

CAPITALIZING ON SYNCHRONIZATION
REDUCING THE EFFECTS OF CHURN IN WIRELESS NETWORKS

AN ECONOMIC APPRAISAL SPONSORED BY
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ABSTRACT

Racing ahead in the deployment of 3G (3rd Generation) wireless networks and services, carriers often give minimal pause to the concern for improving subscriber satisfaction through improved reliability of essential voice calls. Rather, the ambition for most operators is rooted in providing as many services as the network is capable to bear and offering these ahead of the competition. The net result of this hurried evolution has been the failure to stem the churn of subscribers leaving one carrier to join the next. As consumers today have options created through regulatory policy to abandon their providers, the inevitable path of choice leaves many operators focused on turning their attention toward service quality management (SQM) as a means to enhance profitability and increase operational effectiveness of the network.



This notion of attaining higher levels of service quality presents a landmark step toward looking inward for profitable growth and justifying the necessary capital expenditure (CAPEX) spending to differentiate one network over another. Introspectively speaking, the change in financial benefit comes from tuning the assets already in place to produce a higher yield of subscriber satisfaction with the carrier. Our research of the stand-alone element of network synchronization produces an interesting perspective that underscores the relationship of subscriber behavior and usage preferences to the effective lowering of dropped calls. Through an analysis of billing data and operational use patterns, a distinct bias exists toward networks that demonstrate better-than-standard synchronization and produce fewer call disconnects over the subscriber experience.

SERVICE
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THE PROGRESSION OF TIME — WHY SYNCHRONIZATION MATTERS MORE TODAY

Annoyance, by itself, is a disruption to the economic will or desire of consumers to purchase greater quantities of a service. Given the fact that dropped calls have become a “conditioned annoyance” for many wireless users, the status quo is somewhat more tolerant of the technology, and the freedom of mobility often outweighs the negatives of a certain call disconnect factor. But in the past few years, subscriber tolerance for such poor call quality and a rising incidence of dropped calls has reached a loud roar of vocal discontent. Whereas before mobile users would compare rate plans by dollars and minutes, the new benchmark is moving rapidly in favor of reliability and quality as the standard for comparison. Coverage and service availability matter even more as subscribers find themselves using network services in diverse locations across the globe.

Recall those times in the early days of analog voice under the advanced mobile phone (AMP) platform and the hollow echo experience of calls that encountered synchronization difficulty. Handset manufacturers must have invented the redial button just for this reason, as the phenomena of repeatedly dialing the same call recipient became the accepted norm. As users, we simply absorbed the fact that out-of-phase calls and those that eventually dropped were part of the mobile experience. Then came the digital revolution of 2G (second generation) cellular with the advertised promise to enhance voice clarity and yield fewer dropped calls. Analog service was dead, and digital time division multiple access (TDMA) networks gave hope to better suit voice traffic. In reality, congestion increased and coverage remained weak as operators battled over digital platform standards. With no clear winner decided, congestion was now further impaired by the addition of data services over largely voice-centric networks. Timing and network synchronization fell to the wayside as expansion of new service features took priority over improving the quality of the subscriber experience.

Fast forward to 2006, and the fallout penalty for this accelerated adoption curve of new users is a focus on the issue of churn—that is, subscribers leaving the network and opting for service with a competing carrier. Competition is a healthy and integral component of the free choice economy, but it poses a costly downside to the network operator. The advent of local number portability (LNP) implies that users can whimsically choose their carrier without sacrificing a valuable attachment to their mobile number—and with minimal disruption to their service too. Mobility and choice have never been easier, and this leaves little else for the carrier to do other than improve the quality of their product.

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To succeed in reducing churn and improving subscriber profitability, our research shows that carriers need to set forth an economic agenda that enhances synchronization capabilities within the network and lowers the frequency of marginal call experiences. As we study the data of various networks across a variety of metropolitan statistical area (MSA) regions, the formula for producing a sustainable operation encompasses four critical factors: *performance management, reduced churn, return on existing network investments, and a scorecard of real-time key performance indicator (KPI) metrics*. Each of these factors is strategically important in the goal of retaining desirable consumers of the service and ensuring their long-term loyalty to the network operator.

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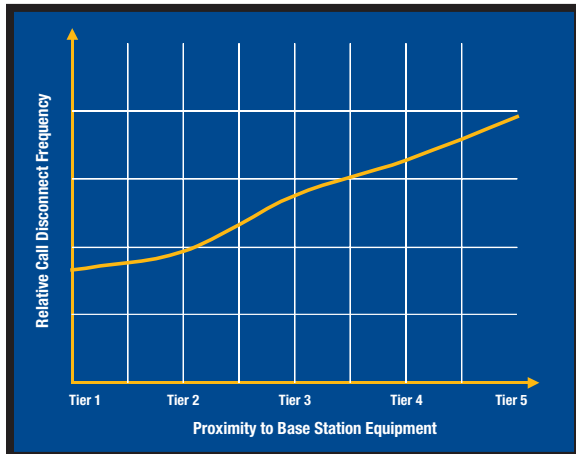
Factor	Impact
Performance Management	Reduces the frequency of dropped calls caused by poor synchronization
Reduced Churn	Improved call quality and subscriber satisfaction with the network leads to stronger loyalty with less likelihood of abandonment
Return on Investment	Maximizing the quality of existing network infrastructure through improvements such as synchronization delivers better investment performance
Scorecard KPIs	Applying meaningful analytics and metrics to monitor network quality is vital to consumer satisfaction

The Economic Agenda for Synchronization

In observation of data related to billing and operational support, we determine that carriers who continue to evolve their networks with investments in the core platform—including base station, switching, and monitoring technologies—performed markedly better with consumers over a measured period of 18 months. Using this interval of time as a trial period for how applied changes in synchronization can improve the circumstances of dropped calls, we note an average MSA contribution of 12.8% fewer instances (than a similar period with no modifications). That percentage equates to roughly one out of every eight dropped calls being eliminated from within that region—an improvement that further shows to reduce subscriber churn by 4.2% during the time interval at which enhancements were made.



While these estimates seem relatively insignificant, the amplified results over time tell a different story. The combined interpolation of billing and operational data supports a conclusion that network quality is, in fact, reliant upon sufficient voice and data synchronization rates to produce a satisfying experience.



Synchronization Improves the Relative Call Disconnect Frequency

Subscribers that operated mobile handsets within these MSA regions positively raised their monthly spending allocations over time and incrementally added more utility in the form of billed usage over the same period.

THE ECONOMIC ARGUMENT FOR NETWORK INVESTMENTS

No logic is more important than keeping a satisfied consumer is less expensive than adding a new one. The same is very true in preserving wireless subscribers that have turned the corner on their acquisition subsidy costs—handsets, provisioning, and billing—over their potential lifetime value to the carrier. This is why

approaching the operator’s customer pool from a subscriber lifetime value (SLV) method creates reasonable justification for adding capital equipment that delivers the best possible experience and stabilizes their average revenue per unit (ARPU) values over time. Stabilization of ARPU is a very central problem, especially as the cost per minute or kilobyte of data continues to fall in light of bundling greater quantities of voice minutes and data blocks.

Indeed, stability alone is not enough to make the difference in a direction that emphasizes a growth strategy. Rather, carriers have seen modest increases in ARPU in the 2004-2005 period of approximately 4.8% overall, but the nagging problem is the weighted drag of subscriber churn at a lapse rate of almost 18.2% annually. While the ARPU rises only slightly, the real cost of keeping subscribers increases in tandem as nearly one in five users will exit the network. By providing more available minutes or blocks of data usage, the net ARPU imbalance is actually trending downward. And spreading this perceived quantity of usage over a growing base area proves disastrous in terms of producing a sufficiently high quality of service index. With perceived dissatisfaction in service, there comes a lower recognized SLV figure when deciding how to optimize ARPU sums against network availability.

KPIS ARE RAPIDLY DELIVERING EXECUTIVE-LEVEL INSIGHT TO NETWORK OPERATORS. COMMON METRICS INCLUDE:

- *New Customer Adoption (NCA) ratios*
- *Subscriber Lifetime Value (SLV) figures*
- *Total Call Quality (TCQ) with mean opinion scoring methods*



What we learn from contrasting billing data with behavioral research of mobile consumers is that a distinct set of preferences exist among consumers for how they define their service experience. The way in which they rank their bias or preferences in the realm of wireless service is best measured by an economic order of quality (EOQ). The EOQ approach gives us a quantifiable method to analyze those elements that add to (or subtract, in some cases from) the value being delivered. In looking at the respective top elements of improving wireless network quality, we observe synchronization as a leading predictor of higher EOQ with regard to changing the influence of service. Pay more attention to synchronization within your network and the EOQ index rises appreciably to generate incrementally better satisfaction scores.



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The economic value generated by adding higher EOQ points is recognizable across several discrete boundaries of measurement and lends support for setting investments on a long-run basis. Of the benefits associated with these types of equipment investments, the most dominant patterns reveal the following:

- Relative Call Disconnect Frequency (RCDF) percentages are lower, yielding a higher reliability score in overall performance
- Churn rates fall sharply with increased quality of calls placed over the period of allocated minutes
- Retention rates between service contract renewal periods increase
- Spending propensity increases for new services and reflects higher ARPU rates

Clearly, the backbone of long-term spending is strengthened by removing impairments that currently exist within the subscriber experience and raising the bar of service quality by ratcheting up noticeable improvements. Mobile operators that follow these steps will reap the rewards of higher returns on their existing infrastructure assets and monetize these gains through effective growth with sustained customer relationships.



LESS IS NOT ALWAYS BEST—LOYALTY COUNTS TO REDUCE CHURN

Today’s telecom supply chain has come to the crossroads of an unusual problem: the consumer drives the demand for service networks. And that has specific bearing on how to foster—or in some markets attract—a loyal contingency of subscribers that stay for any length of time. In the numerical calculations of our research, we apply a statistical method known as Survival Analysis to determine in a time-forward sense just how long a given profile of subscriber will stay within a network. The byproduct of performing such tests is to understand not only when a given user will abandon the service provider but more so to recognize what caused this purchaser to leave in the first place.

In the case of looking at synchronization as a causal factor of satisfaction or dissatisfaction, we observe the role that dropped calls play in staying with a particular operator over the choice of terminating a service relationship. Of course, we speculate that the price of service is a determinant factor, however we did not expect to find a shocking conclusion about price versus quality. In a scenario of expected outcomes, more times than not, mobile consumers actually stay longer with a carrier that improves their network quality despite the removal of discount incentives. This is prominently highlighted between the first 12 months of service and the following 8 months of continued payment patterns where initial rates increase with subscriber attrition being slightly lower. Tracking those subscribers that left the network for lower priced service and later rejoined the test model carrier did so based on performance concerns. Some, however, stayed at the lower priced carrier and subsequently switched within the following year to a subsequently even lower model of spend performance.

This supports the conclusion that given the quality of service being raised or held equal, price is less deterministic of the relationship survival with a carrier. Still, while loyalty is far from anchored within the wireless network marketplace, the differentiable factor appears to be more aligned with quality and supportive of retaining subscriber members. A considerable amount of contemporary research is underway to profile the economic patterns at work with mobile users, but the constant theme of service quality continues to point in the direction of creating stable ARPU tenants over the long haul.

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IN SUMMARY — CAPITALIZE ON SYNCHRONIZATION

The endgame of winning success for wireless operators will be determined by the advantage of applying SQM principles to resolve quality impairment issues and how carriers choose to orientate themselves to the discipline of seeking to improve the internal strength of their networks. Resilience to overcome the synchronization challenges of voice and data on the same network platform poses a strong reason to think strategically about customer viewpoints on quality and how much can be gained by investing aptly in evolutionary improvement as opposed to a blanket expansion of coverage. As we previously noted, the imposition of churn stands to be a barrier to profitable growth for the carrier community. And by diminishing the likelihood of forcing subscribers out of the network, the operator succeeds in recouping their subsidy investment and stabilizing ARPU values in due time.

Apart from steadily increasing a healthy ARPU outlook, the wireless service provider must continually seek the means to reduce operational expenditure (OPEX) levels on a per subscriber basis, and this involves adding technology that heals the network autonomously before a customer complaint is ever generated. Dropped calls and imprecise timing lead to a breakdown in subscriber satisfaction, thus weakening the overall value position for a carrier. Investing in synchronization equipment at the base station and other levels will assure a smooth transition to advanced data services as demand continues to grow with higher bandwidth pressures.

Annoyance is difficult to overcome, and the loss of a profitable subscriber is even more of a stumbling point along the path to a solid future. As wireless users start to demand more capabilities from their service providers, the issue of quality will be a stronger determinant than the function of price incentive when it comes to retention. Protecting the interests of those that already belong is much more certain than trying to attract others outside the network.

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METHODOLOGY ENDNOTE

Conclusions and various perspectives contained within this appraisal integrate the latest economic data related to mobile users and organizations covering metropolitan statistical areas (MSA) within the domestic United States. Our sample data populations derive from sources that include: the OMNI Network Economics Study (NES), mobile operator networks, enterprise network environments, the U.S. Bureau of Labor Statistics (BLS), the U.S. Bureau of Economic Analysis (BEA), the U.S. Federal Reserve Bank, World Bank, and various university consortia studying subscriber behavioral relationships to wireless technology.

We launch our modeling exercise with the compilation of these data concerning mobile usage alongside how groups and individuals relate to specific economic patterns. The initial phase involves applying multivariate analyses for logistic regression and CHAID (chi-square detection) relationships. We expand the scope of the modeling exercises to concentrate an understanding of the relationship between factors influencing the aspects of mobile network performance and subscriber spending within given MSA populations. The resultant statistics and measurements are computed using the best available data and commonly applied stochastic methods.

FOR FURTHER INFORMATION

An electronic version of our analysis and findings may be viewed online. Please visit the Symmetricom webpage: <http://www.symmtd.com/OMNI>



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