

Telecommunications Competition in a Consolidating Marketplace

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with

Opening the “Walled Airwave”

by Eli Noam



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The logic of the layered approach to regulation is that business and policy approaches that have been used for other communications media become more relevant than under a separated “silo” approach. This logic is true as we look at the future of mobile wireless. As long as mobile telephony was used primarily as a fancy cordless phone for voice calls, it could occupy a separate niche, with its own policy approaches. This approach worked reasonably well—although the mobile wireless industry in the United States has not exhibited quite the same dynamism as that of the mobile sector of several other advanced countries, or of the Internet.

In the United States, government if anything often has been the brake, not the engine. In the emerging third generation of wireless, U.S. policy again is slow and uncertain. Less spectrum is allocated in the United States for cellular use than in Europe or Japan. Allocation of spectrum has been a near-farcical process of bargaining among entrenched industries and bureaucracies. Fortunately, the Europeans and Japanese have encountered problems of their own that permit us to pretend that we have engaged in a process of grave policy deliberation, instead of simply being unable to get our house in order. We should also note that one of the main problems Europeans have encountered is caused by the auction with up-front payment process, a successful U.S. export that had received the eager attention of European budget officials.

The major problem with the emerging wireless environment is that it is vertically integrated in ways that have become unthinkable in other media. Could one imagine a telephone carrier that can limit user access to its own Internet portal that can select the accessible websites that can control the type of telephone equipment its users are attaching and the software that these users are downloading? These limitations have not been particularly noticeable in the past, when cell phones could be thought of as some kind of advanced cordless phone

for the car. Cell phones, however, are becoming much more than that, for more people, and more like computer terminals on the go.

Each of these setbacks can be explained. Collectively, they raise the question of whether we are proceeding with the right strategy or whether we have the fundamentally wrong approach. It is rare to find European telecommunications policy being more pro-openness and pro-consumer choice than American policy,² but this situation is the case for wireless communications.

American telecommunications and information policy has been at its strongest when it focused on consumer choice and lowering of entry barriers. This approach translated to a willingness to let control over communications shift from the core of the network to the periphery and for the core of the network to be competitive. The Internet is the classic manifestation of this philosophy. Its success—in contrast to government-sponsored, centralized, PTT-driven videotex operations such as the Minitel, BtX, Captain, Prestel, and so forth—has demonstrated the fundamental strength of this model.

Therefore it is regrettable that the FCC apparently has not applied the lessons from past successes to wireless. It is never too late, however. A new crew is at the oars and tiller, and the Commission might take a new look before it becomes responsible for yet another \$20 billion or more in forgone future benefits.

The main characteristic of the wireless business is that the customer is a contractual subscriber who is served horizontally by a wireless carrier that provides a full bundle. The carrier:

- Selects, markets, and approves the customer handset and connects it to its network;
- Provides, selects, and adopts many of the features, capabilities, and content resident on the handset;
- Operates the wireless portion of the communications path;
- Operates or provides the local fixed-line distribution;
- Operates or selects the long-distance carrier;

- Selects, for areas in which it does not provide service itself, a partner mobile carrier that services the subscriber, at rates negotiated and billed by itself;
- Provides software defined functionalities on the network;
- Selects and approves services resident on the network and provided by itself or by third parties; and
- Controls access to a radio portal, and its content and features, by the providers linked by that portal, as well as the placement of these links.

One can readily recognize issues that have bedeviled fixed-line telephony and cable television. Among the issues that can be identified with this arrangement are the following:

- Reduction or lack of customer choice in applications and content;
- Reduction in innovation of service provision as a result of the closed nature of the applications and software that can be offered by third parties;
- Absence of choice for customers to use, where more advantageous, alternative wireless arrangements are possible, such as wireless LANs, other carriers for roaming, or stronger signals of another carrier;
- Market power with respect to vendors of m-commerce (mobile commerce) and requirements on such vendors to become business partners;
- Selectivity over content, which would be particularly troubling if the wireless medium were to become a mass medium with video, audio, and text; and
- Carriers can prevent intercarrier transfer of instant messaging.

This arrangement resembles the “walled gardens” of some Internet portals provided by cable companies but potentially goes far beyond that scheme. One can term this arrangement the “walled airwave” system.

Absence of Convenient Choice Among Different Types of Wireless Services

In the past, cellular phone service constituted an end-to-end service, separate from other services. Other wireless services also are being offered, however. Paging has long been a widespread service, and smart paging via narrowband PCS (personal communications service) has gained increasing popularity. An example is the BlackBerry pager for always-on e-mail. Some of these services are being offered on cell phone terminals—but only using the cellphone frequencies, as opposed to being allowing switching to the service provided by another paging company. Furthermore, a cell phone terminal could be used directly as a terminal for a cordless phone at home or at the office, without going through the wireless network. Similarly, it could be used as a “walkie-talkie” between several other cell phones in a neighborhood, again without going through the network. (Nextel provides this popular feature for its own subscribers.) It could be a terminal to the type of data services pioneered by Ricochet. The cell phone terminal also could bypass the wireless network through wireless local area networks (WLANs). The cell phone terminal could be used as a radio receiver for broadcast programs, a scanner for police frequencies, an advanced pager, a ham radio, a marine radio, and so forth. It might be used in a peer-to-peer fashion, bypassing carriers altogether. It is time to think of what we now call the cell phone handset as a future general multi-purpose wireless terminal—not as an end point of a specific wireless network but as the starting point of use applications, using whichever wireless system fits best.

Approval of handsets by carriers and by the FCC is a two- or even three-stage process. The FCC (and similar regulatory bodies elsewhere) issues specifications regarding the radio (RF) and health aspects (SAR) of equipment. A second stage of approval involves the air interface standards that govern transmission from the handset to the base station, such as CDMA (technical standard IS 95), TDMA (IS 136), I-Den, and GSM. These standards are set by a variety of manufacturer-driven groupings. The decision about whether to approve a particular handset for connectivity, however, lies within the discretion of the carrier

because that carrier is entirely free, in the United States, made the FCC's PCs tales to select its standard. In Europe, by contrast, any equipment that complies with GSM specifications will be connected to the network. There is no carrier discretion. In the United States, the Cellular Telecommunications Industry Association often certifies a manufacturer's equipment to the industry, but each carrier can add its own requirements and flavor of specifications. As a consequence, large carriers also test and approve equipment for connection to their networks. Hence, mere adherence by a manufacturer to the standard specifications in the United States is not enough. The manufacturer also must find favor with the carrier. There is no right to use equipment to connect to a cellular network.

The handset makers also tend to be major suppliers of network equipment. Manufacturers would not lightly put used equipment into the marketplace that would be disfavored by the carriers as threatening their basic business by facilitating access to services such as WLAN that compete with the business of their best customers.

Implications for Public Policy

The foregoing section identifies the potential for real problems. Recognition of such issues does not mean, however, that regulatory approaches are needed. Vigorous competition among mobile carriers could overcome most issues and generate unbundling through market forces. At the same time, the ability to exercise market power with respect to mobile commerce providers or wireless LANs might be common to all mobile providers and more profitable than a more open system. In such a case, market forces might not lead to unbundling.

The knee-jerk response to the problems identified above is that competition will take care of it. Suppose, however, that carriers would be consistently worse off by offering consumers the choice of moving easily around to other carriers or service providers. Such competition would reduce prices and profitability. On the other hand, it would grow the market. It is quite likely, however, that each carrier would be better off servicing a less-competitive slice of a smaller market, rather than engaging in greater competition in a larger market.

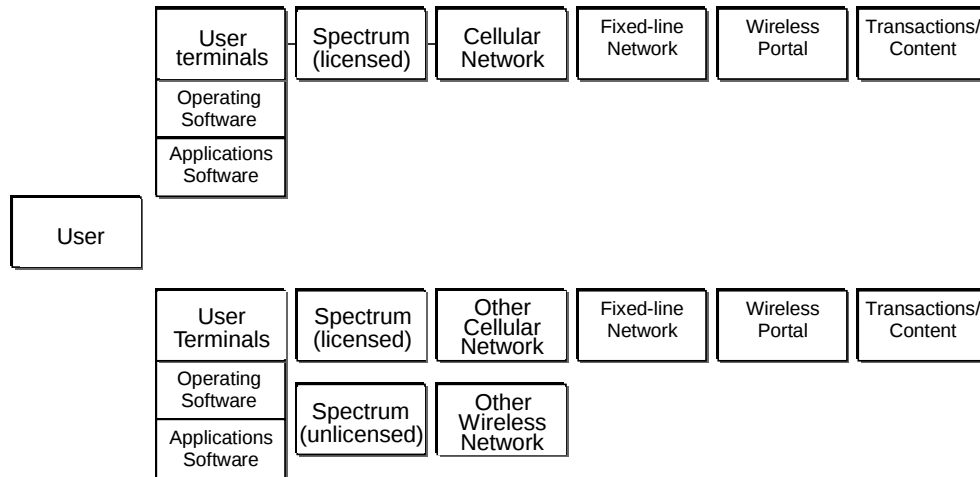
It is not clear why a carrier A would be the first to offer such choice to its customers. After all, it would provide an exit to its own customers, without a potential compensating gain from the customers of carriers B and C. The main reason would be to hope that enough users of carriers B and C switch their subscriptions to A in order to have the choice of not using A. This hope can hardly be a strong selling point. Furthermore, any choice requires the consent and cooperation of B and C, which might not be forthcoming once they realize that they are opening the door to a mutually destabilizing competition. They will be concerned with reputation effects if they are blamed in users' mind with poor performance caused by an element not under their direct control. They also might be able to use bundling as a way to price discriminate, as George Stigler has pointed out in a different context. The likelihood of oligopolistic behavior within a small group of carriers is high. As the number of competitors shrinks, each has less to gain and more to lose by maverick behavior. It also is an inhibitor for any software developer to take initiatives for new applications if the market is largely closed, which further reduces the attractiveness of any nonconforming behavior by a carrier.

Where market forces do not work, would regulation?

A schematic view of an unbundled wireless network environment is provided in Figure 1. It shows, at each stage of the chain of wireless provision, alternative providers. We conclude that only one factor—openness of the terminal equipment to access multiple providers of wireless services and providers—is critical. (A subsidiary second opening—unlicensed spectrum—would support such policy but is not essential).

Separation of the User Equipment (UE) From the Carrier

Such a policy would simply be a “Carterfone” policy for users' wireless equipment. Following *Carterfone*, the FCC permitted users to attach equipment chosen by themselves to the telecommunications network. Although the carrier could still offer and market its preferred equipment, it could not exclude other equipment as long as that equipment conforms to certain technical specifications pertaining to the RF transceiving function and nondiscriminatory industry specifications for air interfaces standards. These specifications could not close equipment third-party applications or

Figure 1

access to other network protocols offered by other types of providers, as long as it conforms to the FCC's new and constructive rules on software-defined radio. Although a carrier could offer a fully bundled service as before, the carrier could not prevent a user from selecting another wireless service provider for any given call or using the equipment for other communications purposes.

The significance of such an arrangement is that equipment will be offered by the market that adds features and, more important, permits a user to select service providers depending on circumstances. For example, a user in a shopping mall, campus, office building, or airport could connect to a wireless LAN. A user encountering a circuit busy could switch to another carrier. A user seeking to receive synchronous music, radio style, could do so by accessing a specialized broadcaster.

This choice would reduce the need for most other access requirements because the user would not be tied to a single carrier with significant costs of switching to another. This arrangement is partly embodied in the GSM standard, which provides some user selectivity over carriers, although approval of such alternatives remains with the primary carrier, which also handles the billing.

This approach would be similar to that adopted by the FCC for customer premises equipment following the *Carterfone* decision in 1968. The approach followed Cassandra warnings of impending network chaos, but it has worked spectacularly well.

Access to Unlicensed Spectrum

The key source of leverage for carriers is the high entry barrier for new and future entrants in service provision arising from the spectrum auctioning system with its advance payment feature. Given the difficulty in freeing additional spectrum and the high cost of acquiring it, it seems unlikely that there would be new entrants emerging to challenge the reduced group of carriers. Therefore, government should provide adequate spectrum on a license-free basis, with users and service providers paying for usage rather than for ownership, in the way that users pay for the use of highways through tolls and gasoline taxes. This has been developed in detail by the author in other papers.³

Once such spectrum is available, and once users' terminals can access service providers such as WLANs operating on such spectrum, users will not be constrained by the limited choice of perhaps four cellular carriers that could still collectively be restrictive.

Conclusion

The focus of FCC policy has been to provide carriers with choice: in the utilization of licensed frequency, in the technical specifications of its service, in pricing, and so forth. There does not seem to have been a similar orientation toward choice for users—broadly defined as consumers and providers of various attached services. The implicit notion was that providing carriers with options and creating competition will serve users well. That approach certainly goes a long way. Yet carriers are likely to resist offering consumers the choice of moving easily around to other carriers and other types of wireless, portals, and content. Such competition would reduce prices and profitability.

The conclusion of the analysis is that the key point of openness, and arguably the only one needed, is openness of user equipment. With this openness achieved, the user would have alternative avenues to spec-

trum, content, portals, applications, software, and so forth. A secondary policy would be to assure alternative wireless pathways such as WLANs by providing an adequate amount of unlicensed spectrum.

Why is all of this important? The overall goal of the openness approach is to establish for the wireless environment the same dynamism as in the Internet, with its open access terminals—especially the PC—encouraging hardware and software innovation and applications. Cellular telephony is a dynamic sector right now, mostly because of the growth of penetration. Soon, however, this growth will plateau as universal wireless connectivity is approached. At that point, we will need the impetus for further innovation that a more open system provides. For carriers, the overall positive impact in terms of traffic generation may well outweigh some loss of control. For users, service providers, and technology developers, the advantages of openness might be significant.

American communications policy has fared best when it puts its faith in the dynamism of the periphery of the network, instead of seeking to strengthen the ability of the network core to dominate. Wireless is no exception. The mediocre results of policies focusing on the core, in contrast to those for other parts of the communications environment, suggest that a reorientation is in order. The key step now is to follow the opening set by the FCC for software-defined radio by a *Carterfone*-style opening to equipment that can access multiple wireless networks. With it we can leapfrog the “3G” model, with its carrier orientation, to a “4G” model patterned after the Internet.

Notes

1. This paper is an excerpt of the discussion paper, "The Next Frontier for Openness: Wireless Communications," prepared for the 2001 Telecommunications Policy Research Conference, October 26, 2001.
2. See Eli M. Noam, *Telecommunications in Europe*, Oxford University Press, 1988.
3. See Eli M. Noam, "Spectrum Auctions: Yesterday's Heresy Today's Orthodoxy, Tomorrow's Anachronism. Taking the Next Step to Open Spectrum Access," *The Journal of Law and Economics*, vol.XL1 part 2, pp. 765-790.