

Could your sales drop suddenly and surprise you?

Multiple-technology substitution (MTS) provides a new way of losing or growing revenues

Alistair Davidson is a strategy and technology consultant, former CEO of several high tech startups, and author of three books and numerous articles on technology and strategy. He has worked with telecom service providers, communications equipment vendors, software and media companies.

Copyright Alistair Davidson, 2009 as an unpublished work.

E-mail: alistair@eclicktick.com,

Phone: +1-650-450-9011

Executive Summary

Having your strategy be disrupted by a *single* inexpensive lesser performing product represents one type of disruption risk that has been frequently written about in the past decade. [1] A second type of disruption, Multiple Technology Substitution (MTS) is based on a collection of products or services that, in combination, compensate for individual weaknesses of the complementary technologies. The complementary nature of the collection of offerings – a “synthetic” product offering -- can compensate for individual low levels of performance, surprising established competitors which sell more capable product offerings.

During a period of initial customer experimentation, market growth due to the disruptive products/services maybe misinterpreted as a long term trend towards an increase in category use and/or spending. Marketers may overestimate market growth and fail to anticipate a sudden drop in users’ category spending. A 3-stage cycle of (1) increased spending due to experimentation, (2) learning how to use the inexpensive products, and (3) consolidation of usage is likely as users gain experience in assembling and optimizing solutions.

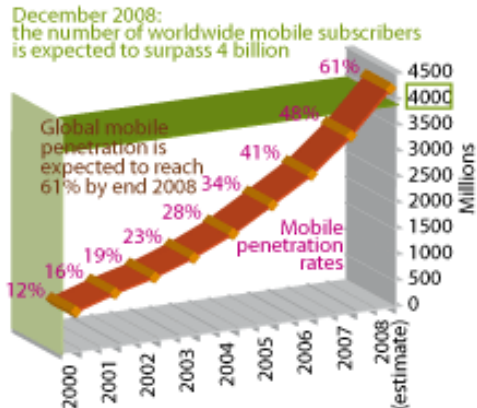
Adding to the impact of MTS is the idea of MTS amplification, or products/services that amplify the effectiveness of the MTS combination. *MTS Amplifiers* may present ways of changing customer relationships and represent opportunities both for competitors competing on a different basis than traditional competitors and for existing players defending their markets.

Introduction

There is nothing worse for a career than a nasty sales surprise. In the case of a small business case, the resulting cash flow problems can kill the business. In a larger business, it can kill your career.

For some industries, multiple technological substitution (MTS) presents an unperceived and hence unmanaged risk -- one that may be invisible to managers without new kinds of user research. Many markets demonstrate MTS – software companies facing open source solutions; hardware vendors facing open source software replacement; cable companies facing Internet-based video competition; to name just a few.

For a more detailed look at the phenomena, consider the specific situation of fixed line voice service providers (recognizing that telcos exist in various formats: fixed line, mobile only, integrated with both fixed and mobile, and virtual operators leasing capacity from companies with actual networks). [2]



Globally, there were 4 billion mobile cell phone contracts as of the end of 2008 [3]. As mobile phones have become more popular, fixed line telephone company executives in developed economies have worried about the substitution of mobile phone for the combination of mobile plus fixed services (FMS). Such replacement would cause them to lose highly profitable fixed line voice customers. And the data for telcos suggests that FMS has been occurring on a large scale as consumers cancel their traditional fixed phone lines.

If you are student, living at home in summers and on-campus during the school year, a mobile phone makes perfect sense for a transient live. Demographically, one would expect to see younger telephone users more likely to be mobile-only customers *but the trend towards increased mobile usage is actually quite broad*. Research on phone use shows that people will use their mobile phones in the workplace and at home for reasons of convenience and in order to always be reachable. Roughly 50% of mobile usage occurs in situations where a fixed line is likely to be also available.

But there is a more insidious danger for telephone companies, one that is less obvious. It comes in the form of a *collection* of voice communication services delivered over the

Internet. Voice services like Gizmo, MagicJack or Skype cost nothing or next to nothing to purchase. Skype accounts for 8% of world international call minutes according to the company fact sheet [4]. Like many disruptive technologies, the services can have unpredictable or lesser quality. MagicJack works well on a fast machine, and not very well on a slow machine. Skype works better with a Skype “box” attached to the router than it does on a personal computer. VoIP (Internet based voice calling) over WiFi on a WiFi enabled unlocked cell phone is sometimes difficult to set up and can be unreliable.

Sidebar: Internet Based Telephony Data Show That Low Cost Services Are Significant

Number of Magic Jack customers: > 2 million as of January, 2009. [5]

Number of Skype user accounts: 405 million as of Q4, 2008 [6]

Skype was reported as delivering 20.5 billion Skype to Skype minutes in Q4 of 2008 and 65.3 billion minutes for the full year. Skype calls to regular phones cost money: \$2.6B of paid calls for SkypeOut minutes were used for calls to regular phone numbers. 33.4 million users were active in Q3.

To date, the unpredictable and lower quality of these Internet-based services (relative to the gold standards of the traditional fixed line or the higher quality of cable VoIP voice services) has been a disadvantage for these Internet IP-based voice providers. Voice quality is an important service attribute. It has represented a barrier to further market expansion by these free or low cost services. The need for some technology knowledge to figure out the best way of using the services makes them a poor choice for those unwilling to experiment. As a result, usage is often low and adoption has been limited to the tech-savvy.

The Risk of Synergistic Substitutes

But *synergy between a mobile phone and an Internet IP-based phone service* changes the value proposition significantly. If the IP-service does not work, you can always use your cell phone. If the mobile carrier is charging a higher rate for roaming or international long distance, the cost conscious user can use the Internet IP-based services. Skype additionally permits allows cell phone users to dial a local number in order to access Skype’s international rates, which are typically lower than cell phone international rates. One CEO of my acquaintance came back from S. Korea with a \$500 roaming bill. The next day, he put in place a policy of using Skype when travelling internationally and calling home.

There is a general pattern here. When you have an *established product/service category* (e.g. fixed line phone service), and you are competing with *multiple disruptive services* (e.g. the available but slightly less reliable mobile service as well as a more unreliable Internet-based voice services), user behavior may become harder to predict. Users will initially try substitutable services; as they gain experience with the substitutable services, they may become decide that they have sufficient redundancy in their two or more new

services; this insight means that they can drop their less used and now perceived to be redundant traditional (fixed line) service.

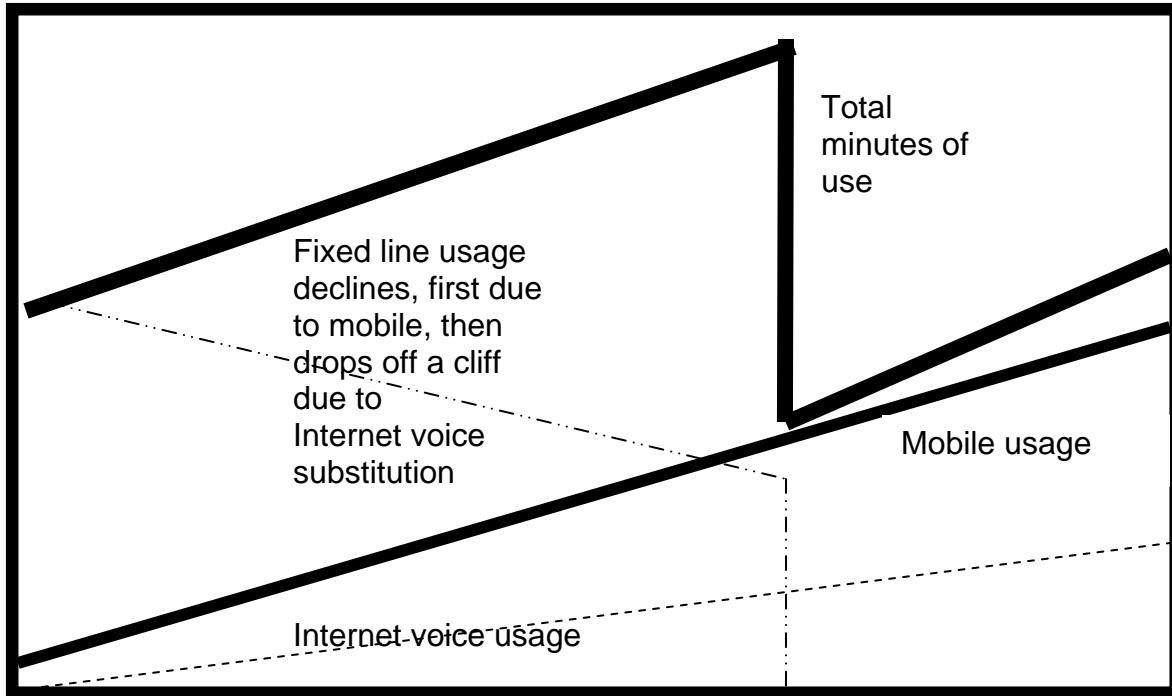
As validation for this insight, consider the following question: “How many people would give up their cell phone to retain their fixed line?” One could only imagine this choice occurring if the customer were using the fixed line for *both* dial-up Internet access and voice, a decreasingly common usage pattern. For most users, if they have to choose, a broadband connection ranks higher in importance than a fixed voice line. And of course, if you have a broadband connection, you can use it for voice calling so it acts as a strategic amplifier.

In the early stages of a new disruptive technology, reliability and ease of use may be poor, but over time, failed experiences may be replaced by more successful experiences as the technologies improve.

When consumers are financially flush, they are likely to try out new and potentially substitutable services *in addition to* “trusted” services or products. Total spending in the category goes up until the consumer becomes so comfortable with the cheaper technologies that they decide to drop the traditional service. Consumer cutback due to job loss or income reduction may trigger the decision even faster.

The implications for managers facing substitution is that past market spending and trends are likely to be misleading. The 3-stage cycle of **trial, learning, and product/services consolidation** means revenue growth can be followed by a sudden drop to a new and lower revenue level. This process of overestimation parallels the problem of pipeline fill in distribution organizations where initial demand for product inventory in the pipeline causes overestimation of end-user demand. The difference here is that the disruptive products are inexpensive so they don’t increase revenues proportionately as much as they increase usage, but when the traditional product or service is dropped, the revenue effect is dramatic. Free or low cost replaces traditionally priced products.

Graphic: Fixed line usage has declined because of increased mobile use. Service providers will suffer more dramatically if individual customers find that Mobile+Internet voice is an adequate substitute for traditional landlines. (Illustrative model rather than actual data)



Amplifying MTS Disruption

For the example of fixed line telephone companies, the challenges don't stop with the double substitution of mobile and Internet voice services for fixed lines. There exist "amplifying" products and services that make the substitution more effective. They improve benefits, lower risk and cost. These amplifying services may sometimes move the locus of account control to third parties which are using the benefit of the *amplifying* service as a novel way of building relationships with customers often by deploying different business models.

The combination of on-line advertising-supported video programming at sites such as Hulu.com or Joost.com offers another amplification example. TV and movie video content has only recently become legitimately available on the Internet. Here the amplifier is called "media extenders" or technologies for connecting the Internet sourced video to the TV. Media extenders – typically a WiFi-based specialized set top box -- are a new phenomenon, so retail availability and consumer understanding have both been limited, and adoption has not yet been large. As the availability of devices for linking the Internet to TVs is adopted, the acceptability of the Internet for sourcing video content improves dramatically. Netflix's download services which are free if you subscribe to the

core product of unlimited TV rental also amplify any decision to eliminate cable subscriptions.

In the telecom sphere, Google’s GrandCentral service is a strategic amplifier. It is a free unified communications (UC) services with the feature of *single number ring*. UC single ring is actually simple in concept. You give out a new phone number to your contacts. The new phone number is controlled by the user via a web page and automatically rings all the phone numbers the user has specified. So, if a user doesn’t trust the reliability of his Internet based phone services, he can introduce redundancy by having more than one service and having his cell phone also ring. With a close to zero-cost Internet telephone service, users can rethink the nature of their communications services. And each time they chose to pick up their Internet phone (instead of their mobile phone), they avoid using their ‘basket’ of mobile minutes.

Many telephone companies have not picked up on unified communications with single ring for consumers -- perhaps for fear of loss of revenues to Internet services. Google’s service forces consumers to have yet another phone number. Mobile telephone companies already have assigned the consumer a telephone number so less work is required for the consumer if single number ring is accessed through a call to the mobile number. A wireless provider launching this product as first mover is likely to gain advantage and reinforce the primacy of its relationship with consumers who dislike changing phone numbers.

The results of these three overlapping technologies (mobile, Internet-voice and unified communications) is that a US consumer now has the opportunity of reducing his communications cost by \$700-1000 per person per year. In other international markets where the cost of mobile minutes is higher than in the US, the savings might be even greater. From the carrier perspective, customers switching to an MTS solution represent a significant drop in market size. For the consumer, such a savings is significant in a normal economy and more so in a recession. It represents a savings in excess of that being claimed by online insurance companies for switching automobile insurance and therefore, is likely to be adopted. These technologies can also spread easily via word of mouth, corporate policy changes, and marketing to mavens and experts. [7]

Technology Amplifiers take a substitution problem and increase the effectiveness and perceived usefulness of the new substitute technologies. Just as importantly, Amplifiers can trigger permanently reduced spending on the product category. When Amplifiers are owned by different competitors, a non-amplifying company may be perceived as offering less value than previously.

Product	Strengths	Weaknesses
Traditional fixed line voice service	The gold standard in voice quality.	Tied to specific location Mobility not an option Number not portable if you move beyond area of telco

		switch or to new area code.
Mobile cellular service	Mobility, improving voice quality and coverage. Small form factor computer available on the move.	Indoor coverage is sometimes a weakness.
Voice over Internet Services e.g. Skype. T-Mobile fixed line service	Inexpensive to deliver. Number portability superior to fixed line.	Erratic call quality. May take experimentation to optimize. Learning curve for use Very inexpensive, sometimes free.
Unified communications	Simplifies the task of being reached. Visual voice mail provides email notification of all received voice mails. All phones ring, given user option of which provider to arbitrage.	Not understood by most people. Users need smart phones to access to computer for full features.

Implications

The implications of Multiple Technology Substitution and Amplifiers is that competitive risks can, in some markets, become more complex to analyze, more difficult to anticipate. While some disruptive competitors may have a deliberate installed base strategy of pursuing users of the higher performing product, other may not. MTS introduces new *accidental* groupings of competitors, that pursuing their own narrow objectives, constitute a *functional* or *virtual* competitor. Traditional competitive analysis and extrapolation is insufficient to predict such emerging coalitions of use. Scenarios and forecasts need to be considered for these synthesized virtual competitors that could emerge and accidentally combine in almost biological way. For vendors launching a disruptive product, a failure to consider how complementary disruptive product can *assist* in a launch will lead to missed opportunities.

Understanding *why customers are not buying* is important in a downturn. MTS implies that it is just as important to investigate consumer patterns of usage and experimentation. Attitudinal research and the rate of change of attitudes towards potential substitute products should be tracked. If you understand where customers are experimenting with products and services, you may be able to anticipate the consolidation risk. In some cases, you can forestall consolidation through pricing and product changes. In other cases, the reasons for the exit may force you to change your business strategy and operations.

Telephone companies are being forced to face these new technologies. Not surprisingly, their reaction depends upon whether they see these new services as threats or opportunities. For mobile operator T-Mobile USA these disruptive technologies allow

them to expand their service beyond their narrow product offering of cell phone services. T-Mobile USA now offers three kinds of phone service: (1) cell phone service, (2) WiFi-based phone services if you have a dual mode WiFi capable cell phone, where you trade off a fixed monthly fee for unlimited voice over WiFi services, and (3) a \$10 a month fixed line service that runs over the home fixed broadband connection.

T-Mobile is attempting to displace the traditional phone company relationship for both fixed and mobile voice services without having to build an expensive fixed line network. It is changing the rules of the game by dramatically reducing the cost of a fixed line to reflect its dramatically lower cost of providing an Internet-based phone services.

As a side benefit, T-Mobile's strategies also reduce the cost of delivering mobile services by converting regulated bandwidth-consuming cell phone calls to unregulated free WiFi which is then, in turn, transmitted over the consumer's fixed broadband connection back to the operator's backbone.

For marketers, understanding how different buyers see and are using your and MTS products may allow new segmentation, pricing, delivery and value propositions. Strategic costing studies often suggest that a small portion of customers are particularly profitable. Rules of thumb in activity based modeling suggest that roughly 10-30% of customers account for more than 100% of the profits of the organization in any given year. Understanding who is profitable is important. Losing the most profitable customers can be devastating. Equally as importantly, making explicit decisions about the life cycle profitability of customers may salvage a business in trouble or provide new growth opportunities than can grow sales and higher profit relationships. Some telephone companies are attempting to use femtocells, or small cellular base stations located within the home or office to improve their value propositions and capture a higher share of customer telecom spending.

The Amazon Kindle electronic book reader provides another example of an amplifying technology that preserves and grows market share for Amazon, but also offers significant opportunities for content that were previously uneconomic. The obvious benefit to Amazon is that Kindle owners are often frequent book buyers who have decided that they buy enough books that the breakeven on the Kindle will be achieved quickly. Travelers and readers with two homes will appreciate not having to carry piles of books. But non-Amazon entities such as authors and publishers can now skip the traditional printing and distribution process. Perhaps more importantly they avoid the pervasive and costly problem that books are a returnable product, additionally lowering the cost of distribution.

Example Reconfiguring of Products for a New MTS Environments

Digital content is an example of a market where product reconfiguration is required in response to MTS. In digital environments there is often more opportunity for product reconfiguration that managers realize. *Content companies will have to manage a more*

complex portfolio of business models and develop more sophisticated ways of integrating their view of individual consumers and their usage.. There are five basic forms of revenue models that will emerge or which can be bundled together:

1. **Traditional advertising based models.** (Examples: classic network or cable TV)
2. **Fee-based models** for one time viewing or viewing for a period of time, unbundled from subscriptions. (Examples: video on demand, Pay-TV, single viewing downloads, downloads valid for a narrow viewing time slot.)
3. **Subscription models** analogous to current cable or satellite tiered services. (Examples: premium cable subscriptions, satellite subscriptions, Netflix, music subscription services)
4. **Product placement, sponsorship and brand integration models** sometimes combined with other economic models. (Examples: various soap operas or drams financed by e.g. Procter and Gamble or Hallmark, combination network TV shows financed by product placement and advertising.)
5. **Purchase models** which include a variety of portability, versioning and resale rights. (DVD purchase, download purchases.)

These revenues models can more broadly be thought as a collection of pricing models, rights granted to consumers and services around the purchase, use, storage and management of the rights. *Rights represent a new frontier in content marketing* and can include:

1. Right to view on one or more devices
2. Right to save
3. Right to redownload to one or more devices
4. Right to transfer ownership
5. Right to share with a designated group e.g. a family
6. Right to upgrade to a new technology or quality
7. Right to resell
8. Right to receive a commission on referral leading to resale

The marketing of content with attached rights management is likely to be controversial among consumers accustomed to the current simpler legal environment.

It's likely that as users become educated about the rights bundles attached to different ways of acquiring media, different consumers will evolve different buying patterns. For example, less technologically sophisticated users and audiophiles both still prefer to buy music and video on optical data media such as CDs and DVDs. Slightly more sophisticated technology users may find the integration of a music/video downloading service and device more attractive until they get annoyed at the difficulty of moving content or the lower quality of many digital media. More sophisticated digital downloaders will discriminate on the basis of absence of rights restrictions and higher quality. For example, Amazon's MP3 music offering initially offered both a DRM and a price advantage over the brand leader, the iTunes Store. Apple finally responded by offering unrestricted music files, but at a higher cost.

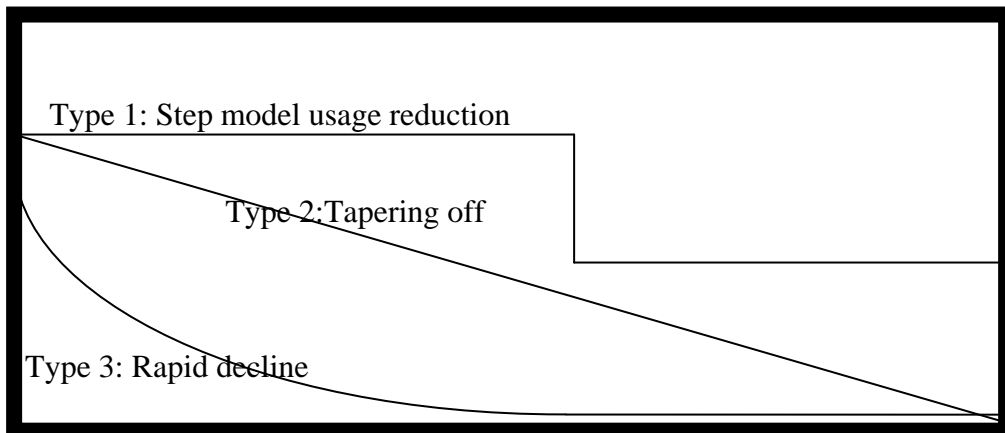
Confusingly, while consumers may evolve their preferences over time, they will likely to continue to trade off rights against price inconsistently, based upon their involvement or interest in specific content.

Researching and Anticipating a Sudden Market Decline

Without research or deep interactions with customers, companies will have difficulty predicting customer exits or the extent to which they are progressing through the three stages of MTS model. As a result, they will find it difficult to figure out how best to reconfigure their offering.

The following graphics suggests three simple potential customer exit models. A step model (Type 1), a straight line decline (Type 2) and rapid initial decline with a long period of low usage (Type 3). Type 1 exits are the most dangerous because the drop in purchase rate is sudden and unpredicted and may be disguised by a period of higher spending before the sudden drop. Type 2 exits are predictable and therefore, easier to manage as long as you can distinguish between Type 2 and 3 exits. Type 3 exits may create a category of lingering but possibly unprofitable customers.

Graphic: Examples of usage reduction patterns



The most general prescription here is not to accept decline, but rather to actively manage the process. These steps should include the following elements:

1. Research and stratify your customers to determine to what degree they are at risk for exit. Understanding their testing and competence with the various disruptive technologies is crucial knowledge.
2. Estimate the potential revenue lost by customer profile.
3. Model the impact of customer loss using an activity based costing model.
4. Evaluate different pricing and business models targeted for different customers.
5. Identify the gateway products which maintain account control. In the telecom space, video services, fixed broadband and converged fixed/wireless services with unified communications all represent potential gateway products or bundles. In contrast, traditional fixed line services are essentially commoditized.

6. Reconfigure the marketing program. For some customers, ease of use will be a critical element in retaining customers. For other customers, launching disruptive collections of services, but making them easier to tie together will be a necessary strategy.
7. Reconfigure the value chain activities where required to be able to compete with the disruptive competitors, e.g. T-Mobile's low cost fixed line service at \$10 per month.
8. In many cases, integration and improved user interface design are required for the traditional offerings. Integrated telcos with WiFi hotspot, fixed and wireless operations are now introducing services that take advantage of their multiple networks. Less integrated operators are pursuing partnerships to enable the same capabilities.

Customer can be categorized into different groups. Examples might include:

1. Profitable customers, where the goal is increased usage.
2. Profitable customers, where the goal is retention.
3. Profitable customers where pricing, business model or value chain reconfiguration is required to preserve the relationship.
4. Marginal customers where different business models and value chains are required to make them profitable.
5. Marginal customers where cross selling is required to make the customer profitable, requiring e.g. bundled pricing.
6. Unprofitable customers that should be "fired".

In actual practice, most enterprises have little ability to perform such analysis. Overstressed and matrixed product managers may be put under pressure to focus on existing and obvious competitors rather than emerging threats. And when the more difficult analysis of potential virtual competitor combinations is performed, it is done infrequently and often too late. The experience of the music industry demonstrates the cost of not adapting quickly to the disruptive effect of networking, peer to peer file exchange, software for ripping MP3s, digital music players and pervasive computer use.

In contrast, Adobe, which has increasingly been moving up-market with its successful suites of imaging products (containing well known products such Photoshop, Acrobat and Illustrator) is faced with an expanding and improving collection of free imaging products such as Google's Picassa, the open source products, GIMP and Artweaver (to name just three of many) all which are increasing in capabilities. Adobe's historical segmentation had been to provide lower cost versions of their software such as Photoshop Lightroom and Photoshop Elements for its consumer and hobbyist niches. Directly targeting the free software tools, Adobe has also set up a free online service, photoshop.com: it provides limited photography editing and 2 gigabyte of storage for storing and sharing photos and videos. Integration and ease of use provides some initial defense against MTS as does the additional value added of free storage.

Summary

The 2008 recession presents businesses with a significant challenge. The deflation of the speculative bubble in the US is likely to take many years to unwind. Consumer spending is no longer financed by increasing real estate prices. Many markets may not recover in ways that businesses and consumers hope for. The consequence will be permanent customer spending declines in many product categories.

Customers, seeking to reduce their spending, will increasingly use low cost MTS and amplifying products to save money. Companies that fail to research their users and markets may over-estimate the recovery of revenues due a failure to anticipate the permanence of the switch to collections of disruptive technologies as customers consolidate their spending and arbitrage their suppliers. Clever strategists can participate in and use MTS value chains to create new relationships with customers and win relationships at low costs.

References:

- [1] Christensen, Clayton: **The Innovator's Dilemma**, Collins, 2003
- [2] Fixed Mobile Convergence for Integrated Service Providers, **Cisco White Paper**, 2008
https://www.cisco.com/en/US/solutions/collateral/ns341/ns523/ns519/white_paper_c11-480809.html
- [3] **Trends in Telecommunications**, ITU, 2008,
<http://www.itu.int/itunews/manager/display.asp?lang=en&year=2008&issue=10&page=30&ext=html>
- [4] Preliminary data, **TeleGeography Research**, 2008. quoted in Skype corporate fact sheet, Feb. 12, 2009
- [5] TelephonyOnline
http://www.telephonyonline.com/residential_services/news/magicjack-two-million-customers-0106/index1.html
- [6] Wikipedia, Feb. 12, 2008, <http://en.wikipedia.org/wiki/Skype> and corporate fact sheet.
- [7] Davidson, Alistair, and Copulsky, Jonathan: "Managing Mavens: relationships with sophisticated customers via the Internet can transform marketing and speed innovation." **Strategy and Leadership**, Vol. 34, No. 3. 2006 also available at http://www.deloitte.com/dtt/cda/doc/content/us_tmt_ManagingWebmavens_Article_022206.pdf

Trademarks referenced in the article are owned by the providing companies.
