Chapter 6
Industrial Organization for the Telecommunications Sector: Main Scenarios

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There are certainly several ways of understanding the "regulation" of an industrial sector. If the public actor is focused on, the way it sets the economic rules will be stressed. If the industrial system is focused on, the question will be how such an almost cybernetic system functions. If the relationships between the industrial actors are focused on, the question becomes where economic added value comes from and how they are shared by these actors. The latter has been chosen in our analysis.

In this perspective, an unoriginal although necessary remark should be made: The overall added value of the telecommunications sector in 1989 (the revenue was about 330 billion dollars*) is produced and shared from a relation between the power struggle among actors and the market structure. However, this relation is hard to grasp. Compared with the past (from the 1950s through the 1970s) designating the parameters of this relation is no longer easy. Faced with such a prosody, no less than three main vectors are needed to define the issue:

- technological innovation due to increasing research and development expenditures;
- the gap between consumer demand and the wide range of supply;
- the rising number of industrial actors in a position to have their say.

* All figures and statistics are IDATE estimates.

Today's priority, not only for the economic partners but also for the exegetes that we are, is to organize this uncertainty.

The regulation of an industrial sector, that is the way added value is produced and shared, is easier to perceive when it is identified with one market (or a small number of markets). Up until the early 1980s, this was true of the telecommunications sector.

Before deregulation, an oliogopolistic structure was imposed on the equipment market by the monopolistic supply of telecommunications services. As the entire telecommunications market was interdependent, the demand for services could not play a well-defined part. The value added partition rules were set beforehand by the public network operators' efforts to minimize their transaction costs with the few industrial partners. This partition never went further than the national boundaries inside which the public monopoly was legitimized.

From this prospect, deregulation is only the end of this pattern; it is the public announcement that the old distribution rule is no longer suitable. It suits neither the public nor the private partners, since it does not enable them to optimize the use of their own resources.

Nowadays, almost everyone agrees that the real deregulatory challenge resides in the capacity to make up a new set of rules—whether accepted or imposed—defining how the overall added value should be shared.

Why did deregulation not impose its own clear set of rules? Actually, the reasons were rather trivial: the system was becoming more complex; the industry had started creating new types of externalities (new demands to share the profits with outsiders); and economic activities were going international. It is easy enough then, to understand why a consensus has become too hard to reach. New coalitions are always coming up, causing a systematic resetting of the rules that seemed to have been emerging. At this point, the motion launched deregulation into an apparently everlasting struggle.

The Japanese understood this long before their American counterparts. Their political authorities chose an economic deregulation which left the industry as the defenders of Japanese interests. This is clearly a pragmatic approach to the regulation issue.

So, complexity and uncertainty are almost equivalent definitions of the relation referred to earlier when describing the partition of the added value produced by the telecommunications sector.

At this point, I would like to shift to a different attitude, and prefer explanatory diagrams to rhetoric, tools to words: "Draw me your concept," as the Little Prince would have said on today's telecom planet.

COMPLEXITY, UNCERTAINTY, AND VALUE-ADDED PARTITION: A THREE-LAYER MODEL

In 1989, the overall telecommunications market was estimated at 330 billion dollars. This added value was partitioned as follows:

1. equipment production,
2. network operation,
3. telecommunications services.

Up until the late 1970s, the partition of this added value troubled little water. But the 1990s will probably be a decisive turn in the evolution of this partition. The partition is becoming more and more conflictual because:

1. Although limited-business and household communications expenditures, investment or consumption expenditures, cannot rise two-fold from one decade to another, the market growth rate is unpredictable;
2. Industrial structures, that is, the nature of the markets and the number of actors involved, are not stabilized. This is partially due to regulation, but also to the burden of technological variable and actor strategies which, in a way, amplify this destabilization.

Figure 1 represents these evolutions.

It is necessary to examine the specificity of the rules that control the partition of added value. The first step will be to apply the conventional concepts of industrial economics to the telecommunications sector.

Subject to an implicit agreement up until the 1980s, the partition of

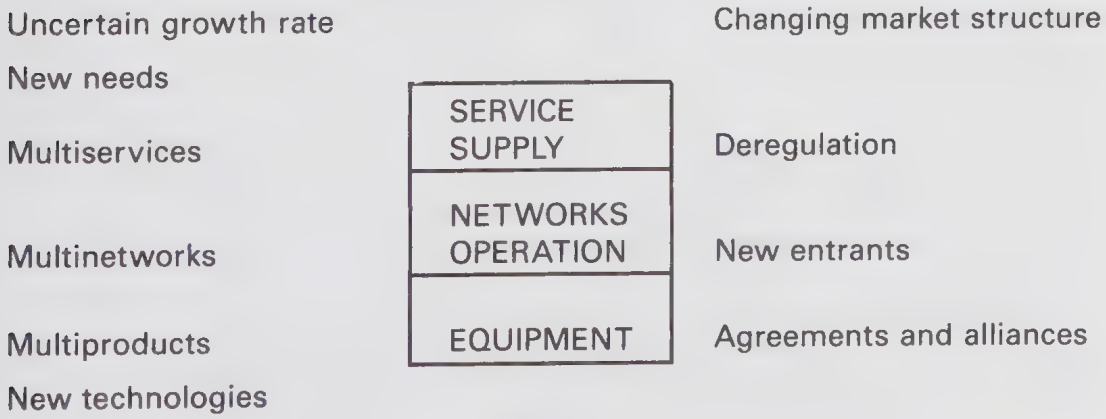

Figure 1.

economies of scale between those who manufacture technological equipment of subsystems and those who integrate and organize networks is now being transformed because of constraints due to research and development efforts and due to the fall of natural monopolies (see Figure 2).

The partition of economies of scope which define the conditions of valorization for a pool of services "using" the same type of infrastructure is also becoming a central and challenging issue. Today, techno-economic conditions in the telecommunications sector open the door to several "arrangements": a dedicated network that optimizes one service only; a network that optimizes one category of services; a service optimized by the opportunistic use of different networks; or a universal or integrated services network optimized by the opportunistic management of all its present and future services. No exact science can guide us in the choice between so many options. Only the intelligence of industrial actors and the justification (if not too late) of a technoeconomic choice based on profit making or strategic criteria can help.

The partition of the value of use is an even newer issue. It is based on the analysis of the role which telecommunications play and will play in the economic activity of the other industrial sectors. Telecommunications are increasingly present in economic activities; they are present in the production phase during which telecommunications and technologies cooperate to improve productivity. They are also present in the transaction phase, where telecommunications networks are used more frequently as the means for market organization. Telecommunications are even present in the products themselves, with the trend to "computerize" market production.

Hence the value of telecommunications is clearly increasing, giving the telecommunications sector a reason to claim "higher fees" for their services. However, users can also argue that they are responsible for the value of use.

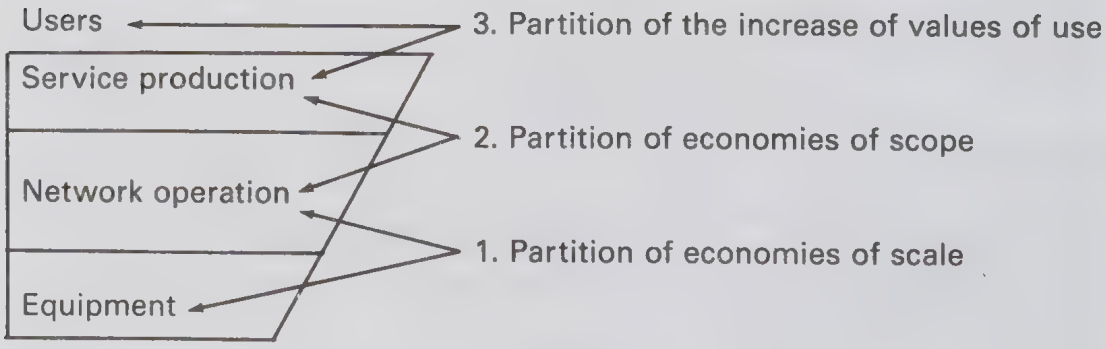

Figure 2.

As said before, a universal rule cannot be used to arbitrate between the internalization and externalization of the value of use. On the other hand, the arbitration will be subject to changes of equilibrium during the years to come. For, although the "distance from supply," that is, user understanding of network and telecom services, is diminishing (it's almost nonexistent in banking) and is still important in many industries. For the moment, this diversity should save the partition of added value from being overpowered by a line of force.

Here again, considering the production and distribution of added value, the economic analysis of the telecom sector remains rather vague.

Nevertheless, it is possible to anticipate how added value will be partitioned in the future by examining the different pressure to which the system is subjected. The following scenario defines a consistent system of parameters. This definition may seem cursory to some, but it leads to a more analytical reflection in order to articulate three categories of parameters: economic (amount of added value, partition, etc.), structural (market structure, concentration of supply, etc.), and behavioral (competitive and cooperative strategies, etc.). Each scenario is designated by a name, a mnemonic chosen from everyday telecommunication jargon, whose definition has already been the subject of many discussions. Our objective is certainly not to contribute to this confusing situation, but to clarify it some by choosing a different angle so as to attribute a "value" to expressions such as ISDN, VAS, VAN, etc.

Four scenarios will reflect the four major levels of the partition of added value. In the first, the ISDN scenario, the largest part of the added value goes to the industrialists. Equipment is economically the determining factor. Industrialists now realize this, although they were slow to adopt the ISDN concept.

The second scenario refers to the notion of value added networks (VAN). In a value added network, all the economic partners accept the idea that networks are essential—and even strategic—for the production of added value. So the network operators are in a good position to "reap" the benefits.

In the VAS scenario, services become the system's strategic point. The commercial valorization of services conditions the breakdown of the overall added value produced by the sector. Thus, computer services and other service providers are in a good position to turn the advantages of their strategic position into economic benefits.

Finally, the private networks configuration should not be ignored. Here, users internalize their telecommunications activities as much as possible. This strategy is based on the existence of private networks, which do not necessarily have a discriminant management.

What counts in this system is how private networks are controlled: cooperative; exclusively private with possible third party use; private with several joint-ventures; or virtual private networks on public networks. Concerning the partition of added value, a scenario such as this one obviously tends to be beneficial for the consumers, and to a lesser extent, for industrialists who, opportunistically but not strategically, may make some profit out of it.

These brief scenarios are analytical grids to interpret what is at stake in a sector more so than predictive tools meant to measure the exact breakdown of added value. They also reflect the logic involved in regulation more than the way they are applied. Although roughly superposable on the former, the model used in the second part of this analysis is slightly different.

METHODS FOR THE PARTITION OF ADDED VALUE AND TRANSACTION COSTS: A FIVE-LAYER MODEL

Uncertainty and complexity are the two terms of reference in the argument developed in the first part of this analysis. The apparently simple three-layer model that I had chosen seemed helpful in grasping the logic behind the partition of added value in the telecommunications sector. This simplification appeared eloquent enough in so far as it enabled a biunivocal relationship between markets and actors. In this perspective, it is clear that the nature of the actors determined the nature of the markets for a long time.

Today, this is no longer exact. Affected by deregulation (directly in the U.S. and France), "technologics," and economics (relationships between the telecommunications sector and other sectors), the system has been reorganized. The actors are no longer the total masters of the game. Structural evolution obeys its own logic and the three-layer model becomes insufficient.

In fact, the partition of added value reflects the arbitration on the sector, and four markets seem to be emerging in today's telecom landscape:

1. communications services,
2. network services,
3. telecommunications functions,
4. technologies.

Basically, this is called market typology, with each type or category corresponding to a variable number of segments (the difference

between a market and a marketplace). It should now be easier to grasp the complexity of the problem and it has even become possible to illustrate this with a diagram (see Figure 3).

This diagram allows us to seize the system's complexity, multiplying markets, logic (from applications to technologies) and actors (per level, on each market).

This five-layer model should be a first step toward a better understanding of this complexity. But the second major term of our analysis—uncertainty—remains unexplained. The first part of the analysis dealt with this aspect in an almost anecdotal way, touching upon market growth rate, new technologies, networks, services, and uses. The discussion now becomes much more precise. The true culprit of today's uncertainty in the telecommunications sector is the possibility for actors to "reorganize" their relationships and change a situation in view of optimizing their share of the added value. Techno-economic evolution has supplied them with the opportunity to "recuperate" this added value on four markets instead of two.

However, uncertainty can also be perceived on another level. We know, and this was made even clearer by Williamson (1975), that there are basically two ways of breaking down added value: markets, of course, but also *hierarchies,* the integration of industrial relationships in the well-defined boundaries.

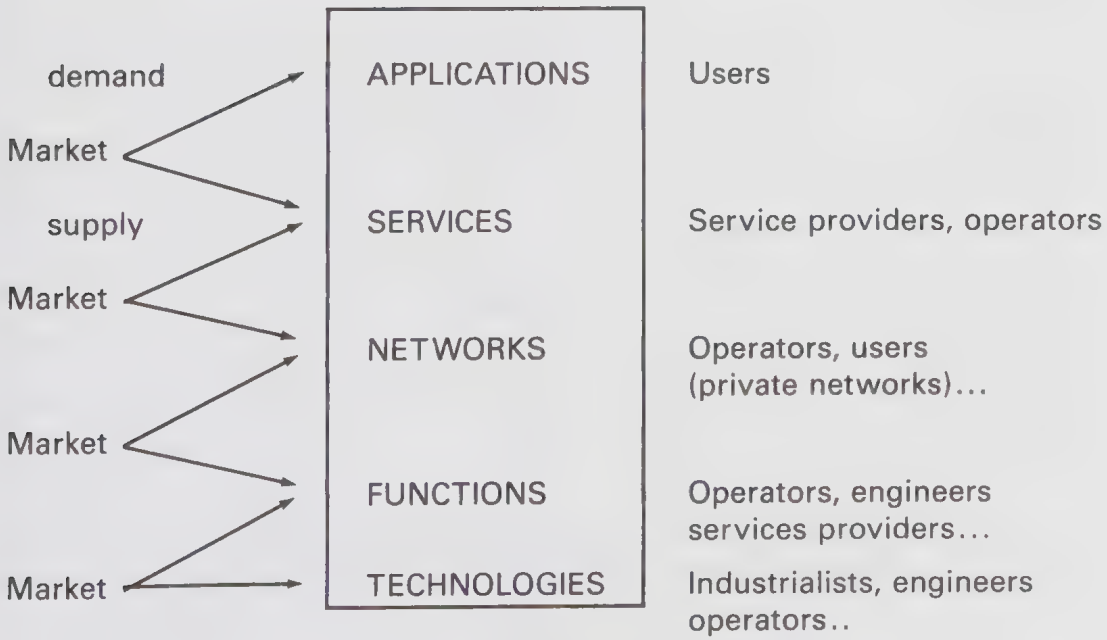

Figure 3.

The diagram of a generic matrix which associates five layers with two forms of industrial organization can illustrate this uncertainty (see Figure 4).

Given this perspective, the earlier definition of a scenario becomes important, since it enables the characterization of the logic-dominating actor strategy as well as a better comprehension of how the rules are set: Choices made between markets and hierarchies at each level of the telecommunications system will lead to very important practical repercussions.

Since each combination gives rise to a new coherence, there are far more scenarios this time. Conversely, the four scenarios presented before should become a subset of these possibilities. This exercise, although of a formal nature, is rich in concrete information.

The future of the ISDN scenario depends on the hierarchic relationships including technologies, functions, networks, and services (see Figure 5).

There is only one market: services (value-added services). This suggests it would be a fairly rigid system, with a serious bottleneck when it comes to the partition of added value.

Figure 6 is an open scenario: Economic relationships between actors can be polarized on three market levels. Nevertheless, the telecommunications services remain by definition the determinant factor in this scenario.

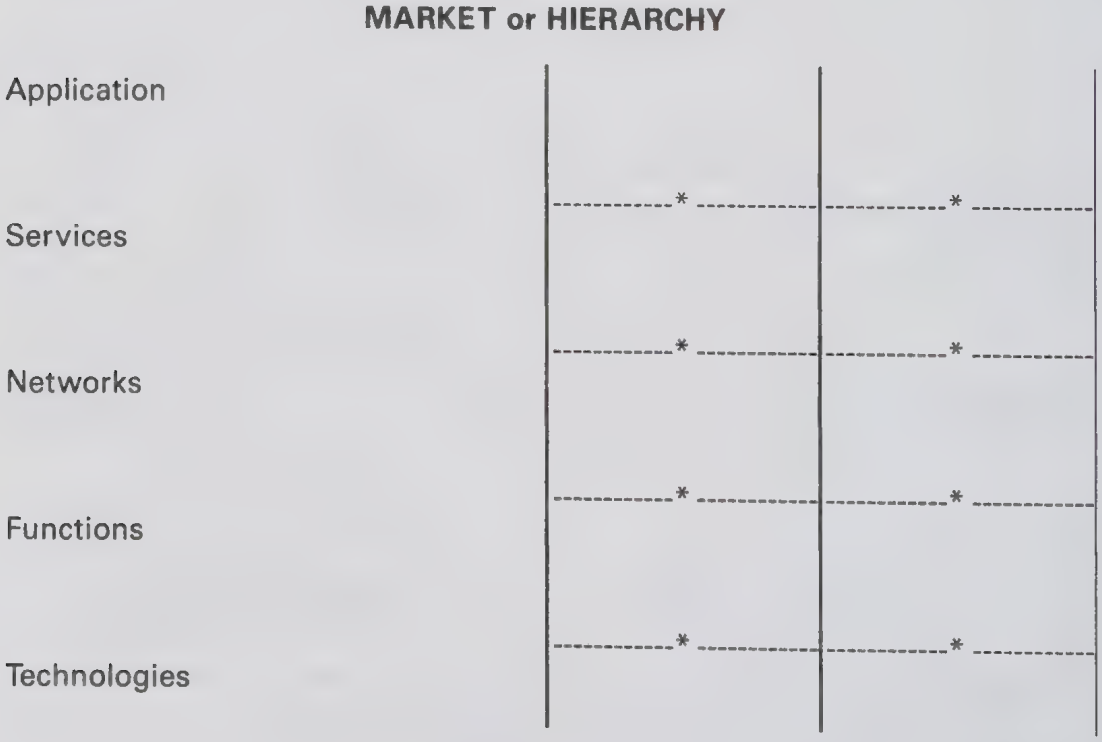

Figure 4.

1. ISDN scenario

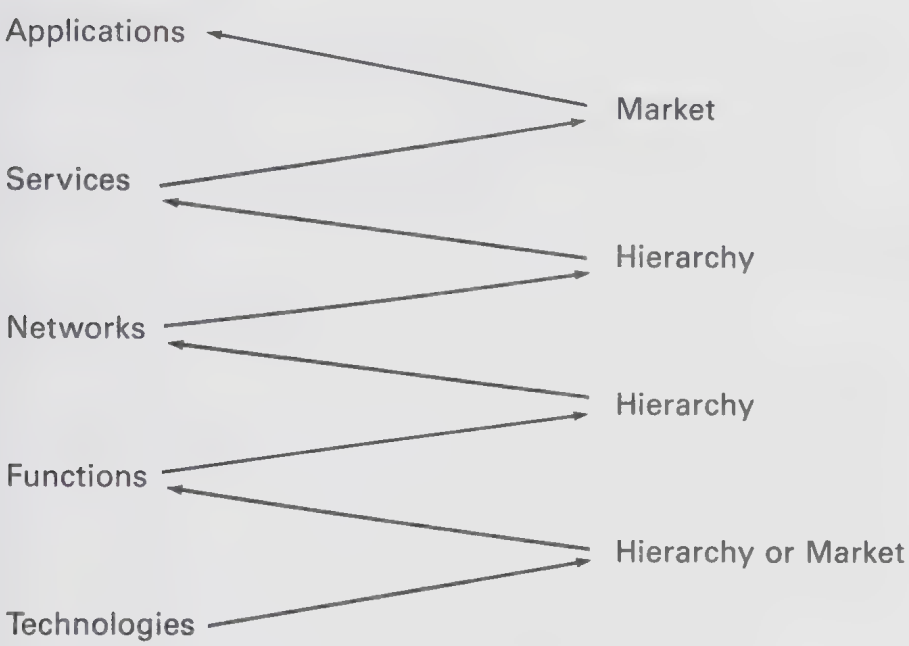

Figure 5.

2. VAS scenario

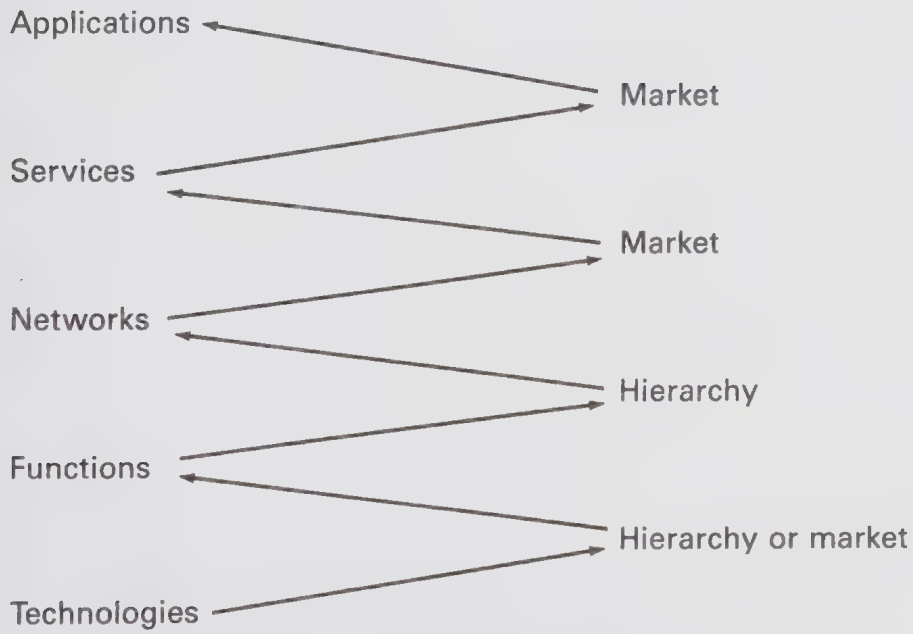

Figure 6.

3. VAN scenario

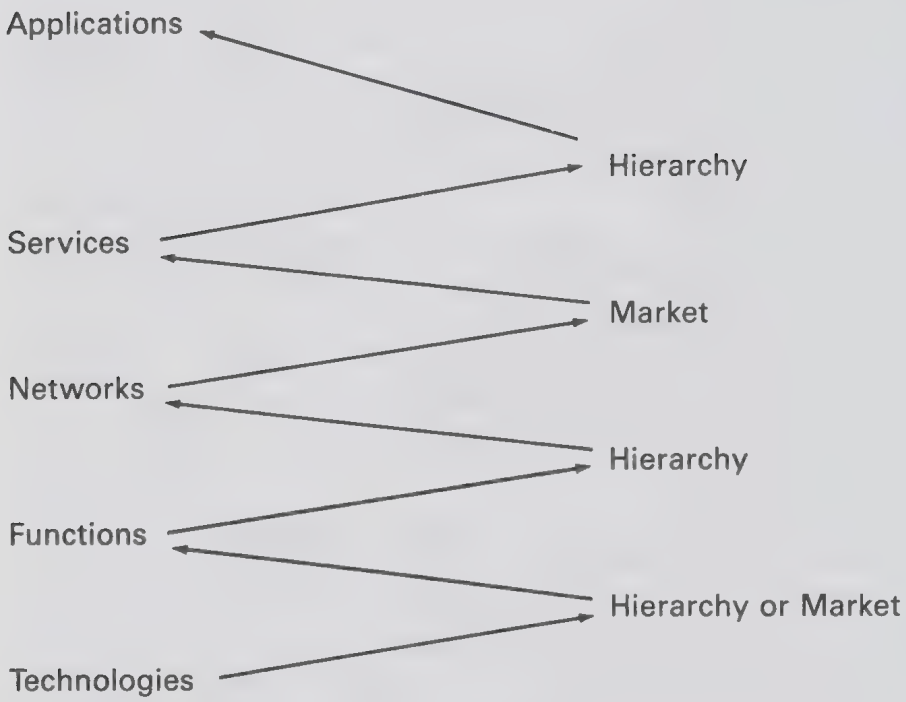

Figure 7.

In this third scenario (Figure 7), the system focusses on the network: market downstream, hierarchies upstream. As for industrial relationships, the aim is to try to control this level.

The scenario (Figure 8), in which consumers "integrate" (internalize) the biggest share of added value, can only work if a real market based on functions is created (Centrex, for instance), and if public and private networks are transparent (ONA/ONP).

However, this type of analysis does not give a satisfactory answer to one fundamental question: What makes actors choose between defining their industrial relationships in a market context or in a hierarchical context? Williamson helps solve this problem, or at least ask the right question, by explaining why transaction costs are an essential factor.

Transaction costs are all the costs connected with the transfer of property rights. In other words, they are the costs, often unseen, which make transaction possible: The acceptance, or certification, of a telecommunications terminal costs something, and this "something" must be located in order to control certain market-related industrial relationships which may develop.

4. Private networks scenario

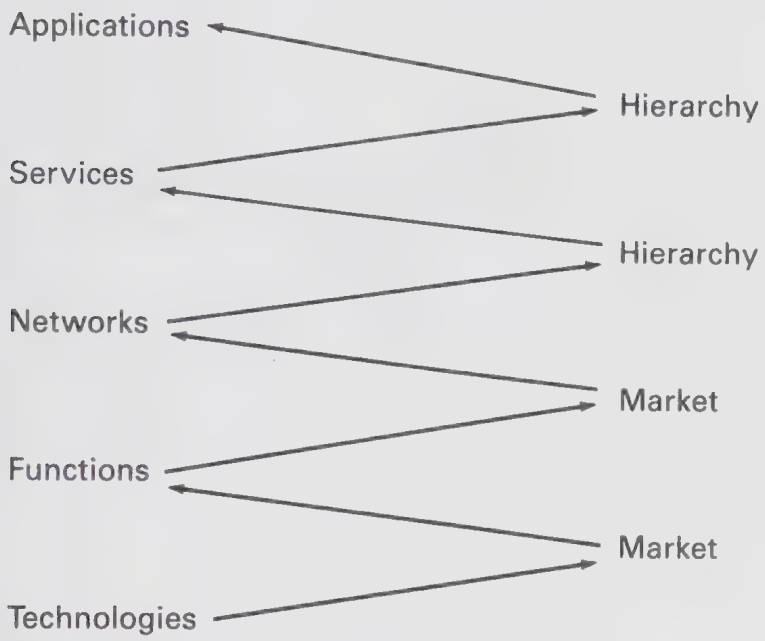

Figure 8.

Minimizing transaction costs has always been an objective common to industrial actors and customers. In a system that increases the ways an inter-actor equilibrium can be reached and authorizes a growing number of actors, this preoccupation has become of major importance. The stakes for transaction costs are shifted from the periphery to the center. Their perception becomes a key element of success or failure.

This is the direction which will be taken, since today's telecommunications sector possess all the "virtues" of a system in which the mastering of transaction costs has become essential. However, this statement is a profession of faith more than an actual demonstration.

Although a reasoned intuition, it does merit a far more analytical argument. These three questions need to be answered:

- Where are the transaction costs located?
- Who is in charge of estimating them?
- Who will accept the cost for them?

These basic questions were already brought up during discussion about deregulation in France. Answering these questions will probably take some time. But before then, industrial actors will become

aware that today's strategic orientation should be in increasing their market power—that is, their capacity to impose a choice between markets and hierarchies—while minimizing their transaction costs.

REFERENCE

Williamson, O.E. (1975). *Markets and hierarchies*. New York: Free Press.