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The Rise and Fall of Global Network Alliances

Success or Failure?

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THE ECONOMICS OF TELECOMMUNICATIONS

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ABSTRACT

The purpose of this article is to examine and explain the changing use of different modes of organizing global telecom networks that provide global telecom services to multinational business customers. In this market, service contracting and integrated network firms eventually replaced global network alliances. Whereas efficient adaptation of governance modes to changing conditions may explain a significant part, strategy mistakes and governance failures definitely also play an important explanatory role in our story about the rise and the fall of global network alliances.

1. Introduction

After a decade of experiments in providing global telecom services to multinational businesses, time has arrived for closer examination of its results. To the surprise of many, global network alliances such as Global One, Concert and AT&T World Partners failed. Left on the arena are now mostly the polar forms of integrated corporations and contract organizations. Whereas the former group includes companies such as Infonet and Cable and Wireless, the latter group includes service provision contracting between upstream carriers and downstream service providers and system integrators, besides traditional back-bone contracting under the old Correspondence System and the much younger Internet for voice and data traffic respectively.

The purpose of this paper is to examine mainly through the lens of transaction cost economics why this happened.[1] Were the alliances dissolved after having accomplished their entrepreneurial mission and after basic conditions had changed in favor of rival organizational forms, or were the alliances structure simply a mistake from the start, badly adapted to prevailing conditions and just another way of creating anti-competitive mini-cartels? Although they died, should their death still be considered more of a success than a failure (Williamson, 1999)?

We start our discussion and examination of this question in section two with a short description of global telecom network and services before we present our theoretical approach in section 3. Emerging global network organizations are described and evaluated in section 4. Interpretation and conclusion finalize the paper in section 5.

2. Global Networks and Services

Rather than starting from scratch, global networks were initially built by interconnecting numerous vendor-specific national networks into global "networks of networks" across a number of high-capacity international transport lines.[2] The most seamless of these "networks of networks" would run with a minimum of snags and delays, approaching but never achieving, the quality and functionality of local area computer networks. For many years now, global seamless networks have been organized as a matter of routine for international voice traffic within the contractual framework of the Correspondence System. Transforming, upgrading and standardizing advanced data networks and extending these into ever-wider territories, however, is a much more daunting entrepreneurial task. To accomplish this successfully, a considerable more complex and elaborate management system was required than the one provided by simple contract organizations such as the Correspondent System. Not only will performing such a task require more firm-like governance.[3] It will also require establishing a more widely distributed network of local sales and service units, especially to the degree regular transfer of leading technology and best practice to local sales and service units is needed to perform efficiently.

In fact, above requirements are exactly the performance functions that characterize mission-critical global services that global service providers such as Infonet provide to its most demanding multinational business customers such as Metso Finland (having 23.000 employees and 140 operating units in 40 countries). Up to quite recently, most of these customers had mainly supplied their own global services on private networks and leased lines (e.g.; IBM, General Electric, Ford) or across customer-owned network co-operatives (e.g.; SITA for the airline industry; Swift for the banking industry). As international traffic were

liberalized, global alliances and carriers started to offer quality service at lower cost than most multinationals could provide on their own.

The resultant global data networks took shape of a hub-and-spoke network where the hub was made up of a few high-capacity backbone networks and the spokes of numerous distribution lines and local access networks. The core network, consisting of the backbone network and selected parts of the distribution networks, could be organized in three different ways, either as (i) a fully integrated corporation (e.g., Cable & Wireless), (ii) a strategic alliance or joint venture (e.g.; AT&T WorldPartners, Unisource, Global One, Concert), or (iii) a contract organization (e.g.; the Correspondence System providing international voice traffic; the Internet conveying international data traffic). Independent local operators (national incumbents) owned and operated the larger remaining part of the "non-core" distribution networks under exclusive (first tier) or non-exclusive distribution contracts (second tier), acting as the global operators' local representatives or distributors (Williamson, 1991).[4] Finally and furthest downstream, the various types of local distributors (internal or external) delivered global services to business users under various supply contracts, ranging from simple spot contracts to long-term collaborative agreements.

Each of the above network organizations represented different ways of having a large number of separate and independent customers share the costs of common assets (switches, transmission, management expertise, operating capabilities, etc.) rather than paying for the extra costs of producing such services internally with private/leased and underutilized assets. If for example, the multinational corporate clients of Concert were to operate their own private networks, these companies would have to: a) buy the necessary computer and switching hardware, b) have spares on hand, c) lease high-speed telephone transmission lines from the local phone companies in various countries, d) hire local technicians in each city, and then, e) figure out how to pay separate phone bills in different currencies in each nation. A

global operator alliance such as Concert would manage all these aspects and still save their clients money, as they share the network, service and support costs among different customers.

In particular, consider the package of Concert services once delivered by Telenor/Concert to one of their premier customers, Kværner, involving voice, data and e-mail services.[5] Through the Telenor/Concert organization Kværner was offered access to four separate data networks, located in the US, England, Australia/Pacific and the Nordic countries, based on Frame Relay and Cisco routers. The global voice network consisted partly of various public networks in different parts of the world, administratively connected through interconnection agreements with partners, distributors and independent local operators. On the Norwegian network Telenor offered its own VIP service with functionality similar to private networks. Telenor Nextel from their main office in Bergen provided the e-mail service.

The practical work was administered through a frame agreement and carried out by two parallel twin organizations, Telenor/Concert on the supplier side, and Kinet/Group Network on the customer side. Each of these parallel organizations consists of a number of local units and one central unit with the responsibility of controlling, coordinating and supporting the local units in different parts of the world (the central units being Telenor DSK in Oslo, and Kværner Group Network at Lysaker). Local Kværner orders were sent via the central Kværner units to Telenor DSK who asked Telenor Global in Norway, MCI in the US or BT in UK, to execute them. That is, Telenor DSK bought Concert services internally from Telenor Global and other services from the local units of BT and MCI. The agreement regulated sales and operation of network and equipment all the way to the customer router, including 24-hours monitoring of routers and traffic. For the supply of additional customer premises equipment, Concert would have to compete with other local equipment suppliers and service providers.

After the acquisition of Trafalger House and the migration of Kværners main office to London, the communication need of the larger Kværner enterprise expanded rather dramatically and triggered a reevaluation of the company's total need for telecom networks, applications, service and support. After finishing the competitive bidding process for the expanded services for the larger Kværner company in early Spring -98, where several competing operators and services providers participated, Kværner eventually chose to modify its contract with Concert/Telenor rather significantly. Since Telenor in the first period had experienced significant problems in delivering global services as promised over the Concert network, Kværner decided to include alternative network operators and services providers and to redefine the services bought from Concert and Telenor correspondingly. First, the backbone network linking the four main nodes in the global Kværner network (Singapore, London, Oslo and Philadelphia (earlier Huston)) were replaced with the SITA transport network, leaving the remaining local and national traffic to be sent over Telenor's , BT's or MCI's networks. Second, Kværner decided to phase Telenor out and Digital in as application supplier of e-mail and intranet. Still, Telenor maintained the role as A-side operator for Kværner, meaning that Telenor has the total customer responsibility for Concert services for Kværner in Norway, while buying B-end services (local installation and maintenance) from BT, MCI and other distributors elsewhere in the world.

As illustrated above, to reach the most appropriate solution, global networks should be able to route the traffic according to the priority set by the client's worldwide use of mission-critical applications. Today's critical business transactions depend on a complex interaction of applications and networks. Data traffic on a network is analogous to traffic on a freeway. Trucks move supplies to stores, ambulances race to hospitals, and people rush to work - all at the same time. Poorly designed networks can have the equivalent of data traffic jam if their creators don't consider size, speed, throughput, and priority. Modern network design enables

traffic to be prioritized in such a way as to optimize the network for the applications, thereby speeding up the important data traffic and allowing the network to waylay less important traffic. By helping clients to "right size" their network needs, global service providers such as Infonet may help clients improve their internal processes, and ultimately, gain a competitive advantage. In global network services provision, prioritization and customization have increasingly become the key differentiator that distinguishes the most successful from the less successful operators.[6]

Until quite recently, global network alliances would typically compete with corporations in providing one-stop shopping of bundled, customized, uniform, end-to-end primary telecom services and support, especially to their most demanding business customers. Primary services consisted (then as now) of basic switching and transmission services, enhanced services generated within the network (caller identification, speed dialing etc.) and value-added services produced by services applications in the network and the user terminals (e-mail, file transport, web-browser, videoconference etc.).[7] Various support services (ordering, fault finding, repair, billing, customer assistance etc.) had also to be supplied to provide the full range of basic, enhanced and value-added services.[8]

Primary services were digitized, processed and transmitted by network equipment (switches, routers, multiplexers, cables, microwaves etc.), handed over at the boundary switch of an adjacent network (point of interconnection), or terminated at some customer premises equipment. Increasingly, also support transactions were digitized, automatized, and electronically, rather than manually, produced, although a substantial share will continue to be carried out manually such as physical installation and maintenance and the administrative work of secretaries, specialists and managers. Primary and support services were delivered as more or less coordinated bundles of services produced by a number of technologies and

service people at various locations that operated and linked the pieces of the network together into a more or less global seamless network.[9]

Significant transactional difficulties are still involved in operating such a global network, particularly in the distribution part of it. As pointed out in a study by Forrester Research (1996), local access problems were substantial and included not only technical and regulatory difficulties, but also non-cooperative attitudes and behavior among local incumbent distributors. Even though the need for corporate governance to solve these difficulties may be higher in the local distribution part than in the international backbone part of the network, national regulation and politics will be more restrictive in the local than the international part of the global network. In particular, since local access has been highly monopolized, regulated and protected against foreign acquisition in most foreign countries, and since dominant local access providers tend to be the exclusive distributor of only one global carrier, local access has been and still is severely restricted in most countries. Whereas these conditions would cause problems both for alliances and corporations, the organizational capabilities for working on these problems and finally solving them will generally be lower for less unified alliances than for fully integrated corporations.

3. A Strategic-Dynamic Transaction Cost Approach

Now, in this international market of global service provision, why did one organizational form (e.g.; firms) out-compete another rival form of organizing the same activities (e.g.; alliances)? Transaction cost economics' main tenet (Williamson, 1985, 1991; Teece, 1987), as it applies to the problem at hand, is that transactions between network operators and service providers will be coordinated by corporate governance mechanisms rather than by market or hybrid

mechanisms to the degree *non-redeployable* assets have to be used or *less-transferable assets* have to be shared to perform successfully.[10]

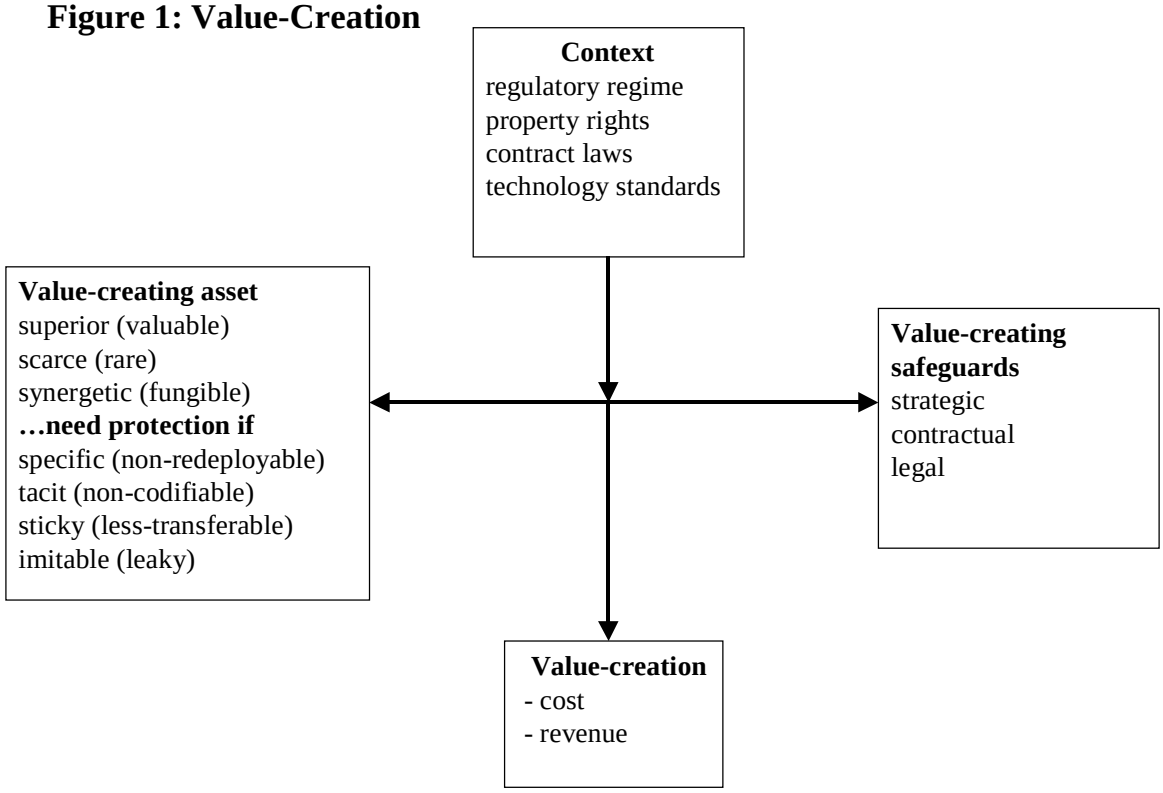
Having once discovered the recipe for *superior* performance in this market, transferring the recipe to all remaining service units serving a larger group of multinational clients will generate extra income and profit. To appropriate such extra income, superior recipes with their supportive capabilities must be protected against destructive frictions and leakage by appropriate *legal, contractual or strategic safeguards* (Teece, 1987*).* That is, protective safeguards should be used to avoid redeploying superior assets to alternative uses or users when this is *value-destroying* (i.e.; firm-specific assets) and to facilitate safe transfer to others when this is *value-creating* (i.e.; synergetic assets being also tacit, sticky, or leaky). When successful, such differential use of safeguards will also provide incentives for the further development of even higher-yielding recipes and support.

In the figure below these reciprocal effects are indicated by a double-headed arrow between sources of value-creation and value-creating safeguards. Only under the most transaction hazardous conditions will corporate governance offer more cost efficient safeguards than hybrid and market contracting. Here, value is created (revenue increased, costs reduced) through a transaction cost discriminating alignment between sources of value-creation (superior capabilities, exclusive positions) and value-creating safeguards (strategic, contractual, legal measures), conditioned by the relevant institutional context (technical standards, regulatory regime, property rights, contract law).

In particular, corporate governance will help to safeguard business relations so that external redeployment of critical resources is avoided when this is loss making, and internal transfer of critical resources and solutions is safeguarded and supported when this is profit generating. Under the opposite conditions, when critical facilities and capabilities are redeployable, transferable or eliminated as transfer objects, contractual governance will

constitute a less protective, and therefore more efficient alternative, than corporate or hybrid governance. Expressed in more strategic terms, network operators may profit from the efficient development and utilization of potentially *value-creating assets* to the degree these assets are *protected or safeguarded* by strategic, contractual and legal measures from being wasted, copied, or expropriated in the subsequent commercialization period.

Figure 1: Value-Creation



Now, consider in somewhat greater detail, global service provision for multinational customers. In this business, exploiting excess capacities in network and service capabilities is the key to extra revenue and profits. Whereas physical assets such as telecom data networks have capacity limits, knowledge assets have no similar internal capacity limit, only external ones to the degree knowledge is sticky to its creator, or highly specialized to a limited number

of users. Otherwise, knowledge can be transferred to and applied by a limitless number of users and customers without suffering any kind of wear and tear. If sticky or specific, however, the capacity limit of its creator and the consumption limit of potential users, will also limit the useful capacity of the knowledge.

Value-creating assets will include both physical network facilities such as reliable high-speed global connections and capabilities in operating those facilities and marketing the associated services. Reliable high-speed transport and access lines are abundant in some parts of the world (developed countries), but highly limited (emerging markets) and often non-existent in others (developing countries). Obtaining exclusive deals with network owners in those part of the world where supply is scarce (monopolized) will constitute a competitive advantage, if permitted by local laws and regulation. In other areas where high-speed network is completely missing, expensive high-capacity satellite connection is the only remaining (freely accessible) alternative. Quite obviously, achieving "seamless" interconnection and efficient coordination of such a large number of diverse networks, mostly owned and operated by non-affiliated foreign operators, is an extremely difficult task. In particular, to achieve competitive advantage in providing advanced global services to multinational clients, a wholly owned and fully managed backbone network, extended into local markets by highly motivated national access providers, might be considered a prerequisite, as suggested by the award-winning operator Infonet. [11]

While some of the assets needed for global service provision are redeployable, others are not, and must be replaced or rebuilt each time interconnecting networks and major alliance partners are replaced. For example, to make different vendor-specific networks interoperable, the participating network operators must invest in internetworking equipment such as protocol converters, gateways, bridges and routers.[12] Some of these investments are sunk such as most of the specialized internetworking equipment and installation work spent on integrating

existent vendor-specific networks.[13] If the contract in this case should be prematurely terminated, and the previous network partner replaced with a new one, sunk resources and specialized equipment have to be scrapped or resold at a loss, and new equipment purchased and installed.[14]

Consequently, if one network operator fails or defects, the others may suffer great losses, especially when *non-redeployable* facilities are combined with high degree of *network complexity* and *operational uncertainty*. In particular, the larger the number of technically diverse networks and culturally and linguistically diverse partners, and the higher the network complexity, the higher the chances for serious misunderstandings, failures or defections. Similarly, the higher the performance standards in terms of data security, customization, uniform service provision and real-time interactivity for complex bundled services, and the more frequent the changes in critical market and technology conditions, the harder to comply with such standards and changing conditions, and the higher the level of operational uncertainty. Combining investment in local network facilities that are mostly sunk with high level of complexity & uncertainty will cause transaction costs to rise, and motivate corporate organization to replace hybrid and marked contracting.

Other assets are redeployable, but not easily transferable such as tacit (non-codified) knowledge that in addition also is firm specific and diffused over a larger number of individuals. This may characterize the operator's service capabilities which include it's ability to diagnose the client's communications needs and deploy network resources so that these most effectively fulfill the customers' unique network requirements, mainly determined by the client's use of capacity-demanding or mission-critical software applications. Such knowledge cannot be transferred without hiring or collaborating closely with the persons possessing it.

Tacit knowledge can be codified, however, and codification may first help knowledge transfer, creation and utilization, then network utilization and profitability. That is, having

once succeeded in developing a number of appropriate network solutions, more explicit knowledge in network utilization and service provision can be developed and formalized in recipes and programs (so-called externalization; see Nonaka et.al., 2000). Such tacit-explicit conversion will then facilitate other conversions or learning cycles. Experiential knowledge that not only is tacit, but also specific, sticky and diffused can be converted into more explicit, applicable, fungible and compact service programs, ready for being transferred to and applied by every internal service unit.

Then, on the basis of more explicit, and therefore transferable, knowledge, more useful network solutions can be derived and custom-tailored to the unique needs of remaining customers (so-called internalization). [15] In short, *physical network capacity is exploited by exploiting operator's service provision capabilities*.[16] Furthermore, this may have profound effect on profitability. Since sunk costs are huge, marginal costs negligible and physical network indivisible, extra income from additional capacity utilization beyond break-even will generate pure profit.

Within global service provision, knowledge conversions are complex interactive learning processes that require considerable amount of real-time coordination. Interacting teams that collaborate across borders in developing customized and uniform solution for multinational clients need to be synchronized both in the creation and application phase. If one of the participating team fails or defects, the larger organization will suffer significant setbacks and losses. As customers require increasingly more integrated bundles of customized services of uniform high quality on a global scale rather than piecemeal offerings of random quality on a local scale, even more tacit knowledge has to be developed, explicated and deployed, creating even higher levels of operational interdependence and need for global synchronized behavior, for which the chosen service organization should provide the

appropriate governance structure (in terms of administrative controls, economic incentives, and conflict resolution).

A caveat is in order, however, especially to the degree interacting players belong to different firms. When property rights are weak, owners may benefit less from sharing technology (explicit knowledge) with alliance partners than with corporate units. Value is lost when private technology (recipes) licensed out to external partners is deceitfully used to build up competing business without compensating the owner, or when powerful partners supplying complementary products or services succeed in capturing a larger share of joint profit by charging monopoly prices on their contribution to the joint service. Although profitable knowledge and technology may also leak out from internal users, leakage is normally less of a problem in connection with internal transfer than in external transfer due to more unifying *incentives*, more revealing *information* systems, more elaborate *controls* and a deeper sense of *loyalty*, in the former than in the latter case (Liebeskind, 1995; Williamson, 1999). Although similar governance mechanisms may be developed under contractual relations, these are generally believed to be weaker and therefore less efficient in mitigating transaction hazards associated with transfer of imitable private knowledge.

However, all these hazards associated with specialized equipment and non-codified knowledge will decrease as manufacturers develop intelligent networks supporting all the different vendor-specific protocols (Guidoux, 1995). Also the level of non-transferability will normally decrease as technology and industries mature. With the introduction of advanced and more standardized software, services relying on non-codified and less transferable technical competence are increasingly being replaced with services relying more on codified and transferable software intelligence.

Also monopoly positions can to some extent be extended and therefore “transferred” by merging or allying with local monopolists in other countries. In fact, many critical

observers would assert that this was the main motive behind the global network alliances, not the need for global management and transfer of unique resources and capabilities.[17] Many incumbent operators feared that the telecom sector should be deregulated in their disfavor. To compensate for declining revenue, as foreign operators and new entrants rushed into their home markets, incumbent operators expanded into foreign markets and related lines of business. Furthermore, by pooling strategic resources with friendly allies in other countries, their joint ability to fight off competitive entries in their own home market would also become stronger.

4. Emerging global network organizations

4.1 Alternative governance structures

Now, what would be the most plausible explanation for the last decade rise and the fall of global network alliances – failing governance or efficient adaptation to changing conditions? We start our empirical examination of this question by describing in somewhat greater detail the resources, activities and structures of leading global network organizations as they evolved over the last 10 years. Subsumed under their respective governance forms, these organizations are as follows: (i) Contractual governance: the old Correspondent System and the rapidly growing Internet, (ii) Hybrid governance (alliances and joint venture): AT&T WorldPartners, Unisource, Global One, and Concert) and (iii) Corporate governance (fully integrated firms): Cable & Wireless, Infonet and SITA, besides self-supply on multinational firms' own private networks. Table 1 provides a simplified and summarized 1998-comparison of the respective network organizations, at a time when they all were still alive.

Table 1. Global networks - 1998

	Internet	*WorldPartners*[1]	*Unisource*[2]	*Global One*[3]	*Concert*[4]	*Cable & Wireless*[5]	*Infonet*[6]	*SITA*[7]
Type of Organization	C	JV	JV	JV	JV	H	H	H
Date of Foundation	1970	1993	1992	1996	1994	1929	1970	1949
Staff	-	100	3356[i]	3000	1000+	37 000	1300+	6600
Carriers' carrier	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Access provision	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
System integration and outsourcing	Yes	Some	Yes	Yes	Yes	Some	Yes	Yes
Value-added services and solutions	Yes	No	Some	Some	Yes	Some	Yes	Yes
VPN #	-	27	17	11	21	20	46	>150
Private circuits#	-	29	17	-	48	13	-	-
Frame relay#	-	31	17	27	37	24	42	>100
Packet data#	Yes	-	17	52	51	38	-	>150
Conferencing#		-	17	35	13	-	-	-
Calling cards#		-	17	103	46	-	-	-
Internet/intranet service#	Yes	-	17	36	15	-	38	-
Managed bandwidth#	Yes	-	17	21	20	13	-	-

C: Contractual agreement, JV: Joint venture, H: Hierarchy (integrated company)
Number of countries
'-' indicates either that the service is not offered or no information was supplied
All organizations are system integrators, and offer value-added services and solutions.
[1] Source: http://www.worldpartners.com/
[2] Source: http://www.unisource.com/default.htm
[3] Source: http://www.global-one.net/
[4] Source: http://www.concert.com/ab.asp
[5] Source: http://www.cwplc.com/
[6] Source: http://www.infonet.com/
[7] Source: http://www.sita.com
[i] Source: Annual report 1996

4.2 Implicit and Arm's Length Contracting

The Correspondent System

We have still two global-contractual networks fully operative: the old Correspondent System and the much younger Internet. The Correspondent System represents the traditional way national monopoly operators have interconnected their telecoms networks and settled their payment for international communication. To divide revenue between origin and destination country, a dual price system is still used whereby, for a single call, one price is charged to users by the originating operator (the collection charge) and a second price is charged by the terminating operator to the originating operator (the accounting rate). If there is an imbalance in the volume of incoming and outgoing traffic, then the originating operator, which generates more traffic, should pay a certain fee to compensate the terminating operator (the settlement payment, usually half the accounting rate).[18] Currently, there are several pricing structures (combination of fixed and variable charges), especially for data communication, dependent on (i) access and transmission technology being used such as analog versus digital connections, fixed versus mobile, switched links versus dedicated or leased lines, and (ii) the type of service being offered such as virtual private network, frame relay, packet data, conferencing, calling cards, internet/intranet service, managed bandwidth, etc.

The main achievement of the Correspondent System is the operation of a global seamless network for voice telephony, and increasingly also for data communication over X.25 data networks[19]. From a given telephone a user may reach almost any other telephone on the planet.[20] Within networks employing vendor-specific and proprietary technology, equipment from one vendor can seldom be interconnected with equipment from competing vendors without considerable difficulties and extra costs. Between such networks (as well as

between many networks and connecting user equipment), the use of common interface technology, standardized by International Telecommunication Union (ITU), has made such interconnections relatively easy at least for circuit voice switching and simple data-communications, such as the interface for packet switched X.25 data network. To switch and transmit more complex messages and binary information structures, advanced intelligent networks (AINs) will often be used that seldom are completely standardized and compatible when produced by different suppliers, creating sever interoperability problems in many instances. To solve these interoperability problems and create the needed international connectivity, more centralized coordination mechanisms are needed than the Corresponding System; with its traditional emphasize on bilateral contracting and lengthy standardization processes.

The Internet

Internet was born about 30 years ago out of en effort to connect together a US Defense Department network called the ARPAnet and various other radio and satellite networks. The objective was to build networks that could withstand partial outage (like bomb attacks) and still work. In the ARPAnet model, communications occur by having computers talk to each other and ensure that the communication is accomplished. The network itself was assumed to be intrinsically unreliable as any part of it could disappear at any moment. To send a message, the computer simply had to put its data in an envelope, called an Internet Protocol (IP) packet, and address the packets correctly. The demand for networking then spread quickly, and Internet developers from US, UK and Scandinavia, responding to market pressure, began to put IP software on every conceivable type of computer. By then the International Standards Organization (ISO) had already spent years designing the ultimate standard for computer networking without much headway. Users, however, adopted the IP instead. So did also

companies that developed workstation for local area computer networks (LANs), allowing all computers on such LANs to access ARPAnet facilities. One of those newer networks was NSFnet, commissioned by the National Science Foundation, with the objective of connecting computers of major universities. Due to bureaucratic and staffing problems, NSF decided to build its own network based on the ARPAnet's IP technology.

Demand grew rapidly until the computers controlling the network and the telephone lines connecting them were overloaded. The network needed upgrading and professional management, and the contract was awarded to Merit Network Inc., which ran Michigan's educational network, in partnership with IBM and MCI. The number of connecting networks kept growing, recently also including non-IP-based networks connected by special *gateways* technologies.

The ultimate authority for where the Internet is going rests with the Internet Society, or ISOC, a voluntary membership organization whose purpose is to promote global information exchange through Internet technology. ISOC appoints a council of elders, called the Internet Architecture Board, or the IAB, who meets regularly to bless standards and allocate resources, such as addresses. It decides when a standard is needed and what it shall be. When a standard is required, it considers the problem, adopts a standard, and announces it via the network. The Internet Engineering Task Force (IETF) is another volunteer organization. It operates through working groups, which anyone can join. These groups makes different recommendations that either are made available to anyone or sent to IAB to be declared a standard. These standards make computers from different vendors communicate, favoring no one in particular, whether IBM, Sun or Macintosh.

The participating networks financed by governments or private users, connect without a charge, only by adopting the open IP technology or some non-IP-technology with gateway to the Internet. The modern web servers and web browsers have spawned further growth.

Although the Internet is mostly used for information exchange and marketing, new communication software is allowing the Internet to also carry interactive voice traffic. By mid-96 the Internet reached nearly 5 m host computers and 20 m users.

As alternatives to the Internet and the Correspondent System, global customers may contract for a more integrated bundle of services with some global network operator, either Cable & Wireless or one of the recently established global alliance carriers, depending on the customers' specific need for global coverage, scope of service and level of performance.

4.3 Alliances

AT&T WorldPartners Association

The AT&T WorldPartners Association was established as a two-tier equity (partners) and non-equity (associate members) alliance, offering global business communication services, named WorldSource, based on common technical standards. It was established in June 1993 by AT&T, KDD (Japan) and Singapore Telecom. An operating organization called WorldPartners Company (WPC) with headquarters in New York, was created to function as a global support center for WorldPartners members offering WorldSource services. Later this group was joined by Unisource and four associate members (distributors) from the AT&T's previous Pacific Partners project: Telstra (Australia), Telecom New Zealand, Korea Telecom and Hong Kong Telecom (57,5%-owned by Cable & Wireless). Unisource (including the Spanish operator Telefónica with its South America operations) and AT&T established then a new company, *UniWorld*, that provided telecommunications services to multinationals operating in Europe. The new company (assets $ 200 millions) in which AT&T participated with 40% and Unisource with 60% was located in the Netherlands.

Although AT&T WorldPartners may be regarded as a significant global network alliance it only provided a limited service portfolio of WorldSource Services to the users. The individual partners and distributors themselves had the responsibility of interfacing their existing network to eliminate discontinuity and achieve reasonable end-to-end connectivity. Procurement was co-ordinated to ensure sufficient compatibility, but each partner retained a high degree of autonomy over its network infrastructure (Johnson, et. al., 1994). To become a full service provider like Concert, WorldSource Services would have to widen its portfolio significantly which also would have required a more unified organization. Encompassing so many potential competing companies, the areas of close cooperation could not be many, nor could they be closely related to their respective core competencies. After a few years AT&T decided to create a joint venture company with British Telecom instead (see the Concert paragraph below).

Unisource

Although strictly speaking a European regional service organization, Unisource attained a more global reach through its membership in WorldPartners and through a service agreement with Infonet's World Network. Unisource was first started in 1992 as a joint venture between *PTT Telecom* (Netherlands) and *Telia* (Sweden) to supply international telecom services. Joined by *Swiss PTT* and *Telefónica* (Spain) in 1993 and 1995, Unisource consisted for a period of four equity partner; each having a 25% stake.

Unisource started out by providing business support and service in 12 European countries and several countries outside Europe including Japan, Singapore and the US. Gradually, also the Unisource profile were lowered. While Unisource initially was represented with the name Unisource in every country they served, each selected carrier gradually took over the responsibility of representing Unisource with its own name in each country. Telia for

example served Unisource in Denmark, Finland, Norway, UK and the Baltics. The name Unisource was no longer visible, only as a brand name for the Unisource products, quality and prices. At least for some part of their global portfolio, the central unit of Unisource specifies the network architecture and describes how the infrastructure of each of the partners is suppose to perform. The partners procure equipment together, but own and operate it separately. Global branding and uniform quality are the result of contracts and mutual self-interest, tied to equity holdings in the joint venture (Johnson et al, 1994).

In December 1994, Unisource and AT&T confirmed an agreement to establish a joint venture, UniWorld, combining their European data and voice services. In May 1996 Unisource and AT&T decided to abandon Uniworld as a marketing entity and rather merge most of their European operations into AT&T-Unisource Services (owned 40% by AT&T and 60% by Unisource). Then in spring 1997, Telefónica announced that it would leave Unisource to join Concert. With the addition of Telefónica to the MCI/BT family, Concert plc would get a strong foothold in Central and South America, where Telefónica already had multiple interests. Unisource officials threatened to petition the European Union, claiming that a BT/MCI/Telefónica triumvirate would give Concert an unfair competitive advantage. Soon after, however, BT lost MCI to WorldCom and Telefónica left BT/Concert to join MCI.

Lacking cross-ownership, Unisource appeared as a somewhat looser alliance than the original Concert, similar to AT&T WorldPartners. The joint venture into AT&T-Unisource expended the global reach of both organizations, but created also a rather complex and difficult governance structure combining four companies (including AT&T-Unisource) with different business priorities, national positions and ownership types (one being 100% government-owned). The split between services offered by AT&T-Unisource and those retained by AT&T also presented a rather confusing picture to the market place. Subject to a series of ongoing organizational upheavals and changes to its market face and branding,

Unisource never managed to provide sufficient stability and direction from its multiple and diverse partners to compete with the more unified Concert and Global One. Eventually, AT&T decided in July 1998 to leave Unisource and to join BT instead who shortly before had lost MCI to WorldCom.

Global One

Global One, founded on February 1, 1996, was a worldwide telecom service provider for the businesss, carrier and consumer markets. It was a joint venture between France Telecom, Deutshe Telekom and Sprint, headquartered in Brussels and divided into there operating divisions with headquarter in Brussels (Europe, Global Services) and Reston (World). Although a private joint-venture company, Global One had more of an alliance or committee-based management structure than the original Concert, as overall control is vested in the Global Venture Board, which consists of the three chairmen of the parent companies. Services are sold by Global One's sales force in the partners' home countries (France, Germany and USA), and through local business units, national affiliates, partnerships and distribution arrangements in other countries.

As the other global service companies, Global One wanted to obtain maximum global coverage and seamless connectivity. The company had faced a long and arduous process of regulatory approval in both the USA and the EU because of the monopoly position of its two European partners, and due to this, the company could not assume its intended full form until after the January 1998 EU telecoms liberalization. Being the most recently formed global network alliance, its most immediate task was to develop significant market presence in order to reduce the lead that Cable & Wireless, Concert, Unisource and WorldPartners have developed from their earlier dates of entry into the market. Despite of its late entry, Global One claimed already from start to have a sizable business: about 2500 employees, 1200 points

of presence, offices in over 50 countries, and expected first-year revenues of over US $800 million. After realizing the same difficulties as Unisource in using their own sales offices, local marketing responsibility was gradually moved over to the local units of their alliance partners or to other local distributors.

Then Deutche Telekom suddenly decided without informing their alliance partner France Telecom to rescue Telecom Italy from the predatory intentions of Olivetti. It failed, and in the process it also fractured its axis with France Telecom. WorldCom arrived to bid for Sprint, but also failed due to anti-trust intervention. Global One was consequently dissolved. France Telecom picked up most of its assets.

Concert

Concert was established in 1994 as a joint venture between *British Telecom***,** the largest operator in the UK, and *MCI Communication Corporation,* the second largest carrier of long-distance telecommunication services in the USA. Its overarching goal was to provide multinational businesses with seamless telecoms solutions, and to achieve this, Concert had to enter market and distribution agreements with a large number of companies in many countries. By internalizing the production process, Concert hoped to become better positioned than WorldPartners and Unisource to assure global branding and uniform quality.

According to Concert its major goals were to maintain consistent worldwide standards of service and performance; provide a broad array of seamless products globally; have a strong presence in service countries; maintain flexibility in network solutions; provide worldwide billing and local currency options; and offer technology and service simplification. MCI and BT supported customers of Concert through an industry-leading customer service platform that provided seamless global customer service from any one of the five global service centers operated by the two companies. The centers were located in Cary (North

Carolina), London, Amsterdam, Sydney and Tokyo. Each of these centers offered multi-currency billing and twenty-four hour customer support, seven days a week, in multiple languages.

Drawing on the combined strengths of its parents, Concert assembled a portfolio of advanced, value-added networking products and services with worldwide availability and performance. The basis for all Concert products and services was MCI's and BT's advanced global network that connected the world's leading business and financial centers. Utilizing this network, MCI and BT introduced in November 1994, Concert Virtual Network Service, the first truly-seamless global virtual voice network service of its kind. Under the Concert brand name, MCI and BT offered more advanced global data services to more countries than any other global telecom provider at the time. Concert's high-speed data service, Concert Frame Relay Service, soon became available in 33 countries, and Concert PacketServices in 48 countries, including locations in India, Colombia, Venezuela, South Africa, South Korea and Russia.

The alliance was also based on the fact that 50% of the world's multinational corporations had their headquarters either in the UK or in the US. Through its experience in the US market, MCI had acquired a large marketing expertise and developed a number of clever marketing initiatives to build market share. BT had for some years been an international player with global presence and experience from different markets. Concert sought maximum control over its global network. This was done by building their own facilities, like in Sweden, and by entering into exclusive alliance/distribution agreements, like in other Scandinavian countries.[21] Concert had access to BT and MCI research, and was responsible for the development of new products and services for multinationals.

In November 1996 the two companies proposed to merge their activities and established Concert plc. The recent Telefónica change-over from Unisource to Concert, promised to

strengthened Concert's lead and market position. Telefónica then operated communications companies in Argentina, Brazil, Chile, Peru and Puerto Rico. That, along with Avantel, MCI's partnership in Mexico with Banamex, pretty much locked up Latin America for the consortium. Additionally, MCI's deal with Stentor in Canada gave it access to most of the Western Hemisphere. The deal formed Telefónica Panamerica-MCI, a 50/50 venture managed by Telefónica's international division. Additionally, Telefónica was expected to become an exclusive agent of Concert Communications Services in Spain and future investor in MCI's Avantel project.

Having established an efficient corporate structure, built the world's most advanced voice and data communications network, and cleared regulatory hurdles both in Europe and the US, Concert was expected to advance as the lead provider of global services to multinational enterprises. However, just before finalizing the BT-MCI merger, MCI was bought by the contender, WorldCom in competition with GTE, at a final price more than 50% above the BT offer, reflecting the huge difference in expected synergy between the two alternatives. Telefonica then subsequently decided to leave Concert and join WorldCom-MCI instead. For the next five years WorldCom-MCI would support Concert on a non-exclusive basis, but given that WorldCom were competing with Concert and that BT were selling out MCI, the arrangement were considered to be somewhat unstable.

Then in July, 1998, AT&T and British Telecom decided to join existing assets valued at $3 billion to create a venture company to serve multinational corporations. After having passed all regulatory hurdles it started operation in 2000. In the over-capacity down-turn market, the new Concert did never perform as expected, and in January 2001 the owners announced to disband their joint venture and return the assets to the parent companies.

The decision to close the Concert joint venture was made due to changes in the global market since Concert was founded in 1998, AT&T said in a statement issued separately. The

company cited overcapacity and a sharp drop in telecommunication prices that dragged down revenue as reasons for the decision. In addition, many emerging carriers, who had been expected to be Concert customers and suppliers, had encountered financial difficulties. BT and AT&T therefore decided that the best way to serve the interests of customers, shareholders and employees was through an orderly unwind. All existing contracts and service level agreements will be honored for three years. Under the terms of the demerger agreement, BT and AT&T will re-assume control of the assets that each had contributed to the joint venture, including customer contracts, international transport facilities and gateways.

The costs associated with disbanding Concert were huge. AT&T announced it would take a US$5.3 billion charge against its third-quarter earnings, whereas BT would take a 1.2 billion pound (US$1.7 billion) charge. Of the 6,300 staff employed by Concert, up to 2,300 jobs will be lost as a result of the demerger whereas the rest will be absorbed into BT and AT&T.

4.5 Corporations

Cable & Wireless

The *Cable & Wireless group***,** headquartered in London, is the world's oldest international telecommunications operator with a history stretching back some 130 years to support the business interests for The British Government.[22] After privatization in 1981 Cable & Wireless expanded into a great number of activities around the world, mostly through partly owned operations. Up to the late 90s, C&W served all its multinational customers though one organization, Global Business Network, providing global branding and uniform quality. C&W's huge global infrastructure, Global Digital Highway (GDH), produced creative voice and data solutions. In addition, Global Marine was one of the leading international subsea

installation and maintenance contractors, operating the largest commercial fleet of cable-laying and support vessels in the world.

C&W managed its worldwide expansion under the standard hub-and-spoke structure. Under this structure, the focal business unit such as C&W Global Business Network, would supervise two tiers of local operators, the first tier of fully owned federal operators for selected parts of the world, and a second tier of partly-owned telecom operators for the rest of the world. Although part-ownership would allow wider and more rapid expansion, majority ownership was increasingly prioritized for strategy and efficiency reasons. Ownership control would strengthen their influence and ability to take quick and important strategic decisions such as implementing new standards, developing and utilizing common assets, and accessing the experience and customers that each company had in its own country. At the time, C&W had operations in over 50 countries on five continents. The operations were centered round three regional hubs, namely Asia, the Caribbean and North America and Europe. Group turnover for 1996/97 was £6 billion and operating profit £1.5 billion. Worldwide, the Group employed approximately 37,000 people. Compared with the global network alliances, smaller size and global imbalance still represented a liability, however.

In 1999, the company started on their grand transformation. Its future growth should now focus on business customers and Internet Protocol (IP) and data services, the fastest-growing sector of the telecommunications industry. Targeted investments in the US, Europe and Japan gave the company full control of their business in these key markets, which together accounted for 85 per cent of worldwide demand for IP and data services. They also started an investment programme to extend the company's next generation high capacity single-hop network in the US, Europe and Asia.

Cable & Wireless had decided to build a high capacity global IP Network utilizing a single autonomous system AS3561. Its core IP infrastructure was designed to carrier class

standards with the capacity of supporting real-time services such as voice, video and ATM-based integrated access services for wholesale and retail customers. Operating at up to 10 Giga Bits per second (GBps), the C&W Network would transmit the entire content of the Library of Congress from Washington to New York in just seven seconds. C&W was and still is a major owner of fiberoptic cables. It owns 460,000 km of undersea fiberoptic cable around the world, making the company the world's second largest owner of cable capacity, enough to circle the equator 11.5 times.

With the acquisitions and integration of Digital Island and Exodus, Cable & Wireless has now become a leading global provider of hosting and content delivery services. Both acquisitions strengthen Cable & Wireless in the US market and enhanced Cable & Wireless' high-end managed hosting services offering. The organization was restructured so that its business customers in its key markets could be serviced through a single seamless organisation, a prerequisite for delivering world-class customer service, they thought.

C&W alliance and channel partner program played an important role in the company's strategy. Whereas partnering with technology suppliers helped C&W to develop more advanced and better integrated solutions, partnering with major customer was helpful in developing and supplying a broader menu (bundle) of customized and highly-valued business solutions. C&W reached agreements with a number of global strategic alliance partners to support its strategy to be the leading global provider of IP and data services. These were chosen to complement C&W's own capability, enabling C&W to provide world-class IP and data services to their customers. Alliances with Cisco Systems and Nortel Networks enabled Cable & Wireless to offer services that combined and integrated (converged) voice, data and video onto a single IP network infrastructure. In the IBM alliance where C&W provided the telecommunications service, the two partners participated in outsourcing bids for major enterprise customers. Alliances with Sun Microsystems, IBM, HP and Microsoft helped

C&W to build secure managed hosting solutions with connections to C&W' high-capacity IP backbone network. Through the Accenture alliance C&W managed to combine their own global infrastructure and integrated Internet services with Accenture's management consulting and transformational outsourcing service. Finally, without some sort of local presence, service firms like C&W will not survive. Unlike the mass voice market, however, the multinational clients are approached directly and personally through dedicated sales representatives. Key account managers for larger customers are combined with partner agreement and reselling contract with local distributors.

Today, C&W ranks as a top five global Internet service provider, earning a third of its revenue from the provision of IP and data services. It operates through two principal, complementary and well-financed business divisions: Cable & Wireless Global and Cable & Wireless Regional. Cable & Wireless Global provides integrated communications and e-commerce solutions to business customers, in particular to multinational and large national corporations. It offers advanced, internet-based data and voice services primarily in the key business markets of the US, Europe and Japan. It is one of the world's leading providers of hosting services. Cable and Wireless Regional provides a full range of telecommunications services to both consumer and business customers in 33 countries around the world, including the Caribbean, Panama, Macau, the Middle East and South East Asia.

The company's focus for future growth is on IP (Internet protocol), data and hosting services and solutions for business customers. Cable & Wireless' strategy has involved a program of disposals, acquisitions and investments since 1999. It has developed advanced IP networks and value-added services in the US, Europe and the Asia-Pacific region in support of this strategy. With its financial strength and the capability of its global IP infrastructure, Cable & Wireless had a rather unique position in terms of global coverage and services to business customers. The company was profitable for a number of years, being recognized as

the financially most stable company in the market, and awarded repeatedly for high-quality voice, data and Internet/IP services.

Its financial strength, however, has deteriorated rather dramatically over the last couple of years. Like most other international carriers, C&W has been seriously hurt by overcapacity in their main market of international high-speed data traffic, causing declining profit, large write-downs on assets and goodwill, and recent downgrading of its debt to junk status.

Infonet [23]

Founded in 1970, Infonet Services Corporation was a pioneer in the communications industry jointly owned by a number of the world's leading telecom operators. Infonet is now headquartered in El Segundo, California, and went public in December 1999. Its stock is traded on both the New York and Frankfurt Stock Exchanges.

Infonet provides network services such as intranet, Internet, broadband and remote access, based on various platform technologies such as X.25, TCP/IP, Frame Relay and ATM. Their ATM-based backbone , World Network, is an international data communication backbone network, providing connectivity to more than 180 countries and over 3,000 cities with local support in over 70 countries and territories . [24]

Clients connect to the Infonet Network much the same way that the public connects to the World Wide Web. This enables management, salespeople, accountants, vendors, and other business partners to access the mission-critical information they need whenever they need it wherever they are, and at a level of security, reliability, and consistency that is not available on a public network.

Recently, ample supply of inexpensive infrastructure combined with growing demand for global data services among multinational clients helped to improve Infonet’s strategic position significantly. In December 1999, the company was brought public to complete its

large-scale network build-out plans. At the time, they expected to spend about 750 million over a five-year period to purchase the capacity needed to support client demand. Unexpected oversupply of carrier capacity allowed them to complete their build-out program for less than half the anticipated cost. The collapse of fibre prices spurred the company to purchase not only more backbone and regional capacity, but also cheaper high-speed capacity closer to the client such as metro rings.[25] Sharing the increasingly less expensive high-capacity network with an increasing number of multinational clients helped to reduce unit costs significantly. It reduced the cost of managing data communications, relieved client businesses of the need to hire information technology experts, and let management concentrate on running its core business - not its communications infrastructure.

The World Network is designed to support every available communications infrastructure technology. Supported with their Application-Defined Networking (ADN) program, this network also provides the foundation for developing more customized enterprise-wide communications solutions. Under the ADN program, experts from Infonet work closely with the client over a longer period of time to identify business applications and to classify them into mission critical, mission supporting and mission enabling applications. Based on this enquiry, a network solution is developed that promises to meet the client's communication needs in the most productive way possible.

In fact, Infonet now regards as its primary selling advantage its ability to design customized network solutions, unique to each client. The entire process starts with the professional sales team. Every Infonet salesperson goes through a rigorous training schedule to develop a consultative approach. Here they are taught to understand how each client's business operates, to gain insight into the processes and the applications the customers use to run their internal systems. Furthermore, they learn to evaluate the strategic direction of the client.

During the initial phases of the sales process, team members talk to a number of different people in the target client's organization. The goal is to get the "big picture" - the scope of a company's business. When the final value-added proposition is presented such as a return on investment analysis to a CFO or an enterprise solution to a marketing department, those initial dialogues enable the sales force to present the solutions from a strategic business client perspective.

To make their services available to an increasingly larger share of the global marketplace, Infonet have established a large number of direct and indirect distribution channels. This means that in 68 countries, they utilize local resources to sell and service Infonet clients, preferably by forming relationships with the local communications leader. While these usually have good domestic networks in their own countries, none of the local distributors owns a global network as extensive as Infonet. Yet their multinational clients look to them for reach outside their boundaries.

Country Representatives are Infonet 's primary distribution channel consisting of 55 organizations (10 owned and 45 non-owned) that provide services in 68 countries. Country Representatives have access to operational and marketing documentation, as well as company or industry-sponsored training. They also have the right to sell and support Infonet-branded services to locally based multinational companies. Infonet relies on them to initiate sales and provide pre-and post-sales support. Country representatives are also responsibility for signing contracts and implementing the "last-mile" part of Infonet's solution by provisioning leased lines, installing equipment at the customer site, and providing most of the on-site service requirements.[26]

Non-Owned Country Representatives are entities where Infonet has less than 50% of ownership. For owned and non-owned country representatives, the agreements are the same. Both have the right to sell the entire product portfolio, using Infonet trademarks and service

marks, and are given incentives to provide superior customer support. Order, implementation, billing and troubleshooting are all the same. The sales process is identical. [27]

In addition to its country representative structure, Infonet sells its services through *Partner* sales channels. This is a result of certain agreements Infonet has reached with major telecommunications companies. These companies significantly enhance Infonet 's sales distribution worldwide.[28] Infonet 's *Licensed Distributors* operate in much the same way as Country Representatives: They operate under similar controls and have the same requirements to use the Infonet brand name. Licensed Distributors sign contracts with clients but do not have the responsibility to provide operations, network management, or multinational client support.[29] Finally, other major telecommunications companies and other value-added *Resellers* market a number of Infonet 's services. Resellers act as the product resource, buying Infonet global services to meet their specific needs. They currently give Infonet access to more than 400 additional customers.

By partnering with Infonet, local distributors can provide their multinational clients access to one of the world's most sophisticated global network service. The company's objective is everywhere to develop a common dedication and consistent approach to client service. The means for achieving this are both regular training through "Infonet Sales University", and the incentives given local distributors serving as local franchisees of a globally successful sales organization. According to John Hoffman, Infonet's executive vice president for communication sales and service: *" Our franchise is global. The model provides high incentives for our channels all over the world to provide the highest level of customer care in the business. It ensures uniform service for our customers and better cost control for Infonet"* (Infonet, Annual Report, 2001). In light of the many customer care awards that Infonet had won in recent years, he may in fact be right.

SITA[30]

Societé Internationale de Télécommunications Aéronautiques (SITA) is the oldest and one of the most successful customer-managed global network operators. Another is SWIFT (Society for Worldwide Interbanking Financial Telecommunications).[31] By building and expanding on their inherent knowledge of their member industries, customer-owned organizations (co-operatives) such as SITA and SWIFT have succeeded in supplying customized applications and services highly valued by their members (even at a time when the prices charged by the monopoly providers were extraordinary high). Both were initially set up to satisfy the special needs of their respective industry sectors, and both have later developed into global network operators to serve the communications needs of multinationals in related industries, outside the original customer industries.

SITA is a co-operative organization established already in 1949 by 11 of the world's leading airlines. Because it provides services over a single unified network and not over a system of regional alliances, SITA claims to be «*a single point-of-contact for a truly global solution*». It provides single account teams and seamless services, as a single organization worldwide.

Today SITA is the world's leading provider of global telecommunications and information solutions to the air transport industry, serving 1,800 customers in all sectors of the air transport industry, including over 700 members; it operate together with Equant (spin-off from SITA) the world's largest, and probably most advanced, voice and data network, spanning over 2,100 locations in more than 220 countries; it has over 7,000 staff of more than 165 nationalities, speaking over 80 languages, in 170 countries worldwide.

SITA today offers a total service to the air transport industry, providing value-added solutions through SITA INC (Information Networking Computing), and network services through SITA SC.[32] For the air transport industry, basic network services are still provided by

SITA SC on a co-operative basis, as they have been for 50 years, with costs shared among member organizations. The prime role is to deliver competitive services at low unit costs, maintaining its unique regulatory position. Management and ownership of the network are shared with EQUANT through the SITA EQUANT Joint Venture. Since its foundation in 1949 by 11 original member airlines, SITA has very much continued to meet the expectations of its customers, providing innovative, global telecommunications and information solutions.[33]

4.6 Self-supply

Only the largest multinational enterprises (MNE) can afford to interconnect local area networks into more global seamless networks on their own private/leased lines. Prominent examples are IBM and GEIS (General Electric Information System).[34] By running their own data networks and telephone system, MNEs could better control the use of technology to secure sufficient interoperability, customized solutions and data security. For some customers, the most critical aspect is the level of data security. The most sensitive information is either not sent at all, or only sent over private network accessible to especially authorized people. As encryption and similar security technique improve, larger share of sensitive information may be sent over the public network operated by service providers that in addition to telecom services also may run part of the customers' computer system. Such service outsourcing parallels and amplifies the outsourcing trend further upstream in the value-chain. As telecom technology gets increasingly standardized and decomposable, equipment, facilities and service units that previously were part of the customer's business are handed over to telecom operators or further upstream to equipment suppliers and software firms. From these upstream firms intermittent products and services may subsequently be sold back at a lower price to a

larger number of competing local telecom operators and service providers, from which basic and value-added services are delivered to corporate and residential customer at a lower price and higher quality than before divestiture and disintegration.

As a consequence of advances in telecom technologies and worldwide service organization, traffic has started to migrate from corporate networks back to common carriers networks. The old trade-off between (i) higher-priced, but more customized, advanced, and secure data communication on private lines and (ii) lower-priced, less customized, less advanced and less secure data communication on public lines, is still essential. For reasons mentioned above, this trade-off has now changed in the favor of common carriage, which seems increasingly able to combine the best of both worlds.

5. Interpretation and Conclusion

Although the above cases may lend themselves to different interpretations, taken together their evolutionary outcome seems pretty clear: None of the global network alliances survived competition. The only remaining forms are firms and contracts (see Table 1.). The relevance of different explanation is less obvious: Evidence may be found both for governance efficiency and governance failure. To illustrate this, the above cases will now be reinterpreted within our evolutionary-strategic TCE framework and presented in a more summarized form.

Table 1. Global Network Organizations (by January, 2003)	
Implicit and Arm's Length Contracting	SUCCESS
- The Correspondence System	SUCCESS
-The Internet	
Alliances and Joint Ventures	
- Unisource	FAILURE
- AT&T WorldPartners	FAILURE
- Global One	FAILURE
- Concert	FAILURE
Corporations	
- Cable and Wireless	SUCCESS (but declining)
- Infonet	SUCCESS
- SITA	SUCCESS
Self-supply by MNEs	
- IBM, GE, HP etc.	FAILURE (but exceptions)

A. Efficient Governance

According to our governance efficiency thesis, firms and contracts were expected to replace alliances as the underlying productive assets changed in disfavor of alliances and in favor of firms and contracts. In particular, as the *service capabilities* for the provision of customized global services to the most demanding clients became increasingly non-standardized and proprietary, alliances could no longer provide sufficient safeguards and were consequently replaced by the more unified and protective corporate form (alliance-to-firm transformation). On the other hand, as the *network facilities* required in providing less advanced services for less demanding clients became more standardized and non-proprietary, alliances represented unnecessary complex safeguards and were consequently replaced by simpler contracting modes (alliance-to-contract transformation). Let us now examine both of these transformations more carefully as they evolved over the last decade, starting first with the alliance-to-contract transformation.

Returning to the Contracting Mode

After realizing that bilateral contracting systems such as Correspondent System was not the right structure for developing global networks and services, telecom operators in different countries joined forces under collaborative structures to create alternative global networks and services based on more advanced technology platforms (i.e., Frame Relay, TCP/IP and ATM protocols). The initial pool of instantly available network owners in each country was clearly limited, so only a small number of multinational network alliances could be assembled in the first phase. Few of these managed, however, to deliver functionality, capacity and global reach quite as promised.

After having experienced the deficiencies of the first "global" network alliances, multinational customers also realized the gains that could be achieved by combining the strengths of individual network operators of different alliances rather than staying with the first chosen one. To achieve the consequent redistribution of superior network assets, exclusive contracting would have to be replaced by non-exclusive contracting. Whereas the transition to non-exclusive contracting enabled the assembly of a lower-priced or higher-performing networks, non-exclusive contracting would also increase transaction costs to the degree partnership-specific assets were involved. But, as critical network resources gradually became more interoperable due to advances in open technology standards such as Internet and Frame Relay (including packet-switching-telephony based on those standards) and as service transactions became less partnership-specific, exclusive contracting increasingly gave way to non-exclusive contracting.

The contracting mode is also increasingly being applied across the retail interface. As internetworking technology improved and became more standardized, and as previously bundled operations and services became less tightly bundled, and as customer sophistication

improved, a larger part of the future coordination of global service provision could now be carried out by downstream specialists in systems integration, outsourcing and software applications, rather than by vertically integrated network operators, as illustrated in the Kværner case (see section 2 above). Whereas separate business divisions of incumbent operators provided systems integration, international carrier divisions or independent carriers provided global connections. Since many incumbents also were members, distributors or resellers of global network alliances, competition between various units of the same service provider created often conflicts and considerable confusion in the market about the role of incumbent operators in global service provision. As the functionality of standardized internetworking technology continued to develop (mainly through standardization alliances and extensive technology licensing), the relative efficiency of market contracting improved even further. Global network alliances became increasingly superfluous.

Parallel to this development, an alternative contracting system of global service provision had evolved, based on the non-proprietary Internet technology, and under the implicit contracting structure of the Internet Society. By implicit contracting within the framework of one mandatory standard (TCP/IP) the Internet Society have created the kind of global seamless data network that incumbent operators did not accomplish under the old Correspondent System, neither through their global network alliances later on. As the Internet demonstrates, simple contracting may be the most cost-efficient and creative way of participating in the development and deployment of global networks, given that (i) the underlying critical assets are redeployable and intermediate services are easily tradable (i.e., based on Internet-compatible network technology), and (ii) network complexity and operational uncertainty are at least moderate, or performance requirements correspondingly relaxed.

So far, global network firms have outperformed Internet contracting only on more advanced features, but as the quality and global reach of IP-telephony improves, and high capacity lines are added, differences in performance may decline and migration accelerate. With a moderate price markup, global operators may also provide private Intranet solutions, based on the same IP technology as the public Internet with a level of security, functionality and controllability equivalent to private networks. That is, by offering Internet services, global operators may have started the process of cannibalizing not only the value-added part of their own global service business, but also their core telephony business.[35] At what speed such cannibalization will develop, depends on the global operators' ability to differentiate their global services based on semi-proprietary technology from competing service offerings, based either on similar semi-proprietary platforms or standardized Internet technology.

Drifting towards the Corporate Form

On the other hand, Unisource, AT&T WorldPartners, Concert and Global One may have lost out to global network firms such as C&W, Infonet and Sita because alliances provided *insufficient* contractual safeguard for their most important, but also most hazardous activities. In short these would consist of converting experience into explicit client diagnosis and network utilization programs to be subsequently transferred and applied by local service units. Significant hazards will be associated with such knowledge conversion and transfer. To mitigate such hazards, more unifying incentives and more elaborate forms of administrative and social control would be needed than alliances could provide in general, and ours in particular. Foreign network partners were not only different in cultural and political terms (state-owned versus private firms). They were also potential competitors in the longer run or in other contexts. Global operators could easily ally and partner with non-competitors, however, for a number of strategically important activities, such as product development,

production and distribution. Extending these alliances into their global services network did not seem to be a good idea, however.

To replace the contracting mode - which now had become the standard way of organizing international voice and data traffic - with the corporate mode, opportunities for developing something less standardized, more valuable, and above all, more profitable, had to be found. Whereas highly specialized customer alliances such as SITA only had to consider the need of their member industries, generalist service providers such as Concert and Infonet had to service the needs of the whole range of multinational customers. In both markets, global operators' ability to provide customized high-quality services turned out to be decisive.

In particular and as illustrated in the Infonet case, the development of specialized service capabilities for the provision of custom-tailored network and services to multinational customers are the result of years of practice and knowledge creation. The resultant package of tacit and explicit service provision capabilities are both valuable and unique and constitute as such the company's core capabilities and its most important source of competitive advantage. If left alone without codification, global service capabilities will be difficult to imitate by competitors, but also difficult to teach and transfer to one's own professional team members, partly because they are tacit and difficult to communicate, sticky to the persons or team having acquired the insight, specific for given industries or customers, and diffused over a larger number of individuals. To increase network utilization, service provision capabilities are therefore explicated and distributed through Infonet Sales University, Infonet's Network Analysis Program (NAP) and Infonet's Application Defined Networking (ADN) philosophy. As a consequence, *advanced service capabilities are also more fully exploited on a global scale, thus leading to higher utilization of global network capacity and higher return on investment for service companies such as Infonet*.

To some extent these are results that also could have been achieved through hybrid organizations such as global network alliances (i.e.; Concert) or global sales franchises. In fact, a larger part of Infonet's sales force (indirect distribution channels) is exactly run as a global franchise with the right to sell Infonet's branded network solutions and services. Extending hybrid forms into the core network and service capabilities of the organization, however, will normally provide insufficient safeguard (too risky) in terms of *less* unifying incentives, *less* revealing control systems and *less* authoritative conflict resolution mechanisms compared to the corporate form. Consequently, alliances broke down and lost out to integrated corporations that proved to be more efficient in explicating and transferring global service solutions (i.e.; Infonet, Sita, C&W, others), whereas they lost out to contracting organizations sufficient for transferring non-proprietary and already explicated knowledge (increasingly contained in highly codified network management technology). [36]

B. Governance failure and strategy mistake

In line with the strategy/governance failure thesis, we would expect that national operators expanded into foreign operations for the "wrong" reasons supported by inappropriate governance structures. Also here we find supportive evidence. First if all, rapidly growing competition in a market with increasing overcapacity turned international service provisions into a significantly less profitable (commodity) business than domestic service provision, as illustrated in the MCI case where the foreign operator BT lost out to the domestic operator WorldCom. Besides, state owned alliance partners turned out to be far too politicized and thereby far too unstable and unreliable not only as alliance partners, but also as corporate partners. More recent merger failures among European national operators indicate the same,

such as the one between Telia of Sweden and Telenor of Norway and the one between KPN of the Netherlands and Telefonica of Spain.

Consequently, global network alliances may have lost out to corporate governance mainly because of unresolved conflicts on the corporate strategy level rather than on the service production level (causing delays, service quality problems, etc.). Apparently, all the four network alliances (Unisource, WorldPartners, Global One and Concert) dissolved because the respective owners were not sufficiently unified and committed to withstand the temptation to exit from the relationship and join more attractive partners as these arrived on the scene. In other words, global network alliances can be regarded as useful vehicle for testing out international market, strategy and partner potentials, but as insufficient safeguard for permanent partnership. To achieve this, stronger commitment would be needed, even stronger than the one provided by a unified corporation as long as national and partly state-owned incumbents participated as active industrial owners of the new organization. The solution to this problem is, however, not to create some supra-national governance structure, but rather to privatize (de-politicize) before merging the companies.

In this respect, alliances may be regarded as strategic mistakes, but so should also mergers, as long as these involved state-owned companies.[37] On the other hand, alliances are still operative, but now only in the complementary non-core part of global service provisions. Extending alliances into the core network of global services, however, should be considered a strategic failure, probably motivated by other objectives than efficient organization.

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[1] Such global telecom services not only contain (i) primary services such as voice, data, e-mail, and video, along with the associated support services such as order processing, fault finding, repairs, billing and customer assistance, but increasingly also (ii) related products and services such as distributed multimedia, communication equipment, customized software, systems integration, facilities outsourcing and professional services (customer education, training and consulting). Additional complexity is introduced in global service provision as an increasing number of different national distribution networks is added, situated in different political, institutional, technological, and cultural environment. Most multinational customers want customized uniform services for all their subsidiaries, but to standardize across such a vast number of local differences is almost impossible, thus restricting the service offering of the global alliances to more simplified bundle of international primary and support services.

[2] This was accomplished by interconnecting numerous local distribution networks via a common high-capacity international backbone networks across a number of different physical and contractual "interfaces". While physical interfaces included gateways, bridges and routers, contractual interfaces would typically range from simple interconnection agreements to fully integrated companies via various hybrid forms (e.g.; exclusive distributorship, strategic alliances).

[3] Compared with contractual governance, a more firm-like governance structure would be characterized by (i) administrative control systems that are more powerful and elaborate, (ii) incentive mechanisms that are lower-powered and more long-term and therefore more collaborative and (iii) conflict resolution mechanism that rely more on private ordering than court ordering (Williamson, 1991).

[4] Here, the more general term *interconnect* refers to the complete set of technical, commercial and administrative arrangements under which two operators connect their networks together so that customers of one have access to the customers and/or services of the other. Like any other contract, interconnect agreements will contain *technical specifications* of product, services and facilities to be provided (e.g., principal and ancillary services, point of interconnect, network planning), specification of *prices* to be paid for such products, services and facilities (e.g., interconnect charges), along with the various *governance structures* and *institutional safeguards* for executing the contract (e.g., procedures for calculating and paying interconnect charges, customer access and billing arrangements, joint working group, dispute resolution procedures, updating procedures, legal protection, etc.). The relations between two interconnected networks may vary from highly complementary to strictly competitive, and dependent on the degree of competition between interconnecting operators, extra safeguards should be designed to protect against costly disputes. Interconnect will emerge as the negotiated agreement between two or more operators, to some extent influenced by current government requirements and interventions (by regulatory agencies or courts).

[5] At this time (1997 - 2000) Telenor served as partner and local distributor of global Concert service to Norwegian customers.

[6] As proclaimed by Infonet: *"Infonet's patent-pending Network Analysis Program - NAP - provides the answer to these questions. NAP consultants analyse the software applications and ask the data traffic equivalent of whether a special lane for emergency vehicles is necessary."* (see Infonet Annual Report, 2001).

[7] Among Norwegian customers, data communication based on Frame Relay is probably the most common service. More advanced services, including VPN services, is less used, mostly due to the pricing structure that tend to favor user that generate more traffic than most Norwegian companies do. Increasingly, however, expensive voice services over ordinary telephone lines may be replaced with cheaper packet-switched telephony, albeit of somewhat lesser quality (based on Frame Relay or Internet technology).

[8] As defined by Williamson (1985: 1). *«A transaction occur when a good or service is transferred over a technologically separable interface. One stage of activity terminates and another begins»*.

[9] Network industries are characterized by large externalities, where the user value of one product (telecommunications devices) increases with the number of complementary products and services and accessible users (telephone subscribers). Such bundles may vary both in the use of value-creating technology and contractual structures. In a competitive environment, and under sufficient network complexity and operational uncertainty, transaction cost economics would predict that fully integrated corporations will be chosen for providing those bundled services transactions (e.g., primary telecom services and associated support services) that require the most non-redeployable assets and non-tradable intermediate products and services, leaving contracts and hybrid arrangements to more tradable unbundled services supported by more redeployable assets.

[10] Although our question relates more to the competitive advantage of rival *forms* than of rival *firms*, the latter is relevant for the former. The same critical factors that distinguish between profitable and less profitable firms may also distinguish between profitable firms and less profitable alliances. Moreover, should previous sources of competitive advantage disappear, contractual governance may gradually out-compete both corporate and hybrid forms.

[11] According to Infonet, the recent winner of the prestigious WCA Awards for "Best Customer Care" and "Best Carrier*": "Most important, our service provides a level of security, reliability and consistency that is not available on a public network. The World Network reaches more than 180 countries and 3,000 cities. And because we own the Network, not only can we provide superior reach, as part of our service level agreement (SLA) we guarantee our Clients network availability beginning at 99.7% but we typically deliver more than 99.9%."* (see: http://www.infonet.com/services/network/the_world_network.asp).

[12] Most of these are developed, produced, installed and maintained, not by the network operators, but by external equipment suppliers.

[13] E.g., VPN, X.25, Frame Relay, ATM etc.

[14] To make the BT-MCI network truly seamless and fully scaleable, and thus complete the integration of their Virtual Private Networks into a unified, dual-vendor intelligent network based on Northern Telecom equipment in North America and Ericsson in Europe, considerable amounts of costly and specialized development works have to be undertaken (Johnsen et al, 1994).

[15] Knowledge Conversion refers in this connection to the various ways by which tacit/explicit knowledge is converted when knowledge players interact (Socialization: tacit into tacit; Externalization: tacit into explicit; Internalization: explicit into tacit; Combination: explicit into explicit; Nonaka et.al., 2000). Here, Internalization and Externalization correspond to "Fundamental Transformation" and "Fundamental Transformation Reversed" respectively (Williamson, 1985).

[16] Infonet describes the application of such knowledge as follows: *"Using a proprietary methodology with industry-standard tools, Infonet personnel dig into a company's application and network platforms. They conduct an "on-site data collection," analyze selected applications and review their behavior on the client s existing network infrastructure. Then they build a profile of the company's data traffic to see if the current infrastructure is up to the task, predicting performance and response times. Finally, Infonet will compare the return on investment between low-cost and highly-tailored alternatives, using Infonet's "Return-On-Investment Builder" software*." (Infonet Annual Report, 2001).

[17] See "Alliances: old model, new life?" in *Public Network Europe, 2001 Yearbook*, London: The Economist Newspaper Limited.

[18] From an economic point of view, the current accounting rate system is inefficient because it rewards those public telecom operators that keep accounting rates high and/or those that generate less traffic. Although prices have come down over the last years, international calls are still overpriced in order to subsidize local and residential service, provided by over-staffed and inefficient local monopoly operators.

[19] An X.25 network is any network that implements the internationally accepted ITU-T standard governing the operation of packet-switching networks.

[20] Albeit still plagued with lags, noise and bad lines in many parts of the world.

[21] Through the agreements with the Nordic carriers in Denmark, Finland and Norway, Concert has access to an interesting test market, as the Nordic countries have the world's highest penetration of mobile communication per inhabitant.

[22] Until 1934 C&W was named Eastern and Associated Telegraph Company.

[23] This company profile is based on Infonet Annual Report, 2001.

[24] As expressed by CEO José A. Collazo: "Success or failure for multinational corporations depends on their ability to access information, process it quickly, and redirect strategies accordingly. That's where we come in. By choosing Infonet, companies can focus on their core business and leave the details of their data communications to the experts" (Infonet, Annual Report, 2001).

[25] Metro rings are the termination points of carrier circuits encircling major cities throughout the world. Carrier build-out plans in these cities during the past few years have created surplus capacity. New York City, Washington, D.C., San Jose,Los Angeles, London, Frankfurt and Amsterdam are some of the terminating points of Infonet clients.

[26] These include: Infonet Belgium S.A.,Infonet Services Canada Inc., Infonet France S.A., Infonet Italia S.p.A., Infonet Luxembourg S.A., Infonet Servicios de Comunicaciones, S.A., de C.V.(Mexico), Infonet Telekomunikasyon Hizmetleir A.S.(Turkey), Infonet UK Ltd., Infonet USA Corporation, Infonet China Limited

[27] These include: Sedeco S.A.,Telstr Corporation Limited, Datakom Austria GmbH, Datacom,S.A.,Interpac Telematica Ltda., Infonet Chile S.A., Infonet Primalliance Co., Limited,Enterprise Ltda., Tecnologia Apropiada S.A. (TECAPRO), Aliatel AS,Tele Danmark Erhverv A/S, Cia.Dominicana de Telefonos C.A.(CODETEL), Datos y Comunicaciones Cia.Ltda (DATCOM), LINKdotNET, Oy Infonet Finland Ltd., Infonet Network Services Deutschland GmbH, OTE S.A., PCCW-HKT Network Services Limited, BankNet Ltd., PT Telekomunikasi Indonesia, eircom (Infonet Ireland)Ltd., Infonet Israel Ltd., KCOM Corporation, Korea Telecom, Telecom Malaysia Berhard, Infonet Nederland BV, Infonet Telecom AS,CCNet S.A., Philippines Long Distance Telephone Company (PLDT), Naukowa i Akademicka Siec ' Komputertowa (NASK), Infonet Portugal, Servicos de Vlor Acrescentado,Lda., Telefonic Large Distancia, DATEK Telecom S.A., INFOCOM TELECOM, Singapore Telecommunications Ltd., Telkom SA Limited, Telefonic Data S.A.,Lanka Communication Services (Private)Limited, Infonet Svenska AB, Infonet (Switzerland)Ltd.,Taiwan Telecommunic tion, Network Services Co.Ltd.(TTN), Siam Infonet Co. Ltd., Infocom GmbH, CACI,Inc., Setradat C.A.

[28] These include:Deutsche Telekom AG,KPN Telecom, SBC Communic tions Inc., Swisscom AG, Telia Telecom AB.

[29] These include: AUCS Hellas Telecoms Svcs., Eircom, Harmony Telecommunications Pte. Ltd., KPN Belgium, Mannesman Arcor GmbH, Netscalibur,KDDI America Inc.,KDDI Europe Limited,SIRIS SAS,Telia

Iberia , Telia Megacom AB,Telia Telecom A/S,Telstr Europe Ltd,Telstr Incorporated,Telstr Satum Limited, KDDI Corporation

[30] The information source about SITA is Sita's Corporate Guide, at «http://www.sita.int/index.asp?activeDir=/Home/News_Centre/Corporate_profile/&activeFile=index.html»

[31] SWIFT was created in 1973 by a consortium of European and American banks to provide the telecoms links needed to enable the clearance of financial transactions between banks at international level. Today SWIFT is the industry-owned cooperative supplying secure messaging services and interface software to 7,000 financial institutions in 197 countries. SWIFT carried over 1.5 billion messages in 2001. The average daily value of payment messages on SWIFT is estimated to be above USD 6 trillion. SWIFT provides messaging services to banks, broker/dealers and investment managers, as well as to market infrastructures in payments, treasury, securities and trade. These services help customers reduce costs, improve automation and manage risk (see: http://www.swift.com/index.cfm?item_id=41322)

[32] Its value-added solutions include: application services - meeting the requirements for airline, airport, aerospace, aircraft and e-business applications and systems; end-to-end desktop and infrastructure services; and network services focusing on systems integration, outsourcing and consulting, in support of complex solutions.

[33] For further information, see «http://www.sita.int».

[34] IBM recently asked Merrill Lynch & Co. to auction out its global network at a suggested price of $4bn.

[35] Internet may here play the Schumpeterian role of «creative destruction».

[36] Infonet is very explicit about distancing themselves from their distribution partners, mainly on the basis of relative competitive advantage: *"Why don't our indirect channel partners build their own networks? Some have. But if global network services isn't your core business, chances are you won't be able to devote the level of attention necessary to provide truly global value-added services. And by the time you build the infrastructure, the service technology is bound to have changed. Not to mention the fact that in order to support a sophisticated, global client-centric network, you need to follow the sun all over the world, on a real-time basis." (Infonet Annual Report, 2001: 25)*

[37] If this is true, the recent Telia-Sonera merger may also end up as a strategic mistake.