

# Competing Visions for World Telecommunications\*

## The Global Evolution of Industry Structure

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### ABSTRACT

The globalizing telecommunications fraternity is rife with competing visions for its own future. How do we choose among three such visions, each associated with a major carrier? In this paper, we consider the full dictates of network evolution – innovation together with standardization. Instead of standard competition policy, networks that serve the evolution of their *communities* require a careful mix of structure and dynamics, according to this logic. The carriers' three structural visions sort by how well each supports such policy. The paper concludes by reviewing in this light the recent announcements/reports – by BT - MCI and about AT&T - DBP Telekom - France Télécom – then asks about next steps.

At least three distinct visions of the global future for telecommunications are competing to be accepted within the world's telephone industry.

Over the past five years, the relatively insular monopolies which provide telephone service in most countries have stirred dramatically, particularly the largest telcos around the world. Each has reached beyond its borders to offer regional (Europe-wide, for instance) or global reach for its customers – but in the process the company's monopoly status is subsumed within the larger geography and network. In these few years there has been an on-rush of activity, transforming what previously had been a placid world of collegial bilateral relations among separate duchies.

Then early this summer [1993], the announcement of a corporate marriage galvanized the industry. A global network will be offered by two of the major contenders, now together – BT, the flagship of British telecommunications and a "break-the-mold" voice for globalization, and MCI, the US long distance company which as an upstart pushed hardest for liberalization of the American telephone system.<sup>1</sup> Now in the early winter, the press is bruited another possible alliance between Europe and the US. American Telephone and Telegraph, or AT&T, once the American flagship and still the nation's largest carrier, is huddled at its Brussels office with the two carriers at the core of continental Europe: Deutsche Bundespost Telekom, or DBP Telekom, the German flagship, and France Télécom, the French flagship carrier.<sup>2,3</sup>

Along the way, a contest for the hearts and minds of a globalizing telecommunications fraternity has broken out. At stake in this contest of visions is the prospect for communications capability to solidify at the global level – the electronic nerve tissue, we could say, that might connect across national boundaries and around the world. At first, attention will focus mainly on expanded business uses for global networks, such as links to tie together the far-flung operations of global companies, or as another example traders following an ever-dawning new day and a financial market that never sleeps. But soon enough, personal use of a global system will come to the fore. For instance, newly super-abundant video channels could carry programs from other countries. Even today the Internet

already connects, by one reckoning, eight million individuals in over 40 countries.<sup>4</sup> In fact as we proceed below, we will find ourselves trying, most of all, to puzzle out how we can usefully think about what is at stake here.

The three visions for global telecommunications differ over the relative status of individual players as against collaborative groupings - such, in other words, is the turf for the contest among the visions. This question of divided but coordinated resources, of balance between parts and a whole, echoes in the new BT - MCI venture. Though coordinated as a joint effort, the two are dividing the world between them – MCI takes the American hemisphere and BT the rest. Indeed, the question arises for anyone who grapples with constructing an organization – as encapsulated by one of the first modern economists, Adam Smith, in his model for organizing a pin factory, divided parts but coordinated whole.

### THREE COMPETING VISIONS FOR GLOBAL TELECOMMUNICATIONS

Implicit in the three competing visions are different future structures for the global telecommunications industry. What are these different outcomes, how do they compare with each other? Who espouses which position?

#### Future Global Structure

##### Three visions for telecommunications

##### Company most identified with the view

<i>Few dominant companies (or, single dominant?)</i>	<i>Competing groups</i>	<i>Single group</i>
BT (UK)	MCI (US)	DBP Telekom (Germany)

The three visions are widely identified with three operators - BT, MCI and DBP Telekom. However the philosophical positions which lie behind these views are just as widely debated by other industry members, certainly by the other firms that are active globally. What is more, the purpose here is to establish contrasts among the *outcomes* implicit in these visions. We will not look at the detail or nuance which is necessary to propound each view. In fact, the alliance that opens this paper is between two of these operators with differing positions - that will certainly be grist for our work below, as will be the other, prospective alliance.

BT, in the UK, is identified with a view that sees a few companies emerging to dominate the global industry. It is even possible to infer the rise of a single dominant company, around the world. The mechanism to reach this result is a classic competition among combatants, and competition will define relations among any survivors. BT acknowledges, though, that there will be some coordination at the physical transport level, where one network interconnects physically with another.

In contrast MCI, in the US, has proposed a future in which consortia compete with each other. Individual companies gather into groups, which then compete with other groups to shape the future of global networks. Relations within the groups are marked, in MCI's terminology, by "cooperation" - a combination of collaboration and competition internal to the group. Almost as if to put a stronger stamp on this vision, MCI has proposed a directly parallel approach for personal communication systems (PCS)<sup>5</sup> within the US. MCI has proposed that PCS in the US be developed by competing national consortia, including a mix of competition and cooperation internal to a group.

Finally DBP Telekom, in Germany, has brought forward a proposal for a new European structure in telecommunications. Though not yet so active as a template for global networks, this conception stands in the wings on the global stage. While a brief description fails to convey its several facets - as brevity fails each of these three views - a fair rendering of the proposed structure is, I believe, that all the principal actors join in a single group. Relations within the group are consciously a mix of competition and cooperation.<sup>6</sup>

So future industry structure in the BT vision is a few dominant companies, or perhaps a single dominant company; for MCI, it is competing groups of companies; and for DBP Telekom, a single group. Superficially, the structural outcome seems to differ across the visions by whether the units are individual companies or groups of companies. When we look a bit more closely however we see that the two extreme positions, BT and DBP Telekom, both (potentially) result in a single entity. The difference between them is whether individual companies are joined together by integrating into a parent organization or, instead, by forming into a collaborative group. In other words, the contrast between these structural extremes centers on the relationship between the individual company and the group.

Nominally there appear to be two entries from Europe and one from the US. Does the BT - MCI announcement suggest the divide is in fact between Anglo-American and European? We will come back later, to discuss new alliances.

#### CHOOSING A VISION: NETWORK EVOLUTION AND A POLICY CYCLE

If the present tussle, at some level, is between Anglo-American and European ideological positions (with, so far, no substantive entry from Asian ways of thinking) how does a thoughtful industry participant make a choice? Europe at this time is a major laboratory for the expansion of community, which globalization would further expand to world scale. Certainly, pan-European networks to support such a wider sense of community are necessarily subject to forces at the global level. Nonetheless, Europe's step toward a *regional* network may suggest some of the concerns which a choice among *global* visions must address.

- A more integrated telecommunications system for Europe faces (among others) two fundamental requirements, but in tension with each other. (1) The new community looks toward a universal infrastructure which will seamlessly interoperate across intra-community borders. Particularly for the more sophisticated intelligent services, integration to make the flow seamless will require collaboration. However, (2) tariff structures have become dependent on a tradition of higher rates for greater distance and particularly higher rates across the same intra-community national borders. Competition among the community's telecommunications firms - *not* collaboration, certainly - is the vehicle chosen to break this mold and bring lower rates that will encourage a greater flow of traffic across the new community.

This only samples the concerns, but perhaps the apparent tension marks a degree of significance for these two.

If these are some of the concerns, on what basis do we make a choice among the competing views of future industry structure? I take as starting point a page from what we know about the evolution of networks. Evolution is, after all, the generic for community/network expansion, in Europe and throughout the world.

- INNOVATION AND STANDARDIZATION, COMPETITION AND CONSENSUS

To enjoy continuing innovation in a network requires, we know, an iteration, a round - a repeated cycle between innovation and standardization.<sup>7</sup> An innovation, by its nature, breaks the network's connection;<sup>8</sup> to reap the benefits of new network technology, consensus about the network of choice must re-assemble. The policy implications are profound. The

experimentation essential to the innovation phase is probably best supported by competition. But the new consensus for the other half of the cycle requires the opposite of competition.<sup>9,10</sup>

Two recent cases, both between Europe and the US, illustrate the pitfalls of neglecting either phase of the cycle.

- In digital cellular, Europe easily reached consensus on a standard while the US has instead produced hotly contested technical proposals. Europe demonstrated its capacity to reach consensus on a common approach, while competition in the US promoted experimentation and new ideas. But each lacked the other's strength, for the other phase of the cycle, and each is paying the price. Questions have been raised about the quality of Europe's GSM<sup>11</sup> standard, while the wrangling in the US seriously slows or even prevents adoption of a common approach.
- High Definition Television (HDTV) showed the same pattern. Again, Europe demonstrated its ability to agree on a standard. And again, US scrappiness brought forth winning technical proposals. In this case Europe's HD MAC<sup>12</sup> standard has already been eclipsed by the US scheme for digital transmission.

However, the US recently brought together its competitive HDTV proponents into a "Grand Alliance," with agreement on a common approach. Is the US learning the other phase of the cycle? An attempt to answer that question highlights one crux of the new policy appropriate to these dynamics.

At this crux we find the switchover from competition to consensus. Prior to that point of inflection we can, and must, enjoy all the benefits of competition that most thinking about evolution holds dear. But if we are to enjoy the benefits of connecting our community of interest by means of new technology, the mode must shift. Rather than rely on competition, we must take direct responsibility for our collective welfare – as a group, take responsibility – and sort out, from among all the new ideas bruited during the experimentation phase, those which will meld together to serve the group best.

This was exactly the task set for what became the HDTV "Grand Alliance" in the US. After a strong competition which produced several opposed proposals, the backers of those separate ideas were asked to combine them into a single "best" standard. Did they succeed? The resulting omnibus proposal is actually a collection of guidelines. The competing HDTV proposals in the US were particularly divided between the use of interlace or progressive scan.<sup>13</sup> Television set manufacturers argued that television viewing is best served by interlace; computer manufacturers said, on the other hand, that progressive scan is essential for closer-to-the-user computer viewing. The "Grand Alliance" made provision for both. Does this dual provision represent legitimate needs for variety from different constituents in the community? Or, is this just political horse-trading that only protects some entrenched old-technology interests, in this case manufacturers of the less expensive interlace method?

- A SOCIAL CHOICE *VERSUS* PROTECTIONISM

So, the social choice that must be executed at this crossroads between competition and consensus also raises the specter of protectionism. Decisions by a group open the door to decisions that favor *just* a group. Fortunately however, now we are in a position to see – so far only conceptually, not yet with a numerical metric;<sup>14</sup> but at least conceptually – what separates undesirable protectionism from a necessary social choice, a choice on which vital function of the relevant community depends. Protectionism (in the network case<sup>15</sup>) sustains interests with passé capabilities and blocks access for new ideas. Legitimate social choice, by contrast, melds old and new ideas into a single common approach that will best serve – until, of course, the time is ripe for the next iteration of innovation and standardization.<sup>16</sup>

The crucial distinction between protection versus essential choice for the community is rarely perceived, if at all. The resulting confusion has regularly led into a morass of

disagreement and opacity about useful policy direction, not infrequently on a global scale. Since the distinction between the two must be drawn in an exchange among community members, there will always be opportunity for those inclined toward protectionism to try and obfuscate. But simply to understand the framework for discussion – that best choice and protection are opposed to each other – is the first step. And success at instilling this approach holds the prospect for a community to enjoy benefits both from innovation and from connection.

- VARIETY WITHIN THE STANDARD

The policy indicated is not as simple, however, as a temporal sequencing between competition and consensus for, say, fixed periods. We see already with the HDTV story in the US how agreement on a standard may serve as a sort of window that enables on-going diversity. There the debate between television viewers and computer users illustrates variety across a population, within the underlying standard.<sup>17</sup> In addition there may also be variety across time. Generations of technology, such as the fax G-series, typically represent incremental improvements which follow some basic technical breakthrough.<sup>18</sup> One label for these two types of diversity-within-the-standard is “variety in space and in time.” Eventually the (old) breakthrough technology, which underlies a standard, is itself stirred to renewal; ideally a whole new iteration between innovation and standardization then takes place.<sup>19,20</sup>

The result is cycles (for the nested, “lesser” innovations) within cycles. This is one characterization of the interdependence that is found widespread among technologies. A policy with temporal sequencing was already not a simple story. Now we see that to enjoy the most savory technical fruits in our networked lives requires policy agility indeed. With numerous technologies, almost too many to name, each at a different stage and interdependent with other technologies ... we must be sharply competing on some fronts, sagely agreeing on others, all at the same time, and inevitably at some times, doing both with the *same* party on the other side of the table.

- COMPETITION, IN THE EVOLUTION OF NETWORKS?

Clearly, the policy formula is more complicated than just “competition.” But, as we noted above, competition is integral to Europe’s policy plans for the future, and indeed competition is the heart of a new creed for liberalization that has caught hold around the world. So far here, however, we have treated competition only in general terms. Though really a digression from our focus on choosing among three visions, we must nonetheless ask how competition applies in the particular. The policy cycle pursued in this paper is consciously dynamic.<sup>21</sup> If we believe the desirability of competition should change with time, how can we in fact use it?

The discussion of this question, since a digression, is relegated to an appendix. That appendix concludes:

- A policy for network evolution values competition, first, for an environment that supports experimentation. Even for experimentation, however, collaboration is also important. More, the competition here is a contest of ideas – decidedly not the commodity competition of neoclassical thinking.
- Diffusion is the next step in this dynamic approach, after the innovation. Though competition may have some mixed utility for diffusion of a network, such competition still is not commodity competition. Interestingly, other mechanisms also seem to be available to deal with a central challenge, that of the dominant incumbent.
- After the standard, is there commodity competition? The evidence is not so encouraging, though competition does seem to work when given a chance. Here are some considerations (fuller treatment is deferred to a forthcoming book): The peculiar character of a network requires mechanics, such as pricing, that fit. Demand

emerges, as with any innovation – but a network also requires an initial installation the size of a critical mass, for a *demand*-side experimentation-and-consensus to unfold.

The relevant question, though, is how competition fits within this phase of the dynamic innovation-standardization process. Again as with diffusion, other mechanisms besides competition appear to be available to deal with the monolithic, dominant organizations that arise regularly in telecommunications.

The competition that suits an evolving network is decidedly different from neoclassical commodity competition – and different indeed from phase to phase of the evolution. Its application is only episodic, and typically it is also mixed with other regimes. Perhaps most important, the persistent challenge in telecommunications, namely the large organization, appears to be amenable to other means besides competition. Indeed, telecommunications policy cannot be summarized simply as “competition.”

- MAKING THE CHOICE OF VISION

Our purpose is to choose among the three visions for global telecommunications. We have described a policy scenario for network evolution. How does the expansion of community and network, which is projected by each of the three visions, grow from our evolutionary scenario?

Widening the sense of community surely depends on an underlying set of social and political forces. But just as surely that occurs in a joint unfolding with the communications tools which would help to knit such a larger community together. In both cases, the essential event is a joining together by smaller sub-communities. That linkage is tautological for the social expansion of community; for the network, linkage was implicit in the process of forming consensus around a new standard. Linkage across communities is the mechanism.

In the evolutionary scenario, linkages form for a consensus, then to enable the next experimentation the links are broken and the group fragments; the group re-forms, then re-fragments; re-forms, then... *Expansion* of a community/network – compared with network evolution for an already established group – is the special case of linkages that have not been forged before, in earlier iterations of the evolutionary cycle.

Before we move to answer our main question, we should note a fundamental feature of the architecture in this process. There is nothing magical about our notion of community. The entity that we have been calling community is not necessarily the community of nations, or the community of companies in an industry, or of residences in a neighborhood, or of members of a family, or of... It is as fluid as its members choose, and it could be as small as two individuals. The three-decade history of UNIX illustrates well, with the step toward a world agreement in the mid-80's through X/Open, then the split again in the late 80's into UNIX International and the Open Software Foundation, and now the recent turn yet again back to X/Open.<sup>22</sup> Perhaps the basic metrics for these dynamics in the innovation-standardization sequence are the *size* that bounds the largest consensus and the *speed* of transit through a cycle. Together, these parameters determine who enjoys benefits and when – they measure what is at stake, in this approach.

Now, how do we choose among the visions for global telecommunications? Well, how do we implement the policy cycle that encourages fruitful evolution of the network? The final description, on the page before - where we are competing and agreeing, on multiple fronts, even at times with the same party for both competitor and partner - is demanding indeed. Does the DBP Telekom vision, of a single group, offer a structure with the potential to realize this demanding regimen? That depends, pretty clearly, upon relations within the group.

- DBP TELEKOM'S SINGLE GROUP – STRUCTURED FOR SUCCESS

The structure itself is what the contradictory policy demands require. When the occasion calls for consensus the group can *act as a group*, and when more independent action is indicated the pieces can *fragment into separate units*. The “nesting,” of units within a group,<sup>23</sup> makes possible the re-forming and re-fragmenting that successful evolution - and expansion - require.

Relations within the group determine whether the group is actually so capable. Is the leadership core vacant, with leadership “handed around the group,” so that there is a peer basis for participation - despite that some may be more equal than others? That seems essential, both for successful operation as independents and also for the willingness to re-form into a group. It also seems the character of a workable democracy.

The essence of the arrangement is to be capable of operating *both* as units *and* as a group. That puts a premium on strong identity, and boundary definition, for individual units; equally it puts a premium on the ability to link together, across those strong boundaries. Perhaps we can see now the one common thread that does run through all use of competition in dynamic evolution. That is the style of competition. If companies (and people) are to organize in this both-contest-and-agree world, then they can only accept plus-sum conflict. Some competitive environments emphasize the detriment of other competitors; resources are expended just to demolish the opponent. That would be intolerable for those who had also to work with each other. Plus-sum competition focuses instead on doing better than the other side, even hoping the other side does well too, since that can make for greater wealth all around.

Thoughtful policy is only as good as our ability to implement. This “nested” organizational structure seems to be the right start for what is a complex and demanding - but prospectively quite rewarding - policy. We can also see that this approach is indeed the alternative method we need to deal with the large, potentially dominant organization: The nested structure, together with the new policy, aims to be both monolith and fragments, at the same time.

#### REPRISE: THE NEW ALLIANCES

- BT - MCI

Do the announced details of the BT - MCI alliance suggest any insight into BT's and MCI's positions on these matters? We could look for evidence of BT acting on a view consonant with its vision of competitive winner(s). BT will control 75 percent of the new company. The investment is from BT into MCI. In board cross-memberships BT takes three and MCI one. Or, we could look for MCI following its vision of “cooperatition.” MCI sells only 20 percent and intends to remain independent. Indeed this is not the first significant minority investment in MCI, IBM once holding 16 percent.

These are straws in the wind. Though another straw suggests a different possibility. While forming the joint venture BT and MCI also carefully divided the world between them (as this paper recounted at the outset). MCI is even acquiring BT North America, seemingly to complete the separation. This is just the arrangement we have framed above – strong identity for component units, at the same time linkage between them. Is there reason to imagine migration toward such a view, over time, among *all* actors globally?

- MIGRATION, ACROSS THE SPECTRUM OF GLOBAL VISIONS?

BT's vision (the extreme interpretation, that is, with just a sole survivor) surely encapsulates one stage in an historical process. In the US, around the Kingsbury Agreement after the turn of the century, AT&T vanquished its rivals, often by acquisition, and dominated

American telecommunications for 50 years. In Finland a single long distance carrier emerged in the 30's, unchallenged until now.

MCI's vision clearly is intermediate between that view and the single-group structure we have explored here.<sup>24</sup> Further, for each of its global groups, the MCI approach also includes regional, feeder groups which flow traffic into the global ensemble.<sup>25</sup> (Again, this structural detail is reinforced in MCI's proposal for PCS in the US, where each national group is to include distinct local licensees.) The internal structure for any MCI group parallels, in other words, the DBP Telekom single group.

In effect, the DBP Telekom architecture specifies the internal structure for any one MCI group. The difference between them is competition among groups, in the MCI world. And BT has seen fit to pair with MCI. Will future history record a migration from the historically-founded view of competing companies, a migration facilitated by the intermediate position, and onto an evolved view that aims for the single-group structure, where competition and consensus consciously mix?

Another question must be asked beforehand. The single group looks, at least superficially, to be similar to the collegial correspondent relations that so far have structured international telecommunications. Is there any important difference? does the vision of a single group entail any change, really, from the correspondent relations of the past?

- AT&T - DBP TELEKOM - FRANCE TÉLÉCOM

The prospective alliance under discussion among AT&T, DBP Telekom and France Télécom offers some evidence. The company identified with the single-group vision, DBP Telekom, along with its partner France Télécom, reportedly<sup>26</sup> have rejected the loose sort of affiliation they see in AT&T's earlier global proposal, WorldPartners. Instead apparently, they want a stronger union.

The loose affiliations that define the correspondent relations of the past assume no social rules-of-the-road, beyond the narrow focus necessary to deal with the business in hand. However, a functioning social group does develop broader, often implicit, guides that will shape behavior across the group. Culture, or social contract, are commonly-used descriptions. Conventions about internal governance are particularly central.<sup>27</sup> The single-group vision entails, it appears, a transformation of correspondent relations into those of a new group – what now is seen as *outside* converts into an expanded definition of the *inside* to create, or expand, a sense of community for the companies.

- “NESTED” STRUCTURE, NOT DOMINANCE

Does this second alliance seem to spur, or deter, a migration of views toward the single group?

The historical AT&T, as said, dominated its territory when the chance arose (a description that would also fit its many monopoly brethren around the world). But the main news report of the proposed alliance<sup>28</sup> cites fears that AT&T will continue its dominating ways. Here, we have not looked in detail at AT&T's vision, or model, for future telecommunications – the reported fears may be groundless in fact. But we can see that tendencies to domination, whether from AT&T or from another player, are anathema to successful operation of the new scheme. Success at shifting the focus back and forth between individuals and the group depends fundamentally upon individual integrity for each player (what was described above as strong identity and boundary definition).

In fact half the news report is devoted to the prospect that Europe may draw back from an uncomfortable alliance with AT&T, apparently to build instead a strong European regional network around DBP Telekom's and France Télécom's Eunetcom. How would our new policy guide us here? If we interpret DBP Telekom's vision of a single group in terms

of MCI's structural detail at the regional level, we see that the "nesting" actually involves at least *three* levels. The highest level group becomes a group of *groups*, which is then comprised of individual companies.

Successful policy depends, I believe in other words, on the formation of a strong intermediate *regional* identity, which is then able to contribute in a *global* forum. Nothing else seems likely to account adequately for the diversity around the world. The dynamics in such a multi-level world are challenging – perhaps we are not surprised at the complexity, as the arena expands to global scale. Mastering those dynamics does hold out to us the fruits of joint technical and social evolution.

If Europe does draw back and build its distinct regional network,<sup>29</sup> AT&T is reported not willing to accept a minority position in the enterprise. But rather than consider a minority position, the possibility for migration toward a single-group view suggests a different course.

Asia, and possible steps toward an Asian community, are also much in the news now; perhaps NTT, among others, might take a role on the network side. If that began to flower, there could be three regional building blocks in place – Europe, Asia and the Americas – to begin in earnest the assembly of a global system. AT&T, along with each of the others, would have strong ties within region as well as links across regions. Such a relatively balanced tripartite division would diminish threats of dominance and elevate the prospect for a community of communities.<sup>30</sup>

## SUMMARY AND CONCLUSIONS

Among the visions for world telecommunications that try to win our hearts and minds, which do we choose – a few/one dominant company or competing groups of companies or a single group? Network evolution – innovation with standardization – leads us to a policy that combines contradictory regimes – competition with consensus. The structure offered by the single-group vision can support the sophisticated dynamics necessary for this policy.

Competition by itself is not a satisfactory policy, and trials of classic competition have in fact not worked very well in this industry. Instead a carefully calibrated mix of structure and dynamics is required – "nested" structure to facilitate a dynamic iteration, where competition (particularly for ideas) is vital but where consensus must also alternate with competition and is equally vital.

Recent alliances offer some evidence for a migration of views, across the industry, toward the single-group vision. However the path forward is not well demarcated, and there are plenty of contrary impulses. If we master the challenges of this demanding new arrangement – complexities that seem unavoidable as a global world emerges – communities with strong boundaries will be able, as the most fundamental hallmark of our success, to open to new ideas, even if originating from the outside. The threat of dominance, which competition was hoped to eradicate, may actually be turned back only by this new policy. Nowhere is the imperative – as dictated by the pitfalls to sidestep *and* the fruits to relish – more palpably stark than in telecommunications.

APPENDIX

**Competition in the Dynamics of Network Evolution**

If we consider competition from the perspective of network evolution, how will we use competition? Since this is really a digression, the objective here will be to mark out just the contours of the question.

EXPERIMENTATION: A CONTEST OF IDEAS

Our policy cycle first of all lauds competition for creating an environment that is amenable to experimentation. Equally however, we can be fairly sure that collaboration, too, is vital to successful technical innovation – for spillovers among related technologies, for cross-fertilization between large R&D laboratories and small research boutiques, or simply for the social atmosphere that surely imbues many creative workplaces. In any event, the competition here is a competition of ideas à la Thomas Kuhn and shifts in paradigms. We can see that it decidedly is *not* - certainly not as its principal thrust - the neoclassical commodity competition of costs and prices.

DIFFUSION: STILL NOT COMMODITY COMPETITION

With our dynamic perspective, once we have succeeded with an innovation, the next step is diffusion. (Now we have introduced demand alongside supply - but that will be full-blown in the third, next step.) To think about the role of competition in diffusion, we might compare cellular in Germany and the US. Together these cases cover both entry against a dominant and the pairing of relative equals. In Germany with an established dominant provider, competition seems to have speeded the uptake of cellular. Though the balance of judgment on the US duopoly probably comes down in favor of competition, the industry has so far failed to reach a seamless network while some prices have also proven sticky. But then Sweden, with a quite dominant service provider, has if anything diffused cellular even more rapidly. Competition can be useful in the diffusion process, though not without drawbacks – but apparently there are other ways to deal quite effectively with diffusion. Separately, these other ways, besides competition, may also be an alternative to deal with the challenges raised by a dominant organization.

Primary activities during network diffusion are: communicating attributes of the novelty as well as disseminating information about its uptake, providing opportunities for trialling it, rolling up segments into a seamless web, and bringing costs and prices down a learning curve. Though closer than a competition of ideas, these activities still are not neoclassical commodity competition.

AFTER THE STANDARD, COMMODITY COMPETITION?

Then, straight commodity competition - do we find it in our dynamic world? The bulk of this discussion will be deferred to a forthcoming book - but, to outline some considerations:

First to look at cases, the US experiment in competition for putatively commodity long distance is coming under increasingly sharp scrutiny. Recent work argues that US long distance is an oligopoly and price reductions are the work of regulators' shifting between carrier and user access charges.<sup>31</sup> Some wonder if the point of divestiture could have been had without divestiture itself.<sup>32</sup> By contrast in Finland [a case like almost no other] relative equals face each other (and some of the US subsidies are not possible). There competition has lowered some prices; it has also raised local prices, and residence prices more than for businesses. Competition works when given a chance, but the pertinent question is how that

fits the dynamic process. In Finland for instance, it is possible that concerns for overall investment in new technology will be addressed in common, even as the competition swirls.

Intriguingly however, just as with diffusion, there seems to be another dimension, beyond competing-equals *versus* entry-against-a-dominant. The Nordic/Scandinavian countries, as a group, appear to have produced especially high quality telecommunications systems. Though competition has not been absent from their practice, they seem to have other means to deal with organizations that tend to grow up monolithic and dominant.

Do the mechanics of commodity competition fit network evolution? To the extent that a network is an extended organism, a web, decisions about it have a longer-term character. But classic pricing is a mechanism for short-term signals. All businesses encounter this difficulty to some extent, but for the network there is a perfect mismatch between the signal and the decision, short-term signal but long-term decision.<sup>33</sup> Current Internet practice is one example of pricing that does account for the character of a network, though only statically. Institutions pay (most of) the price of (say) a T1 link, which hooks the individual members of the institution into the Internet. The institution as a surrogate for the community makes the purchase decision, and the price is set for the community as a whole. Dynamic pricing for network evolution, however, invokes the network externalities. This necessarily engages the demand side - the user - in the process. For instance in Japan the user has provided significant capital, in Finland the user has also been made an owner.

Can we say what is "the market" - the demand - for a technically evolving network? The market for any innovation can only emerge as the technology and its users mold - co-evolve - to fit each other. The market does not exist but emerges, evolves. Because of the network externalities, however, users cannot even experiment with a network until the supply side has installed a critical mass of sufficient size for some community of interest. France Télécom's Minitel shrewdly built geographical region by geographical region, but nonetheless it faced billions of francs in investment for what could start only as an *experiment* at the national level. Users negotiate a cycle strikingly similar to the alternated regimes that have already been described for the supply side.<sup>34</sup> A canonical form of user variety is the demand for private networks.<sup>35</sup> Nested/private communities of interest are the basic building blocks.

ENDNOTES

\* Chapter 23, *The Race to European Eminence: Who Are the Coming Tele-Service Multinationals?*, Bohlin, E., and O. Granstrand, eds., North-Holland, Amsterdam, 1994.

<sup>1</sup>These company names originated from phrases, such as British Telecommunications, but have now left behind the words and use only capital letters, a practice not uncommon in the industry.

<sup>2</sup>At the time of the BT - MCI announcement, AT&T also announced a global joint venture, WorldPartners. DBP Telekom and France Télécom also have a joint venture between themselves, named Eunetcom. The Swedish, Dutch and Swiss carriers have also formed Unisource.

<sup>3</sup>Among the largest carriers, only one does not have its global intentions accounted yet: Nippon Telegraph and Telephone, or NTT, the Japanese flagship carrier (though it is the dominant, and prominent, domestic carrier in Japan, NTT operates in a liberalized market with many competitors). NTT has so far been constrained from international carriage by domestic regulation. Nonetheless, it was one of the first to establish a full-fledged international presence, with offices around the world.

<sup>4</sup>John Quarterman, in *Computerworld*, February 22, 1993. Explosive growth in the Internet means, however, that in the intervening half-year the numbers are now much higher - some estimates place the current number of users well over 10 million, for instance.

<sup>5</sup>PCS envisions equipment so small, capable and mobile that a person takes the array of telecommunications services - phone, fax, data, even video - potentially anywhere.

<sup>6</sup>The views at each of the three carriers were discussed early spring 1993, in a series of visits to each headquarters. In turn, these were part of a series of visits to a wider set of all carriers. For BT, numerous published reports of statements by BT Chairman, Iain Vallance, were confirmed by discussion at BT's strategy group, London. Discussions with MCI International were held in Rye Brook, New York. Discussion with DBP Telekom's international directorate were in Bonn; see also an address delivered at the Münchner Kreis Congress, 24-25 November 1992.

<sup>7</sup>For a directly parallel approach, see Mark Leary and William Sines, "Open Systems: Impact and Import," White Paper, International Data Corporation, March 29, 1993. Leary and Sines speak in terms of a "standards wheel [with a cycle that spins faster or is braked and slows]."

<sup>8</sup>Like many others first encountering this discussion, you may ask how is it that the connection is really broken. E-mail is one case to consider. In the early stages of e-mail, those who became accustomed to it were frustrated, on occasion, by the isolation on their island of interconnection - indeed such frustrations continue today. Discussion of information have's and have-not's is another case, whether the have-not's are developing nations or just the house down the street which is still waiting for a network installation. User push for open systems is another case.

<sup>9</sup>The annealing of metal has been suggested as a metaphor. The metal is alternately heated, when it is more malleable, and then cooled, when it becomes stronger.

<sup>10</sup>For a full and detailed treatment of this subject see David Allen, "Between Innovation and Standardization: The Evolving Network," first presented in Turin, Italy, April 18, 1991.

<sup>11</sup>The provenance for the GSM moniker descends first from Groupe Speciale Mobile but later became Global System for Mobile communications. Today the standard is known universally by the acronym alone.

<sup>12</sup>High Definition Multiplex Analog Component. The two parts of the video signal, the chrominance (or color) and the luminance (or black and white), are treated as components rather than as a composite - but in analog form, not digital.

<sup>13</sup>Progressive scan produces a complete picture in a single sweep down the screen. Interlace takes two sweeps to complete the picture, the first sweep drawing every other line in the picture, the second sweep filling in - "interlacing" - the remaining lines.

<sup>14</sup>Mathematically-based tools for network analysis (one formulation of the subject here) are beginning to emerge, however. For one enjoyable recent review see Mario Maggioni, "Network Analysis of Regional Industrial Dynamics and Local Economic Policies," Society for the Advancement of Socio-Economics Conference, March 28, 1993.

<sup>15</sup>For a step toward broader application of the ideas - intermediate cases, that is, which do not require the strict interconnection of the network - see the reference in note 7 (also note 18).

<sup>16</sup>Though not emphasized here, the turn to another spate of innovation is also an inflection, one in which the prevailing consensus must be set aside to allow further experimentation (or in terms from the text, protectionist inclinations could try to use "inertia" from the current standard). Schumpeter dubbed this inflection, of course, to be creative destruction.

<sup>17</sup>Scalability is a form of this diversity.

<sup>18</sup>Extensibility is used to describe the more predictable features of such a path.

<sup>19</sup>"Breakthrough" and "incremental" emphasize the differences - "more basic" and "less basic" would be equally accurate.

<sup>20</sup>For another discussion of variety within the standard, see David Allen and John Gilbert, "Standards and Convergence: New Realities," Pacific Telecommunications Conference, January 18, 1993.

<sup>21</sup>Rather than a set of comparative statics.

<sup>22</sup>Because computing does not strictly require interconnection across machines, in the way that networks do, but interconnection can nonetheless be powerful, computers make an important intermediate case.

<sup>23</sup>This is not, strictly speaking, the decentralization of organization theory (nor descended from Ronald Coase and Oliver Williamson, either). The parts and the whole are expected, instead, to cycle repeatedly through fragmentation and formation.

<sup>24</sup>Interestingly, some of the MCI public discussion about its blueprint seems to echo the AT&T *before* divestiture.

<sup>25</sup>BT's and MCI's careful separation of their new venture into geographic regions seems to follow nicely from MCI's prescription for the local component of organization.

<sup>26</sup>Communications Week International, 8 November 1993.

<sup>27</sup>Parallels with the network firm are intentional, of course. Again though, the policy discussed here also includes a continuing iteration between the whole and the parts, the group and the companies.

<sup>28</sup>See note 28.

<sup>29</sup>By the time you read this, you will know how this turned out, at least in part.

<sup>30</sup>Societies which do not substantively benefit from the new telecommunications have been left out of this discussion - and they constitute a significant portion of world population (see for instance, Don Lamberton,

“Globaloney: The Impact of Regions on the Future of Emerging Markets in Information Technology and Trade,” *Pacific Telecommunications Review*, v14, n4, June 1993; also in *Telecommunications: Bridge to the 21st Century*, ed Meheroo Jussawalla, AMIC, Singapore, 1993). But that omission does not betray contempt, only that adequate treatment will demand a larger text. Any community of communities is not complete until those many, many voices are also heard.

<sup>31</sup>William E. Taylor and Lester D. Taylor, “Postdivestiture Long-distance Competition in the United States,” *American Economic Review*, v83, n2, p185, May 1993; and Peter Huber, Michael Kellogg and John Thorne, *The Geodesic Network II: 1993 Report on Competition in the Telephone Industry*.

<sup>32</sup>In the other major cases, NTT in Japan has lost quite significant share, but decreasing prices have been a function of the regulator’s maintaining a price differential between NTT and the competing New Common Carriers. BT in the UK still holds greater than a 90 percent domestic share.

<sup>33</sup>Of course, Fred Kahn tried to bridge the gap with the notion of “long run marginal cost.”

<sup>34</sup>As described in the critical mass literature. My own work is an example; there are several others as well.

<sup>35</sup>There is some tendency to confound moves toward privacy with the fragmentation necessary during experimentation (experimentation either on the supply or on the demand side). The discussion about a network of networks, in the US, tends not make the necessary distinction, for instance. There is a relationship between privacy and fragmentation for experimentation, but the distinction is also fundamental.