

The Structure of the Mobile Social Media Industry

Author (omitted)
Affiliation (omitted)

Abstract

The debate about the open mobile platform should be informed by an economic analysis of the structure and conduct of all the likely players in the value network for provisioning mobile services. Based on the principle of structure-conduct-performance in industrial organization theory [1], the analysis of the market structure and conduct of market players involved will show that the optimal paths to social welfare in the next-generation mobile social data services will likely be achieved with coordinated value-related propositions and activities by multiple—rather than single—functional segments of market players. Market efficiencies can be achieved across the value network based on complementary business models and compatible competences. How this open platform might benefit consumers and foster innovation will be determined by the aggregate economic and social performance of the value network, rather than by the sole regulatory and social outcomes in the segment of carriers.

1. Introduction

In the U.S., software vendors such as Google and handset manufacturers like Apple have recently announced initiatives for fostering a mobile service platform that would allow a wide range of applications to run on mobile phones [2-4]. Although there is still much uncertainty about the scope and scale of its rollout, the promise of an open mobile network has created much fanfare among the technology circle [5]. This reaction seems to originate in the sentiment against the status quo in the wireless mobile market—a walled garden dominated and dictated by wireless carriers [6-9]. The tight control over handset and service provisioning by carriers has allegedly undermined consumer welfare and inhibited the development of innovative mobile data services [10].

Among the many third-party applications that would likely emerge on a more open mobile network, a type of mobile data service that merges social networking and media content delivery is particularly interesting [11-13]. Via carriers' gateway of internet access, these mobile applications enable people to access their existing web-based social services and supplement them by uploading and sharing media content captured and stored on their mobile phones. Running on the Internet protocol (IP), some applications also provide users with new ways to seek

news and information and communicate with friends, all without relying on the regular packet-based cellular services furnished by carriers. In some cases, providers of the so-called social media, such as YouTube.com in the video sector, release mobile applications for users to access their content and socialization services on mobile phones, supplementing the use of media content with a social networking context [14-16]. In spite of their different focuses on communication, information and media entertainment, these applications roughly fall under the umbrella of mobile social media applications [17, 18].

This article aims to show that the discussion of an open mobile platform should be based on a structural analysis of the mobile value network in the production and distribution of mobile social media applications. Based on the principle of structure-conduct-performance in industrial organization theory [1], the analysis of the market structure and conduct of market players will show that the optimal paths to social welfare in the next-generation mobile social data services will likely be achieved with coordinated value-related propositions and activities by multiple, rather than single, functional segments of market players.

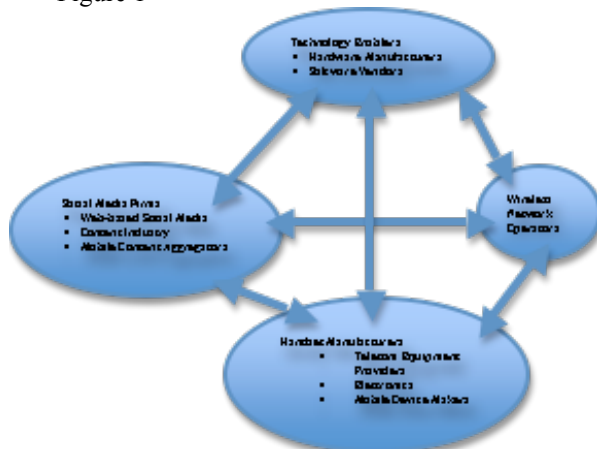
2. Structure of mobile value network

The creation and distribution of mobile social services are organized around a multi-layer value chain. Different sectors of the information technology industry interconnect with each other in multiple two-sided markets to provide services that integrate appropriate devices, software environment and network technologies. By pooling in vital resources, these firms collectively contribute to a value-adding process that terminates at the paying consumers of the mobile social services. The aggregation of multiple value propositions from these firms results in a multi-nodal and multi-dimensional value network of mobile social data services, rather than a linear value chain where actors interact only with the adjacent supplier or customers [19, 20].

There are different approaches to the structural analysis of the mobile data value ecosystem. The key to a convergence in these approaches lies within the two dimensions of capabilities and resources distribution: functional and institutional [21]. In the mobile data value chain, firms from different institutional sectors are engaged in either or both of the two major functional components, content generation

and network transport [22]. This means that the functional and institutional divisions of competence and value propositions among participants of the revenue streams tend to intersect. This intersection of roles and functions results in a value network in which players interact with others based on the functional value relationships of compatible expertise and resources [23]. Therefore the institutional structure of the mobile social media service needs to be placed within the context of the particular patterns of concentration and integration within each segment and partnerships across segments (Figure 1).

Figure 1



2.1. Social and media service providers

While the first institutional segment of the mobile social service value chain is usually called content provider or aggregator, the functional component involves the generation and distribution of social media services. This business can engage social networking and media service providers from different industries. These firms include emerging web-based upstarts that have built their main line of businesses in facilitating information-sharing, collaboration and communication among friends, established media companies which have used the web as a digital delivery platform for their proprietary content and are seeking its mobile extension, and aggregators which are specialized in distributing and publishing content intended for mobile devices such as games and ringtones. Despite distinct market and technological externalities, a high degree of concentration has developed in these sectors where a few key players hold the largest market share. In the social networking service sector, for example, MySpace.com and FaceBook.com already have a large user base and control a predominant percentage of revenues, after only a few years of operation.

2.2. Technology enablers

The second institutional segment in the value grid is broadly composed of technology enablers that provide necessary hardware and software solutions. As the functional requirement for this segment is to ensure the packaging and delivery of social and media content over the mobile networks, many technological solutions need to be coordinated on software and hardware levels by firms from various industries with compatible competences. On the hardware level, chipmakers such as Qualcomm, SiRF (a GPS chip firm), Intel and Texas Instruments produce necessary chips to enable the transport of data over different mobile network protocols. All of these hardware technologies will be needed for supplementing location information and providing functionalities of synchronization with services on other platforms. On the software level, firms design and license products to facilitate the development of application software on several layers. These software range from the operating systems such as Windows Mobile and Symbian and the development and delivery environment such as Java and Brew, to platform tools that facilitate the interoperability of applications across systems such as Nokia S60 middleware or provide the building blocks for specific media applications such as Adobe Flash.

Again, the simple name of technology enablers disguises the complex pattern of fragmentations among the hardware and software layers of technology vendors. With respective capabilities and resources in either network transport facilitation or content distribution, these firms need a higher degree of coordination, usually from device manufacturers and carriers, to participate in the value streams of mobile social data services. On the software level, however, economies of scale (on both supply and demand sides) have driven dominant actors to pursue platform strategies of integrating the development and provisioning of all of the network transport and content delivery services.

2.3. Handset manufacturers

The third institutional segment involves the manufacturers of mobile handsets. The functional role for most major handset manufacturers in this segment such as Nokia and Motorola is to design and produce phones according to the network and hardware configurations of various wireless carriers, and introduce their products to the marketplace bundled with and locked in carriers' service contracts. As an industrial sector that is relatively young with about 30 years of history, mobile handset manufacturing is dominated by firms traditionally specialized in

telecommunication equipment such as Motorola, Siemens and Ericsson, manufacturers of consumer electronics such as Sony, Samsung and LG, and specialized mobile communication companies such as Nokia and Research in Motion. Increasingly, this segment is joined by firms with competence in other industrial sectors such as software development and IT product manufacturing, as illustrated by the recent introduction of the iPhone by Apple and the mounting rumor of the gPhone by Google.

2.4. Carriers

Thus comes the final segment of the value chain, the operators of mobile wireless networks. The institutional and functional roles for actors in this segment are relatively more converged. Most of them are institutionally the spin-offs—or at least subsidiaries—of the traditional landline telecommunication providers, which grants them the regulatory and market identifiers of “telecoms”. Functionally, these firms own considerable chunks of radio spectrum, operate hardware infrastructure and equipment such as transmission towers and exchange facilities on regional or national levels, and have extensive networks of retail presence either independently or in collaboration with large retailers. They market and sell mobile handsets as part of the bundled contractual voice and data services, and take charge of most of the business interactions with subscribers such as customer service, technical support and billings. Wireless carriers may lease their network capacity and bandwidth in wholesale to retailers of niche mobile services, although the viability of this model of mobile service is being questioned after the failure of several high-profile niche operators. The wireless telecoms have functional advantages because of their capabilities of accessing and serving consumer demand, and their possession of the resources of spectrum and equipment that are adequate for controlling the supply chain for basic and advanced mobile services. These advantages of the wireless operators result in their position as natural oligopolies in a highly concentrated market where several incumbents dominate and the entry barrier is high.

2.5. Structural implications

Although the value chain for the mobile social services can be divided into institutional segments to differentiate stages and specialties of service provisioning, each segment contains multiple functional components that can engage firms from originally unrelated industries. To efficiently complete

market transactions, firms need to respond to the actions of competitors horizontally, and coordinate supply and demand relationships with technology or service vendors vertically. Furthermore, firms are increasingly required to be aware of and responsive to changes in the structure and externalities of any functional components in the value network diagonally, to meet the behavioral requirements in a complicated set of two-sided markets [23].

To put it the other way around, efforts by firms from a particular industry sector to partner or merge with others should be understood and interpreted more broadly. Close attention should be given to how the combined capabilities and resources as a result of such integrations impact the competitive structure in each of the functional units in this multi-nodal, multi-dimensional value network. Such cross-sector activities will influence the efficiency of each actor in contributing to the provisioning of content and network transport services. This observation implies that the competitive analysis of the mobile social data services can not be solely based on the structure of any single institutional segment in the value network.

That a carrier-centric competitive analysis of mobile data services is misleading has two-fold implications. First, the competitiveness in the carrier sector alone should not constitute sufficient basis for drawing conclusions or proposing solutions for the prospective competition and innovation in the entire business of mobile social media service. That is, one should neither embrace the deregulation argument made in the FCC verdict on the effective competitiveness in the carrier sector, nor see the oligopoly structure in this sector as the necessary bottleneck for innovations in open mobile networks. Both stances are based on the flip sides of an insufficient judgment. Second, in considering the competition and innovation issues in mobile social media services, there should be sufficient sensitivity to the competitive structure within and across all of the functional components of the value network. The overall structure of the value network might be shifted by the mergers and partnerships between firms with compatible capabilities, or by the anti-competitive behavior by firms holding key positions in one or more functional components. Due to the specific mechanisms of market externalities in different segments, certain firms might hold formidable first-mover advantages and exercise monopolistic practices. These anticompetitive practices might practically increase the entry barrier and the opportunity cost for users to switch, undermining the efficiency promise in a truly competitive market. For example, although the web-based social networking service is theoretically a competitive market open to all players, network effect

might lead dominant firms to engage in anticompetitive behaviors that stifle data transportability and user choice, as illustrated in the recent fight between FaceBook.com and Google. Or similarly, merger and acquisitions for gaining dominant advantages in adjacent (upstream or downstream vertically) as well as related (connected diagonally) functional components by firms should be given special consideration by regulators, observers and strategists concerned with an efficiently competitive mobile social data value network. All these structural changes in one or more functional units of the value network other than the carrier segment will likely have equally important influence on the performance of the mobile social media service market.

3. Competitive conduct in mobile value chain

Mobile data services currently generate a fraction of the revenues for mobile wireless carriers in the U.S. IP-based mobile social and media services claim an even smaller portion of these revenues [24]. But as the deployment of the third-generation (3G) network approaches saturation in the U.S., it is predicted that the enhanced capacity and bandwidth of the networks will provide improved quality of service and user experience, boosting the usage of mobile data services. In addition, as the web-based social media services continue to grow in terms of user base, revenues and market valuations, the mobile version of such services will likely usher in a new generation of broadband mobile data services. In order for these services to maximize social welfare by enhancing consumer surplus and encouraging innovations, market equilibrium needs to be achieved in the mobile data value chain.

This equilibrium requires coordinated actions by players in the value network, which are constrained by the unique market structure and externalities in each of the functional component. To maximize returns on investments and efficiently leverage their competences, firms engage in price and non-price rivalry strategies based on the choice factors of supply and demand, and on the cost and margin analysis in their unique functional segments.

As different market externalities exist in each functional component, however, it is often difficult for these firms to engage in mutually rewarding and complementary value propositions and conducts that lead to overall market efficiency in the value network. The overall social welfare in the mobile social media value network, as a result, must be determined by how the coordinated actions of mobile players facilitate

complementary, flexible and robust value streams and efficiently bring consumer such benefits as the low-cost access to diverse choice of devices and applications.

3.1. Social media service providers

Seeking to leverage the economies of scale and scope on the demand side, social media firms aim to provide their existing user groups with a mobile platform to access the same service and content. On the supply side, though, firms with different competences and resources for organizing production and generating revenues might adopt different rivalry strategies for the mobile value network. Social networks such as MySpace.com and FaceBook.com might replicate their existing platform strategies to attract developers and advertisers for their mobile extensions. Media firms might rely on their horizontal control of other platforms and their production personnel and asset resources in order to create value-added services as the tie-ins for related products and business models on other media outlets. Existing mobile content aggregators can leverage their experience in partnering with carriers and content developers in order to secure a stable share of the value from mainly the on-deck service model.

The initial value propositions for these firms are likely to be the replication of their main business models based on their respective assets of user base, content and sales channels. As the current situation shows, mobile social media applications are primarily incorporated into the on-deck service models dominated by the carriers. There is no additional value generated beyond and above the revenues collected from carriers' billings on data plans and purchased content. Depending on the development of mutually complementary business models for both on-deck and off-deck services by the carriers, however, social and media service providers have the potential and flexibility of leveraging the indirect network effect across media platforms to develop new competence out of the current value sources. While their current mobile strategies are based upon and bounded by their existing capabilities and resources, these firms might choose strategic partners from the segments of handset manufacturers and technology enablers to identify new capacities and introduce innovative communication applications and participate in more efficiently coordinated value creation and distribution. For example, location information can be accessed by social and media service providers efficiently (at low cost) to provide innovative services to users, given that appropriate technology enablers can be engaged so that complementary value propositions from all these

parties can be made to carriers and other dominant actors in the value network [28].

3.3. Technology enablers

The structural analysis of the segment of technology enablers shows that chipmakers and software vendors dominate the functional organization of value creation in providing hardware and software support for application development. Chips are seldom sold as standalone products, and instead embedded in the handsets marketed and sold according to the supply arrangement between carriers and manufacturers. Therefore, chipmakers tend to focus on non-price rivalry strategies to ensure a high degree of interoperability among different communication protocols and software integration among multiple platforms. Similarly, as most mobile devices are shipped with licensed and pre-installed operating system, software vendors do not have a salient price rivalry strategy to differentiate their value propositions. Instead, they often compete on the economies of scale and scope on both the supply and demand sides. On the supply side, vendors may leverage their advantages in the large installed base for related products on multiple platforms, in the technical and personnel resources for mass-level software development, and in the experience in managing relationships with customers and developers. On the demand side, vendors may take advantage of the high adoption or acceptance of particular software products by a wide range of users of various devices, and lock users to related proprietary products on the mobile platform. In other words, software vendors, like chipmakers, aim to maximize the value of their products by achieving a higher degree of integration between the mobile platform and their existing product lines. But unlike chipmakers, software vendors have yet to prioritize a high degree of interoperability among the standards and configurations of their rival products.

The value propositions for the mobile social media value network from the technology enablers are based on the integration among their cross-platform products and the extension of their existing business models. For example, the Office suite products for Microsoft, advertising for Google, server support for Sun Microsystems and WiMax technology for Intel, are all the likely entry points for these firms to bring their capabilities in elastic pricing, demand assessment and supply chain management to the value network. But as their hardware and software products need to be bundled with handsets, the functional roles for technology enablers will still be shaped by the conduct of handset manufacturers in coordinating

complementary on-deck and off-deck service models with the carriers.

3.2. Handset manufacturers

As value is created and distributed among the whole value network of mobile social media services, the outcome of such off-deck strategic coordination by carriers for consumer welfare and service innovations relies on the rivalry conduct of players in other functional sectors to provide complementary knowledge and competence. Handset manufacturers hold a unique position of efficiently providing value-added mobile devices bundled with either standalone or carrier-supported services. In the U.S., such advantages are usually delimited by the cross-subsidization, interface and feature customization and lock-in practices that carriers impose. As a result, handset manufacturers currently engage in a limited range of price and non-price rivalry strategies. Specifically with regards to non-price rivalry strategies, firms have mainly focused on customizing the appearance and multimedia functions of handsets to appeal to different demographics (and engage in price discrimination accordingly by way of carriers' sales channel). They have avoided differentiation strategies that innovate communication-related functionalities because of the potential collision with carriers' service models [10], until recently. The iPhone by Apple, however, provides an example of how handset manufacturers could differentiate themselves and create value by leveraging their capabilities in hardware and software design as well as their competence in sales of digital content to contribute service innovations complementary to both on-deck (visual voicemail) and off-deck (Google maps, iTunes) models from the carriers. As a result, manufacturers actively participate in the creation of new value from the integration of each firm's competence in network and content services. Rather than rely on the allocated shares of revenue streams from existing carrier-centric business models, manufacturers such as Apple have contributed to the efficient coordination of the capabilities dispersed across segments in the mobile value network. Such partnerships between manufacturers and carriers, in which efficiency is pursued in complementary business models for multiple functional segments, are likely to be increasingly adopted by other major handset manufacturers.

3.1. Carriers

In the wireless carrier sector, the largest chunk of investment is placed in the acquiring of radio spectrum

as well as the installation, maintenance and upgrade of wireless network infrastructures [25]. To maximize the returns on these investments, wireless carriers are obliged to increase the average revenue per user (ARPU) while reducing the churn rate as much as possible. In the U.S., price rivalry strategies are mainly in the form of discriminatory pricing for long-term subscriptions to different tiers of usage of both voice and data services. Voice service is offered and priced as monthly plans with varying quota of peak-time air minutes, which are often supplemented with unlimited off-peak-time air minutes. Data services are offered on both an a la carte basis where consumers pay for each use or on a monthly package basis with normally capped maximum usage.

In comparison, the non-price rivalry strategies for wireless carriers include technology differentiation and upgrade, quality of service, device and application differentiation and service innovation. In the U.S., four national operators are currently equally divided between two major network technologies. But as they upgrade their networks to provide higher data rate and more bandwidth, such differences in the network standards might get blurry. A higher degree of interoperability might become a convergent rather than rivalry strategic goal for carriers. Quality of service might be differentiated among carriers in terms of the technical quality of voice and data services and business-related issues such as billing and customer service.

Whereas multiple rivalry strategies are attempted by the major carriers, differentiation particularly in the network transport services tends to blur, as evidenced by the adoption of Long Term Evolution (LTE) as the fourth-generation (4G) network standard by both CDMA and GSM operators, and the recent introduction of the unlimited calling and data subscription plans (at the same price of \$100 a month) by all U.S. carriers. In the provisioning of content-centric services such as mobile social media applications, in comparison, carriers still tend to rely on on-deck portal strategies for service differentiation. The on-deck portal strategies are so called because carriers serve as the portal gateways by customizing the handset and the user interface for the delivery of media content and controlling the pricing, billing and revenue sharing for the content service on top of the network transport service (i.e. charging for both transmitting the data and delivering the content) [6]. The differentiation strategies for on-deck portals sometimes include exclusive deals on branded content and handsets with distinct appearance and functionalities. At the same time, carriers often tend to adopt rivalry strategies based on pricing and service models for content-centric services, offering

consumers different ways of retrieving, using and storing mobile content and applications at different prices [26]. Carriers are able to more directly gauge the consumer demand for certain services to elastically adjust the service offering, and leverage their competence in network transport services to provide the value-added mobile data services more efficiently, based on the supply conditions such as network bandwidth and security as well as handset capacities.

While these on-deck portal strategies are often attacked as the carriers' firm control over the walled garden, the off-deck approach implied in the open mobile platform initiative can actually be viewed as nothing but a derivative amendment to carrier's overall content service strategies. The central issues remain to be the pricing and servicing models that differentiate carriers in the mobile data service market [6, 27]. From the perspective of consumers and advocates, an open off-deck model would provide a wider range of mobile social media services in more flexible ways of access, retrieval and billing. But for carriers, the issue is how to efficiently maintain pricing elasticity, provide value for consumers, and assess user demand in the provisioning of diverse and low-cost mobile social media services. In other words, carriers are still in the process of exploring the best combination of strategic moves for an off-deck model that will supplement, rather than replace, a competitively efficient but not effective (in terms of user adoption and revenues) on-deck service infrastructure for convergent mobile data services [28].

3.5. Behavioral implications

The above analysis shows that the carrier-centric on-deck business model, intended by carriers based on the market and technological externalities in the wireless network sector, has not adequately achieved equilibrium and maximized value in the current mobile social media value network. This market imperfection leads players in the value network to seek disruptive revenue streams from the off-deck alternatives, creating disequilibrium in the network and arousing debates about the open mobile platform. Early examples have been set by the mutually complementary and beneficial partnerships between handset manufactures and carriers aimed at perfecting off-deck models and improving on-deck models. But many more efforts are needed from players from all functional segments to identify relevant indirect network effects from multiple two-sided market transactions, and develop complementary competences to create innovative mobile social media services. While carriers and handset manufacturers will continue

holding the dominant position in the value network, both incumbent player or upstarts from other functional units can still aim for the equilibrium in the overall market by bridging mutually beneficial capabilities, merging compatible business models across functional segments, and adding new value to the network.

4. Performance of the mobile social value chain: consumer welfare and service innovations

The performance of a market can be evaluated with the social welfare that it achieves, which, from a purely economic perspective, includes the consumer surplus and profit margins for firms [29]. In other words, a market would be successful if consumers could purchase goods or services at a bargain and firms could provide these goods or services at a margin. This situation would be achieved with equilibrium in a competitive market, where services are provided and consumed efficiently based on balanced, fair and voluntary exchange of information on input and output, supply and demand, and resource and production. In a networked marketplace with extensively fragmented externalities such as the mobile social media value chain (or network), it is theoretically impossible to achieve all these desired outcomes for a competitive market [30]. Furthermore, incompatible or even competing choice factors in each segment of the value chain make it a slow and delicate process to bring innovations into the marketplace and create new value [31].

Currently, the mobile social media service market generates only a small volume of revenues for wireless carriers (which in turn results in a smaller revenue share for players joining in the on-deck services as a business experiment). Despite the optimistic estimates, user adoption and market valuations of such services remain relatively low in the U.S. [8, 18]. As a result of this suboptimal situation, advocates of the open mobile platform have blamed the carriers for abusing their control over device and content portals to prevent mobile users from accessing a wider range of content and applications [10]. This accusation, however, needs to be evaluated with a more careful analysis of the structure and market behaviors in the whole value network.

The market imperfections as a result of the networked value relationships in a connected marketplace suggest that one should avoid basing the discussion and assessment of consumer welfare and innovations in an open mobile platform solely on the structure and conduct of one market segment. As much

as the anticompetitive behavior of carriers is not the only cause for failure in the mobile data service market, simply opening up cellular wireless network would not be its remedy or solution. As the previous analysis reveals, the structure and market conduct of each functional component in the mobile social media service value network need to be examined to understand how value is created, and how the imbalance and incompatibility in market structure and capabilities across segments in the value chain might influence the overall market efficiency. The current debate about the anticompetitive behavior by carriers in terms of opening up the mobile network can be framed as one about the market disequilibrium. This situation happens as a result of the conflict among different value propositions held by actors based on the capabilities and externalities in their unique functional segments for furnishing either content or network transport services. Inefficiencies occur, when the convergence of content and network services in the mobile social media market requires that various value propositions be coordinated and new competences be identified in aggregation of two-sided markets and multilateral value relationships in the value network.

This is an economic problem that should be solved with measures that a) aim for a competitive market structure in each functional unit of the mobile value network to prevent anticompetitive behavior in any component of the value creation process and ensure a smooth and balanced flow of supply and demand of capabilities across the network, b) encourage coordinated innovations in pricing and service models between functional segments in ways that are mutually beneficial for leveraging their respective capabilities and resources, and c) preclude collusive behavior between structural dominants in any functional units that inhibits cross-segment innovations in pricing and service models. To ensure the performance of the mobile social media value network, the structure and conduct in each functional segment need to be made conducive to the efficient provisioning of innovative and low-cost applications for consumers and the maximization of value for the whole network. This might require a mix of both market power and regulatory coordination, but it by no means can be achieved only by opening carrier's wireless networks to any random devices and applications.

The performance of the mobile social media value network can also be analyzed with comparisons vertically with parallel value networks such as the internet and horizontally with the markets in other countries. Indeed, advocates of the open mobile platform have used the example of carterphone regulation to argue that the openness to third-party devices and applications in the sector of network

operator alone would promote innovations and enhance consumer welfare. Furthermore, there is the argument that the principles of network neutrality on the internet should be applied to the wireless mobile networks. As a result, third-party devices and applications should not be discriminated against and consumers have the freedom to access them over a “dumb” mobile network [10, 32]. Among the many lines of argument in the debate over the economic merit of network neutrality regulation, two points can be applied in the assessment of the performance of the mobile social media service value network. The first point is focused on whether it makes economic sense for monopolistic actors on the network level to adopt anticompetitive behavior in an adjacent market such as the application level of the internet [e.g. 33, 34]. The second point deals with the balanced view on both the social opportunity cost for consumers to be denied third-party applications and the real cost for carriers to furnish both network and value-added data services [35]. Without getting into theoretical detail and sophistication, these two lines of discussion can simply be applied as points of reference in the context of mobile social media value network. Such cross-references show that the analysis of its market performance needs to above all consider the economic interaction in the form of complementary service and pricing models between actors from multiple levels or segments of the value creation process. A second metric should then be based on how the efficiency is achieved by providing value-added services to consumers at low cost while maximizing the return for firms. More empirical evidence, however, would be required to discover the applicability of these dimensions of performance metrics for both the internet and the mobile social media value network.

On a horizontal level, both success and failure in the rollout of mobile data services on a global level can be used as references to consider the case in the U.S. context. Despite the tight control by the Japanese carrier NTT DoCoMo over a relatively closed network, i-Mode, for example, has been a runaway mobile service model since its launch in 1999. It has provided a wide range of social and media services to millions of paying subscribers in Japan and turned the Japanese carrier into a global wireless powerhouse. Among the many factors that contributed to its success, NTT DoCoMo has above all partnered with technology vendors to customize a special version of HTML language (cHTML) to ensure a high degree of interoperability and compatibility between the mobile and fixed web service infrastructures, successfully merging its wireless network capability with the market competence and knowledge of a broad group of web-based content providers. It then managed to

maintain a complementary balance between the on-deck model (in which the “official” partner service sites are listed and endorsed) and the off-deck model (in which the unapproved service sites are listed but not endorsed), encouraging service innovations among the segment of content providers while holding on to flexible pricing and billing schemes for both these service providers and subscribers [36, 37]. Although NTT DoCoMo became the monopoly in the carrier segment, it was able to reach across the different functional units of the value ecosystem and maintain the decentralized structure in the content provider segment. As a result, it combined its capabilities in network service with those of a wide range of content providers to develop new value-added service models. The key to the success of i-Mode, in short, is its competence in developing complementary service and pricing models that fully engage the capabilities and resources of all major functional units in the value network.

While the efficient provisioning of reliable network transport service is important in the carrier sector, the wholesome competition and service innovation in the sector of providers of various information, financial and entertainment services play an equally vital role in the success of iMode. In Sweden, the mobile data service is surprisingly stagnant for a global communication market leader. It is believed that the lack of the dominant coordination of the value network by carriers has resulted in insufficient guidance and stimulation for the search for complementary competence and solutions from the sectors of information service providers and technology enablers [38]. The cases of i-Mode and Sweden, in general, show the importance of analyzing the performance of a mobile service value network with a holistic perspective on the structure and conduct of all the functional segments. Arbitrary judgment of the mobile market performance based on the condition of the carrier sector should be avoided, and instead a more flexible perspective on the mobile value chain as an ecosystem network should be attempted.

5. Conclusion

This article has tried to show that the debate about the open mobile platform should be based on a careful economic analysis of the structure and conduct of all the likely players in the entire value network for provisioning mobile services on an open mobile platform. In addition to its social and ideological values, advocates for consumer welfare and innovations on the open mobile platform need to give sufficient attention to the economic definition, conditions and consequences of the accomplishment of

social welfare for both consumers and firms. Understanding the economic rules of the mobile social media value network, one would have a clearer idea about how innovative mobile services can be efficiently provided as a result of the coordinated value propositions among the market players based on the externalities for achieving efficiency with their unique competence and resources. These are the necessary knowledge for one to join the discussion on the social externalities of service innovation and user welfare in the mobile field and make meaningful observations and comments.

References

- 1 Bain, J.S.: 'Industrial Organization' (Wiley, 1959. 1959)
- 2 Martin, R.: 'Google Unplugged: gPhone Or Not, Google's Going Mobile', *InformationWeek*, 2007, (1156), pp. 19
- 3 Vogelstein, F.: 'The Untold Story: How the iPhone Blew Up the Wireless Industry', *Wired*, 2008, 16, (2)
- 4 Broadcast Engineering, T.: 'Choking off innovation', *Broadcast Engineering*, 2007, 49, (5), pp. 10-10
- 5 Lawton, G.: 'US cell phone industry faces an open future', *Computer*, 2008, 41, (2), pp. 15-18
- 6 Wireless Business Forecast: 'A Tale of Three Models: Can Off-Carrier Strategies Work?', *Wireless Business Forecast*, 2005, 13, pp. 1
- 7 Wieland, K.: 'Walled gardens come tumbling down', *Telecommunications*, 2007, 41, (9), pp. 16-18
- 8 Stross, R.: 'When mobile phones aren't truly mobile', *New York Times*, 2007, (BU.3)
- 9 Noam, E.M.: 'Access of Content to Mobile Wireless: Opening the "Walled Airwave"', in Groebel, J., Noam, E.M., and Feldmann, V. (Eds.): 'Mobile Media: Content & Services for Wireless Communication' (Lawrence Erlbaum, 2006)
- 10 Wu, T.: '[Special Section on Net Neutrality] Wireless Carterfone', *International Journal of Communication*, 2007, 1, (1), pp. Available: <http://ijoc.org/ojs/index.php/ijoc/article/view/152/196>
- 11 Lugano, G.: 'Mobile Social Software: Definition, Scope and Applications'. Proc. EU/IST eChallenges Conference, The Hague, The Netherlands 2007 pp. Pages
- 12 Lugano, G., and Saariluoma, P.: 'To Share or Not to Share: Supporting the User Decision in Mobile Social Software Applications', *Lecture Notes in Computer Science*, 2007, 4511, pp. 440-444
- 13 Terdiman, D.: 'MoSoSos, Not So So-So', *Wired*, 2005, 15
- 14 Feldmann, V.: 'Leveraging mobile media: Cross-media strategy and innovation policy for mobile media communication' (Physica-Verlag, 2005. 2005)
- 15 Medford, C.: 'YouTube Mines Mobile Gold', *Red Herring*, 2008
- 16 Richtel, M.: 'YouTube Coming Soon to Cellphones', *The New York Times*, 2006
- 17 Toivonen, S.: 'Web on the move: Landscapes of mobile social media', in Editor (Ed.)^(Eds.): 'Book Web on the move: Landscapes of mobile social media' (VTT Research, 2007, edn.), pp. Notes 2043
- 18 McCarthy, C.: 'The mobile social: Not ready for prime time?', in Editor (Ed.)^(Eds.): 'Book The mobile social: Not ready for prime time?' (Cnet, 2008, edn.), pp.
- 19 Hearn, G., and Pace, C.: 'Value-creating ecologies: understanding next generation business systems', *Foresight: Journal of Future Studies, Strategic Thinking and Policy*, 2006, 8, (1), pp. 55-65
- 20 Peppard, J., and Rylander, A.: 'From Value Chain to Value Network: Insights for Mobile Operators', *European Management Journal*, 2006, 24, (2), pp. 128-149
- 21 Buellingen, F., and Woerter, M.: 'Development perspectives, firm strategies and applications in mobile commerce', *Journal of Business Research*, 2004, 57, pp. 1402-1208
- 22 Barnes, S.J.: 'The mobile commerce value chain: analysis and future developments', *International Journal of Information Management*, 2002, 22, pp. 91-108
- 23 Pil, F.K., and Holweg, M.: 'Evolving from value chain to value grid', *MIT Sloan Management Review*, 2006, 47, (4), pp. 72-98
- 24 CTIA: 'Semi-annual Survey', in Editor (Ed.)^(Eds.): 'Book Semi-annual Survey' (CTIA, 2007, edn.), pp.
- 25 Sabat, H.K.: 'The Network Investment Economics of the Mobile Wireless Industry', *Information Systems Frontiers*, 2005, 7, (2), pp. 187-206
- 26 Nairn, G.: 'Big challenge as interests collide', in Editor (Ed.)^(Eds.): 'Book Big challenge as interests collide' (2004, edn.), pp. 1
- 27 Wireless Review, A.: 'Knocking down the content garden walls', in Editor (Ed.)^(Eds.): 'Book Knocking down the content garden walls' (2005, edn.), pp. 24-29
- 28 Methlie, L.B., and Gressgard, L.J.: 'Exploring the relationship between structural market conditions and business conduct in mobile data service markets', *Journal of Electronic Commerce Research*, 2006, 7, (1), pp. 14-27
- 29 Shy, O.: 'Industrial Organization: Theory and Applications' (MIT Press, 1996. 1996)
- 30 Wilkie, S.: 'Economic policy in the information age', *Engineering and Science*, 2001, 1, pp. 28-36
- 31 Chakravorti, B.: 'The Slow Pace of Fast Change: Bringing Innovations to Market in a Connected World' (Harvard Business School Press, 2003. 2003)
- 32 Thierer, A.: 'Are "Dumb Pipe" mandates smart public policy: Vertical integration, net neutrality, and the network layers model', *Journal on Telecomm & High Tech Law*, 2004, 3, pp. 275-318
- 33 Yoo, C.S.: 'Beyond Network Neutrality', *Harvard Journal of Law & Technology*, 2005, 19, (1), pp. 2-78
- 34 Van Schewick, B.: 'Towards an economic framework for network neutrality regulation', *Journal on Telecomm & High Tech Law*, 2006, 5, pp. 329-392
- 35 Frischmann, B.M., and Van Schewick, B.: 'Network neutrality and the economics of an information superhighway', *Jurimetrics*, 2007, 47, pp. 383-428
- 36 Barnes, S.J.: '"Big in Japan" - iMode and the mobile internet', *Journal of Information Technology Theory and Application*, 2001, 3, (4), pp. 27-32

37 Natsuno, T.: 'i-mode: Value Chain Strategy in the Wireless Ecosystem', in Austin, R.D., and Bradley, S.P. (Eds.): 'The Broadband Explosion: Leading Thinkers on the Promise of a Truly Interactive World' (Harvard Business School Press, 2005)

38 Lindmark, S., Andersson, E.J., Bohlin, E., and Johansson, M.: 'Innovation system dynamics in the Swedish telecom sector', *Info - The journal of policy, regulation, and strategy for telecommunications*, 2006, 8, (4), pp. 49-66