Introduction to Telecommunication Economics

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The telecommunications sector has become a dynamic key area for the economic development of the European Union (EU) and remains in constant evolution. Because of intense competition, telecommunications companies are forced to diversify their offers and thus to propose an increasing number of services. However, economic analysis often ignores important technical aspects of telecommunications and may not be aware of new developments. On the other hand, engineering models often ignore economic factors. Thus, the design and deployment of future networks that incorporate new services are subject to uncertainties such as equipment and capacity prices (due to technological innovation), and demand and supply for services (due to competition). Questions surrounding the deployment of telecommunications infrastructure and next generation networks – together with the massive adoption and increasing demand for new services – bring to the forefront hard questions about the future of Telecommunications and the need to address those questions in a multidisciplinary manner. This book on "Telecommunication Economics" fills that gap, presenting the multidisciplinary outcomes of COST Action "Econ@Tel: A Telecommunications Economics COST Network".

A set of scientific objectives was defined and was addressed in the course of Econ@Tel Action:

a) To support a European engineering leadership gained by new sustainable business models in a fully deregulated and diversified demand framework.
b) To study and identify business opportunities throughout the value chain, especially for enterprises, content, and specialized services.
c) To contribute to a strategy relative to socio-economic needs by increasing the motivation for deployment of cost effective and flexible solutions using networks and content.
d) To provide guidelines and recommendations for utilizing different types of technologies, as well as to model and quantify necessary actions.

To achieve these objectives, leading researchers with various backgrounds, all working on innovative aspects of techno-economic, social, and regulatory issues, focused in an integrated manner on four main areas. The four Econ@Tel areas pertaining to the broader theme of Telecommunications Economics are listed below, while a chapter of this volume is dedicated to each one.

Evolution and Regulation of Communication Ecosystems: This chapter provides insights into the changing landscape of regulatory frameworks, extending across the international roaming domain to the mobile search domain. Particularly, Europe's policy position on the mobile search domain is analyzed, taking in mind the evolution of mobile ecosystems and available policy tools. The angle of privacy protection data

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and competition policy is also examined, in the context of international roaming of data services and emerging need to revisit relevant regulation activities. The chapter also takes a different perspective on competition policies, highlighting on one hand the conflicting interests of stakeholders which may bias regulations and on the other the employment of community trademarks to track industrial dynamics.

Social and Policy Implications of Communication Technologies: This chapter addresses four different aspects of communications, emphasizing their implications on society and as a consequence to economy. The chapter begins with the examination of affordability indicators for mobile communications, presenting comparative results from seven countries to characterize cost barriers of inclusion. Another comparative study identifies the implications from the deployment of electronic and mobile health (e/m-health) services, using a heart tele-monitoring case. The enhancement of social cohesion is also examined, based on the introduction of services over digital television. Finally, the chapter examines the use of communication technologies for distant cooperation and how leadership is affected in such virtual teams.

Economics and Governance of Future Networks: This chapter covers two broad and interrelated areas, namely the domain of public intervention and governance, and the domain of business model evolution. Regarding the former domain, this chapter describes the public intervention and investments promotion in Next Generation Networks (NGN), also covering the issues pertaining to public-private partnerships (PPP) for infrastructure deployment. In relation to the above, the complementary issues of Internet governance and network neutrality are introduced, making the connection with the latter domain of business model evolution. Aspects of environmentally-friendly or "green" ICT are presented, applied to the cases of "green" mobile tariffs and to the transport sector. Finally, evolving business models for fiber infrastructure deployment and software adoption in Telecommunication complete this chapter.

Future Networks Management Architectures and Mechanisms: This chapter provides a collection of forward-looking technical approaches, addressing aspects which affect Telecommunications Economics. The chapter begins with analyzing the economic aspects of Quality of Experience (QoE), examining links between quality as delivered by the network, as perceived by the user, and as valued by the market. Relevant algorithmic aspects of telecommunications competition for converged networks are also presented. In terms of architectures, Economic Traffic Management and Autonomic Management are examined to reduce the operational expenditures of network and service management. Examples mechanisms of decision support in service contract formation and provisioning of services in rural areas complement the above architectures. The chapter ends with two topics on infrastructure protection, emphasizing on one hand the importance of risk management for ICT and on the other the interdependent nature of ICT and Power networks.

Finally, the last chapter provides major lessons learned during the four years of "Econ@Tel" COST Action and concludes this volume of selected research reports from within the Action.