Buying Telecom Futures

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BUYING TELECOM FUTURES

Summary:

Traditional communications is a world where the service providers are responsible for building the networks, providing the new communications services, and managing the lot. Non traditional communications is the evolution of the "Stupid Network": a world where innovation comes from computer companies (e.g. Microsoft, Apple, Intel), Portal companies (Google, Yahoo, eBay, Amazon), and software companies (Oracle, SAP, IBM) and networks are distributed lily pads in a peer-interconnected pond. In the wake of the burst bubble and the dual trends of service provider consolidation and growth of the internet fringe industries, what will tomorrow's communications world look like? How you can shift the outcome!

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Selecting the future you

During the crest of the ATM standards movement, one of the mavens of routing and I were sharing a car back from an ATM Forum meeting in Denver to the brand new Denver airport. We were both long time IETF junkies who had joined the ATM Forum at its inception because of our respective jobs in telecommunications – he as a switch engineer for a vendor and I as a telecom engineer for a service provider. He asked me a question that burned into my mind and stayed in my memory. One of those pivotal questions on which your life turns.

He said he was getting tired and overwhelmed from attending both IETF meetings and ATM Forums meetings and with leading and participating in working groups in both. "I think I need to choose between the IETF and the ATM. Wedge, which do you think will win out; which is going to be the winning technology?" Up until that moment it never occurred to me that one technology was better or would displace the other. I only saw a complex network of many technologies delivering different kinds of communication. I truthfully answered that I did not know, and I was going to keep feet in both ponds for now; but that the IETF seemed more robust if undisciplined,… and definitely more fun.

That I remember was his last ATM meeting and certainly he wound down his involvement and went on to start spear-heading the introduction of large network architecture design into the internet. I held on with both forums, but the question kept working through my mind. Soon thereafter, at the ATM Forum meeting in Alaska, when faced with the Anchorage Initiative (which stated ATM was now complete enough to implement), I stood as one of only two companies to stand and speak against it in the general session. I voted our companies negative position and never went to an ATM Forum meeting again. I had made up my mind to cast my lot with IP technologies as well.

Earlier, I made a similar choice in 1990 when I had opportunities to work for a major energy company or join MCI in starting its data division. Energy or Telecom: which would be the best opportunity? Predictive modeling or communications protocols: which would be more satisfying? I chose telecom and for the last decade of the 20th Century, I clearly chose correctly; but industries swing back and forth and certainly the energy sector has done better this decade. Did I make a mistake in not switching? But why this preamble about questions at the balance point? I believe a similar question faces us today: traditional or non-traditional communications; and likewise, traditional or SOA software development systems; and lastly, traditional or next generation OSS models? Where should we cast our carriers? Who will win out at the turn of this decade?

Is telecom still relevant?

Traditional communications is a world where the service providers are responsible for building the networks, providing the new communications services, and managing the lot. Non traditional communications is the evolution of the "Stupid Network": a world where innovation comes from computer companies (e.g. Microsoft, Apple, Intel), Portal companies (Google, Yahoo, eBay, Amazon), and software companies (Oracle, SAP, IBM) and networks are distributed lily pads in a peer-interconnected pond.

Putting it on the line for this pivotal question, The Insight Research Corporation has just released a new study "The Future of Telecommunications 2006-2011". I am not here to review this study or say they are right or wrong. Only that they are clearly touching on a major question confronting us today. In the wake of the burst bubble and the dual trends of service provider consolidation and growth of the internet fringe industries, what will tomorrow's communications world look like?

The Insight Research Corporation lays out three scenarios and models the economic impact of each out to 2011. These three scenarios are:

- Traditional telecom
- All Public Internet
- All wireless

Theirs is a "what if" study that is technical and thematically neutral: likely winners and losers, likely revenues for each.

> "Continuing turmoil throughout the worldwide telecommunications industry warrants a systematic look forward at the possible repercussions of the forces that are now pushing the industry forward: the end user's demand for more bandwidth; increased reliance on mobility services; and the end users' assessment of cost versus performance." "This study imagines the future of the telecommunication industry using a premise that everyone has considered: what if the Internet or my wireless provider is the only way I communicate five years from now?" ["The Future of Telecommunications 2006-2011,"; The Insight Research Corporation]

But how will this actually play out in the future? Behind this are pivotal evolutionary choices that will be made by venture capitalists, planners and executives in many different companies. But ultimately the winners will be determined by consumers.

Individuals count

I maintain that individuals will make a difference in the outcome of these evolutionary trends. Today mixes of forces leading to dominance of all of these are present and the tide currently can lean in any direction. We are at a pivotal position. What each of us decides, inventors, investors, consumers – will provide a force tipping the results from future potentials to future realities. This month a movie, based on the historical events at Thermopolis, will premier in theaters. I use this example because just about any military historian will agree that this was a pivotal point in history decided by some 300 energetic soldiers who stood off thousands of Persians, yet remember also by the leaders and military planners who sent them there. If they had not followed this plan and held the Persians, likely we would all be speaking a derivative of Farsi.

Decisions count

Deciding what to do - executives deciding where to put resources; engineers deciding what to learn and where to work – are elements of Game Theory. In this our choices are not independent, but also involve interaction and sometimes cooperation with the choices of many others. Games that involve coordination, yet where the communication of information and intentions is not complete/perfect are quite complex. Lots of strategies present themselves, many of them overlapping. But investing in all strategies is

certainly too expensive for the executive, and impossible for the engineer. Here the qualified planner can make their salary worthwhile.

It is not always best to look only for the ultimate end of a game. Sometimes the outcome is too far in the future to rationalize the strong commitment of current resources to it (an extreme example of this is the global warming dilemma). Other times the stopping point - ending time and state - cannot be known. In this case, it is often best to search for stable equilibrium, and then to pick out and work toward those which appear to present the best results or utility. This may be why progress actually occurs in society even when many short term choices of best interest result in sub-optimal returns. In game theory, one way to find these equilibria is

> "by searching for *focal points*, that is, features of some strategies that [the game players] believe will be salient to other players, and that they believe other players will believe to be salient to them. (For example, if two people want to meet on a given day in a big city but can't contact each other to arrange a specific time and place, both might sensibly go to the city's most prominent downtown plaza at noon.)" [http://plato.stanford.edu/entries/game-theory/]

While this is abstract; nevertheless, it gives a strong rational for the existence of forums and standards organizations. These are places where we can meet and discuss relative merits and values of future choices and then commonly seek to cooperate to achieve certain equilibria. I keep arguing for forums even when I must acknowledge that forums are notoriously inefficient even when communication among attendees is very good and honest. Among forum members goals will be different and some players will always see advantage by increasing private interests over achieving the common equilibrium. Nevertheless, attending the forums is always cost effective, because learning about common trends and communication with other players always provides better information for playing a winning hand in the overall game – even when you decide to buck the common trend. The cost of getting this information in forums and standards groups is actually relatively low. This is why it is important for planners to go to forum and standards meetings. When it is vitally important to make the right future planning decision, attending forums, trade shows, conferences or other focal points also becomes vital - as is reading from journals like this one.

Capital choices

In the Insight Research report, the value of our telecommunications industry is shown to currently exceed 1.2 trillion dollars and growth is still occurring from an overall international perspective. Enough so the industry will be worth perhaps 1.6 trillion dollars in another five years. This growth may be driven by fresh product demand and extensive new markets, but it fueled by capital investment - Billions of $ worth of investment each year. Capital investment is a limited, expensive resource. It should be committed to specific projects with very careful planning. If you invest in a non-wining technology or a product the consumers do not want, the capital is wasted. A bad choice can cost a company more that the total cost of your lifetime salary. Commitment of these resources is a competitive game - projects compete for these resources and resulting products compete with other products for the consumer's interest. How do you chose which is best?

When an executive is faced with continuing two projects past exploration phase and into development, each of which could result in a solution, it is best to commitment to just one rather than fund both at starving levels. When an engineer picks a job, usually it is committed to only one technology or product

group. Flipping a coin might be best if you were trying to outwit someone else (as in the fugitive's river crossing game). But if we are planners instead of gamblers, we will seek out more information on which to base that decision. If one team or one product is better than another, we must find the information that shows which is best. If we assume that all the teams are equally likely to succeed, than we must find an external reason to choose one over the other.

When consolidation occurs in our industry, as is happening in the US today with reintegration of telecom in massive companies like at&t and Verizon, competing projects will come under scrutiny. Some are best eliminated and the resources given to other groups, increasing their likelihood of success completion of that project. But will this result in an overall win.

A bad choice is to use the relative power of various management groups/executives to decide which projects are kept and which die. Unfortunately, in the absence of strong strategic planning, and good marketing information, this will usually be the way resources are allocated. If we can eliminate relative corporate power of management as a factor in decision making, than another method of choosing must be selected.

Collaborative solutions

In an earlier article, I argued that in evolutionary game theory, we learn that following the crowd is best when times are stable. When competition is high, when times are complex or chaotic, like today, innovation is best. But here we increase the refinement of our analysis. Often the way to reach innovation is to travel with a crowd. If you strike out on your own you will likely succeed only if your choice is overwhelming correct (Like discovering a brand new valley to colonize). But if you want to succeed with innovation when the relative rewards are smaller (like the similar relative outcomes in the growth model of the Insight Research report) and the chances of failure are pretty even among all the paths to get there, than it is best to team up. In this case, you are not so much "following the crowd" as "traveling with the crowd" or worst case "dragging the crowd with you".

IP and the IETF "won" over ATM not just because the technology was superior, but because enough of us joined the IETF and worked at overcoming the architectural disadvantages IP had against ATM. While in the end, ATM just could not function in the speeds needed in backbones, the IETF won because the invention of MPLS provided a simple way of organizing IP backbones.

Muddied waters

Insight Research acknowledges that the world will likely have a mixed solution and not become just one of the three scenarios they investigate. They see these as just ways of showing relative value of each to the industry. I argue, that seeing that one scenario has more value than another, mandates a strategic decision to commit resources to reaching that scenario. In the case of the three choices inherent in the scenarios of the Insight Research report, "All Networks" evolving together has the most revenue for the industry; winning out over All Wireless or All Internet. But ultimately this scenario building and modeling is just a trending solution. Trending solutions are notoriously bad at predicting the future - because the future results from many decisions being made in a big game.

The future will be altered by the decisions of executives in allocating capital and in consumers in their choice among products. Strategic planers and marketing research groups should be providing information on the value of outcomes so that executives can best choose.

Once we planners told Executives to concentrate investment in IP services. They selectively listened, committing to internet associated access and backbones, but not to internet products and management. MCI Internet provided the first internet commerce service as a sub part of 1800MUSICNOW, but the executives killed the project. Once MCI and AT&T respectively held the largest share of web hosting market, but these projects were relatively starved and growth and innovation shifted out of our control.

> "A wide array of new Internet-enabled communications services geared to the needs of consumers is expected to generate nearly $265 billion for phone companies and other telecommunications carriers worldwide over the next five years, according to a new market research study from The Insight Research Corporation." …"'However, the actual revenue contributions made by all of our IP services represent just 0.9 percent of all global wireline and wireless telecommunication service revenues forecasted for 2006 and just 5.7 percent of those forecasted for 2011." [ibid.]

Insight Research finds so little Internet-related revenue because most of it has already migrated out of our industry and is concentrated in computer, portal and software firms.

Today it seems that most innovation is coming from outside Telecommunications. Relatively, the computer, Portal, and software companies are making great inroads into our traditional product base and these are gaining considerable acceptance by the consumers. And executives can no longer hedge their bets by buying computer, Portal, and Software companied, because today these are valued by the market higher that us. The market is another voting mechanism where investors are trying to predict the future and weight investments according to expected future value. So what should we do? Decide to quit telecommunications?

Playing to your strengths

I argue that we can still survive as a strong and independent industry, if we can provide the strongest product. If we identify and invest in our strengths, than we can shift the probabilities that this outcome will be achieved. There are several current technical *focal points*, which are also our strengths, where we can gather, band together, and drive forward to succeed. Technically these come down to:

- UTRAN for wireless
- Fiber-to-the-home
- SOA and "software as a service" as a product infrastructure
- IMS for application integration of all

The price of choosing wrong could be quite high. Again the findings of even the simple Insight Research Report (And for once a study is presenting the consequences of their work in even more dire terms that I usually use):

> "…if the network evolving scenario is displaced, then the entrenched carriers and suppliers could see their cash cows shrink dramatically to a level from which they are unable to recover their

> investments adequately, and continuing depreciation of their assets would lead to bankruptcies. Of course, those that invested in the Internet and wireless scenarios also face the same risk if their approach is not the predominant one." "…the other two scenarios should be viewed as more likely to win based on price, as long as they don't have major problems with service quality, service usability, service availability, or service support."

But here is our successful strategy! The relative strength of our network over computer companies, portals, and software firms is two things:

- Our experience with networks as 'complex' inter-working systems
- Our commitment to quality, achieved via active management systems

So strategically, our executives should be investing strongly in these – not just as a means of managing the above new technologies, but independently to provide a differentiation from the "stupid network".

Returning to my original example question, IP or ATM or some mix; of course IP came to dominate and ATM became an edge technology. One dominates but both continue on. Likely the scenario future of networks (mixed telecom based, wireless based, or Internet) answer will also be mixed. One will dominate but all will continue to play roles in what after all is an organically growing industry.

Today most innovation and momentum are now coming from outside service providers and traditional vendors. The best investment play for providers is fiber to the home, IMS and UTRAN. But the best hope for overall success (and maybe even the survival) of service providers is in insuring quality through effective management of networks and services.

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