Point of View

Femtocells: Implementing a Better Business Model To Increase SP Profitability

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Today, many cell phone customers experience poor signal quality at home. Moving from room to room to avoid missed words, dropped calls, or web timeouts is now a common occurrence. To address this problem, many service providers (SPs) have introduced what are called "femtocells"—small wireless transmitters that allow cell phone usage in homes to flow over existing broadband connections such as DSL or cable.[1] Femtocells represent the next generation of coverage by giving customers a personal cell tower dedicated to delivering a much better mobile experience in the home.

Over the past few years, femtocells have moved from the lab to field trials, and more recently, to commercial rollouts. Sprint was first to market a femtocell in the United States with the company's AIRAVE product.[2] Verizon Wireless and AT&T soon followed with launches of Network Extender[3] and 3G MicroCell,[4] respectively. In Europe, Vodafone has reintroduced its femtocell offering, now called Sure Signal.[5] In addition, StarHub's HomeZone was the first femtocell product to be rolled out in Asia.[6]

Despite broad industry support, market reception for femtocells has been disappointing. This is surprising since, on the surface, femtocells offer benefits to both SPs and consumers. For SPs, femtocells promise to reduce network costs and improve business metrics such as customer retention rates and average revenue per user (ARPU). For consumers, femtocells offer lower monthly costs and a better mobile experience at home.

So, what is hindering adoption?

Customer Resistance

Femtocell offerings have been based on what the Cisco Internet Business Solutions Group (IBSG) calls the "Consumer Pull" model. This is where SPs ask consumers to invest in the femtocell device and / or pay a recurring monthly fee. Unfortunately, the recent recession has changed consumer behavior to the point where customers are not willing to spend more money to receive additional services. Cisco IBSG has observed that there is an implied limit to the amount SPs can charge for monthly mobile services. In an attempt to remain competitive, this has forced SPs to offer more minutes and data without increasing the price.

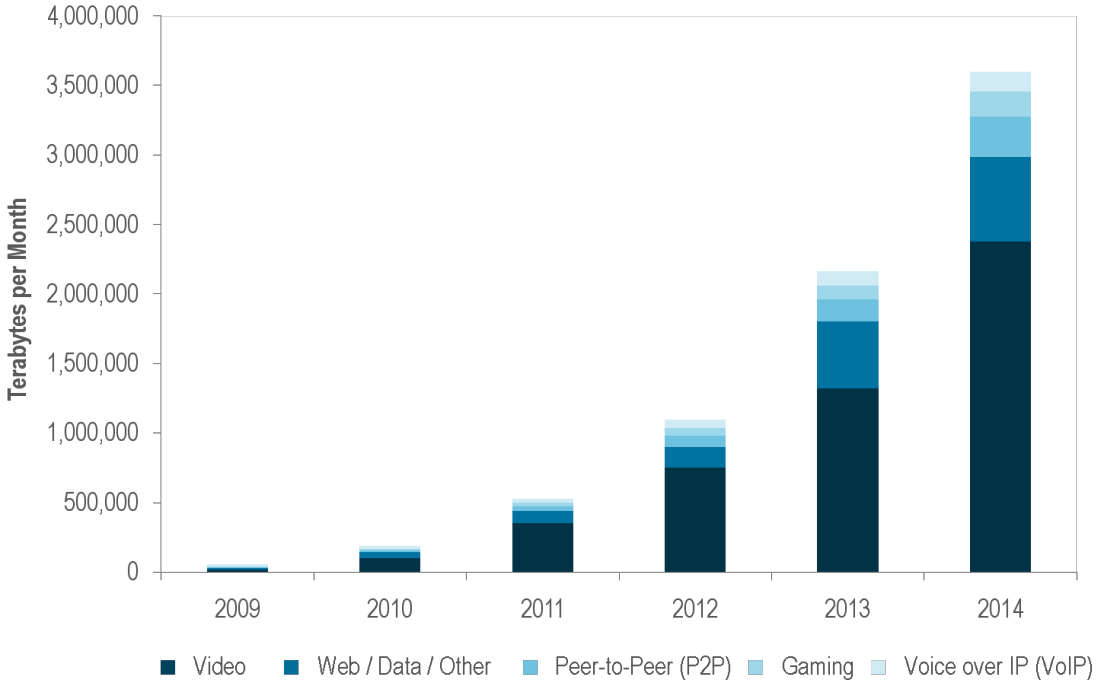
Given this scenario, consumers with poor mobile coverage in their homes will be more inclined to switch SPs rather than purchase an additional service from their existing provider. From the consumer's point of view, it is the SP's role to provide good coverage—whether in the home or on the road. Cisco IBSG believes the lack of a compelling value proposition for consumers is the main reason for slow femtocell adoption to date.

SPs Challenged by Traffic Growth

SPs are also facing significant challenges. Mobile voice and data usage is exploding (see Figure 1). In fact, Cisco forecasts there will be 3.6 exabytes[7] of mobile data traffic

per month by 2014. This represents a compound annual growth rate (CAGR) of 108 percent from 2009.

Figure 1. Global Mobile Data Projections



Source: Cisco Visual Networking Index, 2009

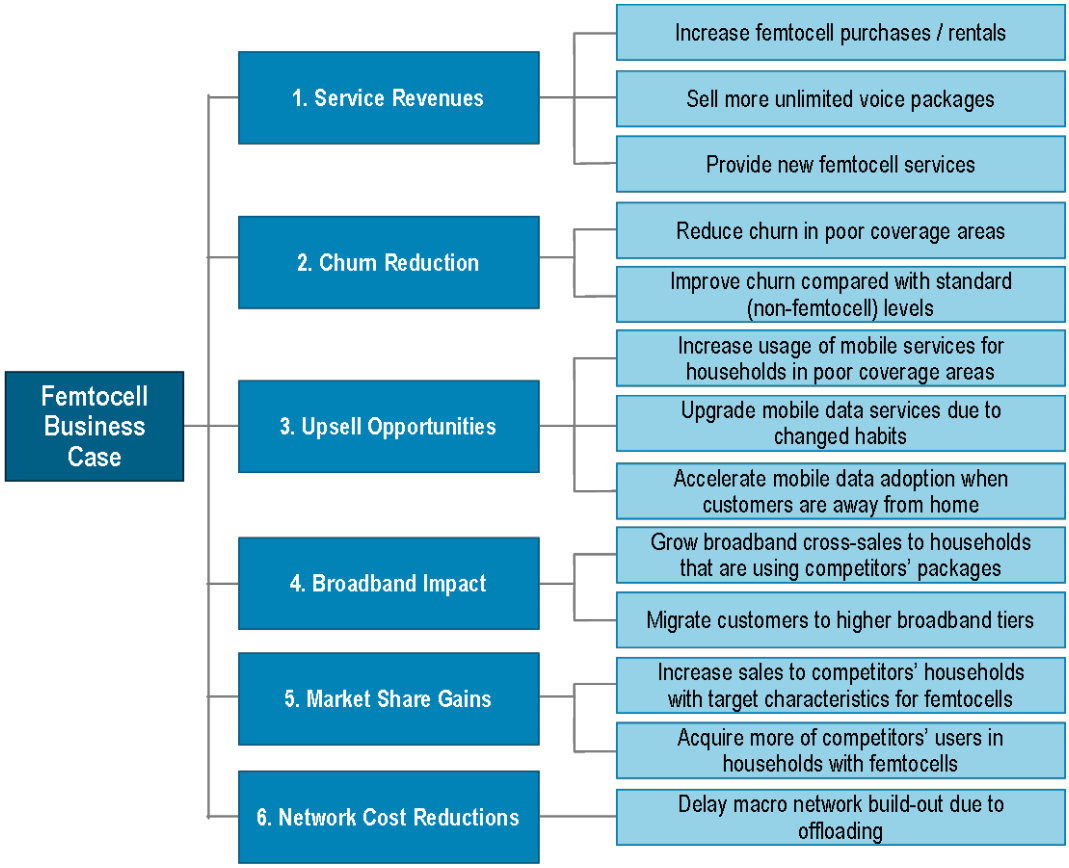
This rapid growth is taking place faster than most SP planners expected. Networks once thought to have sufficient capacity for years to come are quickly becoming overutilized. This is forcing SPs to revisit their forecasts and seek new ways to fund their investments.

In addition, much of this growth is not taking place where it was initially expected. In fact, according to the Cisco IBSG 2009 Connected Life Market Watch survey, 40 percent of mobile usage, including mobile data cards, is now occurring in the home. To accommodate this growth, SPs are trying to determine if they should continue to invest aggressively in 3G networks, initiate traffic blocking, impose quotas, raise prices, or even acquire additional spectrum capacity and cell sites.

Femtocells: Key to Increasing Profitability

Given the high cost and difficulty of implementing these approaches, femtocells represent a potentially attractive alternative to offload in-home traffic directly onto customers' broadband connections, thereby relieving the load on SPs' 3G networks. Moreover, femtocells can drive key financial indicators that further increase their attractiveness. Cisco IBSG has identified six major areas where femtocells can improve business metrics for SPs (see Figure 2).

Figure 2. Business Model Levers



Source: Cisco IBSG, 2010

1. **Service Revenues:** Service revenues can come in two forms. First, SPs can charge a monthly fee directly related to femtocell usage. And second, SPs can charge for new services the femtocell is helping to support.
2. **Churn Reduction:** Consumers, generally speaking, fall into three categories when considering the quality of mobile coverage in the home: 1) service is acceptable, 2) service could be better, and 3) service is unacceptable. For the latter two groups, a femtocell solution will likely increase loyalty by improving their perception of the service they receive. Orange in France, for example, has seen a 10 percent reduction in churn as a result of its femtocell service.
3. **Upsell Opportunities:** Due to the hassle and frustration of poor-quality calls, customers with substandard home coverage have likely limited their mobile phone usage and instead relied on PCs and fixed-line phones. With femtocells, these customers will increase usage of their mobile phones, giving SPs an opportunity to upsell additional services.
4. **Broadband Impact:** Broadband will be the sole transport mechanism for backhauling in-home wireless traffic to SPs. As a result, a small percentage of homes will need to upgrade their existing broadband plans to receive higher levels of service.

5. **Market Share Gains:** Because femtocells provide an improved mobile experience, household members that use a different carrier are likely to switch to the SP providing the best service. Additionally, new households may be more attracted to SPs that offer femtocells than to those that don't.

6. **Network Cost Reductions:** Because in-home wireless solutions represent a fixed cost per user with nearly unlimited usage, there is a clear breakeven point after which it is more cost effective to use a femtocell solution rather than build out a 3G network. The breakeven point is at approximately 500 MB per month of in-home usage.

A New Business Model Is Required

Given these potential benefits, why are SPs limiting adoption by forcing customers to purchase femtocell devices? For femtocells to reach their full potential, Cisco IBSG believes a new SP Push model is required where SPs fully subsidize femtocell devices and provide coverage to customers at no additional cost. The idea is to deliver a superior in-home experience as a way to improve overall business results.

To test whether the SP Push model could generate superior financial returns as compared to the Consumer Pull approach, Cisco IBSG engaged with a major mobile SP in North America. The findings from this work were then applied to a fictitious SP with 50 million mobile subscribers and a fixed broadband network. Cisco IBSG then tested a series of key inputs for both models and analyzed the results to determine which model produced the best financial returns.

For example, Cisco IBSG evaluated the level of subsidization and policies for receiving a free femtocell device (see Figure 3). The SP Push model assumed only select customers (based on a minimum household ARPU and data volume) would receive a 100 percent subsidy. In practice, this approach simulates a bundling strategy where femtocells are offered for free with certain high-end data plans or family packages.

Figure 3. Key Analysis Settings (Only Key Differences Shown)

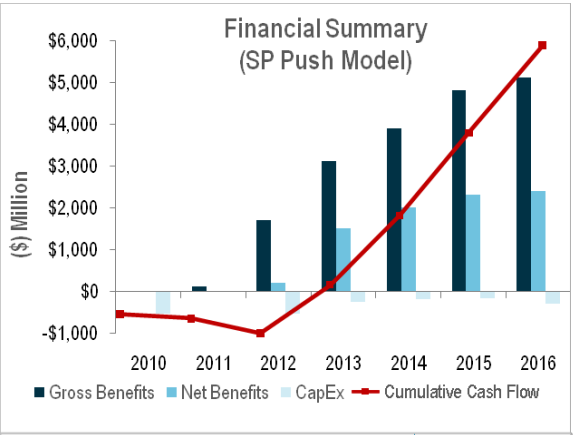
Key Settings	Business Model Settings	
	SP Push	Consumer Pull
Level of femtocell subsidization	100%	0%
Customer selection policy: voice usage	$80 per household per month	All households (no minimum)
Customer selection policy: data usage	1.8 GB per household per month	All households (no minimum)
Femtocell monthly fee	$0 per month	$10 per month
Additional fee for unlimited home calling	$8 per month	$5 per month

Source: Cisco IBSG, 2010

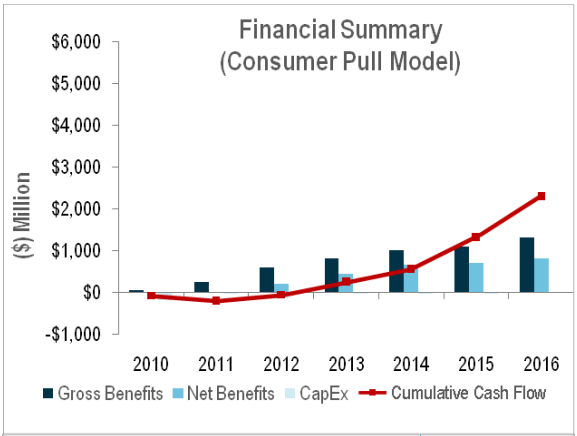
SP Push Model Creates Three Times More Value

Findings from these tests (see Figure 4) show that the SP Push model creates more than three times the net present value (NPV) of the Consumer Pull approach ($3.1 billion versus $1 billion). In addition, the SP Push model creates $57 of incremental value per subscriber, while the Consumer Pull model adds only $18 per user.

Figure 4. Benefits of SP Push Model Versus Consumer Pull Approach



Net present value (NPV)	$3.1B
Femtocells (2016)	12M
Value per femtocell	$253
Value per mobile consumer	$57

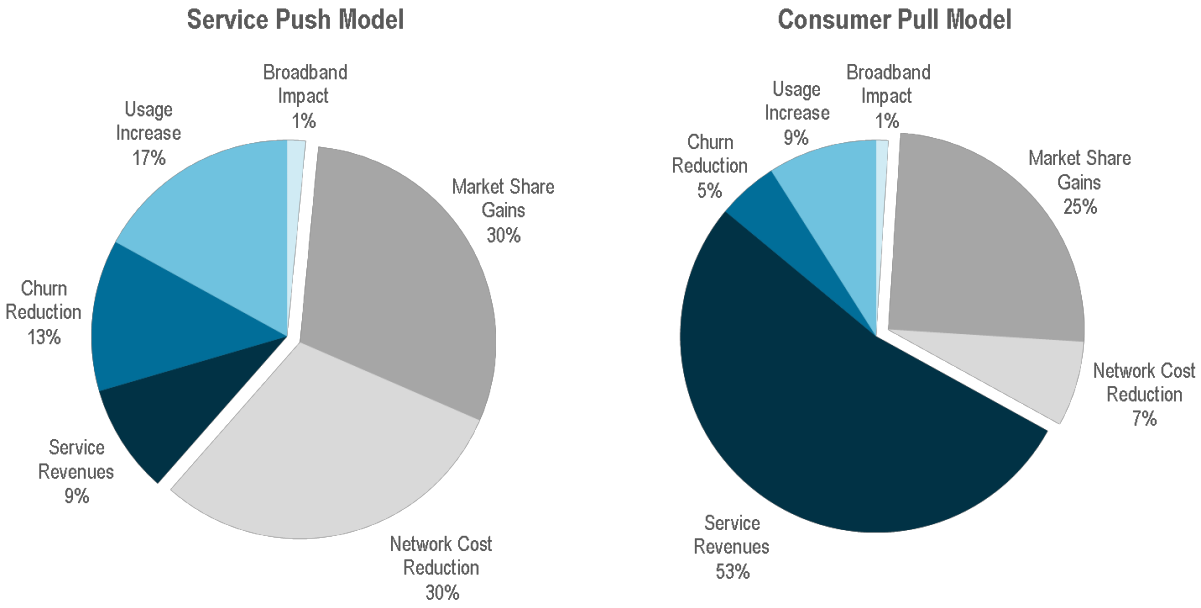


Net present value (NPV)	$1.0B
Femtocells (2016)	2.5M
Value per femtocell	$387
Value per mobile consumer	$18

Source: Cisco IBSG, 2010
Note: Data derived from applying the two models to a fictitious SP with 50 million mobile subscribers and a fixed broadband network.

The benefits of femtocell service come from a finite number of sources. A close examination of the two models, however, shows that value migrates significantly across services as a shift in business models takes place (see Figure 5). As expected, service revenue is a much smaller value driver in the SP Push model due to the lack of direct customer premises equipment (CPE) payments. In return, network cost savings and market share gains play a much more significant role. In addition, market share gains, upsell opportunities, and churn reductions are also greater in the SP Push model.

Figure 5. SP Push Model's Network Cost Reductions and Market Share Gains Eclipse Those of Consumer Pull Model



Source: Cisco IBSG, 2010
Note: Data derived from applying the two models to a fictitious SP with 50 million mobile subscribers and a fixed broadband network.

Implementing the SP Push Model

Given these results, Cisco IBSG strongly recommends SPs implement an SP Push model as soon as possible. By following the five steps shown in Figure 6, SPs can begin rolling out the model while limiting risk and maximizing the ability to scale deployments as financial indicators become clear.

Figure 6. Femtocell Deployment Model

Source: Cisco IBSG, 2010

1. **Segment Customers**. Categorize customers by household voice and data usage to identify prime targets for femtocell service. Cisco IBSG defines these segments as:
   - Data Hogs—people who use a disproportionate amount of mobile data
   - Undercovered—customers who have less than ideal in-home mobile coverage
   - Value Hunters—people willing to go out of their way to save money
2. **Define Value.** Assess financial drivers including:
   - Additional services that can be better deployed over femtocells
   - Potential market share gains from more "friends and family" plans
   - Network benefits from freeing cell capacity and increasing cell throughput
   - Cost of purchasing, distributing, and managing femtocells

3. **Develop Policies.** Determine femtocell policies by relating the financial drivers to the identified customer segments. For example, consider subsidizing femtocells for customers who purchase a high-volume data plan or an "all you can use" voice plan.
4. **Begin Deployment.** Identify and implement a practical deployment approach such as using point-of-sale displays at retail stores or bundling femtocells with services provided by other customer equipment such as home gateways.
5. **Monitor and Manage.** Monitor feedback from all aspects of the deployment. As proof points validate the SP Push model, accelerate plans to move forward. Ideas include offering femtocells with higher-tier voice and data plans or as a way to improve customer satisfaction for service-related calls.

Conclusion

Femtocells represent an important new mobile opportunity for SPs. If femtocells are deployed in the home, consumers will enjoy a greatly improved mobile experience that will lead to accelerated service revenues, reduced customer churn, increased upsell opportunities, greater broadband adoption, improved market share gains, and lower network costs. Femtocells can also provide SPs with a way to remain relevant in the home data connectivity market with an in-home device that has the potential to become an entry point for future home services.

In a positive sign that industry leaders are beginning to understand the need to shift business models to accelerate femtocell adoption, Vodafone is slashing femtocell prices by 70 percent as the company relaunches its Home Gateway / Sure Signal product in the United Kingdom.[8] Cisco IBSG believes this is a step in the right direction, and that ultimately operators will find they can push the subsidy model much further and reap the full benefits that femtocells promise.

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Endnotes

1. A femtocell—originally known as an Access Point Base Station—is a small cellular base station, typically designed for use in a home or small business. It connects to the service provider's network via broadband (such as DSL or cable); current designs typically support 2 to 4 active mobile phones in a residential setting, and 8 to 16 active mobile phones in enterprise settings. A femtocell allows service providers to extend service coverage indoors, especially where access would otherwise be limited or unavailable. Source: Wikipedia, 2010.
2. Source: Sprint, August 2008.
3. Source: Verizon Wireless, 2009.
4. Source: AT&T, 2009.
5. Source: "Vodafone Slashes Femtocell Price by 70 Percent," FierceWireless Europe, January 20, 2010.
6. Source: StarHub, November 2008.
7. An exabyte can be estimated as 10 to the 18th power, or 1,000,000,000,000,000,000 bytes (1 billion gigabytes). Sources: Wikipedia, March 2010, http://en.wikipedia.org/wiki/Exabyte; TechTerms.com, March 2010, http://www.techterms.com/definition/exabyte
8. Source: "Vodafone Slashes Femtocell Price by 70 Percent," FierceWireless Europe, January 20, 2010.

More Information

Cisco Internet Business Solutions Group (IBSG), the company's global consultancy, helps CXOs from the world's largest public and private organizations solve critical business challenges. By connecting strategy, process, and technology, Cisco IBSG industry experts enable customers to turn visionary ideas into value.

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