



# Analyzing competitive and collaborative differences among mobile ecosystems using abstracted strategy networks



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## ABSTRACT

During the last 5 years, we have witnessed extraordinary development in the mobile market. Apple's launch of the iOS platform and associated App Store marketplace turned the market around, and Apple became the leading company in the business. This development caused existing players, such as Nokia, to renew their business and attracted new players, such as Google and Microsoft, to enter the market and introduce their own mobile platforms. To understand this development, we suggest that a generic abstracted model of the ecosystem around mobile platforms should be developed describing how the actors, including users, individual app developers, companies, and digital services, are connected and interact. In this work, we propose that competition and collaboration in this kind of abstracted ecosystem can be modeled and analyzed using network analysis. In our research, we derived weighted competition and collaboration networks for each mobile platform from an expert survey, and by calculating companies' degree centrality in their networks at different times we were able to illustrate how companies' strategies to build and maintain an ecosystem differ and develop over time. We believe that this kind of analysis is useful both for companies that build ecosystems and also for companies that plan to do business in them. The former can use it to compare their strategy with existing competitors and also evaluate emerging new ecosystems and the latter to compare and choose between possible ecosystems with which to do business.

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## 1. Introduction

### 1.1. Background

The developments in the mobile market have been extraordinary. In May 2013, Apple reported that the App Store marked its 50 billionth download since its launch in 2008. The App Store reached this phenomenal number of downloads in only five years. During these years, all major mobile platform providers have tried to follow Apple's lead and set up similar app stores in an attempt to implement Apple's business model. Nokia was the first mover in the smart phone business, but so far it has been struggling to match Apple's success. This turmoil has led to Amazon's, Microsoft's, and Google's entering the market as well. Recently, Google Android has advanced significantly in popularity, and Google's Play market is already challenging the App Store.

To understand this development, in which technological decisions and business strategies are intertwined, we suggest that the mobile market should be viewed as a digital business ecosystem (Nachira et al., 2007), analyzing both the business

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ecosystem and enabling technical layer. In a service co-creation ecosystem, information and communication technologies play a central role in enabling service transactions and co-creation between different parties (Chesbrough and Spohrer, 2006). For mobile ecosystems, technology platforms also enable services and apps to be run on multiple devices. All leading mobile platforms — Apple iOS, Google Android, and Microsoft Windows Phone — already support different kinds of mobile devices, including smart phones and tablets, and other devices, such as TV (iOS and Android), eyeglasses (Google glass) or smart watches (Samsung Gear).

Building such a diverse business ecosystem typically requires that companies cooperate with partners, suppliers, and customers to draw in resources (Moore, 1993). At the same time, competition among the platforms and with regard to some of the actors in these ecosystems is typically fierce. In this kind of highly competitive environment, strategies may also change quickly, as Nokia's changing platform strategy has illustrated. The competition and collaboration dynamics is even more complex, as companies may simultaneously compete and collaborate, called co-competition (Bengtsson and Kock, 2000), with the same actor. For example, Google both collaborates with other manufacturers by licensing Android platform but at the same time also competes with them by producing and selling its own devices.

To understand and compare such ecosystems that are multifaceted, both in terms of business and strategy as well as in a technological sense, we suggest that first an abstracted model should be built identifying all the key actors in the ecosystem. Second, we suggest that network analysis can be used to calculate and illustrate how companies' strategies to build and maintain an ecosystem differ and develop over time.

### 1.2. Previous research

The success of Apple's App Store and other application stores has naturally generated interest among researchers. In this section, we will review the previous work comparing the different mobile ecosystems and platforms.

Amberg et al. (2010) analyzed the application market from the customer's perspective and discussed how the existence and diversity of an application marketplace affected device selection. The paper focused solely on the actual marketplace and not the surrounding ecosystem. Gonçalves et al. (2010) examined the application store phenomenon from the mobile network operators' point of view and provided a platform typology to discuss the possible roles that they could assume. Their typology was limited to two dimensions, the control of assets and customers, and does not possess the required level of granularity for our comparison. Based on a case study, Ghezzi et al. (2010) performed a more detailed analysis of mobile network operator's resources, competencies, and capabilities. They concluded that the rise of the mobile application store model has significantly affected these resources, competencies, and capabilities and confirmed the existence of co-competition between different market players. However, their comparison was limited to operators only.

Holzer and Ondrus (2011) analyzed the platforms from the developer's perspective and summarized eight implications that recent developments have had on the market. West and Mace (2010) argued that Apple's success is mainly due to the better mobile Internet experience it provides as compared to competitors. Ghazawneh and Henfridsson (2011) did an extreme case study of Apple developer APIs and identified five different micro-strategies being employed. In our study, instead of focusing on specific qualitative factors, we will provide an overall quantitative measure with which to differentiate the platforms.

Regarding the ecosystem perspective, Lin and Ye (2009) analyzed the smart phone market as a food web and identified two key resources for competition: the device maker and the application developer. Gueguen and Isckia (2011) instead identified three types of relationships — agreements, suppliers, and alliances — between the various companies in the smart phone business by analyzing articles in three French newspapers. They concluded that ecosystem borders are unclear and that more than half of the relationships are shared between at least two different ecosystems. Their study was limited to the years between 1998 and 2006, and thus, it cannot explain recent developments (i.e., after the launch of the App Store in 2008). Basole and Karla (2011, 2012) similarly studied inter-firm relationships and presented a visualization to show how mobile ecosystems have evolved and what the implications are for different players in the ecosystem. These latter two approaches rely on the availability of extensive and accurate data about the relationships and thus significantly differ from our approach of analyzing abstracted networks.

In our earlier research (Karhu and Tang, 2010), we analyzed how companies control different actors in their ecosystems and were able to show that companies have chosen distinctive strategies in building their application store ecosystems. However, this research was based purely on a conceptual and qualitative analysis and lacked any quantitative measures for the strategies that companies have chosen.

### 1.3. Research problem

The literature review highlighted the lack of studies proposing quantitative measures for comparing strategies between different mobile platforms. The co-competition concept has been used to characterize the competition and collaboration between the various companies in the market, but no quantitative measures have been proposed for it.

The main research problem for this study is to find a quantitative method of measuring and comparing competitive and collaborative strategies (including co-competition) that different platforms have taken in their mobile ecosystems. In addition, due to the continuous changes occurring in the smart phone business environment, such as the launch of Apple's App Store, companies involved in this business need to constantly change their strategies. The method should also be capable of

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