



# Device-Based Social Networking

With Microsoft's launch of its integrated Wi-Fi Zune™ digital media player, social networking took a visible leap forward. "Duets Are Better Than Solos," their ad copy says, and certainly many of today's most killer of applications involve the social sharing of increasingly sophisticated forms of media. Zune-to-Zune sharing capabilities, for example, provide a strong foundation for users to build shared experiences around music and video.

The phenomenon of "social networking" has long been percolating on the Internet with the vast success of a category of applications that help connect friends, business partners, or other individuals together using a variety of tools. Sites like Classmates, Facebook, Xanga, Bebo, Friendster, Tribe Networks, LinkedIn, Orkut, and MySpace (the last now boasting 45.5 million users and growing by an amazing 160,000 new users a day, according to MediaPost).

Social network theory (a term first coined in 1954) views social relationships in terms of nodes, which are the individual actors within the networks (which back then had nothing to do with Internet Protocol), and ties, which are the relationships between the actors. Apply that definition today and not only is it relevant for online social sites, but it is also an increasingly valid way to describe our socially shared use of connected consumer electronics devices.

## Devices That Connect

Device-based social networking (DBSN) is the natural evolutionary result of consumers having access to, and immediately wanting to share, vast amounts of rich media content in a variety of categories. DBSN is a digital instantiation of how socially interactive humans have always shared media that stimulates their senses. A person walking on a country road sees a pretty flower and immediately shares with a second person, pointing a finger and imploring, "Look!" She hears a bird singing, cups her ear, and demands to a friend, "Listen!" With DBSN, a person who is excited by a song or a video digitally points it out to a friend and digitally says the equivalent of "Look! Listen!" The unmistakable trend in electronics is that consumers increasingly expect their connected devices to integrate technological hooks into social networks, so they can behave in interactive ways that are simply natural to a species that shares.

The digital device-based social network also inevitably extends beyond the leisure domain of consumer media sharing. Much like email, instant messaging, and professional networking applications, DBSN stands to penetrate deeply into business applications like sales systems, workgroup tools, and collaboration applications where one-to-one and one-to-many sharing of all kinds of data is of value. The so-called

"Wikipedia effect" is also relevant to DBSN where user comments shared over DBSN devices will increasingly affect consumer and business purchasing decision making. Home automation nodes and information appliances are also easily envisaged in a DBSN, where instead of securely managing access to digital assets, biometric-based digital security can interactively authorize and track access to physical locations via DBSN devices.

But to successfully facilitate DBSN, the entire spectrum of consumer media devices must be able to seamlessly share and communicate in a fashion that facilitates, and does not technically impede, social networking. This means functional requirements like media processing, device-to-device communications, multifunction device capabilities, device-to-Internet networking, and increasingly sophisticated user interfaces must all be implemented in concert with the fashionably small size, easy to use, distinctive industrial design, and power-scrimping attributes of consumer electronics products that penetrate successfully beyond the geek domain.

All these functions, and all the required processing power, will dramatically affect the success of DBSN products. OEMs have to take a hard look at the interactive nature of their designs because the products that most easily and exhaustively enable DBSN are going to carry the day with consumers. But many of today's platforms do not yet possess the processing headroom or flexibility margin required to produce a blockbuster social networking product. Many have hardwired functionality that prevents them from producing the combination of adaptable and concurrent functions required to be a successful social networking device.

## Technically and Socially Integrated

The media-sharing challenges and e-commerce secure identity issues of DBSN also extend and add new requirements to digital rights management (DRM) computational requirements. The need to protect the identity of multiple devices arises in a DBSN world because information and content is now shared in an indiscriminating fashion with a social network that might easily (depending on the viral stickiness of the content) scale millions of nodes. Connectivity alone introduces complexity and heavy computational lifting, but the data sharing and social network membership management issues escalate processing requirements into new realms of application sophistication and concurrency.

It is crucial too to recognize that the "man-machine interface" (MMI), literally the connection between a DBSN product and its social networking user, must introduce a new and intrinsically human level of



transparency to the electronics, the communications, and the complex mechanics of sharing. The metaphorical goal is simply to point a finger and say, "Look!" DBSNers will not focus on, or fundamentally purchase technology, based only on functionality that seamlessly integrates into and enhances their lives. This marks a vital new level of challenge in the way developers integrate functionality and deliver that functionality to users—these products must be both technically integrated and socially integrated to succeed. The shift again places a new level of demands on both the amount of processing and the kind of processing these DBSN products will require.

Among other attributes, Analog Devices' Blackfin® processor was designed to facilitate flexible multifunctional user interface capabilities, easily integrating, for example, with the company's capacitive touch screen sensor. This would be a natural enabler for a digital picture frame, for example, that is part of a social network that includes a PC, a phone, and a digital camera. Such a networked picture frame would require processing support for authentication, connectivity, media DRM, and the multiformat display application itself. The signal processing and control processing of Blackfin combine to make highly integrated solutions with industry-standard interfaces, all designed specifically for applications like DBSN devices.

### Programmability for Universality

The challenges of DBSN device development require processing of Analog Devices' Blackfin processor's class, type, and caliber. The Blackfin processor, already well entrenched with developers of PMPs and Internet radio (the Roku SoundBridge™, for example, is a Blackfin-based social networking device that allows users to share playlists and publicly rate songs and stations) is a well-proven asset for developers facing the challenges of DBSN product design. The processor has been demonstrated time and again to be an ideal match for intensive media processing tasks, plus sophisticated control and user interface needs.

Up to this time, consumers have enthusiastically embraced the benefits of streaming media. But moving forward, the real excitement surrounds sharing media in real time. This means moving to a usage model where networking connection enables social interaction from a car, in a user's hand, or at home. And because fixed-function devices are limited by definition, the processors required to deliver these capabilities must be software programmable, optimized for network connectivity, capable of supporting rich media content, and thrifty on power consumption. Plus, the required universality of DBSN connections is an evolutionary challenge that can only be addressed by programmable, and therefore adaptable, upgradable, transformable devices. In the end, successful DBSN products will leverage software layers that create a social environment, facilitate social networking, and make each user's digital ecosystem easier to manage.

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