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**The Globalization of Telecommunications
R. C. M. (Mark) Baker**

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The Globalization of Telecommunications

R.C.M. Baker

Mark Baker, a native of Great Britain, is vice president of global strategy and operations in AT&T's Communications Services Group. Mr. Baker graduated with distinction in mechanical engineering from Chance Technical College. He subsequently attended East Midlands Polytechnic, where he earned a diploma in marketing and the professional qualifications of the Institute of Marketing, and Salford University for postgraduate studies in business administration. Mr. Baker joined AT&T in December 1993, after an eight-year career with British Telecom PLC. Most recently, he was responsible for all of BT's global business. In 1989, he led the acquisition of Tymnet and became president of BT Tymnet. Later that year, he became the president and chief executive officer of BT North America and BT Tymnet Worldwide and was named regional director for North America. Mr. Baker has extensive international experience not only from BT, but also from Plessey Company, a military electronics firm.

Oettinger: It's a great pleasure to introduce our speaker today. You've had a look at his biography, so I will not repeat that, but I will remind you, since the seminar is about both civilian and military affairs, that today's speaker is on the civilian side, although back in his background he was working for a company that is very big in the military world, so military analogies are appropriate. I highlight that so you know what sorts of questions make sense. But he is now with a company that does business on a global scale, so that in the issues of intelligence, command and control, though the words would be different, the problems are very similar. He comes from a background of having been born in Britain and worked for British Telecom (BT) and its global aspects, and now AT&T. So it's hard to imagine somebody better qualified to deal with global issues and how to work with umpteen hundred countries in all of the things that we've seen in the military context. I hope you'll help illuminate what it looks like on the civilian side.

So saying, it's over to you, Mark. He's agreed to be interruptible with questions from the start, so go at it when the spirit moves.

Baker: The more often I talk about global telecommunications, the more I realize that the subject has become so large that it's possible to be purely superficial about it

and have a mind absolutely packed full of information and be an expert in none of it, or it's possible to be an expert in parts of it and not have a global perspective. This is a problem with this subject. So, some of the questions you ask I'll have some answers for, and some I won't. I hope you'll bear with me. And if you think it's worthwhile, I'll get back with answers.

My objective is to talk about globalization as an open subject in its own right; talk about the global challenge that AT&T has, or what it sees as its global challenge—the issues that it faces and what it's doing about them; and then also talk about the management of it, or what you might call command and control.

There really are some major C³I issues related to any company that decides to go global. Just imagine that you wish to deliver a product to 100 countries and those countries are spread across different time zones, with different geographies, different languages, different cultures. You can't just translate the words and always get the same meaning. There are different ways of saying things. Maybe you have to change your work hours from the usual 9:00 a.m. to 5:00 p.m. to 6:00 in the morning to 10:30 at night, because you're dealing with customers who want your attention around the world, around the clock, however they want it, and in whatever depth they need it. Thought about in that way, there are the

most immense management challenges: getting people on site, getting people into a team, getting people to think in a particular way about products and services, getting people to respond in a particular way.

Very few of us have gone all that far up the learning curve associated with this. Some companies have been on the learning curve for a while; some companies are just joining it. Almost all of us are in a process of learning, and we move among matrix models, shared accountability models, and hierarchical models. All of them have upsides, all of them have downsides. We need to understand what each of them can do, what their weaknesses are, and we need to find ways of compensating for them. I would find it interesting to engage in a debate on that, because I'm sure there are things I can learn from you in the process.

Let's just set some benchmarks and talk about AT&T for a few minutes. AT&T, broken up in 1984, is now a company with some \$75 billion worth of revenue (figure 1), and its products and services are spread around a fairly broad range of what we would call the information services industry. The part of the company that I work for is the Communications Services Group (CSG), and that represents \$42 billion worth of that revenue. That's the AT&T that you'd be most familiar with: the group that provides your long distance service and your international service. It's the largest part of the company, and it's also the part of the company that delivers the majority of the profit. To put that into context, the Communications Services Group produces revenues of \$42 billion, which is about 60 percent of the revenue.

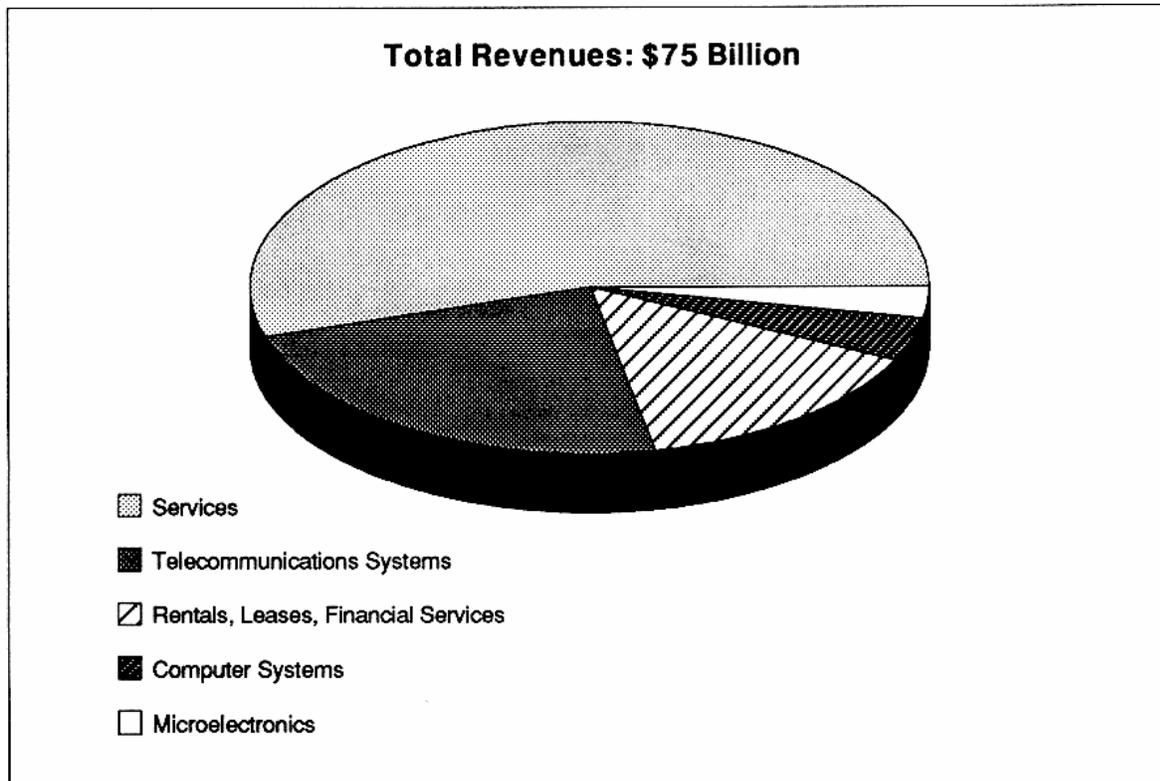


Figure 1
Sources of AT&T Revenues, 1994

AT&T currently conducts business in 189 countries (figure 2), so I guess you could therefore call it a global company. It sells products— switches, equipment—all around the world. It offers systems integration capabilities in many countries around the world. It also provides data equipment and data services. But to the Communications Services Group, globalization means something else, and that's what we're going to talk about.

Student: Are there any countries in which you do not conduct business, and if so, why not?

Baker: How many countries are there around the world?

Student: There are 185 in the U.N., I know that.

Oettinger: Yes, 185 countries in the U.N. and, according to the U.N., less than 200 in all.*

Baker: I can't think of any *major* countries where we don't conduct business. But let me now put a different perspective into your mind. We sell products to a large number of countries, and we also exchange telecommunications services with a large number of countries, and that's a key part of the CSG business. That's what we call international telephony. The United States, or AT&T, in particular, has agreements with 235 entities to exchange telecommunications traffic. So if you want to dial to Germany, you'd be carried by AT&T or, if you preselected one of them, you'd be carried by MCI or by Sprint. All of the American carriers are at around 200 or 200 plus.

Now that business, the exchange of traffic between the individual countries, is a very significant part of the AT&T business. It's the import and export of inbound and outbound bits in the country. However, that is not globalization. Globalization is where you provide network services, perhaps in Europe and between the countries of Europe, or within the Asia-Pacific re-

gion, or, for that matter, in China, where the United States may not be involved at all, but you have become a local telecommunication player. Thus, globalization is not just the import and export of bits; it's literally taking part in the economies, the business and the lives of those other countries.

Student: If you want to wait to answer the second question, then we can push this until later. What I wondered as I asked that was that if we had a problem with North Korea, for example, and as part of that conflict, the United States saw a need to debilitate that state in any way it could, and you provide some services ... I'm trying to get to the point of: where do you become a U.S. corporation versus a multinational corporation, when your allegiances will sometimes be challenged by conflicts? Has it happened, and if so, what's the likely response?

Baker: I'd sooner answer that from a U.K. point of view, because I've only been with AT&T a short time, and I couldn't really comment on the AT&T position. I think the following philosophies apply in AT&T just as they do in the U.K. If it is not desirable to exchange traffic with another country, then service will not be offered. So, for many years, the service between the United States and Cuba has been very limited. Now that is the adjustment of a commercial pattern as a result of a political or security will. The same thing applies in the U.K. For years and years business with South Africa was very, very limited. I could list the other countries and you'd recognize them. Does a telephone company fall in line with that? If it's country policy, yes, of course.

Student: Can I follow up on that quickly? Say that you are the provider of the service in that country. In other words, say you provide the service in Iraq, and all of a sudden, we go to war with that country. Now where do your loyalties lie? Do you shut down the service in that country to hinder their war effort, or do you continue to provide the service?

* The 1995 *World Almanac* is willing to assert 191.

| | | | |
|-----------------------------|---------------|------------------------------|---------------------------------|
| Albania | Djibouti | Lesotho | Russia |
| Algeria | Ecuador | Liberia | Rwanda |
| Andorra | Egypt | Luxembourg | Samoa Isl. |
| Angola | El Salvador | Macau | Saudi Arabia |
| Argentina | Ethiopia | Macedonia | Senegal |
| Armenia | Fiji Isl. | Madagascar | Seychelles |
| Australia | Finland | Madeira Isl. | Sierra Leone |
| Austria | France | Malawi | Singapore |
| Azores | French Guiana | Malta | Society Isl. |
| Bahrain | Gabon | Mauritius | Solomon Isl. |
| Baleares Isl. | Gambia | Mexico | Somalia |
| Bangladesh | Germany | Monaco | Spain |
| Belarus | Ghana | Morocco | Sri Lanka |
| Bermuda | Gibraltar | Mozambique | Sudan |
| Bhutan | Greece | Namibia | Swaziland |
| Bolivia | Greenland | Nepal | Sweden |
| Botswana | Guatemala | Netherlands | Switzerland |
| Brazil | Guyana | New Caledonia | Syria |
| Brunei | Honduras | New Zealand | Taiwan |
| Bulgaria | Hong Kong | Nicaragua | Tanzania |
| Burma | Hungary | Nigeria | Thailand |
| Burundi | Iceland | Norway | Tonga Isl. |
| Cambodia | India | Oman | Tunisia |
| Cameroon | Indonesia | Pakistan | Turkey |
| Canada | Iran | Panama | Tuvalu |
| Canary Isl. | Iraq | Papua New Guinea | Tahiti |
| Caribbean* | Ireland | Paraguay | Uganda |
| Central African Republic | Isle of Man | Peoples Republic of China | Ukraine |
| Chad | Israel | Peru | United Arab Emirates (UAE)** |
| Channel Isl. | Italy | Philippines | United Kingdom |
| Chile | Ivory Coast | Poland | United States |
| Colombia | Japan | Portugal | Uruguay |
| Comoro Isl. | Jordan | Qatar | Uzbekistan |
| Cook Isl. | Kazakhstan | Rep. of Congo | Vanuatu |
| Costa Rica | Kenya | Rep. of Slovakia | Venezuela |
| Croatia | Kiribati | Republic of South Africa | Yemen |
| Cyprus | Korea | Reunion Isl. | Zaire |
| Czechoslovakia | Kuwait | Romania | Zambia |
| Denmark | Laos | | Zimbabwe |
| | Lebanon | | |

*Caribbean includes the following countries: Barbados, Antigua, Dominica, Grenada, Montserrat, St. Kitts, St. Lucia, St. Vincent, Suriname, Guadeloupe, Martinique, Saba, Marie-Galante, Desirada, St. Barthelemy, Turks Isl., Calcos Isl., Trinidad, Dominican Republic, Cayman Isl., Jamaica, Bahamas, Curacao, Aruba, Bonaire, St. Martin, St. Eustatius. Includes also 3 U.S. territories: Guam, Puerto Rico, and the U.S. Virgin Islands.

**United Arab Emirates includes the following emirates: Abu Dhabi, Dubai, Sharjah.

Figure 2
AT&T Conducts Business In 189 Countries

Baker: I don't mind talking about this, but ...

Oettinger: Let me take him off the hook on this.

Baker: In terms of providing services within a country, there are fundamental economic issues that you have to deal with before you make a decision to do that. I would say that, to date, there would be no more than 15 or 20 other countries where it would be worthwhile for AT&T to develop a local capability and become a local telecommunication carrier. The reason for that is that once you go beyond 20 or so countries the teledensities become low, the markets are not open, the regulatory conditions are against market competition, and the GDPs (gross domestic products) are beginning to get very small. In other words, there is no economic case for doing so.

Now as it happens, everyone would be very happy that we were doing business in the majority of the countries on that list because they're part of the world economic trading group. Ninety-five percent of the headquarters of multinational corporations exist in about 20 countries. Many of those multinational corporations are doing business in this country today. Many of those countries have subsidiaries of American-based multinational corporations within them, so they're part of a massive trading community. We would develop a business case and use it to make a decision to develop a local network and tie it into the AT&T network. So, by and large, the issue would never arise.

But the way in which I can reasonably answer your question is that probably the issue won't arise, firstly because of the straightforward economics of the business base, and secondly, because you contract through a number of global industries. Understand what typically happens. Take the oil industry. Countries that suddenly become hostile nationalize the assets of those businesses. You could see that happening in telecommunications. Why? Telecommunications is a major support of the

ecostructure, the strategic structure, and so on. Does that get at your question?

Student: That's fine. Yes, sir.

Oettinger: I think the question is not as black and white as it used to be. Most countries that have historically had prohibitions against foreign control are now relaxing them, partly because the strategic importance is less, given the growing diversity. Second, it's not necessarily clear that one would want to shut down the communications network, and therefore, the thing has gotten much grayer than it was, let's say, 20 years ago. I think the answer's getting more complicated and more subtle rather than less so.

Student: One more question, sir, in between those two. In a scenario where you're dealing most with the import-export business that you were discussing, if the conditions warranted it, Britain or the United States might get British Telecom or AT&T to stop service. Is that feasible and possible with the technology that's out there? Because, to use your Cuba example, I know of people in America who have no problem calling Cuba as long as the call gets routed through Canada. Is it actually possible to isolate a country in the telecommunications field, or is the proliferation so extensive that that's no longer an option?

Baker: I don't know. I think there's clearly a technical and a commercial aspect here. Let me talk around it, and then we can decide what else you need to know. On the basis of refile, which is the activity you're talking about, you phone Canada, and you get your call rerouted back to Cuba. Technically it's doable. If there are operators that see a niche in the market to do that, and if the market they're operating in is open, then you can pretty much guarantee they'll try to offer those kinds of services. Can you cut them off and stop them? Well, trade embargoes of one sort or another may draw a number of countries together to close down trading routes. It wouldn't be the first time that that's happened, but what

you're beginning to talk about is getting the support of a series of countries to close down communication routes, so you're now beginning to build a series of additional dimensions into it.

Student: So you really would need a concerted international effort?

Baker: I believe so, because technically it's possible to do these things. As you say, you could use a gateway through Canada or through any other country that has open trading relationships. If you're thinking about the trade embargo against Iraq, or at one time South Africa, there were numbers of routes by which business was carried out. So, in the same pattern, it's quite a tough thing to control. But insofar as AT&T is concerned, it would support U.S. government policy to the best of its ability.

Let me continue. The Communications Services Group in telephone services—telephone calls, data calls—had \$42 billion worth of revenue last year (figure 3). The company handled 185 million calls a day for 90 million customers in different parts of the world. This part of the company has 93,000 employees. A few years ago, it had well over 100,000, and one of the trends in the industry is that as we've implemented

- **\$42 billion in revenues**
- **185 million calls a day (all digital network)**
- **90 million customers**
- **93,000 employees**
- **Services**
 - Residential long distance
 - Virtual private network
 - 800 number services
 - Dedicated digital services (landline and satellite)
 - AT&T Network Notes
 - Etc.

Figure 3

AT&T Communications Services Group

more and more technology with greater capability and lower cost of service, it has brought down the employment levels quite significantly. I've listed underneath the "Services" heading a number of different types of services: residential long distance, virtual private services, 800 number services. I guess I don't need to go into detail on any of these. This is the communication arm of the company.

Oettinger: Of the \$42 billion, roughly how much of that goes out to the local carriers in the United States, and how much to the aggregate of the foreign correspondents, or whatever you call them?

Baker: In other words, you're talking about how much money goes to the Bell operating companies and other overseas PTTs (Postal, Telephone, and Telegraph authorities).

Oettinger: Yes, because I'd like a number at some point to put in the record, but the significance of it—and correct me if I'm wrong—is that there is a relationship here between AT&T and the local companies, whether it's in the United States or elsewhere, which is equivalent in some ways to what the military or nations do with regard to foreign aid or some other relationship. I think it's not unfair to describe it that way, which is not without its influence in the relationships with multiple partners. I think it's important to keep that in mind.

Baker: AT&T provides long distance services all around the United States, and it also provides international services. Both services are generated and terminated from a domestic point of view in the territories of the Bell operating companies, of which there are seven. We take revenues of \$42 billion from the marketplace. We settle a significant proportion of that in payments for access to each of the Bell operating companies.

In a few minutes we're going to come to one of the significant issues in this industry in the United States. When AT&T was broken up, it retained the long distance business and the international long distance business, and the rest of AT&T was broken

down into the seven Bell operating companies. This was done in 1984, under the Modified Final Judgment. The MFJ has maintained the structure of the industry in this country since that time. It's difficult to find any other country that has liberalized its industry structure in the same way.

What you have, in effect, is that in the long distance business there are some 200-plus competitors. Three of them are significant: including MCI, Sprint, and LDDI. The two really big ones are MCI and Sprint.

The competition that AT&T has faced for the last 10 years has reduced the company's market share in the long distance business to about 62 percent. MCI has the largest of the residual share. Sprint is in third place. Actually, there is a proportion of this 62 percent that is not competed. There's no churn in it, and it's typically the calls that are associated with outlying districts. So, within the market that you've really competed for—and you will all be aware of the MCI and the AT&T advertising campaigns over the last 18 months—our market share is probably about 45 percent. So you can see that what's happened in this period as a result of the restructuring of the industry is that AT&T has faced considerable competition. The market has grown dramatically in that time. We'd argue that the marketplace has enjoyed far higher standards and ranges of services as a result of that, but that is unlikely to go on much longer than 1997.

Before I cover that, I just want to make one more point. Whereas the AT&T market share is statistically at the 62 percent level, and arguably at the 45 percent level, if you look at each of the Bell operating companies, their market shares are 98 percent. They are *de facto* monopolies in their regions. In 1997, what is known as the MFJ relief is likely to happen, and that is likely to allow the Bell operating companies to enter long distance and international service, and it's also likely to allow AT&T to enter local service. As a result of the MFJ relief, we move from this transitional phase into full basic competition in all aspects of U.S. telecommunications services.

When I come to market structure in a minute, you'll begin to see the significance of this for us as a company because I've

been quoting big market shares, but if we look at the market in a different way, our market share is 11 percent. It's very important for us to think about ourselves as an 11 percent player, because it makes us think more clearly about what it is we have to do.

Student: Is that when you add the local services in?

Baker: Let me come to it. Let me just remind you of something else. AT&T CSG provides international services to 235 entities abroad.

We've just been talking about the telecommunication market, telephony—local, long distance, international. But here's a different way of looking at it. This is a picture of what I would call the information services market (figure 4). The arrow is where AT&T is positioned at the moment in the long distance services market: it is worth about \$70 billion. To the right of the arrow is where the Bell operating companies are positioned at the moment in local services, and that market is worth about \$90 billion a year, so the two markets add up to about \$160 billion worth of business across long distance, local, international, and so on. There also are areas of emerging telephony, such as video telephony, which are beginning to develop as a major market opportunity.

But then there are other activities associated with it. There's hosting, applications, content, and so on. These are not a part of telephony, but they are part of the information services market. We'll see in a few minutes what's really beginning to happen. We see Bell operating companies beginning to form alliances with hosting companies. So, U.S. West buys a slice of Time Warner. Time Warner is, I think, the largest content company in this country. They're not doing this just because it's equity on which they could earn some money. These are significant, strategic moves. U.S. West is beginning to think about their product offer, not in terms of just dial tone and talking; they're beginning to think about their product offer in terms of bundling services and providing multimedia services into the business and into the home.

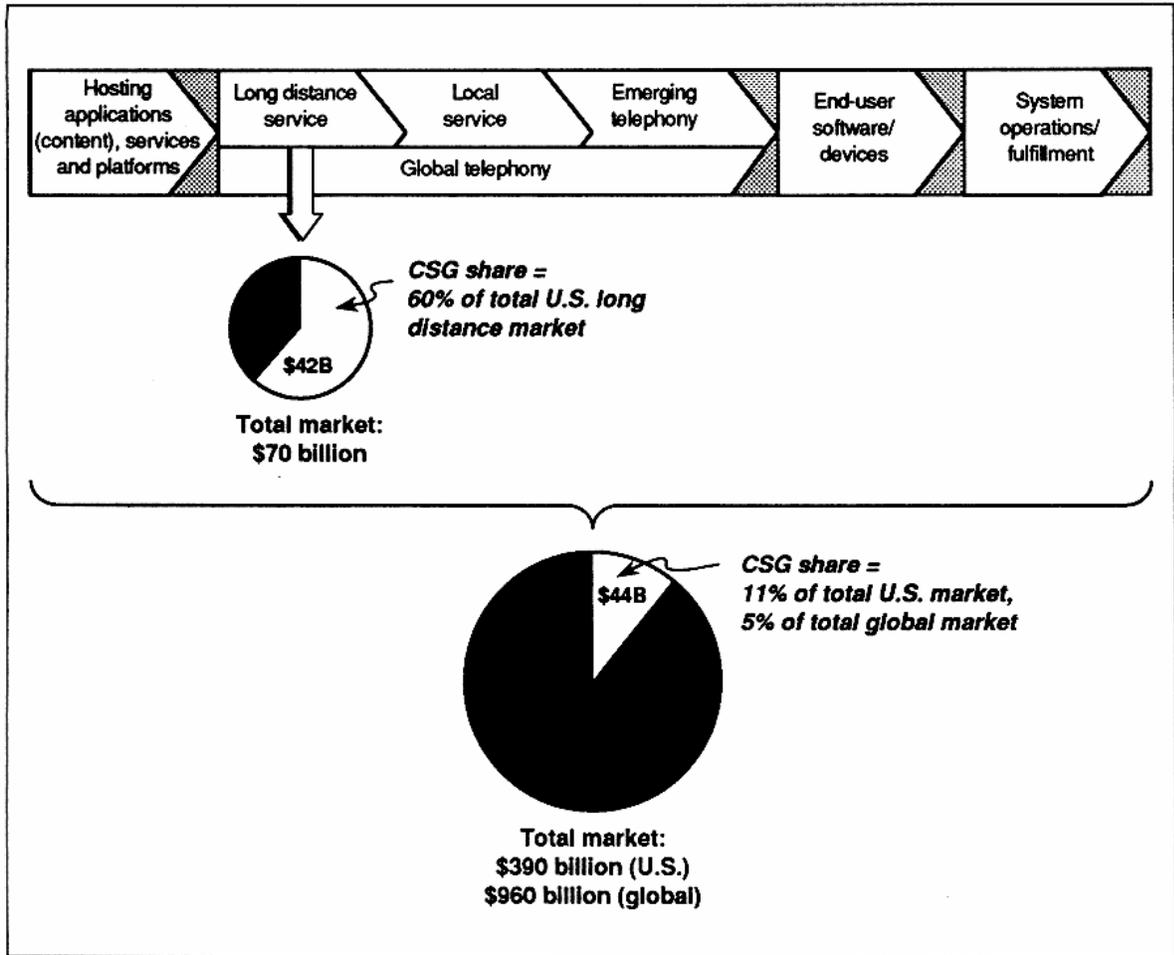


Figure 4
CSG's Position

There's another sector of the market that has to do with the devices that go onto the network and the software that drives those devices, and there's the continual pendulum battle between where the power of the network should lie. Does all of the power of the network lie at the periphery, and is it embedded in devices, or is the power of the intelligence of the network embedded in the network itself, and the devices are essentially dumb terminals? This battle has been going on for a long, long time. Of course, Microsoft would prefer that AT&T become just a utility provider of connectivity with all of the intelligence on the periphery of the network. This is a constant shift in the battle of power and value in the telecommunication market.

Finally, there are things like systems integration. A company such as EDS

(Electronic Data Services) is a principal supplier of integrated services capabilities into the business market. EDS will take a company like General Motors, will look at all of its communication requirements, whether they're voice, data, or visual, and will provide fully integrated services.

Here we have another pendulum going on, which is a swing in the power for account management. Because it's very clear, if you are the company that is designing the solutions for the customer, and you're the company that's implementing those solutions on behalf of the customer, that you actually have the principal relationship with the customer. If you have the account management power, you have power over whose transmission services the customer buys, where the control of the network is.

Let me come back to the earlier point. In this total market, which is worth about \$400 billion a year in the United States alone, AT&T has 11 percent (figure 4). Why is it important for us to stop thinking 60 percent? Because so long as we think 60 percent, we're thinking long distance. This is a market that's going to change shape around us, and if we don't deal with what's going to happen in local service to ensure that we've got all of the software capability and devices that influence the traffic on our network, all the capabilities here that enable us to operate at the appropriate levels of account management, we're going to lose out. We become marginalized. We become a long distance bit provider.

So, suddenly, from a corporation that has main power in the marketplace, we get to the real strategic point, which is that we've got 11 percent. There are a lot of powerful competitors coming into our market, and we need to think about it, and we need to get our investments right, and we need to get the right kind of alliances—and then we begin to think something else: that's only the United States. There's the rest of North America. There's Latin America. There's Europe and so on. What's happening there? Some real change is beginning to emerge in other parts of the world as well. But, by and large, the rest of the world is still developing its telephony capability, and that has some strategic significance for us also.

Just as a reminder, the information industry is a widespread entity. We're talking about everything from Hollywood, Time Warner, databases of one sort or another, interactive shopping, right of way through the telecommunication network and into different sorts of systems integration services. This is the real telecommunications market. When you hear about the information highway, when you hear about multimedia services and the convergence of multimedia and telecommunications, that's the market I'm talking about. If we take a global view of that market (figure 4), it's actually worth \$960 billion a year, and we estimate that by the year 2004, it will be at \$2 trillion a year or thereabouts.

Oettinger: A footnote, if I may. Perhaps it goes without saying that the military proportion of this is relatively insignificant. Therefore, when we hear Admiral Owens* or anyone else talking about military plans, there was a time when the influence of the military on this was fairly significant, but it's gone. I think that's an important element to keep in mind.

Baker: Let me just make this point, and I'll come back to your question. If you'd quickly focus on growth areas, of course, the largest proportions of the market are still in the traditional telephony areas. But the biggest growth areas—nearly 20 percent on content and hosting, 15.4 percent on emerging telephony—are areas that will begin to change the proportions in the future.

If you were to look at just the United States, you would see a different set of proportions. You would see a greater representation in the nontelephony sectors. When you move outside the United States, what you begin to recognize is that there are a number of regions around the world where, because the teledensity today is so low, the real growth in the marketplace is literally happening in POTS, plain old telephone service. For us, that is a major strategic opportunity because it's the basis on which we can penetrate a country, and can begin to grow a global capability. In other words, if we wish to address this market, we don't have to offer more complex services right away.

I'll cover teledensity in a minute, but just to put a figure into your mind: teledensity today in China is less than one line per hundred of the population. By the year 2030, the Chinese telephony network will have grown from its current level to 650 million lines; that is four times the size of the U.S. network today.

Student: ... and with the newest technology.

Baker: They're using the newest technology. But initially, it will principally be in telephony and basic data services. You

* See Admiral Owens' presentation in this volume.

won't see broadband service and multimedia early in that timeframe.

Student: But it's certainly expandable.

Baker: Absolutely. Now, let me just step outside CSG for a moment. For a company like AT&T, with its Bell Laboratories and major equipment capabilities, countries where we are growing, where there is a need to grow teledensity and a local telecommunication infrastructure, present a major opportunity. Having built the local infrastructure, then the opportunity to link those local capabilities into the global network is yet another business opportunity that follows on from that. This is a massive opportunity, and if we get our strategic thinking right, there's a great opportunity for the future of not only AT&T, but also of any other company that is involved in this market.

Student: From where you stand today, do you see the emerging technologies and the strategic thinking of the different players as what's going to drive what the system shape will eventually be? Or do you see more that court decisions and other things are going to determine whatever comes out in the final run, which may be less efficient than what may result from just the best technology forcing?

Baker: It's going to be a balance of the two. If you take the U.S. case, then internally we've haggled over a number of different scenarios. Is it the one wire to the house scenario, which is a bottleneck, and which therefore is going to be heavily regulated to ensure that everyone has access to it? What about the two wires to the house scenario? What about the multiple wires to the house, involving not only cable, but also telephony and utilities, like electricity? The technology exists, so delivery is possible in all of these areas. The U.S. market is relatively free. You're likely to end up with at least two access points to the home. In other countries, that may not be the case. So, in spite of the technology capability, you might have local regulations that actually skew the market and the capabilities

might not mean so much. So it's a balance of both those things.

Student: Are you saying, though, that once whatever drives it determines the technological path, you'll get stuck on it, and that once whatever decisions are made that *this* is where the technology moves, that it's going to be hard to change from that? For instance, if it is two wires to the home, whether or not that's more efficient or less efficient than one, that's what you're going to be stuck with? How does that affect your thinking? Do you then have multiple contingency plans and thoughts and all that?

Baker: The answer is "yes" to all of the above. You have to work within the circumstances that you're faced with. You should probably put a 20-year or a 30-year view on this. As different countries go through their liberalization and deregulation processes, and they evolve through one-wire scenarios, two-wire scenarios, they are always being impacted by the economics and the technology that's available, and that's always going to be an underlying force. I think that the economics of the available technology will win out in the long term. So, you may go through a series of interim periods that in some way skew the efficiency of the delivery model, but in the long term, the technology will win out. I think that's a reasonable assumption.

Let me put a regional view on these matters. Just going back to the earlier point, in the Asia-Pacific region, a significant amount of the growth has to do with basic telephony. For the Caribbean and Latin America it's the same case, and also in the Middle East and Africa. In Western Europe, where teledensity is as high as it is in this country, we're already beginning to see significant growth across the value chain. In Asia-Pacific, you have the same situation in Japan, except that Asia-Pacific bifurcates in a number of ways. You have a series of countries that are high-tech, significant members of the global trading family, and they have high teledensities and are major contributors to the technology in its own right. And then you have a large number of countries that are in the developing mode

and are building their infrastructure. But outside North America and Western Europe, there is a tremendous amount of opportunity in basic telephony.

Now, there are three things that we are concerned about for CSG and globalization. One is the enhancement or expansion of the bilateral service: international telephony. The second one is the provision of global services to customers that we're currently looking for: multinational corporations, for example. The third one is the degree to which we would become involved in local telephony, or local telecommunication operations.

But as we think about all of that, here are the significant global influences (figure 5). I'm going to talk about some of these in a little bit more detail. First, there is the growth of international service itself, and the regularly increasing demand for that. There's domestic market expansion—low teledensities versus high teledensities. There is the process of liberalization—faster in some countries than in others. Actually, where there isn't reasonable liberalization or deregulation taking place, those countries effectively block our ability to enter and provide competitive services. There's competition developing across the value chain; there's competition emerging in global alliances, also across the value chain. There's the growth in the value chain

- **International service**
- **Domestic market expansion**
- **Liberalization**
- **Competition**
- **Global alliances**
- **Value chain growth**
- **Regional and global markets**
- **End-to-end seamless service**
- **Global customers**
- **Technology**

Figure 5
Global Influences

itself. There's the emergence of some regional markets as well as global markets.

A very good example of a regional market is Europe. The European Economic Community is emerging as a business community in its own right. I'll show you some figures later on. But I could demonstrate to you that 50 percent of the international traffic within Europe is passed between European countries, and a lot of that is business traffic. That's an indication of the amount of trade that goes on. We just have to look at multinational corporations and where their subsidiaries are located. If you take multinational corporations in Europe, large numbers of their subsidiaries are also located in Europe. They are a massive trading bloc in their own right. There's a call for end-to-end seamless services, particularly from American customers. They wish to have the services that they enjoy in this country replicated worldwide at exactly the same level. There are global customer requirements and also technology: a whole series of factors that affect us as we think about globalization—what we're shooting for and what we can do.

Student: The seamless aspect of the service to the customer around the world might appear that way; at least there's the perception that it's seamless. How much does it enter into your thought process or your planning that you don't necessarily need or desire a redundant system in order to ensure that seamless aspect? In other words, are there certain places where you feel that you're going to have to provide a redundant system in order to provide any services?

Baker: There are 20 countries that it's economically viable to wire up, and there are probably around 100 countries where we need to be able to guarantee access at a particular level. We could group the requirements of most multinational corporations within about 120 countries. When we're talking about guaranteed access (and I'll talk about multinational corporations in a while, so I won't spend too much time on that now), we have to have that to guarantee service. But, of course, where we're directly networked, we can deal with that,

because we cannot wire up all of these other countries economically, and that's where we come very strongly into the need for alliances. The commercial terms and conditions of those alliances are things that deliver redundancy, alternative path routing, and so on. It's a good point. If we wish to serve multinational corporations, that's what we're faced with.

Oettinger: Just in terms of civil and military things, that also illustrates that there are at least 100 countries that are counting on civilian procurement when it is not necessarily the thing to do. There is no interest in doing business in those, so that the complementarity of that to what military or government procurement policy might be, I think, is a key issue.

Baker: We'll talk about those topics in the context of the value chain.

Student: Regarding the seamless thing again, what are the efforts so far in integrating the architecture of the different systems? Has that been a problem, and what were the steps taken to standardize systems?

Baker: Probably the biggest step that was taken was the acceptance of open network architecture, open systems, several years ago, where all of the manufacturers of equipment render their products capable of interoperating in any environment. But we've got a constant battle going on in terms of proprietary software/hardware, and the intellectual property rights associated with it and the market share.

Let me give you an example. IBM developed a proprietary networking system called System Network Architecture, which was an X.25 data networking system that drove computing capability. A whole series of aspects of that are proprietary, and for many, many years it did not relate to open network architecture. The reason that IBM did this was twofold. They wanted to sell the MIPS (millions of instructions per second), and they wanted to lock people into their network and continue to sell upgraded versions of software and hardware. Some years ago, that was a reasonable position to

take in the market. If you had stolen a march on the competition and you had an advanced piece of technology to offer, you could enshrine the whole of your market position within that, and you could stay ahead of the game.

However, it would be argued today that basic technology is no longer an advantage that gives you longevity. Let me put it another way. Technology lasts a couple of years. But the real competitive skill comes out of software and the use to which you put the hardware, and the demand is therefore that the hardware be an open network architecture and the skills in serving the customer come out of your ability to drive the software and to offer customized packages and programs. So probably the biggest step has been the acceptance by all equipment manufacturers of some element of open network architecture. The big companies, such as Ericsson, AT&T, and Northern, all aspire in some way to that. But it's been part of the evolution of the market. Does that answer your question?

Student: I was just wondering if AT&T is the industry leader in telecommunications in the sense that IBM is in the computer area. Or do we have a trend whereby you have these systems actually coalescing and becoming one, so you eventually have maybe AT&T and IBM coming together to set some common service for all?

Baker: These things usually happen in an industry. They usually happen over a period of time, but they don't necessarily happen because the companies want to do it, because every one is particularly interested in maintaining their share of the market and shoring up their position and creating these position strengths.

Let me now talk about those key strategic drivers in the context of this value chain: regulation, structure, customers, and competition. I'm going to talk about each of them.

There's the uneven pace of liberalization, some countries moving faster than others, producing restricted markets. There's also what is called settlement reform: the bilateral traffic that I talked about that we exchange with 235 entities abroad.

That's the area of the most tremendous competition. Some of that is happening because of the system of settlement between the individual businesses engaged in this, which is called accounting rates,* and is the basis for the costing of the industry. We have been fighting for many years to bring those accounting rates down and down and down, until they are at the actual cost of delivery. They, therefore, represent the economics of the network. In many countries, the costs are very high, and when we have a disparity between the real cost and the charged cost, we have arbitrage opportunities, and those arbitrage opportunities are changing the shape of the market.

We have a number of competitors that come in offering different types of service. The one that was referred to earlier on, which is phoning another country through a third country, is known as refile, and we have refile businesses being set up. They're arbitraging the cost disparities in the marketplace. We have resale, refile, and call turnaround. That currently happens significantly with Europe and with Latin America, where, because of the difference in market prices, a customer in Brazil can phone a switch center in the United States, the switch center will provide U.S. dialtone, and on the basis of that dialtone the person in Brazil can phone anywhere around the world. The customer does this because the rates between the United States and almost any other country are lower than anyone else's rates.

What that call turnaround operator has managed to do is the following: he's captured a customer in Brazil; he's charged the customer in Brazil the combination of the calling rate from Brazil to the United States and the calling rate from the United States to any other country. He's probably going to charge him at least 15 or 20 percent lower than the rate for a straight call from Brazil to any other country. So you've got this whole process of arbitrage breaking down the industry as well.

* For background on the subject, see Jaak Aulik, *Financial Structures in Competitive Telecommunications: An International Overview*. Cambridge, MA: Harvard Program on Information Resources Policy, 1987.

Student: Is that rate in Brazil a market rate or are those regulated rates?

Baker: Brazil is a monopoly. Those are regulated market rates. But these kinds of factors are changing the shape of the industry. It isn't just deregulation.

Student: Does that go beyond legalities, or is that just catch as catch can within the market?

Baker: It's all legal. The FCC supports call turnaround. It's part of the breakup in the market. But what the FCC and the Department of Justice are interested in is customer choice. They're not interested in protecting a monopoly, nor should they be. As a matter of fact, that's the best thing that ever happens to monopoly companies. They're forced to take account of customer requirements and change the way in which they operate. I would argue that over the last 15 years, AT&T has become a significantly—by orders of magnitude—better company as a result of competition. When we negotiate with monopoly companies in other parts of the world, it's curious to have fed back arguments from them that we, as a company, put up 15 years ago.

Oettinger: But the thing to remember is that these payments are something that some of these other countries have gotten used to. It's become almost a form of foreign aid, which in the old global monopoly days made not much difference. I imagine it would be viewed from your standpoint as a serious potential competitive disadvantage, but you're stuck with it because the folks at the other end find it hard to give up.

Baker: Let me give you an example of that. Mexico, teledensity of 8 per 100, is getting ready to liberalize this year to offer second carrier licenses to three or four new telecommunication companies. Today, it's the second largest route between the United States and any other country. We exchange 2.2 billion minutes of traffic a year with Mexico, and there is a significant disparity in accounting rate between cost and what is actually settled. If we don't get those accounting rates down before real competition

begins, then we will face arbitrage on our side of the border. The competition will begin in this country for the same services going south. Within two or three years after that, TELMEX, the local Mexican company, will face considerable arbitrage in its own marketplace. So it's in their interest to respond and get those costs down as well. That's a real example.

The point you're making, that it's almost an aspect of foreign aid, is absolutely right, because there is twice as much traffic going south as comes north, and we settle up the business on a balance of payments arrangement. We end up paying vast amounts of money into some of these countries because typically the United States generates more traffic than any of the other countries. So you're right. It's an issue of Realpolitik as well.

Let's move on and talk a bit about the global environment. In the case of customers, you've got market expansion within individual domestic markets, and growth in requirements and demand for information services. For multinational corporations, those information services provide the competitive edge. They become the means by which a multinational corporation grows in its own marketplace. There's also the fact of technology that impacts demand. In regards to competition, we've already talked about a number of elements including resale, refile, and so forth.

Looking at industry structure and what's happening in different parts around the world, in Europe we've got continuing monopolies: Germany, France, and a majority of the European countries. The open markets in Europe are the U.K. and Sweden. Those two are truly open markets, and competition already exists that at least matches the U.S. standards. The balance of countries are *de facto* monopolies with very significant controls over entry. Those monopolies and the regulation implicit in those countries by and large protect the incumbents, and there's a tendency for companies like Deutsche Telekom and France Télécom to fight for their governments to hold the monopoly status to keep out the competition. That is not good for the customers at any time because it restricts choice. We continually go into battle through the FCC

and directly with the European Commission over issues of this sort, pushing them and pushing customer groups to work with them to develop customer choice through liberalization.

Student: You said that the breakup of the monopoly in the United States has made AT&T much better. Does that prevent companies like Deutsche Telekom, et cetera, since they are domestic monopolies, from becoming more competitive on the global market because they're not competing locally?

Baker: Monopolies don't necessarily have the customer in mind. They administer, and they provide services to the best of their capability. In the case of France Télécom, they've done a very good job; they were one of the first companies in the world to pay for general distribution of PCs. They were one of the first companies to offer very effective X.25 data capabilities nationwide. So I'm not saying these companies don't do good things. But, in the end, the real pressure of competition is what improves customer choice. Anything that happens to break up those monopolies is good for the customer.

Student: I agree with that on the customer level. If they're a domestic monopoly, they may be providing a great domestic service, but does that make them less competitive globally?

Baker: I believe it does. Let me talk from experience at BT. In 1989, BT bought Tymnet from the McDonnell Douglas Corporation. Tymnet was a global X.25, value-added data services company. Regulation, worldwide, has for many years allowed competition in value-added services. The monopolies relate to basic services, but in France, Germany, all around Europe, and in most of the countries around the world, competition has been allowed in value-added services. For BT, the first route to globalization was therefore to get into that part of the market that was already globalized. Tymnet was selling a series of basic data services to individual companies that needed those services replicated around

the world on a data network. So, when the company was bought, they had direct-networked 10 countries, and they had another 50 or so countries connected through what are known as X.75 gateways. They also had technology relationships with a number of those countries.

Within a year, BT launched a 100-country connectivity network. It directly networked 20 countries and developed relationships with 80 countries. A year after that, it offered 140 countries, with 50 countries directly networked for data services because these are big markets and because the infrastructure costs are relatively light. It's a resale operation. You put your data switches in, you hire lines from the local telco, and you resell the capacity on your data network. You offer X.25 connectivity. You offer messaging services. You offer basic electronic data interchange (EDI) file-to-file transfer and so on.

Now, let me get back to the point in your question. In 1989, BT didn't have a clue as to what being competitive on a world basis meant. It didn't really understand 24-hour-a-day operations around the world. However, learning that in its own marketplace caused it to be open to what it really had to understand on a global basis. The fact of competition in the U.K. market created the openness of mind and the readiness to become a global competitor. Within two years, the company had in the region of 1,500 significant global customers, for some of whom it was providing services to between 50 and 60 countries. I would argue that the fact of competition opened the mind of the company.

Student: But how does the strategic industry argument come in here for each country? Each country may want to maintain some kind of monopoly control over some aspects of communications.

Baker: We thought that was going to happen, but the reality is that most of the governments in most of the countries recognize that it's far better to have an open market. The reason is that you generate supply in the marketplace, but first you generate customer choice. Take the case of Mexico. The biggest thing they're concerned about

is how to get teledensity up to 20 per 100. There was an article in the Mexican press last year that criticized TELMEX, saying it had completely failed to support the economic growth of the country. There's a very clear understanding in the minds of the Mexican government of the very strong relationship between their telecommunications capability and the ability to grow, which includes improved standard of living. Many other countries have arrived at the same conclusions. So it started out with protection of the monopoly, but we're increasingly seeing a lot more open attitudes towards this.

Student: This goes back to your global environment. The functions that AT&T, as well as some of its competitors, provide are critically important and essential to trade, economics, et cetera. I'm in the military, so this is kind of why I'm asking this question. Our adversaries, as they become more sophisticated, see that as a type of warfare they can wage against this country and others. So in terms of your global environment, what role does terrorism of that sophisticated nature play in your planning? Do you follow me?

Baker: I'm not sure.

Student: Let's recall the airlines 15 or 20 years ago. You get on the airline and ride someplace, no big deal. A couple of bombs happen in the airports and elsewhere. Everything's changed now. It had its concomitant costs financially and economically. So I can't help but think about the analogue of terrorism within your industry: white collar, highly sophisticated. Why fight the United States on the battlefield when you can now train very smart people, and they can bring our economy down possibly through some terrorism on our information networks and these other types of functions provided by corporations such as yours?

Baker: It's a very serious issue. I'm sure I remember reading some years ago about a hacker in Germany who entered one of the data networks in this country and used it as

a gateway from that data network to another one, and then into government files.*

Student: I'm pretty sure there are some examples at AT&T of the same thing, hackers getting in.

Baker: The issue you raised is a serious one.

Student: But apparently it's not serious enough for your global environment, right?

Baker: No, that's wrong. We are concerned with the security on the network at all times. It's a bit like an electronic warfare battle: it's the electronic countermeasures and electronic counter-countermeasures—ECM, ECCM—and our ability to stay ahead for penetration capabilities is a major challenge. It's of great significance and importance to us all. If it happens, we make every effort to step it up and control the things we can. You just couldn't enter this subject and suggest it wasn't an issue for many years, both commercially and strategically.

Student: Sir, what provisions are you taking for changing the way you charge for transmission over the telephone lines? We're charged by the minute now because we talk over the phone and it seems like a reasonable way to do it: the more minutes I talk, the more I get charged. But if I can now transmit data at 5, 10, or 100 times the speed I used to by voice, then how are you going to charge me for that in the future? If I can transmit all that data in one minute, how are you addressing that?

Baker: We're charging you a considerable amount less. In 1989, the industry was offering services on the basis of 1.2 and 2.4 kilobits. The five-year plan at the time recognized 32 kilobits and the possibility of frame relay. Frame relay is mass transport of data. We'd pick up the data, packetize it, bulk it, and send it out over the main transmission line for it to be broken out at

the other end. I can remember the business plan suggesting that there was a value curve associated with this, and as the company moved up from 1.2 to 2.4, it could justify the investment dollars as a result of the revenue dollars. But, guess what happened? Not only did that not happen at all, there was no additional price. Actually, the 2.4 price became cheaper than the 1.2. I now don't know the relationship between frame relay and the original 1.2, but it is a fraction of the original cost.

Student: So essentially, if I talk for a minute on the phone, or I dump a gigabyte of data over that line in the same minute, you are going to charge me the same amount? Or are you going to change the way you charge me for that one minute?

Baker: You're charged for frame relay services, and there is a very significant difference between a voice message and millions of bits in a frame relay package.

Student: That's if I'm buying frame relay services. I'm saying, in the future, what happens if I have a computer and I use the same phone line to communicate with my computer and voice, and you as the phone company don't know whether or not I'm going to pick it up and talk or send data through?

Baker: You'll be charged on the per-minute basis at the moment.

Student: How are you going to address that as the phone company in the future?

Baker: I'm unable to tell you at this time. I have to be careful what I say. That would be preannouncement of a pricing strategy.

Oettinger: Since I'm not bound by this invisible bond, I would suggest that you're asking an extremely difficult question. Contrary to what you get taught in economics courses here, the relationship between price and cost is very far from inexorable. It's the subject of a great deal of invention, and in many organizations, their most important strategic resource is a flexible pricing system that enables you to ad-

* Clifford Stoll, *The Cuckoo's Egg: Inside the World of Computer Espionage*. New York: Doubleday, 1989.

just the kind of thing you're talking about to current market conditions. That's true of the airline industry, which lives by its pricing algorithms. It's probably true of the telecommunications industry. It's true of many, many others where pricing flexibility and the ability to respond to the global issue you raise in a competitive manner, rapidly and so on, becomes a critical strategic resource. The details, therefore, because it's life and death, will be as closely held as operational plans in the military for tomorrow morning's operations, and for many of the same reasons.

Baker: Let me just quickly shift to a couple of other topics because I'm conscious of the time and there are one or two things that I want to get to.

Just on regulation, if we take the European region, many areas are deregulated, they're liberalized, they're free, and they're open, so it looks as though we're doing pretty well. But actually, the real significant market, in terms of facility-based services—the monopoly telephony—by and large, is still closed in the whole of Europe. Resale of leased lines for voice services, by and large, is still closed in Europe. Those areas that are open are typically to do with what are known as virtual private network services and value-added services, and they are a small portion of the market.

The problem for us is that if we want to offer services to multinational corporations, all of those multinational corporations headquartered in this country have significant operations in Europe, and we are unable to replicate those services. The biggest fight we have at the moment in Europe is how do we push the local regulatory authorities to open up their markets. Just to give you an idea, there are probably six countries in Europe that, if we could wire them up directly, represent 70 percent of the gross domestic product of Europe and therefore the most significant aspects of the business. And yet, with the exception of the U.K., all of those are monopoly-controlled closed markets.

Student: Not having read the entire Uruguay Round document, does GATT

(the General Agreement on Tariffs and Trade) or any of that address those topics?

Baker: Yes, but it doesn't address it in a consummate way. But these are clearly GATT issues. The settlements issue we were talking about earlier on is a GATT issue. The openness of markets is a GATT issue.

Oettinger: But before you go on, though, 12 years ago his answer would have been very different. At that time, the communications issues were specialized issues before technical industry bodies. The evolution of that into playing any role in trade negotiations has been a very slow and complicated one, which is far from having reached its end. So you're opening up a large question, which we're not going to be able to deal with here.

Baker: Sprint, about six months ago, announced an intent with France Télécom and Deutsche Telekom to establish a global business. France Télécom and Deutsche Telekom would between them buy 20 percent of the equity in Sprint, and then the three companies would set up "Newco" to offer world services. We have objected to this, to the Department of Justice and with the FCC, because of equal access. Whereas France Télécom and Deutsche Telekom can enter this country, we cannot enter France and Germany, and, therefore, our position has been that we would support this union provided we are given equal access to France and Germany. Now that is a very good example of a local closed market GATT issue.

In the case of BT/MCI, when they formed their alliance 18 months to two years ago we were quite happy with that. BT buys 20 percent of MCI. BT and MCI, in concert, set up a worldwide business, and we're quite happy with this on the following grounds: that the U.K is an open market, and that we get our license to enter there as well. We duly got that last Christmas. We were given a facilities-based license to provide services throughout the United Kingdom, and we were also given an international, simple resale license that enabled us to provide international services.

So, on the basis of equal access, we were very happy to support that, and at the same time, we supported BT's application for what is known as a "214" license that enables them to land international traffic directly in the United States. We will continue to work with the government and any other interested parties. We will support any competitive alliance provided there is equal access between that country and this country. That's within GATT policy, but it's typically dealt with at a different level.

I'd just like to talk for a couple of minutes about multinational corporations. Here is a multinational corporation, the Hong Kong Shanghai Bank (figure 6). They have operations all around the world. Unfortunately, I don't have the Marubeni slide with me. Marubeni is a large Japanese trading company, and it has twice as much representation. But this one suffices to make a point.

Here is Nissan (figure 7), a large, multinational corporation. When we talk about providing services to these companies, we're talking about replicating data, voice, visual, and intelligence services throughout that business network. When the Marubeni company was looking two years ago for an EDI capability, and you can imagine the need for this—a large trading house with a massive number of international global transactions—they needed basic file-to-file transfer capabilities and EDI support systems, and they couldn't find anyone to provide it to them. Their representation around the world was bigger than Nissan's.

What are you taking on, as a telecommunication company, when you offer to provide global services to a multinational corporation? You've all heard of one-stop shopping? A great idea! That's where the customer appoints a single supplier to provide a global service. The reason they do this is that today a company like Marubeni probably has to deal with a large number of different telecommunication companies, and it has to employ a massive telecommunication function within its own business in order to work all of those relationships. It has to design its own data network. It has to keep it up to date. It has to design all its

own services. It has to manage all the voice relationships.

Eventually, it says, "Our line of business is not building our own telecommunication function; our line of business is trading. We would like to buy one-stop shopping services around the world." This is what we take on. We enable Marubeni, Nissan, Hong Kong Shanghai Bank, Ford, and so on to focus on their core business: to balance their resources and costs and to concentrate on their core business and to drive the market share in their own market. In this way, we become a major strategic partner. Our network goes down and we mess up their business in a big way. There are massive penalties associated with these kinds of contracts. There are massive account management facilities required to develop and manage the relationships. There are massive network managements and customer responses associated with this.

Say, for example, we provide a service to Halliburton in the oil industry. They have exploration sites in Africa. The biggest issue for them is a line going down in Nigeria. If we can't get on that and understand what's happened, sort it out, and have it up and running in a matter of minutes, we're causing them a problem. They were dealing with that before with a large telecommunication function. They now pass it over to a company like AT&T.

My personal experience with J.P. Morgan, as an example, or Gillette, or Citibank, was that up until five years ago they were running their own X.25 data networks. Citibank runs well over 50 different data networks around the world. There's a need to begin to integrate those. In the case of J.P. Morgan, what they decided to do was to pool all of those networks and to transfer that contract to BT. BT is on the line to guarantee those services day-in and day-out, around the world, around the clock, with an evolutionary path to improve services as well, not just basic data, but the addition of EDI, messaging services, and so on. This is a massive challenge.

So when we think about globalization in this context, go back to the point I made earlier on about command and control. We can't run these kinds of contracts without

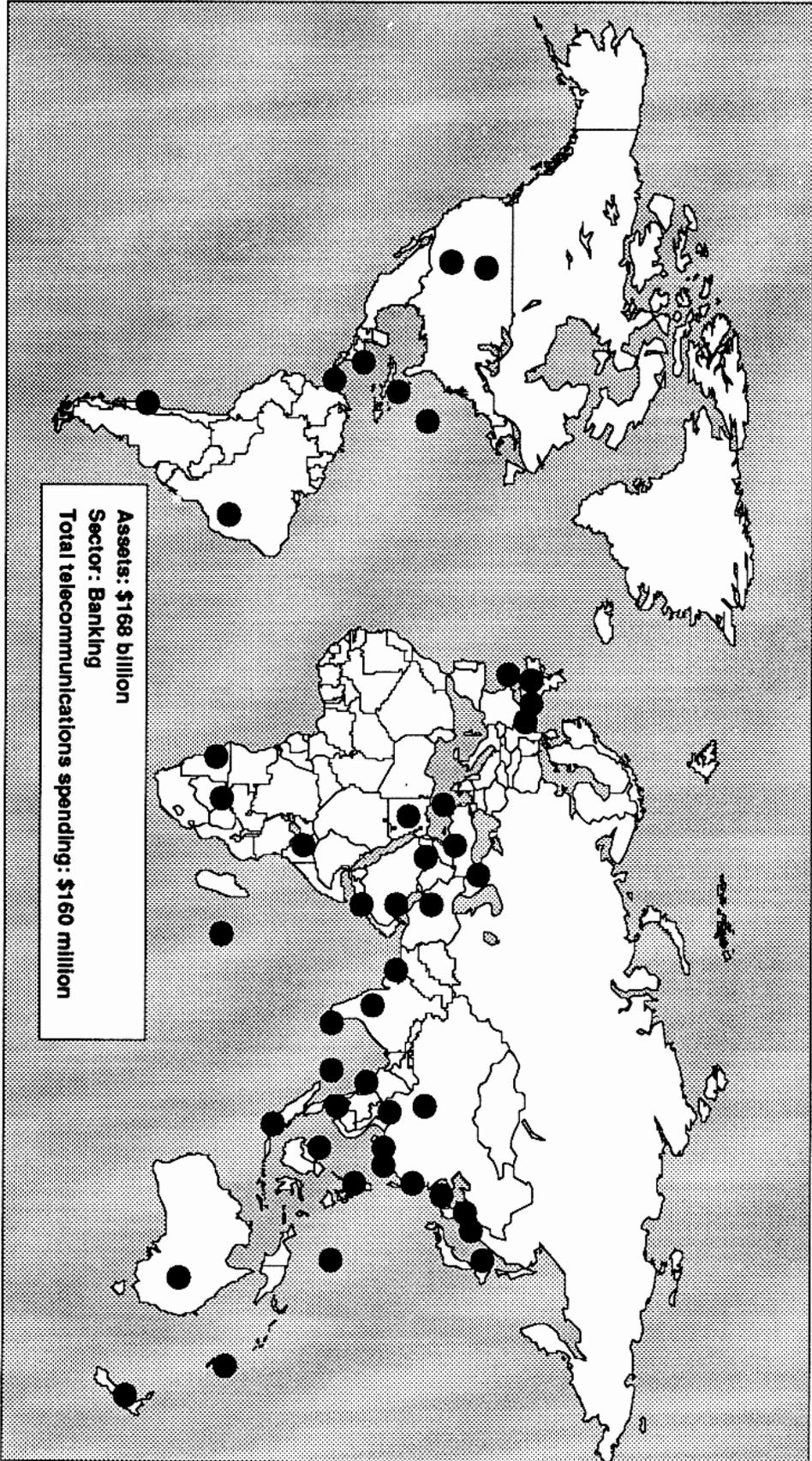


Figure 6
Hong Kong Bank Profile

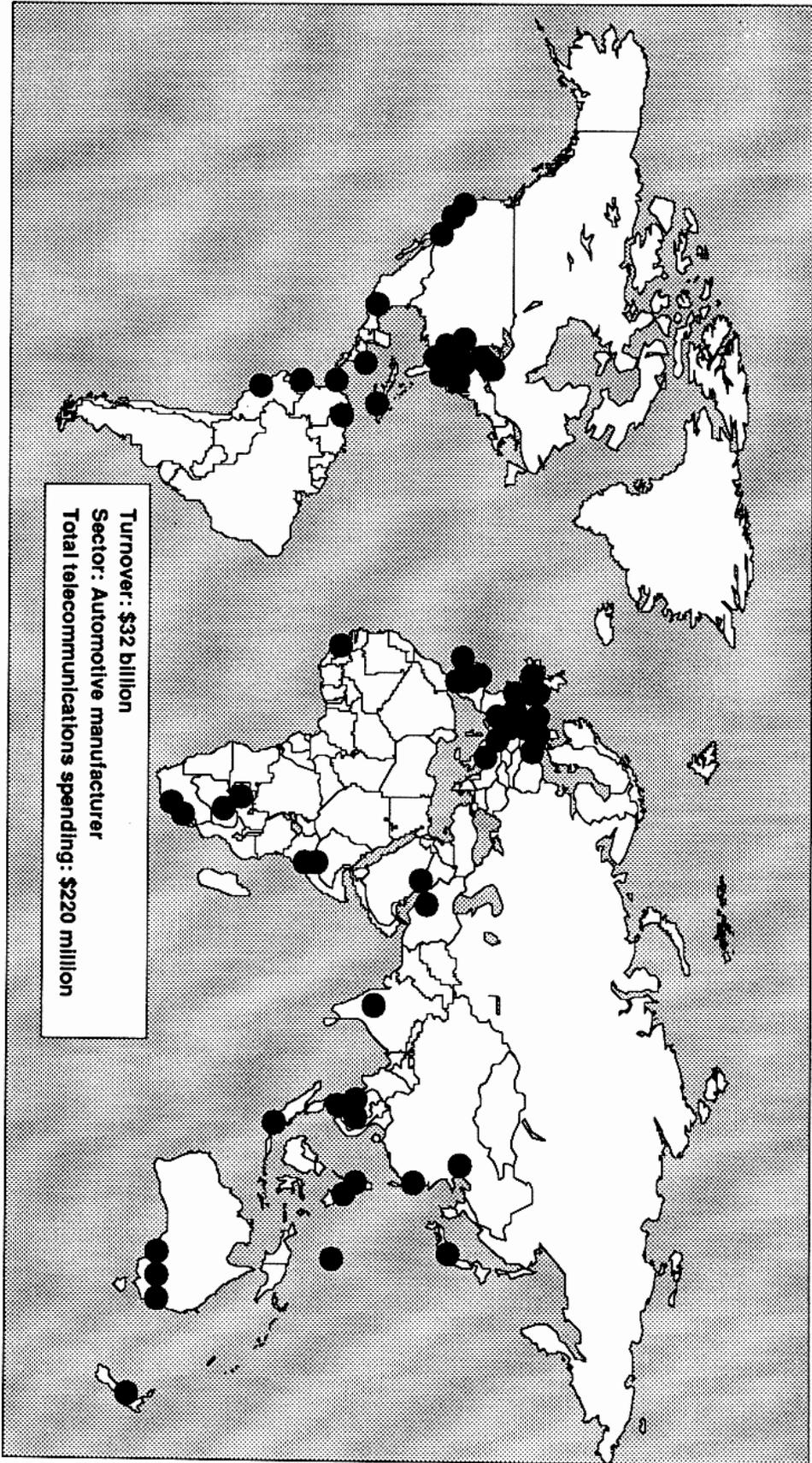


Figure 7
Nissan Profile

having the most significant on-the-ground capabilities, or the most significant alliances, so that we can guarantee that we can provide those capabilities. The C³I elements in this part of the market are profound.

Student: Tied right in to that particular example, a lot of the speakers that we've had, and what we've read about the military command and control world, worry about things that they call "stovepiping of services." The Air Force develops a command and control system, the Navy develops a command and control system. They don't talk to one another. That's a major problem facing them. It seems to me that what we're seeing here is the capability in global telecommunications growth to have a tremendous number of what they would call "stovepipe" systems being set up. If AT&T has a big contract with Nissan to provide services within the Nissan structure, you might be tempted to optimize that towards nothing more than support of Nissan, and somebody else over here, working in an overlapping area, would optimize in support of the company they're supporting. How does a sort of integrated, global network grow out of these kinds of market forces?

Baker: That's a good question. I mentioned a little while ago that the top 20 routes with the United States represent about 60 percent of the international business. Now, if you take each of the top 20 routes with the United States, and if you take each of the top 20 routes of each of those top 20, you very quickly end up with a matrix that makes you realize there's a very strong focus on countries that trade together. We shouldn't be surprised at this. The key countries, the nodal business countries, are obviously the United States, U.K., Germany, France, Italy, Japan, and Hong Kong. If you look at high GDPs, those countries are typically on this list. If you look at the main locations for U.S. direct assets abroad, those countries are typically on this list. There's a strong correlation between the top countries worldwide in GDP and the telecommunication traffic streams. Now I'll get to your point.

We start off by directly networking the nodal countries, the nodal areas, and let's say that's 20. Then we take a contract with Gillette, and what we find out is that, yes, they want services within all of those 20 countries, but there are another 60 that they have on top of that. Then we do a contract with Citibank, and we find out that there's common ground there, and there are still these countries out there being called for by Gillette. And we take on a contract with Ford, and we find common ground with both other contracts, and what we gradually do by building on each of these contracts is to expand the network. We're always going to arrive at a point where our basic network is confined to, say, 50 countries, and we have a series of alliances that enable us to guarantee access and performance in all of those other countries. But the way we have to do it is by working each of those contracts and overlaying them on the basic services network.

So I hope you're getting the sense that we actually evolve our network as we take on more and more of these contracts. Typically, what we will find is that each company wants a particular range of connectivity, and it's not long before we've got a significant common denominator between them. That's where we develop our network.

Student: But MCI and Sprint and BT are doing the same things.

Baker: Yes, that's right.

Oettinger: This, by the way, is one of the reasons why there is competition for what he is describing as the systems integrator role. There will be folks out there who are neither AT&T nor MCI and who will, for a customer, piece together these bits out of several of these other folks. So it's a highly competitive market.

Baker: You're absolutely right. That's what's happening across the value chain, across the different parts of the world. We're beginning to see all kinds of links between these companies, and they're not just in international telephony. They're also happening in hosting, content, systems in-

tegration and so on. But, coming back to your point, I would say that we're probably going to end up with three or four, maybe five, major global service providers. But this market is worth \$960 billion today, and nearly \$2 trillion by the year 2004.

Student: And it's certainly worth their while to be interoperable.

Baker: I agree.

Oettinger: You have relevance, again, common to some of the things we've looked at on the military side, in this matter of coalitions and so on, and selling arms to someone who perhaps tomorrow may be your enemy. Some of the members of these alliances may tomorrow be competitors. All of the issues that we've already encountered on the military side are issues that happen here as well.

Baker: I'd just like to come back to that example. The approach that we've taken is literally against this model (figure 8). There are a small number of countries in which it makes economic sense to develop a local presence, and there are a large number of other countries with which we would have alliances. That's what we called our WorldPartners Alliance. By the end of this year, we will have guaranteed access for intelligent services among 25 countries, and we are investing directly in some of those countries. At the end of last year, we announced a relationship with a company called Unisource, which is a pan-European networking business that concentrates its capabilities in Western Europe. It also joined WorldPartners. We began to develop our own local presence by becoming a local business partner, and we also made sure that they became part of WorldPartners as part of this broad layer of guaranteed access. We developed a company called Unintel in Canada. Last year we announced a major alliance with the Alfa Industrial Company in Mexico. At the turn of the year, we received our license for the U.K. and are currently deciding how we're going to develop local networking capability there. We would expect that the Unisource business, with ourselves, will grow out.

We have a series of relationships with countries in the Pacific area known as PacificPartners. Singapore and KDD of Japan are members of WorldPartners, as are Australia and New Zealand. So what we're beginning to do is to string together this alliance and guaranteed access capabilities as well as directly networked capability, where it is economically feasible to do so.

Just a final point: everything that I've said brings us right back to command and control issues, because, as you can imagine, if you don't have absolute hierarchical control, if you are reliant on the cultures and practices of other companies, with a series of alliances that are strung together commercially, as opposed to hierarchically, politically, and militarily, then the command and control issue is a major one. How do we make sure that the operating team in Japan, Hong Kong, France, or the U.K. is fully coordinated?

Student: An FBI question is that they need to wiretap or access something and you're encrypting it. How do you go back to them with an answer to that?

Baker: I can't answer that.

Student: What's the level of sophistication you're seeing across the aggregate of your customers? Are they coming to you saying, "We know specific technologies and we want this," or are they just saying generically, "We want all this connectivity, what can you do for us?" In other words, when you talk about TQM (total quality management) of what the customer wants, does the customer really come to you with very specific needs, or just something general and technology is kind of driving what you're telling them they want?

Baker: It's a complete range. We'll find customers who currently run private networks, who have a very good idea of what they require, and they can very adequately produce operational requirements that are sufficiently comprehensive for a company to bid on and provide a technical response and so on. We have quite large companies that have had private networks where the

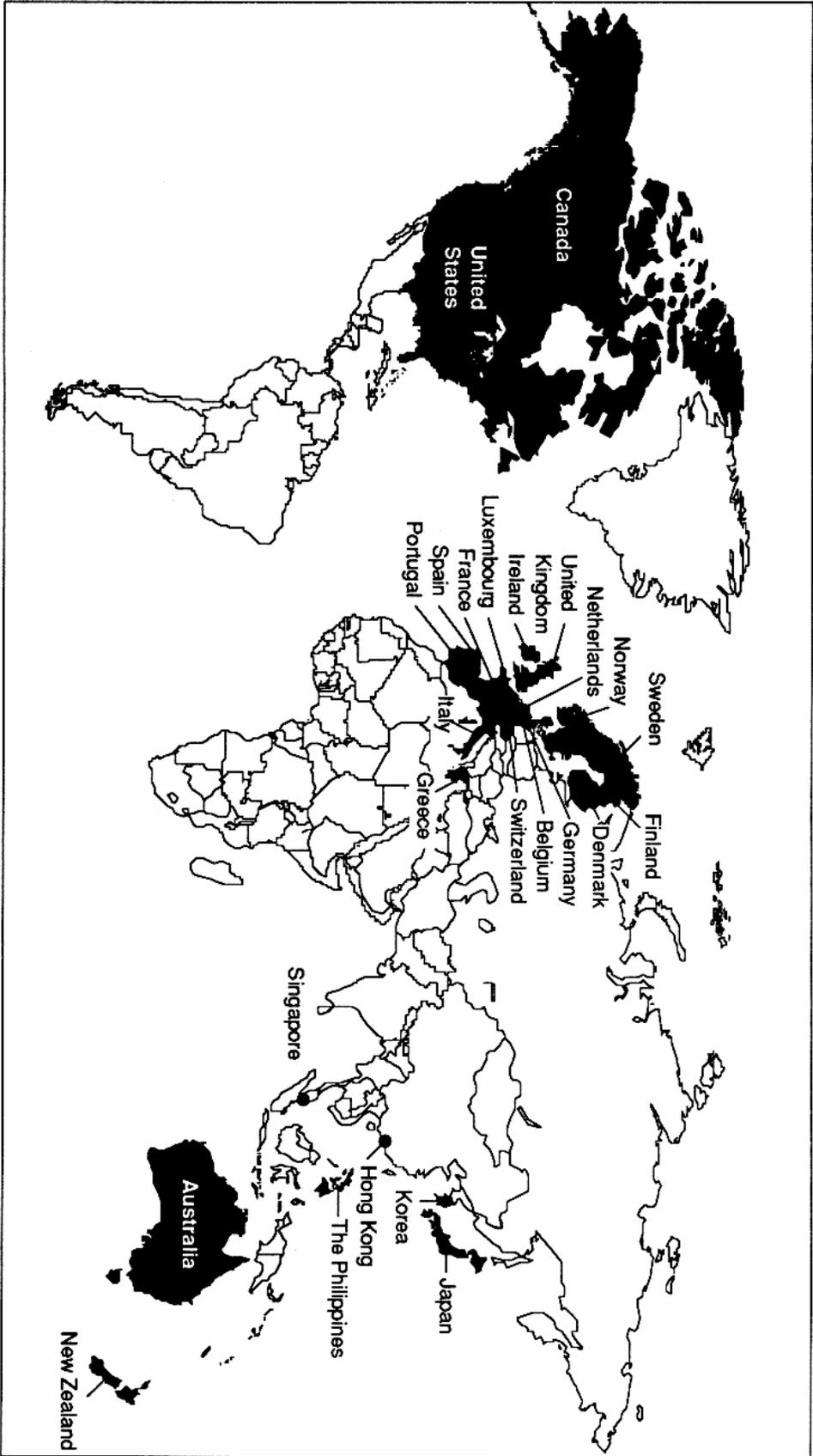


Figure 8
WorldPartners Coverage

networks are partitioned and not linked together in any way, and where their ability to write a basic communication requirement is very poor. Typically, they'll employ consultants to work out the operational requirements and prepare the document to tender so that a competitive bid will take place.

By and large, most companies understand their voice requirements and their basic data requirements, but the biggest challenge for most companies is to understand in a detailed way how telecommunications improves the competitive edge: the direct relationship between different types of communication and management of databases, and how they operate and compete in the marketplace, and it's usually at that point that companies require significant help. But the answer to your question is that it's quite different. Different companies show different characteristics.

What are they looking for in the end? To start with, they're looking for cheaper service. They're looking for migration paths to more advanced services, and eventually they're looking for the way in which telecommunications will make them better than their closest competitor. Most of them will start at the bottom of that and continue on.

Student: But you don't talk much about the hardware aspect of all this. What kind of compensation does AT&T have to give when it goes to a country and starts using their fiber optic lines and so on, and how much do satellites come into the picture at this stage? You were talking about expansion of AT&T in various parts of the world. You don't own the infrastructure; that's already there. So what kind of agreement do you usually enter? And I had a question on satellites, too.

Baker: Provided we've got a license to operate as a reseller, and we're ready to buy local facilities from the local telecommunication provider, we will typically put our switches on site and build up network services in that way. So we would literally buy and then resell, or buy and use one of the facilities. If we are able to operate directly, then we may well use satellite ser-

vices or wireless services. It depends on what's going on in that country. Wireless is becoming an increasingly important option for us, particularly for mobile access. A lot of work has been going on in satellite services on an international basis, and I'm by no means a technology expert, so I'm limited in what I can say on it. A number of companies have been enhancing satellite capabilities at higher frequencies, and those are becoming an increasing business option as well.

Student: Do you have some idea to what extent the global network is wireless at this point? I know very little about the hardware side of it.

Baker: A very small but fast-growing proportion is wireless.

Student: Is that primarily used for direct international calls, or for data exchange?

Baker: I can't think of any mobile cellular networks that don't link into the international service, so you can sit in your car, or you can stand outside and use your mobile phone, and you can phone Europe, Japan, anywhere.

Student: Does that link into fiber optics at some point?

Baker: What happens is that you phone in, you dial your international code, and you go straight into the closest point of presence on the cellular system. That goes through the international gateway, and the chances are it will go through on a fiber link across the Atlantic or across the Pacific. It will go into that country and then it will be broken out appropriately depending on whether you are calling a car, or a home, or a business. It's all locked into the system. You can phone someone in a car, on a ship, and even in an aircraft.

Student: You mentioned earlier in your talk that changes in the law, I think in 1997, will allow AT&T back into the local service business.

Baker: We are assuming that will happen in 1997.

Student: Will these same kinds of considerations that we talked about in moving into a less-developed area then apply in your strategic thinking about getting back into the U.S. local market? There seems to be a lot of underground infrastructure there that you probably used to own just 10 years ago, and that you'd have to get back into if you were to get back into that market.

Baker: Could we use wireless technology as part of the local service net? The answer is yes. You're absolutely right.

Oettinger: It's not only wireless. It's that in the interim since then, local area networks put together by enterprises and so forth aggregate traffic to the point where it may be attractive for them to connect to that directly. That's one of the nightmares of the regional companies if and when things happen in 1997. There are a lot of opportunities and nightmares floating around that relate to that particular question.

Baker: We could work with a cable television company, or a series of them, and bundle the telephony services into the cable TV network. We could work with the energy utility companies. Most of them have quite significant networks. All of them link into the home. We could work directly with wireless. We could lay fiber. There are a number of options, and it depends on what is economically feasible.

Student: Do the FCC and AT&T have any specific strategies for opening up those companies that maintain a monopoly abroad?

Baker: AT&T will invariably be asked by the European Commission or the authority responsible in a country for its opinion on liberalization and policies for the development of competition. It isn't unusual for AT&T to be on the list of expert companies that will give an opinion. The FCC might also be called upon by the liberalization authority in that country to give its opinion on how best to develop competition. Be-

cause I'm familiar with it, a good example of that is Mexico. When the SCT, which is the equivalent of the FCC in Mexico, sent out requests for expert advice on the liberalization in Mexico last summer, AT&T responded, the FCC responded, MCI did, I think probably BT did, as did OFTEL. They culled a large amount of opinion from around the world. The European Commission, concerned about the opening up of the market in Europe, would equally ask any number of expert companies and bodies to help it to draft its policy.

Oettinger: Let me add something to that and see if you would agree with it. That's certainly true, but in the United States and I think to a good extent abroad, among the most significant movers for liberalization have been the large customers. In the United States, as early as 20 years ago, Fortune 500 companies, especially in communications and energy, were the main political force, if you will, for liberalization, and I think that continues to this day. In Japan or elsewhere, it's the large trading companies and so on who want better prices, better service, and therefore have a stake in competition, domestic if possible, but from abroad if necessary because their interest is in being competitive themselves and in having a strategic resource on the best terms possible. I think it's fair to say that to this day they continue to be sort of the major player against the PTT. In any country you find the PTT with a few allies, and against them, in the political context of a particular country, the international trading, manufacturing, et cetera, folks who want to open things up.

Baker: INTUG, which is the international telephone users group, is a representation of business customers, and they would be used as catalysts, typically, by an overseas authority. Sometimes major customers are asked, but they are increasingly going to customer user groups for a part of the advice and process. That's absolutely right.

Student: Is the European Commission pretty much looking forward to liberalizing their telephone industries if the customers or AT&T or the FCC favor it?

Baker: The European Commission is very committed to liberalization, as declared at a conference in the beginning of the 1990s. Its task was not only to set the milestones for liberalization in each of the union countries, but also to agree to a process whereby each of those countries would fall in line. Spain very quickly came to the front of this and said, "We will have open markets by 1997 or 1998." France and Germany have typically held back, and for a while there was a suggestion that they wouldn't open their markets until the year 2000. Then in 1993, Germany allowed the introduction of

virtual private network services, and it began to loosen up a little. I think if you would canvass opinion in Germany now, or at least get a local policy answer, you'd see that they're back on target for 1998. So it's a constant push and shove battle.

Oettinger: I think that the time has come to thank our speaker for a marvelous, marvelous session. We have a literally, but not figuratively, small token of our appreciation.

Baker: Thank you very much.



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