

# Technological convergence: Opportunities and Challenges

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## 1 Defining technological convergence

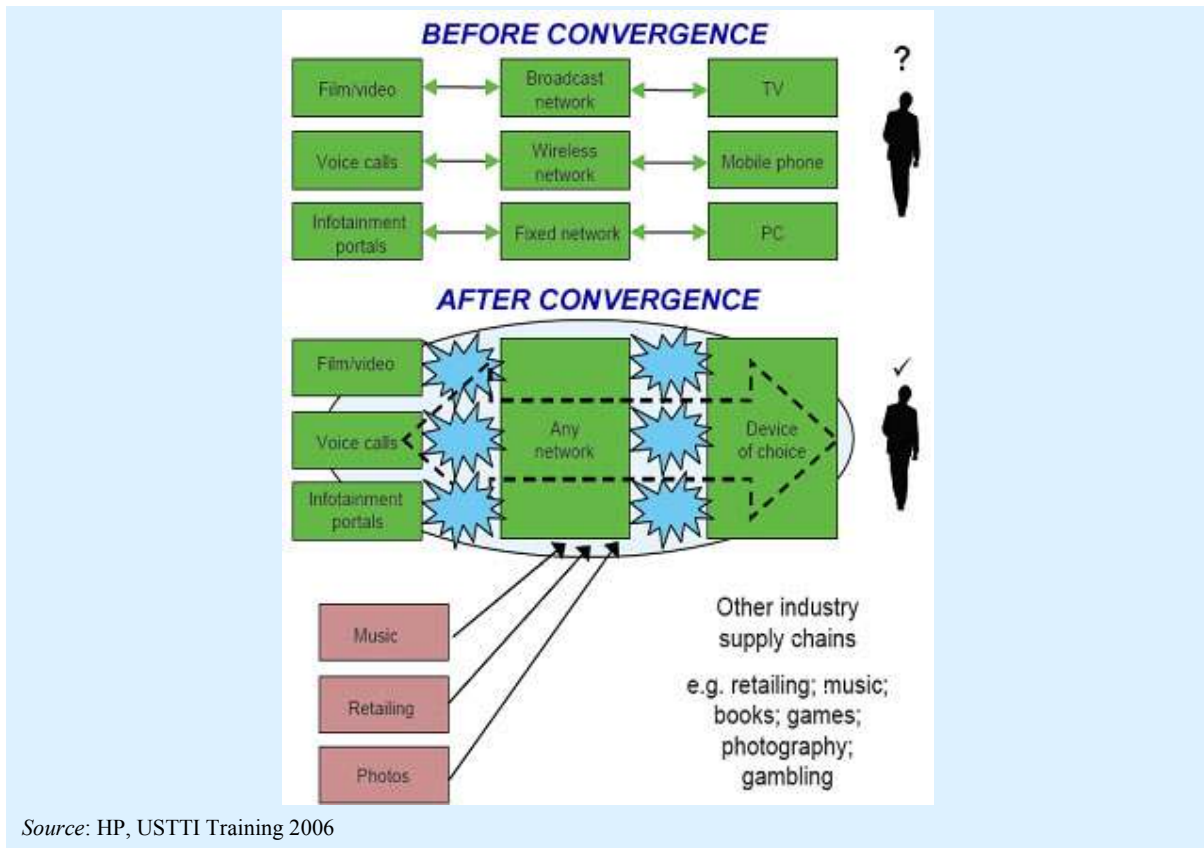
The term technological convergence is often defined in a very generalized and simplified terms as a process by which telecommunications, information technology and the media, sectors that originally operated largely independent of one another, are growing together.

Technological convergence has both a technical and a functional side. The technical side refers to the ability of any infrastructure to transport any type of data, while functional side means the consumers may be able to integrate in a seamless way the functions of computation, entertainment, and voice in a unique device able to execute a multiplicity of tasks.

## 2 Opportunities of Convergence

Technological convergence if appropriately managed can play an important role in national economic and social development of every nation. Governments can capitalize on the opportunity to stimulate market development and meet previous unmet society communication needs.

Figure 1: ICT industry before and after technological convergence



Source: HP, USTTI Training 2006

## **2.1 Increased Market Competition**

Convergence has lowered barriers of entry to the market for new operators and service providers. The emergence of new market players intensifies competition, giving consumers an extensive pool of providers and services to choose from and lower communication costs.

Additionally in a technological convergent environment industry boundaries become blurred, allowing service providers to offer services in multiple markets. For example, besides access to television, cable operators can also offer voice telephony and internet services.

Content providers can now easily access consumers with no need to own the distribution network. For example, a company may produce TV content and distributed it through cable networks without having to own it.

## **2.2 Emergence of New Services and Applications**

Established companies will find in convergence an opportunity to operate more efficiently, increase returns on technology investments and realize other business benefits through development of new services and rapid market expansion. Convergence opens up new sales markets for companies, a case observed in mobile operators. As the market saturates, they look to non-voice services, such as video streaming, portals, messaging, information services, and gaming, to drive future revenue growth.

New applications have given rise to new ways of entertainment (i.e. online gaming) and socialization (i.e. chat rooms). The convergence of voice, video and data gives consumers new ways of communication as we can all talk, send text and video over one single network, using one single application at much lower costs than before.

## **2.3 Convenience and Simplicity**

At device level, consumers find in convergence an opportunity to enjoy the convenience of having many devices all in one, saving on both size and ownership costs. For example, a single mobile phone device can receive television programmes and play videos, thus enabling simplicity and convenience in device ownership as one device can be used to access multiple services.

# **3 Challenges in Convergent World**

Technological convergence has raised a number of issues of adjustment to the new environment by telecom operators, service providers, policymakers, regulators, and users.

## **3.1 New Regulatory Framework**

The combination of services over the same platform is challenging common perceptions about the best means to license and regulate providers. Traditionally, regulatory frameworks were designed for an era when clear functional differences existed between services and infrastructure, but these regulations are increasingly inadequate for dealing with today's world. At first glance, interoperability, interconnection, consumer protection and universal access appear as the most relevant challenges.

Existing interconnection mechanisms focus basically on interconnection of telecom networks based on circuit switching technologies, while for instance broadcasting networks are either unregulated or subject to different types of regulation. Additionally, in a convergent environment, which relies greatly on packet switched networks, circuits are neither connected nor provided. In this way distance and time become less determinants as cost factors, requiring adoption of new units of measurement.

## **3.2 Bandwidth Shortage and Infrastructure Upgrade**

Convergence gives rise to new services and applications which are bandwidth intensive, requiring an existence of broadband infrastructure. Only with broadband access is the use of complex services (e.g. multimedia services) attractive or possible in the first place. While developed economies may not face a bandwidth shortage dilemma, the same may not be said about most of the developing economies where telecommunication infrastructures are still relying on narrowband technologies. These countries face the

challenge of having to upgrade their infrastructure or miss on the benefits of the technological convergence. In meeting this challenge, as it was in the past, financial constraints will continue to be a problem.

### **3.3 Strategic Alignment by Operators and Service Providers**

As barriers to market access are significantly reduced, allowing an increased number of new players to enter the market and provide a wide variety of different service packages, established operators and services providers are required to reassess their business models and strategies not only to face these new providers, but also to upgrade their networks to integrate it into their own offering. Another challenge lies in convincing consumers of the value added by the new services for which they must pay

### **3.4 Privacy, Security and Reliability**

As society becomes increasingly interconnected and dependent of ICT networks, cybercriminals continue to invent increasingly cunning ways to exploit human and computer vulnerabilities to their malicious benefits. This, challenges operators, service providers and users to take measures to minimize risks of network intrusions, attacks and viruses. In a similar way, as technologies and systems become complex, the higher is the risk of their instability. Product designers, manufacturers and operators are challenged to guarantee the reliability of these new technologies.

## **4 Conclusion**

Technology convergence offers massive opportunities for the development of new value-added services, convenience, efficiency and the expansion of markets and consumer choice. It also raises a number of issues of adjustment to the new environment by telecom operators, service providers, policymakers, regulators, and users.

## **5 References**

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