

Vanguard Marketing International, Inc.

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COMMUNICATIONS INFRASTRUCTURE: Driving New Business Models: The Impact of Convergence of Voice, Data, and Video and the Doubling of Knowledge

Topic

This paper discusses intertwining communications and knowledge trends that will have a profound effect on the way business partnerships will be conducted in the future.

About the Research

Vanguard Marketing has conducted annual in-depth reviews of the communications infrastructure market since 1998. We have spoken with the top communications infrastructure companies, global carriers, ISPs, and portals, as well as manufacturers of cell phones, PDAs, and Pocket PCs. The purpose of our investigations have been to analyze the trends and issues that impact the communications infrastructure markets in order to understand their underlying shifts from year to year, and the implications of these trends on business practices in the future.

The people we have interviewed ranges from founders, CEOs, CTOs and engineering professionals at all levels within these companies. The Founders, CEOs and CTOs provided us with industry level insights with specific slants to their companies and technologies. The design engineers mainly focused on technology and the delivery of leading edge functionality that meet customer requirements. Interestingly, this year a majority from both perspectives spoke of a drastic change developing with regards to business models, which will be brought forth in this white paper.

Our Findings

As we look back on the results of our investigations over these last few years, a few notable conclusions stand out:

1) The sophistication of the communications infrastructure market has developed dramatically. Initially companies focused on leading edge technology in the form of *speeds and feeds*. More recently however, companies have redirected their efforts towards end-to-end *solutions*, first delivered by in-house engineers then through acquisitions. This change illustrates the evolution of the industry from providing *breakthrough technology products* to bringing forth more comprehensive *product line strategies*.

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2) A shift in the business model has taken place from one based upon *acquisitions* to that of a much greater reliance on *partnerships and collaboration* — a model with that places critical emphasis on the partners’ *ability to execute*.

Definition of Partner/Collaborator

Throughout this year’s research, it became apparent that in order to move from a mere supplier to a trusted partner or collaborator, a company must excel in **communications**, **collaboration** and **execution**. These attributes were seen as the key differentiating factors in determining overall success.

Communications

Good communication traits included discussions among all critical parties on a project, not just with the customer. In addition, many partners want good communications to assure that no surprises are revealed at inopportune moments. Yet in our interviews, we found that the definition of good communication is different for everyone. No single approach works for all people. Each person or company may want the same information, but they want it in different forms or via different means. All felt that information given in person or face-to-face had a higher degree of credibility than information received via a faceless connection (such as e-mail, fax or telephone).

Collaboration

In the past, collaboration typically involved a supply chain model, where one company dictated to its suppliers what it wanted. This also included the hub-and-spoke means of collaboration, which represented a hierarchical structure where the customer has a relatively complete view of the solution they want, and they control the situation via direct links with suppliers. In contrast, the suppliers have a highly compartmentalized (or myopic) view of other suppliers contributions to the customer. The problem, of course, is no one really knows what’s going on and no one is able to leverage knowledge and ideas back and forth.

The key leading-edge model for future collaboration will be the many-to-many model replacing the one-to-one supply chain model, including the evolving hub-and-spoke model. By many-to-many model, we mean that collaboration will take place among all parties involved resulting in an end-application. Here everyone will be challenged by and contribute to the common good, producing the best possible solution to the market’s problem.

It is important to note that while the extranet will be a key tool for enabling much of the collaboration of the future, it is not a solution unto itself. The clear underlying factor of any relationship is trust, where trust is built and maintained between two human beings over time. The extranet tool will allow people to get some of the more mundane and repetitious forms of communication off their plate, but it might not act as a substitute for face-to-face interaction until much later in the future with an influx in more advanced digital technologies.

Execution

Execution means more than just operational excellence. It again means no surprises, dealing in terms of time-to-profitability, with time-to-market and time-to-deployment as milestones along the way. Ideally, the execution culture fosters the development of breakthrough discontinuous innovation ideas -- becoming a “machine” (read EXECUTION) in all areas of the business where you beat the competition on technology, innovation, service and price. Other attributes of execution mean adding software as a core competency, and meeting rapid demand fluctuations of the market without excess inventories.

The Red Flag

Essentially, many companies are *betting their success on their key suppliers' ability to execute*. To us, this is a big red flag. What they fail to realize is that the supplier is betting their business on their customer's ability to compete and sell the products to make them both successful. Take design wins, as an example, a metric by which many financial analysts judge a company's health and well-being. In this latest market correction, this metric has taught us that it's the quality of the design win that matters, not the quantity. Those who understand the full ramifications of the win in market terms – e.g. demand for the ultimate application, can only judge the quality of the design. How many design wins have fallen prey to companies or product lines that no longer exist?

Why is the Business Model Changing?

In the current economic climate, a skeptic might say, "The market has fallen off the cliff, market caps are negligible, we have lost all leverage to buy so we have to partner in order to survive." While all true, it masks the crucial impact of this new "partnering" business model, because partnering in the future will be far more complex than today's definition.

As companies evaluate themselves and their partners, they will look at technological excellence, customer intimacy and operational excellence as *one required package*. They will seek partners who freely and continually communicate at all levels; are savvy as to the direction and requirements of their customers' customer (i.e. ultimate end market for the application); and deliver the right technology, on time, in required volumes, with a minimum amount of risk and reasonable price points.

This search for trusted partnerships may be a natural evolution or perhaps (more likely) a reaction to the uncertainties of what lay ahead. In order to see what sort of trends were occurring that could cause this natural change or fear of the future, we felt that more research was needed farther up the chain.

The Trends

We found that several trends are occurring in the industry that will have an explosive effect on future growth. With them come the challenges, or opportunities, for a complete realignment of companies serving the market. Successful principles and business models of the past will not necessarily serve companies well in the future. The companies who will succeed in this new market dynamic will be those that can see beyond the day-to-day continuous improvement world of smaller and faster technology, to truly grasp the global impact of the trends we are about to explore. In five years we may have the same prime players, but they will have much different market positions than they have today.

The following trends were selected because of their size and their massive implications. We will call our first three trends the communication trends and second two, knowledge trends. Together, they weave together personalities, families, colleagues, businesses, nations, and the world. The world enabled will hence define new knowledge and communications of the future.

The Communications Trends

In his book on how infinite bandwidth will revolutionize the world, George Gilder calls this new form of communication, *Telecosm*. In this environment, anyone will be able to transmit any amount of information, any picture, any experience, any opportunity to anyone or everyone, anywhere, at any time. This will all be done instantaneously, without barriers of convenience or cost. The resulting transformation becomes a *transfiguration*.

Trend One: Wireless 3G is enabling the convergence of three major technologies: audio, video and data within small handheld, wireless devices.

- Telecommunications carriers have been spending huge sums to secure their place in the 3G-arena, mainly through purchasing spectrum from government auctions. In doing so, they have found themselves strapped for cash and are looking for ways to maintain and expand current operations.
- 3G is just beginning to be rolled out in Japan by NTT DoCoMo; China is expected to be the next robust market.
- The communications infrastructure market must rapidly supplement bandwidth expansion with services that are compelling and affordable, and that will differentiate the carriers to the mass consumer market, (i.e. teenagers).

Trend Two: Wireless is going to generate large amounts of Internet traffic (For example, DoCoMo's 3G phones enable web browsing and Internet traffic). While in the past, desktop computers have been the enabler for development of the Internet and corporations will continue their voluminous wired connections, it is the wireless arena that will drive new applications and requirements.

- **Wireless needs to be considered a *discontinuous innovation* not in the technology but in the way the Internet will be viewed and used by vast segments of the world's population.**
- We cannot think in terms of today's market norm as a desktop with its incumbent local exchange carriers offering broadband services . The norm will be a person who never has or never will have a fixed wire "connection" but will have between one and four separate wireless devices.
- According to the Japan Telecom Council's plan for 4G Mobile Communications systems, which are expected to be commercialized in 2010, the maximum data communications speed will be 100 Mbps, as compared to 2 Mbps for current 3G specifications (IMT 2000).

Trend Three: The convergence of wired and mobile platforms will bring personal computers, digital television, and mobile services under one common portal.

- At the conduit level, companies like Global Crossing are literally wrapping the globe with fiber optic cables, and allowing ISPs to offer localized content at whatever granularity they choose. Services will be highly individualized and therefore will need to be backed by large quantities of highly accessible data. This means that standards at every junction will be critical and the networks will need to house huge data farms. New models such as micro billing for purchases, virtual connections with charges for amount of data transferred (not connection times), collecting fees and distributing them to third party service providers will arise. It also means that carriers will have to completely alter their ways of doing business.
- Carriers may be global in holdings, but their service offerings must be adapted to the local markets. The clearest example is the world's leading carrier, Vodafone, has over 83 million subscribers across 25+ countries. Their customers buy services based on many different factors including language and cultural.

*The people supplying mobile Internet infrastructure are carriers;
carriers are built on a minute-per-minute business mentality;
but the mobile Internet is really the unlimited business media.*

- In Japan where i-mode¹ services adoption rates are high, DoCoMo has set low prices to encourage frequent usage. Users pay a low monthly subscription fee that provides 24 x 7 access and any additional charges are for the amount of data transferred. DoCoMo makes its money by charging content and service providers a 9% service fee of the total revenue, thereby ensuring that providers can develop their business profitability – which in turn has encouraged the proliferation of content and services.
- Japanese and European portals have focused their marketing efforts on young people, while carriers in the United States have been targeting wealthier market segments -- particularly business people. Since Japan and Europe portals have captured the very segment of the market that is most open to innovation, they encourage yet more innovation and the adoption of new services and content. Since young people in the United States are not as “hooked” on mobile services as their Japanese and European counterparts, the level of innovation in the US remains low.

The Knowledge Trends

The communications trends in and of themselves do not explain why the business models of the past are failing. It’s not until we introduce the knowledge trends that we understand the new and vastly accelerated business arena.

Trend Four: As new wireless technologies proliferate, it will allow many countries to leapfrog generations of technologies and catch up to today’s market leaders. For example, throughout Asia, China and India, many potential customers are bypassing fixed, wired communications systems entirely and jumping directly to wireless systems. They are easier and more cheaply installed than fixed systems, and allow much more flexibility. This will allow 500 Million “new entrants” into the market by 2005, allowing these new users to be added to the world’s “brain pool”. These new entrants will bring new ideas and innovations that were previously hard to or impossible to determine.

- The number of people accessing the Internet will more than double between 2000-2004 from 350 million to more than 800 million. Internet traffic (in terms of the amount of data transferred) is currently doubling every four to six months.
- With face-to-face (voice, data and video) 3G communications, trust and credible information will cause collaboration to skyrocket. Potential partners will be able to communicate and collaborate without having to undertake long and expensive journeys to work together.

Trend Five: “Knowledge doubling” will occur more frequently. Today technology knowledge (see Moore’s Law) is doubling at the rate of every two years based upon the number of transistors that can be fit on a single integrated circuit (and has been for the past fifteen). But with the expansion of the worlds “brain pool”, knowledge will continue to double at shorter and shorter intervals. **In areas like biotechnology, total knowledge is projected to double *monthly* by 2005, *weekly* by 2010, and *daily* by 2016. The point here is how little we know vs. how much there is to learn.**

¹ : i-mode is part of DoCoMo’s wireless system that enables mobile users to access over 1,600 DoCoMo authorized websites. Currently it is signing **40,000 subscribers every day** for i-mode service. Some of the websites are free while others charge up to \$2.50 per month. DoCoMo handles the billing for official sites and keeps nine percent of their revenue!

- “Knowledge doubling” is basically a function of how quickly the resource pool (primarily consisting of knowledge held in Europe, North America and Japan) doubles in size. But now, huge portions of the world’s population (China, South America, India) will enter into the world resource pool of knowledge creation and sharing.
- Currently the myopic focus of western business is on the number of people to whom services or products can be sold. While this may be true, it misses a critical point. What’s important is that we will have approximately 500 million more resources added to the worlds’ “brain pool” – people who will be buying, selling, competing and or partnering -- people who will be thinking about and creating new discontinuous innovation. The pool may be segmented by language today, but it is only a challenge that will be overcome within the next few years with universal translators. With these barriers removed, geniuses in Bombay or Shanghai will have the possibility to affect change in Silicon Valley and Singapore.
- With the amount of human knowledge doubling at shorter and shorter intervals, documenting, leveraging, and protecting Intellectual Property on a global scale will be critical, highly valuable and very difficult. Not many years ago in Russia when Russian programmers had no experience with property, let alone Intellectual Property, the idea of paying for a software license was deemed ridiculous. But as these programmers became entrepreneurial and began developing their own Intellectual Property, protecting what was theirs and paying license fees made perfect sense. Having more people participating in value creation will have the same ramifications on China and India.
- The ability to capture and leverage knowledge quickly, across partners will be fundamental. Trust will be the most basic building block of a business.

Conclusion

Reliance on partners and their ability to execute is relevant as today’s business model. However, looking at trends occurring up the communications infrastructure chain overshadows this means of doing business. The convergence of voice, data and video technologies with the fact that knowledge is doubling shows that market requirements are more complex than this business models can support. The impact of 3G (and eventually 4G) systems around the world will cause future requirements to overtake current business models, and communications infrastructure players’ will have to perform at the new expected levels. For this reason the next generation business model will drastically change.

The implication of the communications trends will mean that *hundreds of millions* of people will have access to each other, to new information and to new knowledge. The intertwining of communications and knowledge trends means that new knowledge will no longer limited to “the lab”, but will be available in fully-dynamic-interactive modes to people everywhere. This in turn will allow people to imagine what is possible, and then demand it faster than today’s companies and their business models can deliver. These new entrants will also be creating discontinuous innovations, which will create new levels of competition from previously unimaginable sources.

It’s not important *how* people are connected – whether via fixed wire or wireless – but instead that they *are connected*. Knowledge doubling means that technologies are becoming more complex while at the same time leading to more and better means of communicating. The implications mean more pressure on corporations’ ability to perform on a global basis and pushing the need for the development of a next generation collaborative business model. A much more complex model of acquisitions and global business partnerships is replacing the old business model of “growth by acquisition”. If you thought it

was difficult to buy and digest a company, wait till you try to work together on key projects without direct control.

“A global economy designed to waste transistors, power and silicon area – and conserve bandwidth above all – is breaking apart and reorganizing itself to waste bandwidth and conserve power, silicon area and transistors.” George Gilder.

And you thought time to market demands were tough – just wait!

Appendix

Suppliers becoming partners, where have we heard that one before? In order to have a full appreciation for the partnering “trend” we begin with a quick snapshot below as to how this trend has developed over decades in a laggard industry. We then do a “fast forward” to look at how the trend is developing within a visionary industry to see what the future might hold.

Laggards (the death spiral)

For examples of partnering in its worst form, we need only look at such laggard industries as automobile manufacturers. For years, the automotive industry has been using “partnering” as a thinly veiled attempt to heap more new responsibilities on their suppliers and pushing for continuously lower prices through open-book costing. This application of partnering should be called the leach model as opposed to partnering because every time the “supplier/partner” finds a means to lower costs, the savings are immediately taken over by the customer leaving very little incentive for the supplier/partner. Rarely does the manufacturer allow its suppliers to work in a true partnership mode to determine how best to accommodate customer tastes.

Visionaries

We believe that one leading edge model where suppliers become partners can be seen in Nokia, one of the most successful companies in today’s “commodity” market. The goal of Nokia’s model is to avoid the biggest danger in the business – getting stuck with obsolete finished goods. This includes everybody in the supply chain not just the company at the top. Nokia’s model is called *next-door* service.

In the next-door service model, Nokia has a large production facility surrounded by 12 of its major component suppliers such as IBM and Sanyo, each having large production facilities of their own. The tactical goal is to have transparency of information between Nokia and its major suppliers. Nokia hopes to tip its vendors early whenever it alters demand estimates base on the **latest retail results**. Nokia is even building local restaurants where its staff members are encouraged to meet and talk with their counterparts at the top suppliers, thus cementing partnerships.

Epilogue

Companies that want to stay ahead of their competition must continually demonstrate leading-edge vision and the ability to control, execute and adhere to its company’s pursuit of new opportunities. Vanguard Marketing International works on an on-going basis with many of its clients to ensure that they address changing market needs, capitalize on important industry trends, and maintain brands that clearly differentiate their company and innovations throughout the investment community and prospective markets.