal protocols the internet enables more companies, organisations and individuals to engage in personal, 'one-to-many' and 'many-to-many' communications. The development of the internet was the result of interactions between technological, political and economic drivers of change.

The networked communications environment places stakeholders in new relationships to each other, creates new opportunities for businesses, individuals and civil society, and presents governments with new regulatory challenges. The rest of this paper examines these opportunities and challenges, and the factors influencing change.

Part 2: Trends and dynamics in the networked communications environment

4. Trends and dynamics: Technology

Fixed internet technologies are spreading throughout the world, but not at uniform speed. There is a 'digital divide' between developed and less economically developed regions in terms of people's access to this technology. A range of factors underlie this divide, influencing the spread and uptake of the internet, interacting in ways particular to individual nations. These interacting factors include:

- **politics and economics.** Moves to end monopolies in the telecoms sector tend to be slower in less economically developed countries where state-owned operators generate revenue for cash-strapped governments
- **regulation.** Evidence suggests a global trend towards regulation aimed at promoting competition. However, this is happening at different rates in different countries. Regulation may fail adequately to foster competition, for example by failing to promote common usage of an existing network infrastructure. Regulatory policies are influenced partly by regulators' relationships with government and companies
- **competition.** Regulatory or cost barriers to new companies entering the market hamper the development of competition, meaning that prices can remain prohibitively high for consumers
- **markets.** Consumer demand for services based on new technologies.

The use of **mobile phones** has risen dramatically since the 1990s, including in less economically developed countries. Variations in mobile phone usage between countries often depend on:

- **consumer demand.** This is high in areas where terrestrial infrastructure is patchy or fixed-line services an expensive alternative, and encouraged by pricing structures that make calls free for recipients

- **technology.** Single national and international technical standards stimulate the market
- **competition.** The presence of more than one operator can promote investment in infrastructure and increase coverage, as well as driving prices down for consumers
- **government subsidy,** for example in the form of tax incentives
- **regulatory structures.**

Uptake of **wireless internet access** using 3G (third generation) technology has been faster in Japan and South Korea than in the West, where slower adoption has been the result of a combination of: licence fees limiting operators' ability to invest in infrastructure; high prices for users; lack of user demand; and limitations on the content available to users. Innovation and new partnerships in the market are reducing these barriers in more developed countries, but it is not evident that 3G can offer a straightforward way of closing the digital divide; the cost of 3G-compatible PCs and mobile phones will continue to be a barrier for many. Other wireless technologies (WiFi and WiMax) are developing rapidly; their potential to close the digital divide is as yet unclear and will depend on compatibility, competition and regulatory regimes.

Internet Protocol (IP) is rapidly becoming the technology of choice for telecoms companies, also promoting **convergence** in physical networks and equipment, (e.g. handsets that use both mobile and fixed line networks). Further convergence will depend on both user demand and the development of agreed international standards. Progress cannot be assumed, as co-operation may not be in the economic interests of all companies in the communications sector.

5. Trends and dynamics: Politics, regulation and governance

There are observable trends towards the **merging** of previously separate regulatory bodies, nationally and internationally, and towards **liberalisation** regulation. In this context there are concerns that inappropriate regulatory measures may be transferred from other industries to the internet, and that concentration of media ownership is compromising public interest in terms of the content produced.

Regulators face new challenges in balancing the interests of different stakeholders in the networked communications environment. In particular **tensions** are evident between the demands of:

- preserving freedoms and addressing security concerns, with a clear global trend towards increased surveillance on the internet
- protecting intellectual property and promoting competition and innovation, with current regulation tending to favour the interests of the established players in the communications and media industries.

6. Trends and dynamics: Economics and markets

In most economies the networked communications **environment remains dominated** by the companies who were the major players in the separate telecoms, mass media and broadcast industries. On the whole they are adapting to the evolving environment, with strategies including: re-merging and diversifying services (telecoms); introducing more interactive communication (news media); agreements between music distributors and internet content providers; developing revenue streams from digital music content. At the same time, the music and film industries

in particular have sought to extend and enforce intellectual property rights to content. New companies who have harnessed internet technologies to support market-based business models have also gained substantial power, including Google and Yahoo.

However, **new forms of communication and new actors** are emerging in the 'institutional ecology' of the networked communications environment. These include: successful products and content developed exclusively through non-market collaborations (Wikipedia, Creative Commons licences); and citizen action, organised through the internet, to influence politics and traditional media.

7. Conclusion

The networked communications environment is continuing to evolve, and evidence suggests that players dominant in the traditional industries of telecoms and media are successfully adapting. It remains to be seen what the relationship will be between the incumbent market-based economy and the new 'institutional ecology'. The layer model this paper proposes, together with analysis of the interrelationships between those factors influencing change, will help to focus further debate about the points where those wishing to foster change can intervene.