

Editorial

# Introduction to Special Issue “Mobile Communications and Novel Business Models”

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## 1. Introduction

With the ongoing introduction of 5G, the fifth generation of mobile communications technologies, the mobile communications sector is facing disruption in regulative, business and technology domains [1]. Modern communications networks including 5G serve as the backbone for all digitalization in our society. Mobile communications networks are increasingly becoming virtualized and becoming multi-sided service platforms that facilitate an offering of tailored on-demand context, location- and customer-specific connectivity, and content services to meet versatile and localized end customer- and vertical-specific needs. These service platforms can be topped with various extended, complementary, and ancillary devices, systems and services that turn the business environment into an ecosystem. New opportunities brought about by technological innovation and regulatory developments call for novel, scalable, replicable, and societally, environmentally and economically sustainable [2] business models for the different stakeholders of the mobile ecosystem or industry. In this Special Issue we were looking for contributions that help in mapping the impacts and consequences of 5G and beyond networks on businesses in the mobile communications ecosystem in general and for society and the environment at large. Indeed, this 5G-related disruption is influencing all aspects of sustainability, be it economic, societal, or environmental.

The business model has emerged as the “contemporary paradigm for designing, visualizing and communicating different business and service concepts and their implementations.” [3] (p. 731). As a boundary-spanning unit of analysis [4] it not only helps to map the past, but also to deal with present and future challenges [5]. The versatility of the business model approach is specifically evident in ecosystemic contexts where the traditional networked focal firm approach [6] of business models has been extended to platforms [7] where the platform owners, users, and complementors deal with demand and supply, and the sharing economy [8] where underutilized assets are brought to better use. All these three types of business models are relevant for the mobile communications sector.

Scientific papers focusing on mobile communications business models has increased over the years. A quick search in the Scopus database for research paper titles and abstracts (accessed 15 December 2020) using the terms (“4G” OR “5G” OR “6G” OR “mobile operator” OR “mobile network operator” OR “mobile virtual network operator” OR “telecommunications operator”) AND (“business model” OR “revenue model”) finds 552 documents. The annual numbers of published papers are depicted in Figure 1. In 2020, over 60 research papers were published on business models in the mobile communications domain according to Scopus only. We consider this growth in the number of publications to reflect the interest and expected disruption in this domain.

The research for business models in mobile communications domain is multidisciplinary. Figure 2 depicts the distribution of the publications in the Scopus database across different subject areas in 2010–2019. Approximately two thirds (67 percent) of the publications are within computer science and engineering. Second, around 11 percent of the



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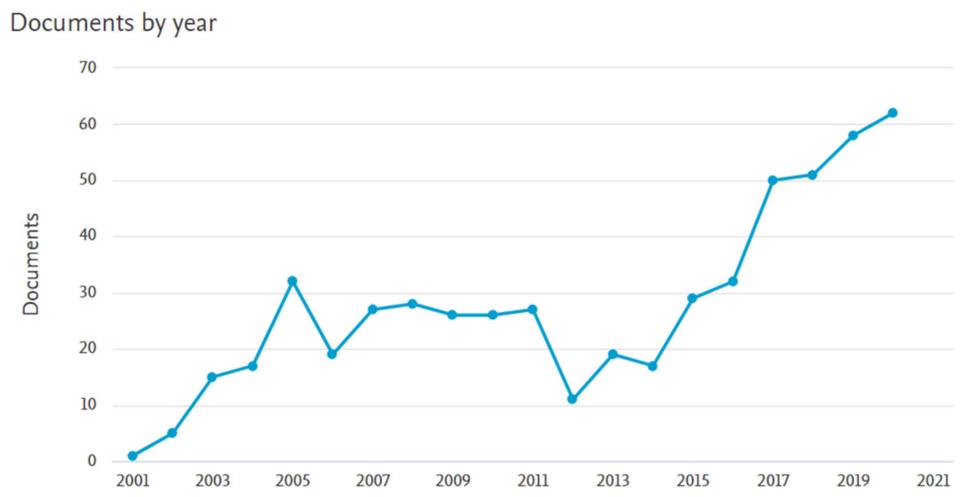
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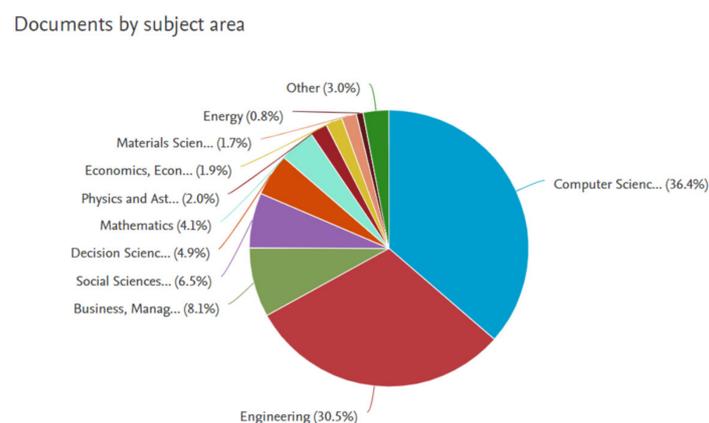


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publications are within business, management, and economics. The rest, approximately 22 percent of the publications represent various other subject areas.



**Figure 1.** Growth in the number of mobile communications business model publications in the Scopus database, 2001–2020.



**Figure 2.** Subject areas of the selected publications in the Scopus database, 2010–2019.

In Figure 3, a SciVal key phrase analysis conducted on our sample of the Scopus database clearly indicated the increasing importance of business model research within the whole of the mobile communications systems—in connection with themes such as virtualization, network slicing, edge computing, and spectrum sharing as examples. The decreasing role of the traditional operators in the extant research [3] appears indicative of the emergence of novel ways of doing business in this context.

More than being multidisciplinary, this Special Issue aims at being cross-disciplinary, and as such sought to publish conceptual, theoretical, and empirical studies that consider the interrelated business, regulation and/or technology aspects of mobile future communication networks. The following questions were of special interest:

- What kind of novel business models and ecosystems could emerge within mobile communications networks for different users (consumers, verticals, etc.) in different places?
- How scalability, replicability, and sustainability may influence business models within mobile communications?
- How business model innovation may influence sustainability in mobile communications?



within 5G. Sharing- and circular economy -based co-creation is expected to be boosted by mobile communications solutions using zero waste and zero emission technologies.

Finally, the Special Issue contributes to business model research by presenting a novel approach that is based on antecedent and outcome concepts related to the business model: with opportunity, value, and advantage as antecedent concepts. These three are related to choices that organizations need to make when servicing their customers. In addition, the business model is presented to have three expected outcomes: scalability, replicability, and sustainability. Scalability, the internal flexibility of the business model enables servicing a growing number of customers. Replicability, the external flexibility of the business model, enables entering multiple different markets simultaneously with minimal changes to the business model. Scalability and replicability can be considered as prerequisites for sustainability, whether economic, societal, or environmental.

### 3. Suggestions for Future Research

The application of business model research raises several challenges for future research. First, as 5G itself is in its first phases of deployment, there are several open, forthcoming practical questions to be answered. From the techno-economic perspective, novel business models for new kinds of end users such as communities, machines and even AIs (artificial intelligence) are under-researched [9,10]. Additionally, the opportunities and business models arising from the softwarization and platformization of networks—such as edge cloud and network slicing—should be researched more, also as indicated by the key phrase analysis presented above [11].

The techno-economic research implications in the extant research trigger several research topics related to societal or environmental outcomes or goals. For example, the intersection of SDGs and the future mobile communications business give rise to several research questions on the scale, scope, and type of viable business models [12]. For example, localized services and local mobile communications networks may face regulative, entry barriers, or scale-related viability hurdles. There are also opportunities for intriguing new research insights on regulatory challenges related to integrating sustainability as a guiding force in policy-making both in the mobile communication sector as any other sector of our society benefiting from future mobile networks. For example, the combined effects of data, spectrum, privacy, competition, and environmental regulation may bring unwanted or counter-intuitive consequences, or the effects may vary across ecosystems and verticals.

From the methodological perspective, the suitability of the business model—and its neighboring antecedent and outcome concepts opportunity, value, advantage, scalability, replicability, and sustainability—for futures-oriented research has been demonstrated in several publications. However, the outcomes of this Special Issue encourage us to advise research to delve into the patterns and meanings of business model interaction in different contexts to further our knowledge and clarify the concepts. Especially, an understanding of the boundaries and interfaces between the business model and its accompanying platforms or ecosystems is still developing.

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