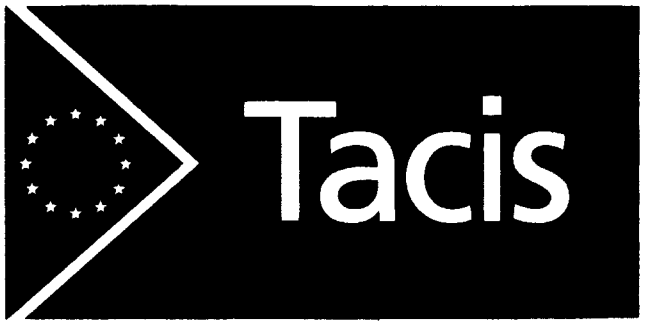

Traceca Project
Immediate Training Action
A-Senior Management Level
B-Sectorial Training of Trainers

Draft Course Material
In Progress

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Contents

MULTIMODAL TRANSPORT

Mr H. de Leijer

Organizational aspects of combined transport

This lecture deals with the organizational aspects of combined transport. After defining the subject of this lecture a description of the Western combined transport market and the latest changes in it is given. Next to that the parties playing a role in combined transport are described as are their interrelations. Finally some starting points for combined transport are given.

The definition problem

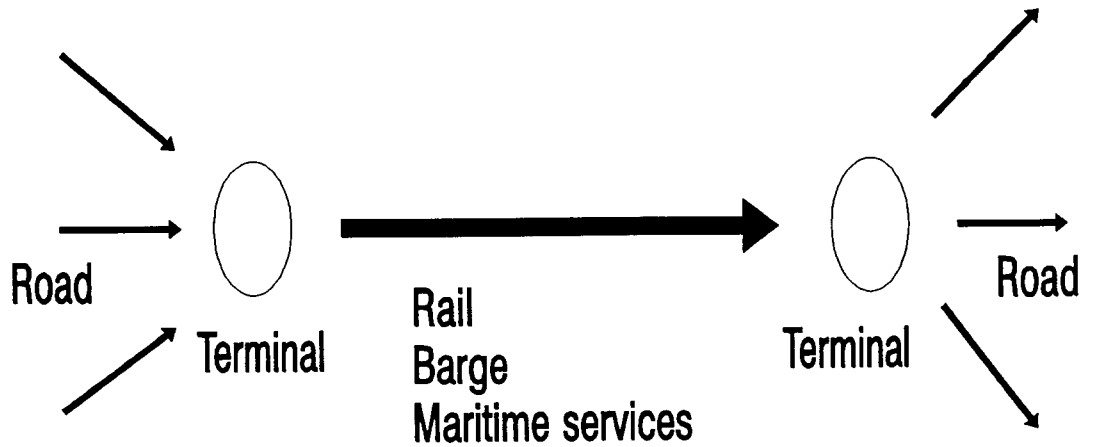
Before going into the organizational structure of combined transport one should have a clear understanding of the field. Several terms are used in relation to the transport of cargo by several modes. Combined transport, multimodal transport, piggyback transport, intermodal transport are all terms relating to the same topic. In 1993 the European Conference of Ministers of Transport (ECMT) published a document "Terminology on combined transport". This document contains definitions of all relevant terms used in relation to combined transport in French, English and German. In the table below the definitions of the general terms are given.

Term	Definition
Multimodal transport	Carriage of goods by at least two different modes of transport.
Intermodal transport	The movement of goods in one and the same loading unit or vehicle which uses successively several modes of transport without handling of the goods themselves in changing modes.
Combined transport	Intermodal transport where the major part of the European journey is by rail, inland waterways or sea and any initial and/or final leg carried out by road are as short as possible.
Piggyback transport	Combined transport by rail and road.
Rolling road	Transport of complete road vehicles on low-floor throughout wagons.

It can be said that this course in general studies the topic of 'intermodal transport', but focuses more specifically at 'combined transport'. The definition used throughout this course is therefore combined transport.

What is combined transport?

The next step is to describe more precisely what is meant with combined transport. In order to create no misunderstanding about what is meant the defintion is redefined. Combined transport means the transport where the tractor unit, lorry, trailer semi-trailer with or without tractor, swap body or container (of 20 feet or more) use the road on the initial and/orfinal leg of the journey and rail or inland waterway or maritime services on the major part of the journey (the trunk route). Furthermore it should be added that, although not part of the definition, it is also possible to use the railways on one leg and inland waterway or maritime services on the other. Which one of the routes is the trunk route is not relavant. What is important is that the transport unit load as a whole is transported by at least two different transport modes throughout the journey. This is clearly different from the situation where only the cargo load in loose form is loaded and unloaded, from one transport mode to another. The situation where for instance looase grain is transferred from a road truck to a train wagon is not defined as combined transport. A combined transport network consists out of two major elements; the terminals, which are defined as interfaces allowing unit loads to change between different modes of transport, and the links connecting the terminals. A combined transport shipment consists of the following elements:



Why combined transport

Although combined transport, especially in the last years, is considered worldwide to be one of the most prospective developments in freight transportation, growth so far has been limited and restricted to long distance transport, to specific geographic relations and to certain commodities. Institutional developments since the 1960's lead to a market organization and segmentation in Western Europe that was the major hindrance to a significant development of combined transport. Only recently measures were taken that can really stimulate combined transport and be the start of a structural change in freigh transportation. Experiences in Northern America, where comparable changes took place 10 years earlier, show that a new market organization, combined with increasing customer service levels, a new product philosophy and marketing can boost combined transport.

Due to market reforms the shippers will be able to choose between transport alternatives. For a number of commodities and transport relations there will be no real battle between the different modes and all serve specific markets: in water corridors the lsow moving bulk commodities by inland waterways, in areas with only land transport these types of goods are transported by rail, distribution transport by road. Starting from the assumprion that finally the formerly monopolistic operated transport companies will act according to the customer needs a vast amount of transport will be linked to a specific mode. A large part of the freight market can be identified as a battlefield. In this battlefield the road transport sector obviously sets the standards. Conventional railway and water transport can not cope with road transport and the majority will finally be transferred from rail and water to road. In Western Europe this transition process already took place.

An unlimited growth of the road transport sector will have its negative consequences, as can be experienced in the Western countries every day. Congestion, use of natural resources, emission of hazardous materials, accessibility of urban areas and decreasing traffic safety are all results of the increasing road transport. It is the general conviction that the major alternative for road transport is combined transport using unit loads. Modern combined transport concepts prove to be competitive to road transport both in terms of the level of service as from the financial point of view. 'Old' concepts such as the waggonload concept, conventional railway transport, general cargo ships, do not fit in this.

Combined transport combines the strong points of the different modes, minimizing the

negative aspects. The strong points of the rail and water mode (costs, capacity, safety, energy efficiency and low emission) are combined with the strong points of the road sector (flexibility, speed, door-to-door capability). For both supplier and user of combined transport and for the society as a whole the development of combined transport can offer benefits.

Combined transport will find its market place in between the conventional railway and water transport and the segment of the market which is ultimately suited for road transport. Time sensitive shipments in general favour road transport and cost sensitive shipments the rail and water mode. Combined transport can be compared with single mode transport on a number of criteria.

Road transport:
- very high door-to-door capability
- flexible and professional
- cheap on short distances
- expensive on longer distances
- fast deliveries

Rail transport:
- strong on the longer distances
- lower transport costs than road on longer distances
- competition with water transport
- limited door-to-door capability

Water transport:
- limited network
- restricted navigation period
- limited door-to-door capability
- in competition with rail
- competitive with road also on shorter distances
- high infrastructure capacity
- limited infrastructural capital needs

The Western combined transport market

In the United States the Staggers Rail Act of 1980 was the start of a new era for railway transport. Together with the Motor Carrier Act of 1980 a substantial measure of rate

freedom was give to both trucking and rail. The changes provided shippers a wider range of price and service options and combined transport combinations of carriers. The acts helped to liberalize permission for carriers of one mode to own and operate carriers of another mode. Shipments could be combined via a single carrier. Also rail roads had more freedom to merge with each other, which provided greater flexibility and the possibility to create single-line services and rates. The impacts of deregulation have generally been positive. Especially on long distances combined transport services took over large parts of the road haulage industry. Quality standards improved considerably and combined transport became a fully accepted transport alternative. Since deregulation, mergers of carriers in different modes and expansion by carriers into combined transport activities have been undertaken successfully. The merger is only a beginning as it takes time for carriers to assess the situation, to organize for change, and to implement plans. Since the 1980's the move to combined transport entities has accelerated.

In Europe the situation was somewhat different. Where in America the railways suffered from restrictions in comparison with the trucking industry, which were eliminated by deregulation, in Europe the railways did not have legal restrictions. Although they had the possibilities to create international services they did not succeed in realizing them. The monopolist nature lead to the situation where domestic traffic was more important for the larger countries than international transport. As a result networks and services were build on the basis of domestic flows. Internationa transport was more difficult to organize, because of the involvement of different companies, border crosssings which meant locomotive changing and thus loss of time and price levels which wer higher than on comparable domestic links. Where international transport hardly showed any positive development, domestic combined transport could develop. Restricted however to a few countries with large domestic freight flows on medium and long distances (especially France and Germany). Tariffs were kept artificially low and they were in fact based on the trucking rates, rather than on the cost figures within the railways. A growing transport volume in combined transport meant greater financial losses for the railways involved. On the long term this situation could not last.
The European Commission decided to create an open market which meant an end to monopolistic market organizations. This created greater freedom for the trucking industry and an improved competitive position against the railways. In an open market with free competition a number of existing situations had to come to an end: the market split in combined transport was unacceptable, no discrimination on terminal access, access to railway transport for other operators, access to the maritime segment and commercial operations for line of routes are acceptable. A few Directives were adopted

and measures were taken which meant a radical change for the railways, especially for combined transport.

The abolishment of the *Agreement of Montbazon*, which ended the market segmentation between continental combined transport and maritime oriented combined transport.

Directive 91/224/EEC increases the working areas of combined transport and creates better working conditions for combined transport operations.

The most important directive is *Directive 91/440/EEC*, which changes the market scene fundamentally. This Directive gives a good example on how the introduction of new legislation can improve the market organization and force the formerly monopolistic companies to adopt market principles. This Directive contains a number of guidelines in how to deal with deregulation and how to introduce fair competition. For this reason the main elements of this Directive will be highlighted.

The aim of the Directive is to facilitate the adoption of the railways to the needs of the single market and to increase their efficiency:

- by ensuring the manangement independence of railway undertakings;
- by separating the management of railway operation and infrastructure from the provision of railway transport services, separation of accounts being compulsory and organizational or institutional separation being optional;
- by improving the financial structure of undertakings;
- by ensuring access to the networks of member states for international groupings of railway undertakings and for railway undertakings engaged in the international combined transport of goods.

'Railway undertaking' in this Directive means any private or public undertaking whose main business is to provide rail transport services for goods and/or passengers with a requirement that the undertaking should ensure traction.

COM (92) 230 contains a number of items:

- the creation of a European combined transport network and its operating conditions;

- amendments to Directive 75/130/EECconcerning the establishment of common rules for certain types of combined carriage of goods;
- the granting of aids for combined transport under regulation 1107/70(1100/89);
- amending Regulation (EEC) No. 1107/70 on the granting aids for transport by rail, road and inland waterway.

The first results of the Directives are already visible and the market scene is changing rather quickly. New companies enter the combined transport market and offer all types of combined transport services representing a broad scope of services. The overlap between the two traditional types of suppliers is increasing and the difference between companies providing maritime transport and continental transport is becoming more and more vague. In Germany for instance a growing differentiation in the organisation of specialised companies and the decreasing importance of the national railway company, the 'Deutsche Bundesbahn', indicate a growing competition among companies offering combined transport services. Whereas in the past shippers mainly dealt with road transport companies or railway companies, in the future more different operators on the market will deal directly with the shipper.

The strategies of the railway companies in this field have not been very clear so far. Some indications and possibilities can be given. In order to maintain or increase their market share in the combined transport market, railways are inevitably forced to have an adequate strategy to be able to face future competition on national markets as well as on the pan-European market. Considering the increasing competition in the pan-European combined transport market, the railway companies face various stragegic options, at different levels. At the level of the line of business the railways have to choose between focusing at the core business (rail traction) or expanding towards combined services (including pre- and end-haul transport by truck). At the level of commercial relationships a number of possibilities exist:

- retail;
- combination of retail and wholesale;
- wholesale through third parties;
- sell network capacity.

In the last case the railway company sells direct access to its network to customers directly or through partnerships. The third level concerns the infrastructure. Should the railway company limit itself to the core network (as is the trend in modern combined transport concepts) or should it keep it secondary and feeder network in service? Finally there is the control of the service link, meaning the infrastructure, the train crews, the

equipment, the terminals and stations, and the marketing and sales. The option the railway companies choose for, means to a lesser or larger extent the co-operation with the other players in the intermodal field.

For the future of combined transport, much depends on how the different parties act after free access to the railway infrastructure but also on how free access is interpreted. A completely free market, with the private sector allowed throughout the value chain, has a number of risks for the railways. Especially the risk of picking out only the interesting routes, leave the railways with the non-profitable routes and perhaps a limited share on the main routes. Also the risk of a fast growing number of private and dedicated terminals is serious. This irrational privatization seems to be one of the least attractive outcomes of the opening of the transport market. A so-called 'negotiated access' provides better opportunities, not only for the railways but for the society as as whole. Combined transport is being operated throught commercial deals between private and/orpublic parties. The most efficient provider for each part of the value-added chain can be chosen which will result in an improved combined transport product at reduced cost. Rail volumes in this case will increase.

Competition in the market place is however a vital element in the strive for continuous innovation and improvements in efficiency. Monopolistic transport concepts and market structures based on monopolies eliminate the incentives of dominating enterprises to make ongoing investments in development and research. Primary corporate (or state) objectives, in the absence of heavy competition, leave space for unnecessary, inefficient or unprofitable developments and can lead to the financial destruction if large state subsidies to keep business going are missing or being squeezed.

Parties in combined transport and their interrelation

Every market has two sides; a supply side and a demand side. The suppliers of combined transport (with rail transport as the trunk route) can be divided in two major forms:

- maritime oriented cargo;
- continental cargo.

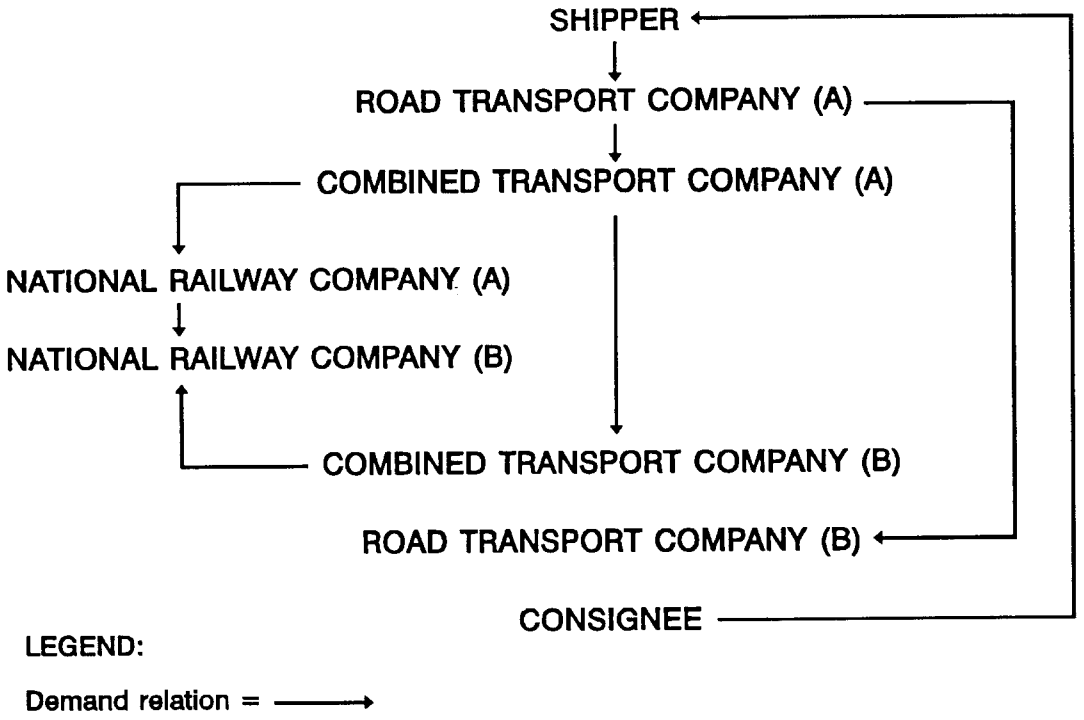
The customers in the two market segments are in general different, although there are some overlaps:

- for maritime oriented cargo the ocean shipping line, the shipper;
- for continental cargo the road haulier and the forwarder.

Institutional developments in Western Europe lead to a market segmentation with different market segments offering comparable types of combined transport services. Railway affiliated companies compete with road transport affiliated companies - being also their customers in combined transport - where the railways have minority shares. The strange situation existed in western countries that the railway company through its daughter company, became a competitor of one of its largest customer, namely the trucking industry. To ensure a sustainable development of combined transport the competetion between companies should be fai and there should be no conflicts of interest within a company.

The combined transport market contains at least the next four main relations:

- the relation between the shipper and consignee (product: goods);
- the relation between the shipper and the forwarder or transport operator (product: integrated transport package);
- the relation between the forwarder or road haulier and the combined transport operator (product: integrated rail or water transport plus transhipment and sometimes plus end-haul);
- the relation between the combined transport operator and the railway or inland navigation company (product: traction, a terminal-to-terminal service).



The shipper hands over the consignment to the road haulier who stuffs the load in a load unit and transports it by road to the terminal of the combined transport company in country A. The combined transport company has an agreement with the railway companies who transport the goods to the terminal of destination. From there on the unit load is transferred back to a road truck again (in some cases stripped at the road transport company) and delivered to the customer in country B.

In some cases the role of the combined transport operator and the traction is performed by one company: the railway company or the inland navigation company. Also between the role of the forwarder and the road haulage company exist overlaps. The situation in inland navigation however is clearer than that of the railway sector.

The main actors in combined transport can be subdivided into four groups:

1. the railway companies;
2. railway affiliated companies;
3. road haulage affiliated companies;
4. the Multimodal Transport Operators (MTO's.) The MTO's are the final suppliers

of the combined transport product to the clients:

- forwarding companies;
- road hauliers;
- sea shipping lines;
- port operating companies.

A vital element of introducing combined transport in order to attract users is that the market should be transparent and clear towards shippers. The user (shippers, ocean shipping lines etc.) should not experience the combined transport market as of low quality, fragmented and lacking a single indentity.

If a transport market has been set in motion to operate according to the principles of a market economy and under liberalized market conditions, it is the user of transport services (the shipper) who sets the boundaries in which the transport sector must operate and it is again the user of transport services who determines the requirements and needs which must be met by transport operators in order to obtain or maintain competitiveness. In other words the transition of a seller market towards a buyer market.

One trend in the organization of combined transport has become very obvious: the trend towards axis management. This is a concept used in combined transport to indicate that there is an overall management responsible for the operations form origin to destination. The combined transport service is not considered to exist of a number of separated services which are combined, but of one single product. Different parties in the transport chain cooperate closely in this philosophy. This means however that all participants involved should benefit from it. Win-win situations have to be created. In the axis management philosophy different cooperation forms (or different joint ventures) can be set up for different axes.

Even in Western Europe in most cases it is vital to set up new companies (or to reorganize existing ones) for the organization of combined transport, based on the axis management principle. This does not mean that new physical activites have to be set up or that the railways should be left out, but mainly that new co-operation forms are set up. A prerequisite for the combined transport company is the neutral character it has. It functions as an intermediate party and it offers combined transport services to all types of customers, segmented to the type of customer. The combined transport company combines the different multimodal packages into combined transport systems (trains or ships). For the traction the company uses the companies who supply the

relevant services (railways, shipping companies). The combined transport company can be seen as a shell-company without major assets. Shareholders could be parties who supply services as well as the potential customers of the company. Majority shares should be avoided in this concept.

Open access to the combined transport system is also a prerequisite. The way the terminal is operated and organized is a major element in this. Also in this field changes are taking place, which are closely linked to the other developments described:

- a differentiation of combined transport functions towards independent companies. Terminal operations, on the other hand, become more and more a task of independent regional operators. In some countries the importance of MTO's (multimodal shipping companies and forwarders) as terminal operators is increasing. This trend means a rising complexity of the structure of participants in combined transport. The coordination and cooperation between terminals could become more difficult;
- more and more bi- or multinational companies or joint ventures of combined transport come into being. Using the growing deregulation in European transport, strong national companies, hitherto restricted to their national market, are establishing their own international axis management. Or they merge with other national companies to build up a bilateral integrated axis management:
- the third trend is the growing importance of MTO's in combined transport. The latest EC directives opens new chances for private companies also in the field of traction of company trains. Big MTO's will be able to organize their own shuttles running between company-owned terminals.

From an organizational point of view the structure of a terminal network will become more and more complicated with the risk of an unstructured growth of the number of terminals. Secondly there is the risk of a decrease in technical-organizational compatibility, which will be a hindrance in the development of networks and axes. Here, the authorities have an important role in coordinating the developments.

The situation of a structured network of privately owned and operated terminals with open access to all companies is by far to be preferred above a large number of dedicated terminals with restricted access and use.

The terminal operator should offer its services in close cooperation with the combined transport operator. Again depending on the market segmentation and the different

needs for different customers the terminal operator can offer five types of services:

1. Transhipment services
   All services concerning the transhipment (vertical and horizontal) at the terminal; this is the basic function of the terminal;
2. Load unit services
   All aspects concerned with the load units themselves (renting, leasing, depot, repair).
3. Vehicle services
   Vehicle services include truck chassis or vehicle renting/leasing, chassis or vehicle depot, repair and cleaning but also maintenance.
4. Network services
   Apart from services like end/pre-haul organisation and customs-facilities also more technology based facilities are meant here, e.g. tracking and tracing systems or EDI-on-line networks.
5. Cargo services
   Some examples are stripping and stuffing of units, availability of a (public) warehouse.

Starting points for combined transport

Type of units

Combined transport is limited to the transport of unit loads. Unit loads in operation in combined transport worldwide are:

- containers:
- swap units;
- semi-trailers;
- articulated road vehicles.

For the transport of these load units different technologies and modes of transport are in use:

- containers and swap units on flat railway-cars;
- containers in vessels;
- containers in airplanes;
- containers on road vehicles;
- swap units on road vehicles;
- semi-trailers on rail-cars;
- semi-trailers in bimodal technology;
- semi-trailers in vessels (ro-ro);
- articulated road vehicles on flat railway-cars (rolling highway);
- articulated road vehicles on vessels (ro-ro).

The different load units require different technologies and in a number of cases unit loads of one type can not be handled with the same handling equipment. Up till now there is a lack of compatibility between the different systems and sometimes even within one system. The different systems under development in the car-less technology or bimodal transport are illustrative in this field.

In the rail/road type of combined transport, especially the ISO-container is favourable, as it is internationally standardized and the handling technology in (sea)ports and inland terminals is the same. Non-ISO containers need different handling equipment and using them in the same services will disturb the operations. In addition to the ISO-container the swap unit can be used. The technology is to a large extent comparable to the containcer and there is a large degree of compatibility between the swap unit and the container. The main difference between the two is the different type of stacking of the units. A third rail/road technology is the semi-trailer technology. This type of transport

has developed steadily in the first years of combined transport, but since the introduction of the swap unit its market share decreased rapidly and at the moment it has a minor share. It is less efficient than a swap unit, as well in economical terms as in terms of use of natural resources and emission. Special wagons are needed. Finally there is the transport of articulated accompanied vehicles on flat railway cars, the so-called rolling highway technology. This technology has prove to be a non-efficient system, especially in economical terms, but also in terms of the use of natural resources and emission. This type of transport is limited to specific corridors where physical barriers exist. These corridors exist on relations with Austria and Switzerland were for mainly political reasons no other options are available.

Combined transport concepts

Four types of production models can be distinguished with regard to railway operations:

1. Wagon-load model
   In this model trains are grouped and de-grouped from the individual wagon level or for groups of wagons. In this model the marshalling of shunting yard has a vital role.
2. Block train model
   Block trains are formed at the terminals and they travel direct from origin to destination. Block trains by pass the marshalling yards.
3. Shuttle train model
   A block train which has un unchanged wagon-make-up.
4. Hub & spoke model
   A mix form in which blocks of wagons are consolidated into block trains. This model requires a large network of feeder lines.

The optimal model depends on the freight volumes, the operating costs and the risk of under-utilization. The shuttle concept asks the highest requirements because complete trains are transported also in the case where the freight flows are less than train capacity. At full capacity the shuttle train however has the lowest costs per load unit. A characteristic of the shuttle train is that is follows strict time schedules. In the block train model the number of wagons depend on demand. The wagon load concept has the lowest risk but offers the lowest quality. Hub & spoke models are in between block trains and wagon load trains.

Scheduled services which offer a high quality, comparable to the competitive modes at acceptable rates is the target for combined transport services. Only the block train and

shuttle train can offer this, as experiences in other countries have shown. Not all relations will have or will get the potential freight volumes to make the block or shuttle train concept feasible. A second best solution is the hub & spoke concept where marshalling is minimized to the coupling and uncoupling of blocks. Apart from the relations for which shuttle, block or the hub & spoke concept where marshalling is minimized to the coupling and uncoupling of blocks. Apart from the relations for which shuttle, block or the hub & spoke model are appropriate there probably will remain some relations which can not be served. For these regions the wagon load concept has to be kept in existence, realizing that the level of service in combined transport will be limited.

Shippers demand for multi modal transport

In this lecture we will try to get an insight in the "shippers" demand for multi modal transport. First we deal with the multi modal transport market as it gives evidence of an unclear situation in the different types of services available to the user. Then we proceed with the role and influence of the shipper in the process of consigning cargo by multi modal transport. Finally we deal with the demands that users such as shippers and road transport companies have towards multi modal transport.

An unclear situation in the multi modal transport market

A large number of parties to multi modal transport are involved in its organization; they partially serve the same market and are partially complementary. This situation, which is a result of historical factors, has led to a division of the market which, in the present transport market, can hardly be called logical. The most striking aspect is that railway companies compete with their best customers, the 'piggyback' companies and road carriers employing them, by means of subsidiary companies; the container companies. The ever growing overlap between the two types of transport, with its subsequent ambiguous allocation of one type of user to one multi modal transport company has given rise to an unclear situation. In short: the market situation in Europe is only getting more and more obscure while the overlaps between the various types of multi modal transport are becoming increasingly larger. The doubt that shippers have regarding the railways and the multi modal transport companies are a consequence of the market's lack of transparency. The shippers experience the multi modal transport market as fragmented (lack of a single identity) and as being of low quality. This is seen as a problem by the shippers, however most of them do feel that multi modal transport has a good future (due especially to further restrictions in road transport).

The role of the shipper in multi modal transport

The party that is decisive in the choice for single or multi modal transport depends on the market segment. In general in continental transport, the shipper chooses for a forwarder or a road transportation company to perform the transport service. The transportation company can than choose to truck the cargo or ship the cargo by means of multimodal transport. This does not mean however that this choice is completely free.

The shipper affects the freedom of choice which the transport company has with regard to multi modal transport. A research in former West Germany stated that shippers would find it unacceptable if the carrier was to switch to multi modal transport without prior consultation. The shipper can have reasons for not allowing the transport company to choose combined transport (e.g. the type of goods, control over the shipment). In a number of cases however, combined transport can be favoured by the shipper. Within the boundary conditions that the shipper sets, the transport company does however have a certain freedom of choice. If the shipper has transport on own account we speak of private transport, something that virtually does not occur at large or medium distances. Hence, at the moment shippers are not direct users of continental multi modal transport, although developments in France and West Germany suggest that this might change in the future. At the moment it is mainly the road haulage industry that uses these multi modal services.

In the transport of maritime containers, the situation is completely different. Shippers do deal directly with the suppliers of multi modal transport, although their market share seems quite limited (according to Intercontainer 6%). The role of shippers as direct users of multi modal transport, then is rather small. The largest part of multi modal transport of maritime containers to and from the seaports, is performed by order of the shipping lines, who are developing an integrator status by taking over road haulage companies and creating their own European inland network. The shipping lines are in this case the users of the multimodal transport services. Another important user of multi modal services are the Purchase Organizations; intermediate organizations between the users of suppliers of multi modal transport in order to hire capacity from the suppliers for the users while obtaining volume discounts. These organizations bring together the demand for capacity of its individual members and obtains volume discounts for these members on the basis of total demand.

Although in a market situation, the shipper is thus not the direct client of the multi modal transport operator, they do of course have an interest in high-quality logistical service, so they may well have a great influence on the choices made by the transport companies (an indirect influence on the mode of transport to be used). The shipper in fact sets the boundaries in which the transport sector can operate.

Shippers' (customers') demands

Virtually all transport companies and forwarders nowadays are acquainted with the phenomenon of multi modal transport and are aware of the services available. This interest has not been translated into a higher use of multi modal transport. Multi modal transport and railway transport have a bad image among transport companies, in the same way as among the shippers. In most cases this is due to unfamiliarity or negative experiences in the past. Certain shippers even forbid the concerning road haulage company to make use of rail transport. Studies indicate that the perception of the quality of multi modal transport differs between users and non-users. The users of multi modal transport are more positive about the quality than non-users, but the situation is not yet optimal. The image of multi modal transport must be improved first of all by improving the quality. That will improve the competitive strength of multi modal transport against for instance road transport.

From interviews with shippers it appears that shippers are willing to consider and accept multi modal transport as an alternative to road transport if they are informed properly by the carrier about the pros and cons of multi modal transport, if quality of service is guaranteed, and if the tariffs are acceptable. For some types of transport such as hazardous materials and tank transport, shippers even prefer multi modal transport. In some cases this has led to a considerable substitution of road transport. The preference of shippers for road transport is the result of a combination of factors such as delivery time, flexibility (in terms of time, space, quantity and ability to improvise), differentiation and range of supply, and personal relations. The needs of clients can be summarised in a very few words: regularity, punctuality, reliability and safe door-to-door transport at market orientated rates.

Road transport has a higher quality of transport of containers on most of the comparative factors with the exception of safety and energy efficiency (see the next graph). Generally the speed of present-day multi modal transport is by no means comparable to that of road transport. A comparison of 9 transport connections in former West Germany shows an average speed of road transport of 60 km/h against rail transport 40 km/h and piggyback transport 44 km/h.

Comparison of quality of various modalities with regard to container transport.

++ = very high - = low
+ = high – = very low

	road	rail wagon load	rail unit train	inland waterway
Speed	++	-	+	-
Door-to-door capability	++	-	–	–
Reliability	++	+	++	+
Security	++	+	++	+
Safety	+	++	++	++
Flexibility	++	-	-	-
Availability	++	-	-	--
Energy efficiency	-+	++	+	++

Studies revealed that the reasons, of transport companies which used to use multi modal transport, most often mentioned for discontinuing the use of multi modal transport are related to high cost and poor reliability. Companies that have never used multi modal transport indicate that the most important barrier for not using multi modal transport, is the size of the vehicles (volume transport) and the end-haul organization. Next to that are speed and arrival and departure times in combination with specific characteristics of the goods (bulk, flowers) cited as problems.

The users as well as the non-users have put forward several factors which affect the choice concerning multi modal transport negatively. Of course the unavailability of multi modal transport services is a major factor. Then the service has to be of a high quality as the quality of the timetable of multi modal transport services is an important factor to the users. Carriers regard the end-haul organization as an important criterion. Companies do not have offices or agents in every country to take care of end- and pre-haul transport. This impedes the use of multi modal transport. Secondly the type of vehicle (type of goods) which limits the freedom to make use of multi modal transport. Specialized equipment and large volumes units are not suitable.

Further the distance of the trip. The average distance at which multi modal transport is considered an alternative to road transport is 700 kilometres, although some carriers indicate that it depends on the price/quality ratio. The availability of return freight is an important factor, for some carriers even a precondition for multi modal transport. The higher tonnage offered by multi modal transport is an important advantage which contributes strongly in favour of multi modal transport. Other and characteristics are: the influence of the shippers, size, the geographical area, infrastructural and other limitations of the destination area, transport with a fixed pattern and customs clearing procedures. Selection of terminals depends not only on distance, but also on the timetable, the prices and facilities.

Concluding from this lecture one can summarize the shipper's demand for multi modal transport services in two main demands, namely the quality of service (in terms of time, frequency, pick up and delivery times etc.) and services at competitive transport rates related to road transport.

So if multi modal transport is to gain a bigger market share in relation to road transport, it will have to meet high shipper's demands in many different areas. The quality of the service must be improved and obvious cost advantages are an absolute prerequisite. The services offered must respond to the demand in the potential market, as a matter of fact, it has to match that for road transport.

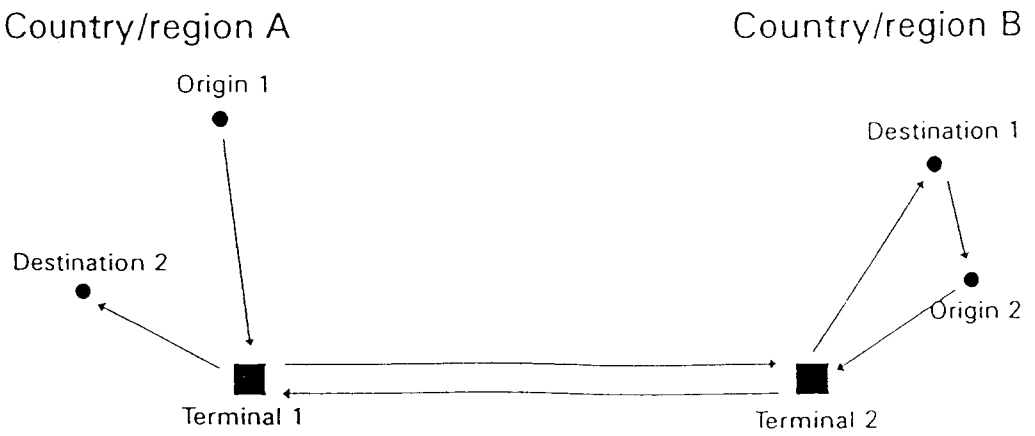
Financial aspects of multi modal transport

A change from single mode to multi modal transport has a number of financial consequences. Of course the infrastructure and facilities have to be in order, so that a real choice possibility for the user exists. These type of financial aspects will not be touched upon in great detail in this lecture. The emphasis is put on the financial aspects for the potential user of multi modal transport. What are the financial consequenses if a shipper or road transport company decides to use multi modal transport?

At the moment, the price is the prime factor that determines the choice between single modal and multi modal transport. The qualitaty of the service (comparable to that of road transport) is considered to be a prerequisite for this choice. Following the market structures it is again necessary to distinguish between continental multi modal transport and the transport of maritime containers. This lecture is focussed at the continental type of multimodal transport. Large part of the financial aspects in case of the transport of maritime containers are comparable and the differences between the two will be mentioned whereever relevant.

Cost Elements in multi modal transport

A multi modal continental transport chain, by rail as well as by inland navigation, consists out of the elements as illustrated in the figure below:



The transport chain is considered to be a round trip, because the road haulier is the prime customer and the load units always return to their origin. In the case of maritime container transport this situation is different. In multi modal container transport the transport on the way there is completely independent from the transport on the way back. Comparing multi modal transport and conventional road transport in the case of maritime containers should thereby take place on a one-way route basis.

The difference between road transport and multi modal transport has a few financial aspects for the company involved:

A the direct transport cost-comparison between single and multi modal;
B a difference in round trip times, having financial consequences;
C additional costs.

A Direct costs

The direct costs involved in single and multi modal transport are:

Single road transport, cost per round trip:

* fixed costs (depreciation, taxes, interests, overhead costs, insurances, maintenance), that are calculated on a yearly basis
* variable costs (fuel, road taxes, personnel) that are calculated on a trip basis

Multi modal transport:

* costs for pre- and end-haul transport
* cost for the trunk transport (rail, inland navigation)
* handling costs at terminals (can be included in the costs (tariff) for the trunk transport)
* equipment costs (interest, depreciation, maintenance, etc.)

B Time-related indirect financial aspects

The round trip time in road transport will in nearly all cases not be equal to that of multi modal transport. This has a direct and an indirect financial consequence. The direct consequence is a differnce in e.g. depreciation, interest, maintenance etc., which are included in the direct costs mentioned in point A. The indirect consequence has to do with the fact that the number of round trips that can be made per year will differ.

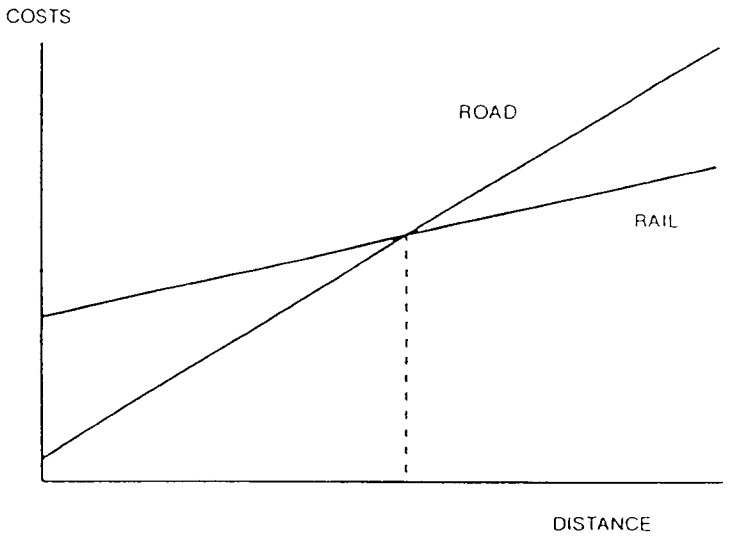
The usability of the load unit in question per year differs between road transport and combined transport and the profits that can be made in a year will consequently differ as well.

C. Additional costs

The load units that are used in road transport can not directly be used in multi modal transport. In the case of trailer transport as well as swap body transport some provisions are necessary so that the unit can be craned. Because of limitations in rail gauge, there can be a loss of capacity as compared to road transport, resulting in lower revenues.

The choice between single and multi modal transport thus has a great number of financial aspects in it for the user. In general the comparion between road transport and multi modal transport is as presented in the next diagram:

Costs in relation to distance

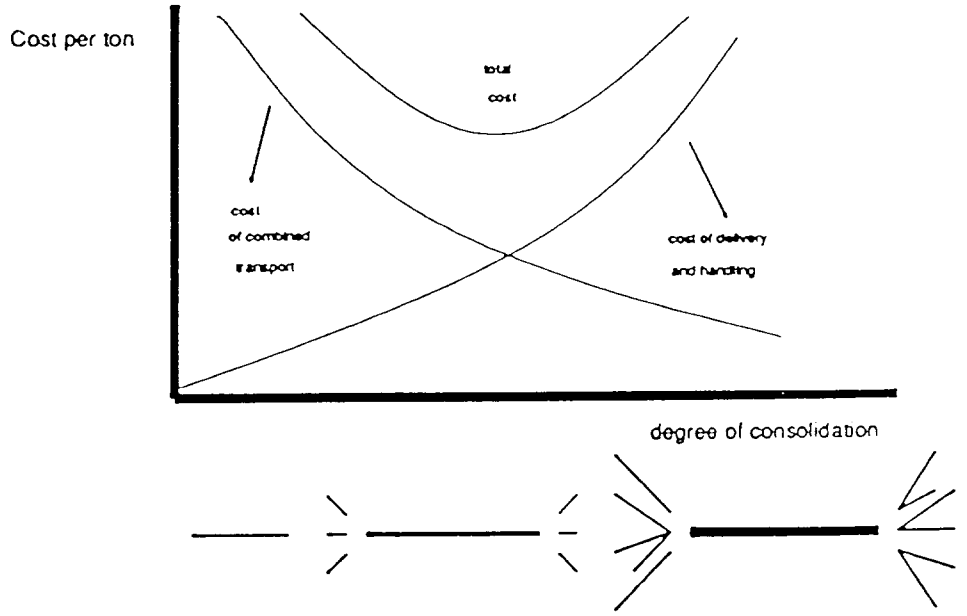


The distance for which multi modal transport becomes competitive to road transport can not be defined in general. A number of cost elements involved actually depend on the structure and organisation of the multi modal transport network. Also the characteristics of the goods play a role in this. In the following a few elements in this will be discussed.

Elements influencing the cost structure

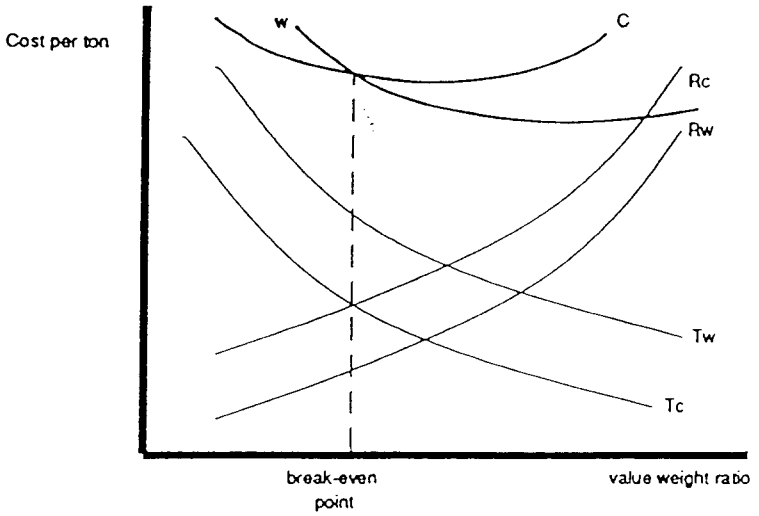
On one hand it is important that transhipment points are located must be as near as possible to the points of origin and destination to obtain maximum benefit from the inexpensiveness of the "cheap" transport method. On the other hand, achieving a sufficient degree of consolidation, large supply and delivery areas are necessary.

Trade-off between direct transport and multi modal transport



This trade-off does not have the same outcome for every shipment or type of good. One relevant factor for instance is the value density of goods (or the value/weight ratio). Interest costs go up with an increasing value-weight ratio and are generally higher for multi modal transport. With regard to transport costs per ton, the reverse is true: if the goods are of sufficient bulk and the transport distance is large enough, the costs of road transport are higher than the costs of multi modal transport. Clearly if the transhipment costs go down or the speed of intermodal transport goes up, the trade-offs will change to the advantage of combined transport. Hence, the aims of international transport companies and government agencies that have an interest in stimulating multi modal transport must be to improve the supply characteristics of multi modal transport techniques and to remove organisational restrictions which lead to cost increases.

Break-even analysis in relation to value/weight ratio

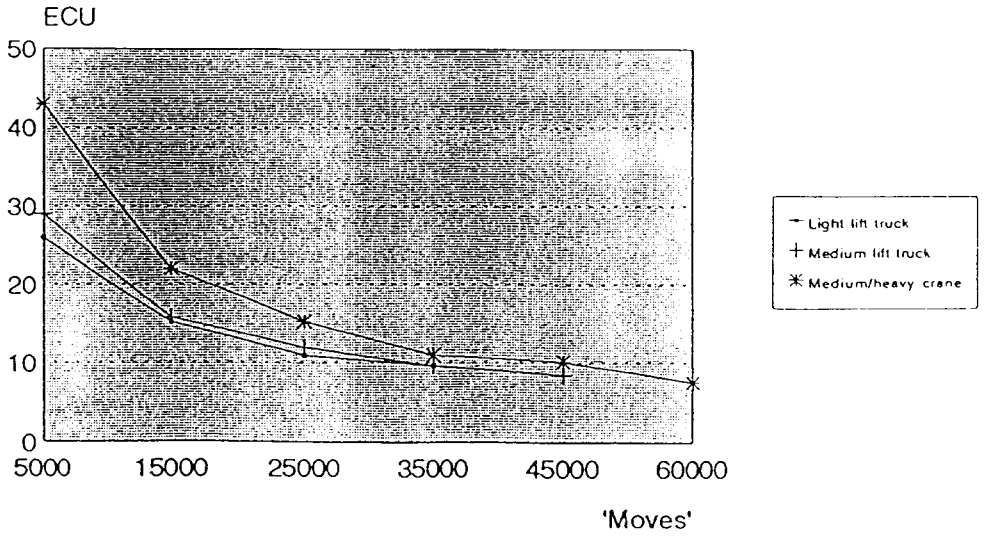


W = road transport
Rw = interest costs for road transport
Tw = the costs of road transport

C = multi modal transport
Rc = interest costs for multi modal transport
Tc = costs of multi modal transport

The costs involved in the handling of the goods at the terminal heavily depends on the through-put of the terminal:

Cost of handling at a land-terminal



The cost of multi modal transport actually depend on a variety of factors, such as the kind of investments, financing and the organisation type, and can only be evaluated and compared in relation to the complete performance of a transport network. The few elements described here only accentuate that the comparion between single and multi modal transport depends on more factors than just the direct transport costs involved.

INTRODUCTION TO LOGISTICS

Rijswijk, March 1996

CONTENTS

1 WHAT IS LOGISTICS?

People buy products not only for their tangible qualities but also for many other less tangible reasons. The customers choice of the product to buy is also influenced by other qualities such as packaging, price, service reliability, availability, reputation, and so on. Logistics is primarily concerned with ensuring that these qualities are delivered. This can be stated as;

The right product,

to the right customer,

in the right place,

and at the right time.

If you consider that the role of marketing is to stimulate demand then the role of logistics can be seen as to satisfy the demand. The organisational implications of this are immense. Logistics is therefore not a functional activity but a framework; not an operational function but a planning mechanism; it is a way of thinking and a way of operating a business.

1.1 Definition of logistics

There are many definitions of logistics depending upon the emphasis being placed by the author. However the definition provided by the USA Council of Logistics Management provides an adequate insight for our purposes;

> **"Logistics is the process of planning, implementing and controlling the efficient, cost-effective flow and storage of raw materials, in-process inventory, finished goods and related information from point of origin to point of consumption for the purpose of conforming to customer requirements".**

There are several important concepts contained in this definition which require emphasis. First of all note the ultimate purpose of logistics; " **....conforming to customer requirements**". This is, or should be, the prime reason for the existence for all companies, to satisfy the customer. Without the customer there is simply no business and the growth and success of any business is largely determined by the customers, are they willing to buy the products or services being offered. Secondly logistics involves movement and storage. This implies that systems are organised so that the right materials or products are available at the right place and at the right time either for the purposes of production or for the consumption by the customer.

The emphasis behind the logistics concept is on systems. It suggests that the "movement" activity in a company is so widespread and persuasive in its effects that it needs to be considered as a total system. Thus instead of marketing, production, distribution, finance and purchasing, all working away oblivious of the others' involvement in the flows of materials and information, and all attempting to optimise their own particular set of logistics activities, the logistics concept suggests that all should work together. In doing this it may be necessary for some, if not all, of the individual function areas to operate sub-optimally in order for the total logistics system to be more effective.

In a company, for example, the marketing manager must be prepared, if necessary, to accept a lower level of service that he might otherwise wish; the production manager must be prepared to schedule shorter production runs with more changeovers than he would think is efficient; the transport manager must be prepared to make more frequent deliveries than he would recommend when viewed from the costs of his department; if these actions benefit the effectiveness of the total logistics system and the customer. It is easy to see why there are major problems in the conventional management structures of companies when attempting to introduce logistics-orientated management. Conventionally management responsibilities are confined to many discrete functional areas and the authority of each manager is limited to his/her area of responsibility.

Acceptance of the integrated systems-based approach which characterises the logistics concept implies a basic recognition that an interrelationship exists between the parts of the whole such that any action effecting one part of the system may, and often does, effect one or more or all of the others. Any decision by functional managers must therefore be considered in the light of its effect on all parts of the business and on the overall objectives of the company.

Thus a company can be viewed as a number of inter-linked subsystems which must somehow be united if the effectiveness of management is to be maximised. The manager who accepts this approach must be concerned with the flow of materials and information through the whole business process, from raw materials through to the finished goods arriving at the customer's premises; in other words from conception to consumption.

From an economic viewpoint it is important to pay attention to logistics because in many companies, logistics or business logistics accounts for 20% to 25% of the total cost of doing business. Another point is that the logistical requirements which ensure the necessary unique combination of;

- packaging;
- materials handling;
- warehousing;
- inventory control;
- and transportation;

will add value to the product.

Another often-quoted definition of logistics is known as the 7 R's and is as follows;

- Right Product in the
- Right Quantity and the
- Right Condition at the
- Right Place at the
- Right Time for the
- Right Customer at the
- Right Cost

Integral logistics Management

In the logistic chain we always distinguish three different flows:

- flow of goods
- cash flow
- information flow

The entire logistic chain is built out of a series of logistic pieces. If one looks at the entire track, from raw material to client, as shown in figure 1, we can speak of *integral logistics*.

The main objective of integral logistics management is to optimise the flow of goods and be able to control the cash flow, with the help of correct flows of information.

The flow of goods is often divided into incoming, continuous and outbound flows, whereby the:

incoming flow of goods	=	purchasing department
continuous flow of goods	=	stores, production and assembly
outbound flow of goods	=	marketing, stores, transport

Figure 2 visualises the object of integral logistics.

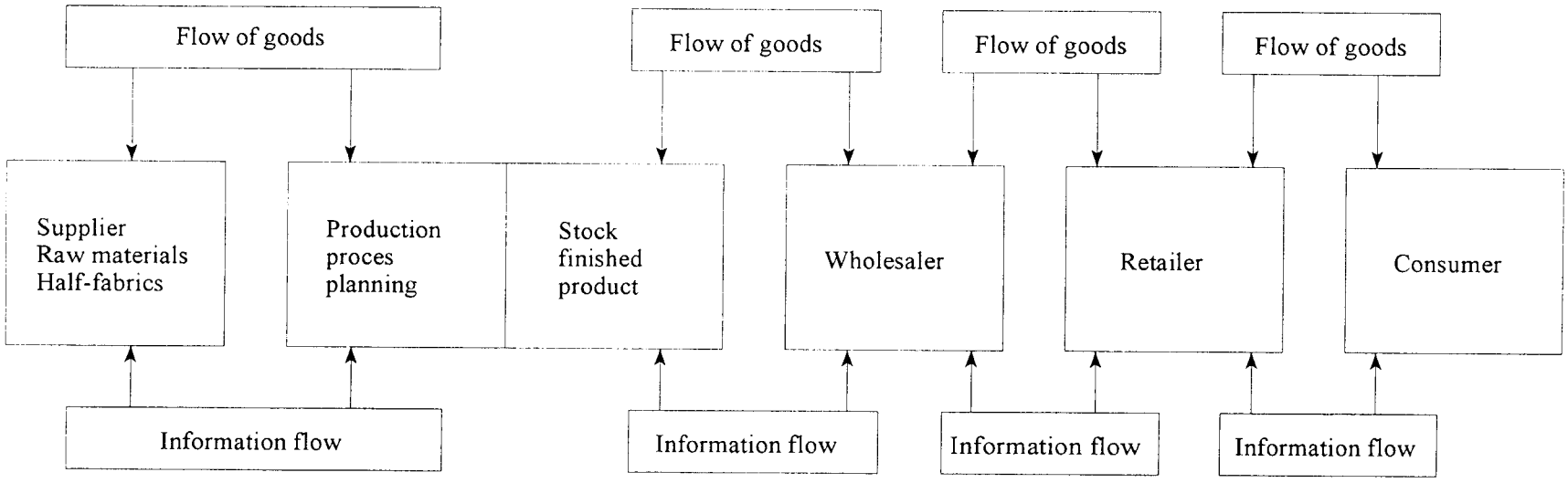
The incoming and continuous flows of goods, also called inbound logistics, are the object of the *material management*. Material management is the total of activities required to get the flows of goods and relevant flows of information to and through the production process as efficient as possible.

The most important activities in material management are:

- dealing with orders;
- acquisition/purchasing;
- production and capacity planning;
- materials planning;
- raw materials stocks and semi-manufactures control;
- materials handling (internal transport);
- receipt of goods;
- communication and data control.

Materials management involves managing the production and determining the stocks required for that production.

The outbound flows of goods is the object of *physical distribution*. Physical distribution is the total of activities required to distribute the finished product as efficiently as possible from the end of the production process to the user/customer.

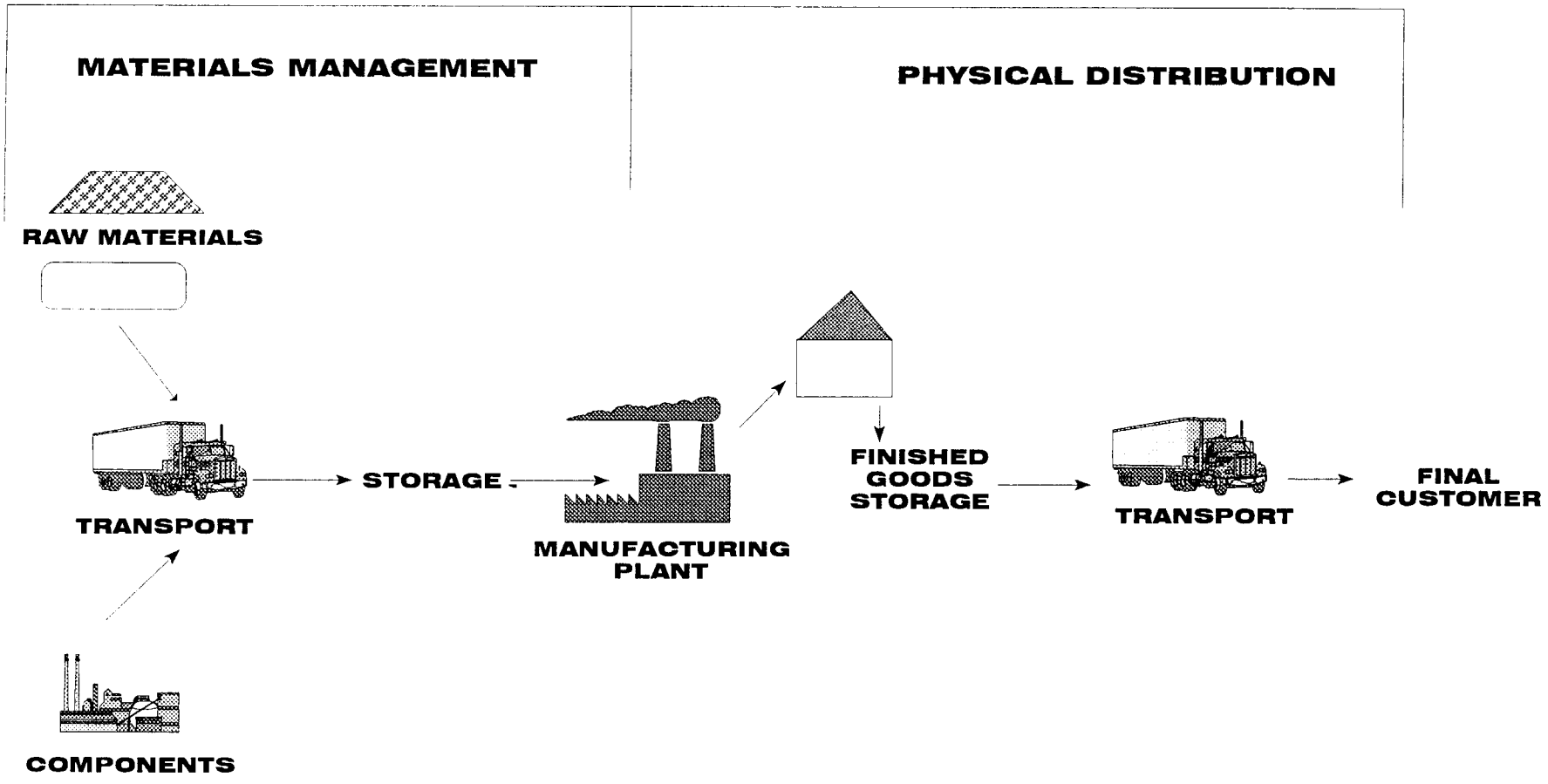


Material management

Physical Distribution management

Business Logistics

LOGISTICS


MATERIALS MANAGEMENT
PHYSICAL DISTRIBUTION
RAW MATERIALS
TRANSPORT
STORAGE
MANUFACTURING PLANT
FINISHED GOODS STORAGE
TRANSPORT
FINAL CUSTOMER
COMPONENTS

The main activities in physical distribution management are:

- transport;
- storage and materials handling (external transport);
- control of finished product stocks;
- communication and data control.

The flow of information and the cash flow can be divided in the same way. The function of integral logistics management is to coordinate the various parts of the goods flow, information flow and cash flow. Not to treat them as separate flows but as an integral flow of goods.

The control of the goods-cash-and information flows can be carried out using different control systems. Every company and organisation will have to develop its own specific system, depending on among others the product.

The four most common control systems are:

1. **Inventory controlled systems**
   The size of the inventory determines whether a product order is released.

2. **Production-plan controlled systems**

   The fixed master production schedule determines whether a production order is released.

3. **Order controlled systems**

   Accepting an order determines the release of a production order.

4. **Project controlled systems**

   The established network planning determines the start of new activities.

1.2 The JIT Philosophy

'Just In Time' is a way of thinking, a philosophy. The JIT concept can be applied to all aspects of management, and influences the way each part of a company functions.

The objective of JIT is to direct all the process to the market demand by removing any unnecessary activities or buffers. This means that the production processes have to be geared to the purchasing, production and distribution of products:

- at the moment they are required, not sooner, not later;
- in the right amount, no more and no less;
- of the required/agreed quality, no faults or defects;
- at the lowest possible costs.

The JIT philosophy is based on the idea that stocks are the root of all evil and that it continuously disguises the real problems in the production and distribution process. By reducing these buffer stocks the problems become visible and can be eliminated.

Examples of such problems are:

- suppliers' unreliable delivery times;
- too late supply of materials;
- bad planning;
- inadequate layout and internal transport;
- poor quality;
- machine break-downs;
- unmotivated personnel and/or management.

Uncontrolled processes or uncertainties about supplies of materials are problems that should not be solved by forming stocks, but should be tackled in order to change and improve.

But JIT is more than that. It can improve the production and distribution process by enabling the company's performance to be aligned with changing market demands.

The basic principles of JIT are:

a. alignment with customers' needs

It is more and more important for a company to operate in a customer-oriented manner. JIT strives to match the internal performance demands with the market demands.

b. optimal functioning of primary processes

JIT places emphasis on the primary processes of the company such as Development, Purchasing, Production, Assembly, and Distribution.

A first requirement for optimally functioning primary processes is to pursue the principles of zero defects and zero stops.

Zero defects means no faults or perfecting the quality of product and process to such an extent that no faults will be made nor rejects occur other than what can be corrected immediately during the process.

Zero stops means no interruptions or perfecting the quality of the primary processes so that no unplanned stops ever occur. This does not just apply to perfect the control of processes, but also to perfecting preventive maintenance and planning. JIT strives to achieve production and distribution organised in a way that is both flexible and efficient.

c. controlling primary processes

According to the JIT theory, companies should use systems which for the short term adjust to changing demand directly and automatically, whereby the main concern is the supply of materials. Planning is done for the medium term.

Timely and reliable supply and delivery of products to the user is becoming more important in the company's strategy. The physical distribution in the delivery channel is where the customer experiences the services provided. Therefore, it is important to keep control of the physical distribution.

When linking the physical distribution in a JIT system, the objectives of JIT are:

- short transport and communication lines which result in short lead times;
- removing stock locations as much as possible or make them transfer points;
- eliminations of possible risks of mistakes, delays, misunderstandings, damages;
- high transport frequency, small transport series;
- tracking and tracing of goods to enable control and correction.

1.3 Value Added Logistics

In recent years many production companies have altered their strategy. In the Seventies many companies upheld a strategy in which as many functions as possible were carried out under their own control. Currently there is a trend towards concentrating more on the core activities of a company. Activities which do not belong to the core are increasingly being subcontracted.

Subcontracting distribution is an example of this. Traditional transport companies are increasingly starting to acquire the role of logistics suppliers, physical distributors, physical distribution contractors or whatever you want to call them.

The concept in which the entire physical distribution and corresponding information function is contracted out to specialised third parties is also called *public warehousing*.

Public warehousing is a concept of physical distribution which began in the United states in the 1960s. It is also becoming increasingly popular in Western Europe. The reasons for this are to be found in developments with shippers as well as carriers.

Manufacturers tend to focus more attention on their core activities. This includes the process of transforming to form, but not to place and time. Transformation to place and time (i.e., transport and storage) are being contracted out more often. The function of storage which has traditionally been carried out by the manufacturer and wholesale dealer is being taken over more and more by the public warehouse.

The developments in the transport function can be distinguished according to a number of phases:

a. Traditional transport

The carrier places his lorries and drivers at the disposal of the principal.

b. Transport and storage

The carrier allots storage space for the principal. The principal requires this space because he has a capacity problem in his own storeroom, for instance if the manufacturers want to have anticipated stocks in order to meet peak demand later on. The principal maintains control of the inventory. Sometimes placing into storage, taking out of storage and transport of goods is contracted out together to the carrier.

c. Transport, storage and management of goods

In this situation the management of goods is also contracted out to the carrier, which includes the collection of orders.

d. Public warehousing

This is the final stage in the development of the transport function seen from the viewpoint of the carrier.

The activities of a public warehouse can b divided into a physical and an information function. The physical function entails all the activities which have to do with transferring goods in a physical sense. The information function consists of management activities which are necessary to move goods and report management information to the principal.

A fast exchange of up-to-date information is essential for coordinating the principal's material management and physical management routing. That is why the public warehouse's computer system is connected to that of the principal.

Public warehouses will strive to concentrate on certain categories of goods and benefit from scale advantages which make it superior to the situation than if the principal had to provide for all these activities.

Many companies can lower the total costs of physical distribution if a specialised third party takes over these activities.

Providing logistic services can offer new perspectives for the transport sector. Logistic services consist of three components, which can be considered as separate items, namely: transport, warehousing and distribution (short-distance transport). The provider of logistic services weaves these components into a logistic product which can then be customised for the final customer.

The provider of logistic services does not need to possess any trucks, storage space or delivery vans. All he needs to do is hire transport, distribution and storage capacity. What the provider of logistic services in fact does is to create *efficient logistic pipelines*. These cover the whole course from product to final customer.

Providers of logistic services sell 'added value', 'destinations' and 'frequencies'. They think in terms of services, rather than in terms of capacity.

Value Added Logistics (VAL) goes a step further than logistic services. It is combination of logistic services and productional activities, so that the local market trends can be taken advantage of both quickly and efficiently. VAL is particularly fashionable among producers of computers, hi-fi equipment, medicines, clothing and cars.

The VAL system works as follows:

Semi-finished and rough finished products are produced in those countries where the factor costs (i.e. labour costs) are low. These semi-finished goods are then transported to warehouses situated on the periphery of the market. In the warehouses, the (final) assembly, packing and finishing takes place, followed by distribution of the final products in the market. The production is order-controlled and demands modern technology.

2 RECENT DEVELOPMENTS IN LOGISTICS

2.1 Introduction

We can see a huge expansion of logistics market, triggered by various innovations in data processing, which created new business opportunities in commodity and service markets. Some examples of new products and services are: made-to-order cars; direct home delivery of hot dishes; overnight parcel transport services. The development of these products and services have occurred with the help of advanced logistics.

The logistics sector is pulled by new needs of customers and pushed by technological advances. The logistics sector is also pushed by negative factors affecting (land) transport, such as increasing congestion on the roads. Therefore, it is important to analyse how demand is being transformed and how the sector, and its structures, are affected.

The structural changes we will focus on are:

a. changes in logistics needs;
b. the evolution of organisation structures;
c. information systems for logistics.

2.2 Changes in logistics needs

The control of goods flows, information flows and cash flows have become a strategic issue for most of the companies. The emergence of logistics in industry, the increasing functions it plays inside every firm, and the place it now occupies in their structure demonstrate this clearly.

In the present period it has become more and more difficult for an industrial company to expand profits by expanding sales, especially in a time of harsh economic conditions and increased international competition. The need for cost reduction has increased.

Shippers - industrial firms, but also wholesalers or retailers- are looking for ways to reduce the costs of the entire physical circulation of goods, and at the same time to increase the service level to their customers. They are compelled to offer services that are better adapted to the fluctuations and movements of markets.

Shippers no longer expect a transport only service, but are seeking complete logistical solutions. This new concept includes services which were previously considered as simple subsidiaries to transport.

Logistics needs are more complex with transport chains combining a broad range of techniques and information systems. It gives traditional transport companies the opportunity to develop themselves into providers of modular or integrated logistics services and thus play a greater part in the economic system.

The management of integrated logistics services requires the application of advanced logistics systems based on efficient and effective information systems in order to control the physical flows.

We have already seen that the rapid development of the different types of products, retail stores and sales offices can not cope with a large inventory of product types or with the diversified needs for consumers. The development of JIT organisational structures did reduce stock levels enormously performing strict inventory control leading to smaller quantities being transported in more frequent deliveries.

Shippers want that the transport production is fully controlled, and that the advertised quality of the service -minimum rate of incorrect or missed deliveries and maximum reliability of operations- is achieved. The search for the elimination of all kind of defects, aiming at zero delay, zero inventory and zero defect, leads to the development of advanced information and telecommunication systems. It also brings the shipper to deal with one or only a few providers of logistics services through long-term contracts based on mutual reliability.

The needs of shippers is becoming increasingly complex.

Shifts can be noticed in the logistics organisation of shippers. Companies are now aware of the necessity to manage physical flows in the production process and consider that these processes of production should be controlled in relation to the whole logistics chain.

Simultaneously, modern information technology is pervading all stages of the logistics chain, from manufacturers to end-users through distribution and transport. The span of control and synchronisation of operations is expected to increase dramatically. More and more companies are using specialised software such as CIM (Computer Integrated Manufacturing) and MRP (Manufacturing Resource Planning). So, we can consider the electronic control and management of transport as an extension of the production process.

Demand, such as the increasing need for customised products, also causes shifts in organisation. Order production is becoming more common. But logistics not only influences industrial processes, but is also a changing factor in distribution structures. It has allowed the concentration of wholesalers and retailers covering whole nationwide areas, and an increase in the number of stores using chain store management methods. It has also allowed the diversification of distribution patterns: specialised mass-selling stores, or even direct selling. Retailing companies are improving their organisational schemes; such as inventory management, automated handling systems, and the use of EDI - Electronic Data Interchange - to pass on orders, order entry processing, etc. It leads to fewer storage points, for distribution over a whole area (country or even continent). Centralised storage needs fast and reliable transport between factories and the storage facility.

We have already seen before that there is a trend to concentrate activities on core business and to contract out the production of standard components and services.

At the same time barriers between countries, people and companies are steadily decreasing: liberalisation of trade; the increased geographical coverage of standards; the integration of world finance markets; the faster geographical diffusion of new technologies; and the increased international mobility of professionals and managers.

Therefore, shippers need wider geographical coverage from their logistics providers and more reliable and cheaper transport using several modes over long distances. We have already seen that the development of logistics is widening to all companies in the logistics chain. This concept of a logistics chain is directly associated with the concept of the network firm, which has to organise correlated planning with the providers of logistics services.

2.3 The evolution of organisational structures

Logistics providers are reacting to the demand for improved transport services as follows:

- a higher attention to customer services;
- a shift in spatial production patterns by networking;
- internationalisation and globalisation.

The almost instantaneous and error-free transmission of information between manufacturers, carriers, customers and intermediaries is altering the role that companies and organisations have traditionally played. Advances in telecommunications and electronics will continue to affect organisations in the logistics chain. Those firms that can afford such communications and electronics innovations will increase their productivity and reduce the costs. The complexity of the logistics services provided, however, requires new skills able to use advanced technologies and communications systems.

Companies will be able to reduce substantially the size of their inventories, and simultaneously, reduce the costs linked with the operation and maintenance of a large inventory control operation. Value added networks are growing in importance as companies, as we have already seen, are transferring functions to new firms providing a multiplicity of transport, financial control, inventory control and shipment tracking services, more efficiently and more accurately than they could perform by themselves. The growing dependence upon precise delivery schedules and the almost instantaneous communication of sales information to production facilities and warehousing will oblige these companies will have to establish new, close working relations with these new providers of logistics services in which they share information, which, in the past, was considered highly confidential and restricted to the company.

In most countries most of the medium and small-sized transport companies are modal operators inserted in logistics chains that they do not control. At the same time, a small number of large transport companies with service offices and terminals, and with advanced information and telecommunications systems, are developing international transport networks offering complete logistics services. It is very likely that these companies will become so-called mega-carriers offering every single mode of transport and integrated logistics services.

These mega-companies will be transport chain operators controlling the entire logistics chain, while the traditional freight transport companies will do the actual transport. In this situation especially the medium-sized transport operators will run the risk of disappearing, crushed between the large transport chain operators and the sub-contractors.

These new providers of integral logistics services can be characterised as follows:

- a multi-service portfolio integrating many logistics activities such as shipping, express parcels, road freight, warehousing, etc.;
- one-stop shopping for logistics services made possible by the development of multi-service portfolio;
- formal business-to-business links between shipper and provider of logistics services;
- emergence of marketing and company branding in the logistics sector;
- increased professionalism of the providers of logistics services meeting the changing needs of the client companies;
- better investment opportunities in logistics companies.

The increasing trend for manufacturers and retailers to contract out the physical distribution function has also affected the pattern of organisational requirements. Stocks previously held in shippers' own distribution stores are now being consolidated in larger warehouses developing their own distribution networks, set up by specialist contractors, who often also take care of the transport operations. This network functions as a hub-and-spoke system, where the node system (hub) requires consolidation of flows on lines (spokes) with various systems: LTL (less-than-truck load) and/or fixed schedule.

The emerging enhanced transport system reveals the increasing importance of terminals which are much more than simple warehouses or platforms. Conventional warehouses are increasingly being replaced by multimodal trans-shipment depots. The concentration of logistics functions is gaining momentum, with clustering in a small number of areas close to urban centres and/or industrial parks adjacent to highways.

Another significant factor of the hub-and-spoke system is the data communication network which is added to the physical network, allowing instant and reliable information with arrival and delivery notices to be passed on from platforms and/or warehouses all along spokes. Electronic data systems play a significant part in the improvement of logistics operations such as:

- the use of bar codes to identify loads, equipment and vehicles, to locate vehicles and other transport means in real time;
- access to specialised databases, i.e. customs;
- access to teleports in harbours, airports and inland terminals.

One of the major constraints, however, in the internationalisation and globalisation of the electronic information systems, is the very slow deregulation of the telecommunications sector impeding the creation of efficient large telecommunications groups, so that it is still difficult for information to cross national borders.

Also communication problems may occur between shippers and providers of logistics services. Therefore, three types of solutions are simultaneously being developed:

- standardisation of the electronic exchange of transport operations;
- setting-up of consortiums to share telecommunications and information-processing systems and to adopt standards and software developed on a rational economic basis;
- VAN -Value Added Networks- offering complete logistics services, the more general and widespread solution.

2.4 Conclusions

A large transformation is affecting the logistics sector. The simple commonplace service -mere transport of goods- has been substituted by a complex of sophisticated services, taking into account changing shippers demand regarding quality, speed, safety of transport operations.

The identified trends are likely to continue and will affect the transport infrastructures considerably in a negative way causing increasing congestion, already noticeable in many regions.

3 ADVANCED LOGISTICS AND CHANGES IN ROAD TRANSPORT SECTOR

In the presentation on logistics we discussed some recent developments in advanced logistics and how these developments are bringing structural changes to the transport systems. Now we will focus specifically on changes in road freight transport activities.

We will make reference to a conceptual framework for road freight transport describing the relationships between system components.

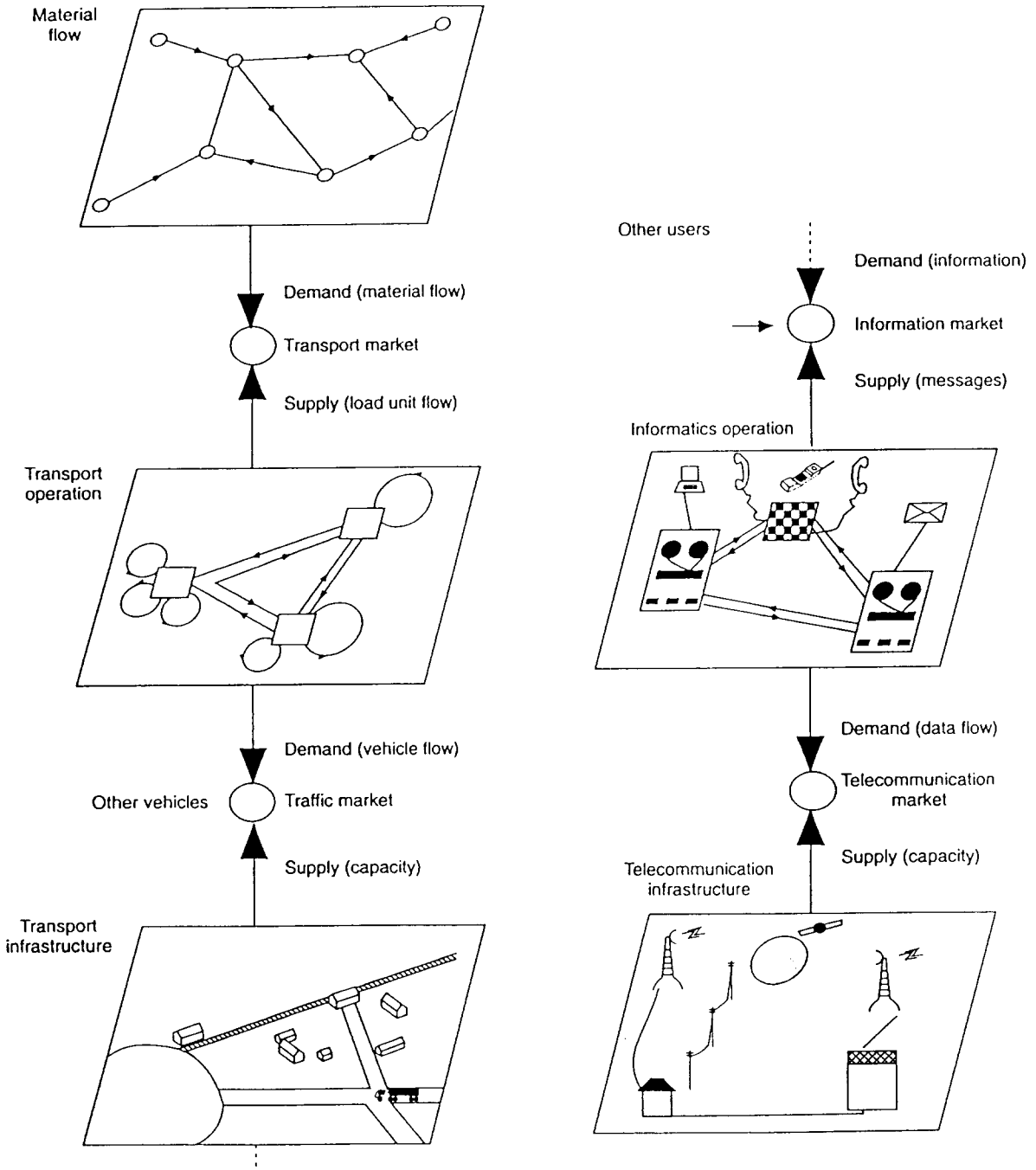
We will discuss:

- shifts in transport demand in relation to changing logistics;
- shifts in transport supply in relation to new systems of road freight operations;
- shifts in infrastructural policies and usage, external effects related to changing road freight operations, policy options to benefit advanced logistics.

3.1 A conceptual framework for road freight transport

The changes in road freight transport activities can be analysed using a five-layered model depicted in figure 3.

A five layer model of road freight transport



The five layers are: material flow, transport operation, transport infrastructure, informatics operation, and telecommunications infrastructure.

Material flow

The product logistics activities of manufacturing or trading companies create demands for moving material and goods among nodes via links in what we can call a material flow system.

This material flow system has nodes for production, assembly, storage and distribution. The demand for each link can be described in terms of tonne/year, shipment size, frequency, lead time, precision and flexibility.

Demand from all product logistics activities at each node can then be aggregated into the total demand for freight transport services for all the links in the product logistics network.

Transport operation

The transport logistics of a provider of logistics services result in the flow of load units and vehicles between nodes, the transport operation. In this system, nodes include modal change, trans-shipment, sorting, consolidation and deconsolidation.

Load units provide supply opportunities for moving materials and goods; examples of which are boxes, pallets, containers, swap bodies and trailers. The load units are moved by vehicles, e.g. trucks, trains, ships and aircraft.

The supply opportunity for each transport flow can be described using parameters similar to those that described material flow. Supply from all transport activities on each link can then be aggregated into the total supply of freight transport services for all the links in the transport system.

The supply and demand is then matched on the transport market, resulting in actual material and load unit flows. The effectiveness/efficiency of this match can be measured using the load factor, unsatisfied demand, service quality level, etc.

There can be load unit flow and vehicle movements without material flow on some links during some time periods, e.g. for backhauls of empty trailers.

Vehicle movement requires traffic capacity, in terms of space and time and thus generate demand for the use of the infrastructure. Hence the relation between transport operation and transport infrastructure.

Transport infrastructure

The transport infrastructure system can be defined as the physical infrastructure, guideways and interchanges, and the management of its usage.

Examples of guideways and interchanges are: roads and intersections; rail tracks and switches; sea passages and harbours; air corridors and airports; pipelines.

Examples of the management of physical infrastructure are: limits on vehicle loads, size and speeds, other traffic regulations, road charges, etc.

The supply and demand for use of the transport infrastructure are then matched on the traffic market, resulting in actual vehicle movement. The efficiency/effectivity of this match can be measured using vehicles per hour, hours of congestion per day, unsatisfied trip demand, trip time reliability, etc.

Informatics operations

All three layers, the material flow, the transport operation, and the transport infrastructure require information for their planning and operation. The information generated in each of these processes is translated into messages that require information handling facilities. These information transfer facilities are provided by informatics operators on the information market. The efficiency/effectiveness of this market can be measured in a similar way as for the transport market.

Telecommunications infrastructure

the exchange of information generates data flows that require a telecommunications infrastructure. Demand and supply of communication capacity is matched on a telecommunications market. The efficiency/effectiveness of this market is measured in a similar way as for the traffic market.

The five layers represent functions and not organisational bodies. Therefore, one organisation may cover several functional layers. Most railways still manage both the infrastructure and the transport operations. But also one layer may consist of several organisations. Transport operations are often divided into forwarding agencies, operators and vessel owners.

In the analysis of the changes in the transport sector the decision activities of the three transport layers and the two informatics/telecommunication layers can be divided into three categories, each with its own time horizon:

- structure: physical infrastructures such as roads, rail links and new buildings at nodes; organisational structures such as business strategy; customer and supply networks;

- components: manpower, vehicles, machines, informatics, traffic regulations, signs, etc.;

- management: allocation of resources, traffic management, scheduling, controlling, etc.

The decisions on structures, components and management made by actors inside the five-layered road freight transport system are influenced by environmental factors such as economy, technology and policy.

It is obvious that the decision activities of the five layers interact in complex, discontinuous patterns. Decisions on investments in physical infrastructure have consequences for decades, while adaptation to new market demand and adoption of technological innovation have shorter cycle times. The different lengths of cycle times create constant disequilibriums in the respective four markets (transport market; traffic market; information market; telecommunication market).

Changes in logistics activities are typically demand-driven. These changes normally start with reorganisation of material flows and rationalisation of the external logistics of manufacturing and trade. These changes result in demand for new transport services changing its strategy, structure, organisation components and management. The shift in transport operations then affects the infrastructure network requiring new investments, regulations and management concepts.

Therefore, it is of utmost importance to be able to predict how particular shifts in product logistics will affect the demand for transport services, and how this affects the infrastructure system.

3.2 Shifts in transport demand

Several trends contribute to the introduction of advanced logistics, changing the demand for transport services. It is important to analyse the relationships between logistics structure and transport demand.

Transport demand can be approached for this purpose by *quantifying transport services* in the following way:

- Tonne km: a measurement of transport operations; it increases when the average length of haul or the amount transported increases.

- Geographical coverage: local, national, continental, worldwide.

- Shipment size: parcel, less than truck load (LTL), full truck load (FTL), train or ship load; larger shipments are relatively cheaper to transport since they require less handling and administration.

- Frequency: hour, day, week; higher frequencies result in smaller sizes.

- Speed: measured in lead time from when the transport order is placed to when the shipment is delivered.

- Quality/reliability: meeting the agreed quality standards with the shipper at a certain service level.

- Quality/conditioning: no theft, no damage to or caused by the product.

- Flexibility: the ability to change previous service agreements to meet changes in customers' specific needs.

- Service coverage: e.g. unimodal line haul, multimodal door-to-door,

distribution/supply, full logistics.

We can identify the following *logistics shifts* and will analyse their effects on transport demand as quantified before:

- Global sourcing: shippers demand larger geographical coverage from their providers of logistics services as a consequence of geographically larger material supply and distribution channels.

- Fewer partners: shippers are forming partnerships with their suppliers and sales channels and have fewer but stronger relationships.

- Outsourcing: both users and producers of logsitics services are focusing more on their core business and contracting out standard components and services; this trend has accelerated by the development of advanced information systems enabling managers to control supply and distribution channels without owning the assets.

- Fewer storage points: fewer storage points demand fast and reliable transport between the storage place and the customer; economic advantages can be realised by sharing distribution systems, warehousing, order entry systems and other logistics services with other shippers.

- Inventories pushed upstream: in order to create more flexible types of manufacturing; this requires frequent shipments in smaller quantities to geogrpahically more dispersed consignees.

- Local sourcing and production: mature products having a high level of standardisation are being procured wherever they are cheapest in the world, while supplies for new and customised products tend to be purchased locally.

- Increased product value: increased use of electronic components and usage of lighter materials result in fewer tonnes to transport, smaller shipment sizes and a demand for higher transport quality.

- Shorter product life cycles: the time to develop and market new products is decreasing; logistics systems must be more flexible and adaptable.

- Customised products: custom-made products lead to greater number of transport-related variants.

- Order production: order production is becoming more common as the final production stages are pushed downstream to respond to market demands.

- Just-in-time: production and distribution schedules are closely tied to customer demand and can be changes immediately in response to changes in customer demand; products of immediate need, normally in small shipments, are transported; real time control and correction at all steps in the transport chain are required.

- Channel integration: one party normally controls the whole logistics chain; all parties involved in the production and distribution processes must think and act as one business unit, sharing responsibility for development and operation of the channel.

- Quality programmes: quality assurance must be built into the system; deviations must be detected and corrected within the process; advanced informatics for tracing, tracking and correcting deviations are required.

- Customised and flexible distribution: providers of logistics services are offering distribution services tailored to the needs of customers.

As general trends in transport demand can be identified:

- decrease of tonnage transported due to lighter products;
- increase average distance transport due to scale economies in production;
- higher quality shipment sizes;
- smaller shipment sizes;
- greater frequency shipments;
- larger geogrpahical coverage shipments;
- increased number of service add-ons;
- shorter lead times;
- greater flexibility.

High quality transport is expected to increase while general haulage will decrease as figure 4 shows.

Estimated shares of road market segments in Europe, 1990 and 2010

Old segments	Market segments	Percentage share in	
		1990	2010
Contract hire transport	Contract hire	9.3	10.7
Dedicated contract distribution Dedicated contract transport Shared contract distribution Shared contract transport	Tailormade transport	8.1	25.0
Express	Express	9.8	13.8
Groupage	LTL	30.2	27.5
General haulage and storage General haulage	FTL	42.7	23.0

3.3 Shifts in transport supply

Transport networks have evolved from simple point-to-point networks into complex integrated logistics networks. Five types of networks can be distinguished as figure 5 shows.

Which type of network is most appropriate is determined by the characteristics of the goods and the requirements of the customer.

Type A Point to point

Point-to-point type services can be provided by normal truckers and other simple transport operators and express services using courier. This network does not need investments in transshipment facilities.

Type B Multistop (pick-up and delivery; trucking)

This round-trip multi-stop network requires structured, efficient transport planning and routing in order to achieve efficient utilisation.

Type C Trans-shipment (pick-up and delivery with 1 trans-shipment)

This trans-shipment network needs one terminal to reaarange the flows of goods to achieve optimum utilisation of load units and vehicles.

Type D Inter-terminal (pick-up and delivery with 2 trans-shipments; line haul)

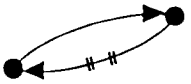
The next stage of logistics networks uses two terminals for each less-than-truck load (LTL) shipment. It often includes interconnection between different modes of transport and is based on a hub-and-spoke terminal system which results in a higher frequency, greater load factors and higher costs due to more handling per shipment.

Type E Integrated hub and spoke (pick-up and delivery with three trans-shipments; line haul)

This is the last stage and the most complete network available to logistics users. it offers the greatest number of distribution services with a high degree of efficiency.

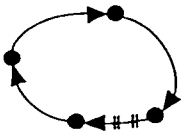
Different types of transport networks

A
Point to point



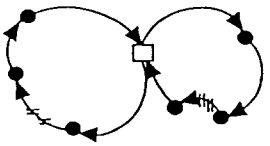
- point to point

B
Multistop



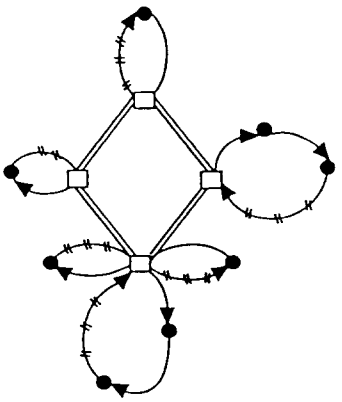
- pick-up and delivery
- trucking

C
Trans-shipment



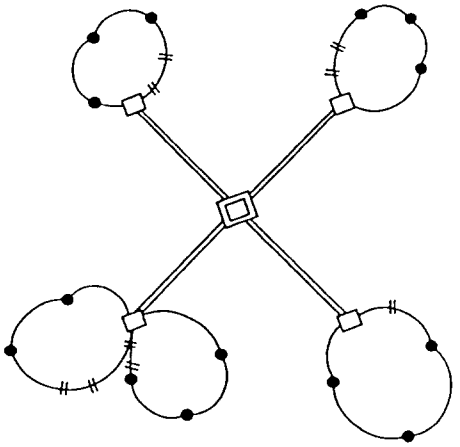
- pick-up and delivery
- 1 trans-shipment

D
Inter-terminal



- pick-up and delivery
- 2 trans-shipments
- line haul

E
Integrated hub and spoke



- pick-up and delivery
- 3 trans-shipments
- line haul

Légende :

- • point of pick-up or delivery
- —— loaded vehicle movement, LTL
- —‖— unloaded vehicle movement, LTL
- ═══ consolidated line haul, FTL
- □ trans-shipment or distribution terminal
- ▣ hub specialised on large volumes and high-speed trans-shipments of packages and unit loads

Obviously, developments in transport supply are largely dependent on developments in transport technolology, information technology and the organisation of transport networks and operations.

Transport technology is changing rapidly in terms of loading units, terminals and guideways. Load units such as containers and swap bodies have become very important. There is increasing standardisation of loading units and packaging techniques. This enables rapid consolidation of different loading units on one vehicle. Terminals are increasingly using quick load systems, robotics and automatically guided vehicles (AGV) for handling and storaging freight.

There is a real revolution going on in the development of the information technology. Freight and vehicle flows can now be monitored, and thus controlled and optimised. In the DRIVE projects EUROFRET and FLEET 38 different types of innovative Road Transport Informatics (RTI) for road freight operations were evaluated from the perspective of the suppliers, users, society and governments. the results were:

First priority:

- Communication with driver/vehicle
- EDI with shipper
- Static route planning
- Interactive route guidance
- EDI with port/focal points
- Collision avoidance
- Dynamic route planning

Second priority:

- Cargo/unit load tracing
- Monitoring vehicle/fleet
- Communication with other modes
- Transport planning
- Cargo/unit load tracking
- EDI with customs.

New organisational techniques in management and planning are emerging stimulated by developments in telematics -the combination of telecommunications and informatics.

Changes in the supply of transport services are largely affected by new technologies, customer demand and external costs. There is an interdependence between logistical change and transport supply. It is important to analyse this interdependence.

3.4 Infrastructure, external effects, policy options

In the measuring of the performance of an infrastructural network what counts is the performing of the whole network, not the performance of individual links. A bottleneck or a missing link affects the whole system and results in less efficiency. Therefore, it is important to identify the weak and/or missing links in a network.

There is a structural infrastructural problem: investments in new infrastructure lay far behind the increase of the traffic flows over the past 15 years. Given current predictions of traffic growth, infrastructural capacity should be doubled within 15-20 years. This will require huge investments, which governments will not be able to provide for. Therefore, it is necessary to think about new ways in financing infrastructure with participation of the private sector, e.g. Build-Operate-Transfer concepts, etc.

Advanced logistics is expected to decrease the traffic volume as transport operations will be organised on a more efficient way, using decision support and expert systems on load planning, route planning or the allocation of vehicles and hub-and-spoke networks, main ports, intermodal transport, etc. This will a positive effect on energy savings.

As logistics services are becoming more and more important but also more and more complex, much more attention should be paid to analyse recent trends in logistics developments in order to be able to anticipate on the future.

THE LOPER GAME

Notes for the teacher

1. QUALITY MANAGEMENT

The LOPER-game follows the lecture on Quality Management. In this lecture the following is explained:

- The history of quality management:
  - beginning with Henry Ford who introduced a new production concept with the production of the T-Ford. Instead of one person producing a product from the beginning to the end, there is now a sequence of workers, each adding something to the product. For that he needed standards and norms
  - quality departments are being set up only in the beginning of the 20-th century
  - in fact World War II meant a major step forward in quality management: large quantities of airplanes and ships had to be build in short time, this was not possible without quality control
  - NATO specified the first checklist/guideline for quality for their suppliers:
    ASAP: the Allied Quality Assurance Publications (1951)
  - in Japan the companies further developed the quality thinking: the introduction of quality circles, zero-defects and Total Quality Management

  But: in the first period: Quality in relation to the product
- Then explain that quality is more and more determined by the customer and non-physical aspects become important: delivery time, availability, reliability etc.
- Companies have to adopt the Quality Philosophy, in transport and logistics this is a result of the general trends in logistics: changes from sellers to buyers markets, customer demands increase, subcontracting and outsourcing etc.
- But Quality Managements costs money:
  1. costs for prevention
  2. costs for judging (monitoring)
  3. costs for internal failures
  4. costs external failures
- Quality in transport and logistics is somewhat different from quality from a product. Differences between a product and a service:
  - moment of production = moment of consumption
  - no guarantee beforehand
  - no storage/inventory of services possible
  - services can not be swapped
- Quality in logistics has four main indicators (resulting from the LOPER project):
  1. Reliability
  2. Time (lead time better than transit time)
  3. Condition
  4. Flexibility

  Of course everything against a certain price level
- What we want to deliver is external quality (for the customer), what we need for that is internal quality (guarantee that the internal procedures in the company are in order).

- A guarantee for the internal quality is ISO 9002. However, having a certificate does not yet guarantee the external quality.
- We have to specify targets for external quality (defined especially by the customer), measure and monitor, analyze differences between targets and performance and take measures or re-specify the targets (see the Quality-circle and the Logistic Quality Process)

2. THE LOPER GAME

The LOPER game is developed to teach participants in a very simple way how they can structure, monitor and analyze the process in their company/organisation.

Deliberately some errors are introduced in the text and things which are not quite clear. It is up to the participants to find out where illogical things occur.

After reading give a few examples of things that can go wrong in the process:

- the goods are not found in the order pick because they are not stored in the right place (possible reasons: wrong categorization, wrong location in the warehouse, pilferage)
- art products can be damaged (in unloading or storage)
- mistakes can be made in order picking
- the liner service arrives too late
- problems at the border: the delivery is too late
- etc.....

JTL has the objective to improve its quality and for that it wants to start with performance measurements and quality control. What we want to find out in the game:

- how to structure the process?
- what are logical points to measure/monitor?
- what to measure?

For the game we use a structure in which we in a logical sequence fill in a complete flow-chart for the process. The flow chart has the following structure:

Responsibility

Physical process

Time

Information process

Time related agreements

(see the examples)

The following tasks are undertaken by the participants.

TASK 1. To prepare a flow chart of the physical activities in the process and indicate who is responsible for what.

They should keep in mind:
- for which activities is JTL responsible?
- is JTL in control of that?
- which agreements are not clear?

When the students are ready, ask one of them to draw it on the whiteboard.

Check if they have found strange things or agreements/responsibilities which are not clear. A few examples:
- JTL has agreed to have the goods in the warehouse 5 days after arriving of the container. But: they are depending on a sub-contractor (Rentokil) and on Inrumours (for categorizing). Especially over the last one JTL has no control
- it is not clear who is responsible for unloading of the container
- hoe can they control their subcontractors (liner service) in the distribution part?

It could be good to hand over afterwards a copy of the upper part of the diagram, so they can use it for task 2.

TASK 2. To complete the flow chart by filling in the information flow

As a help, the list of thirteen messages mentioned in the case can be used. However, this list is not complete.

After presentation of the participants of the information part, hand out the completed flow chart.

TASK 3. Fill in the questions concerning time-related agreements (multiple choice)

TASK 4. Fill in the questions concerning the measurement of the logistical performance (multiple choice)

Quality in Transport: JTL and Inrumours

The transport company JTL has developed into a logistical services provider. One of its clients is the art importing company Inrumours. Among the activities JTL executes for Inrumours are stock control and distribution.

JTL wants to adopt the Just In Time philosophy but unfortunately it has a bad reputation: Just Too Late. Offering a constant quality level in terms of delivery times and lead times is one of the major problems JTL faces.

Therefor you have been appointed as the temporary quality-manager of JTL. Read the following pages carefully. You will need the information supplied in order to complete the quality-project successfully.

Inrumours imports art products from Africa and delivers this to galleries and exclusive shops in Northwest-Europe. A branch office in Paris services the markets in France, Italy and the Iberian Peninsula.

The products are transported on a monthly basis by a sea liner service from Africa (Monrovia) to Rotterdam. A local agent takes care of customs in Rotterdam and arranges transport to the JTL warehouse in Amsterdam. As soon as the agent knows when a container is due to arrive in Rotterdam a telefax-message is sent to Inrumours and JTL. There is no information about the exact containings of the container other then the bill of lading.

JTL contracts Rentokil which disinfects the container. In the contract between JTL and Rentokil it is stated that the container has to be disinfected within 3 hours after the order is given by JTL. After disinfecting the container cannot be opened for another 3 days.

When the container is opened, the goods are checked and categorised by experts of Inrumours. Very valuable goods (> 5,000 US$) are already coded and need special attention. JTL palletizes all goods and places them on stock into the warehouse. At the same time the goods are administered and brought into the stock control system of JTL (a.o. object description, category, number of items and price). JTL agreed to have the goods administered within 5 days after arriving of the container. Inrumours is connected to JTL's stock control system via an EDI link. Now the sales-people can start working.

Inrumours makes the order list for JTL. This list is sent to JTL by telefax every morning at 10.00 o'clock. Depending on the delivery address two options for distribution are possible:

for the BeNeLux	transport by JTL-drivers, one day after order-entry (24-hour delivery)
for Germany and Scandinavia	transport by liner-service-drivers delivery in Germany and Denmark at the latest 3 days after order entry (72-hour delivery) delivery in the other Scandinavian countries at the latest 7 days after order entry (168-hour delivery) All deliveries should be made before 17.00 hours

Apart from the regular orders also express orders arrive from the branch office in Paris. These orders contain high valuable, 1-item articles and are offered from both locations (Amsterdam and Paris). It is agreed upon that express orders are handled within 1 hour after receiving the order by telefax. This means that the order is picked from the warehouse, packed, labelled and custom cleared by JTL. Transport to France is taken care of by Inrumours.

All incoming orders are collected by the planning department of JTL. This department makes the route-planning and the order picking lists. Also the liner-service company is informed by the planning department.

The orderpickers collect and place all shipments on route. The packaging department takes care of checking the completeness of the order, adequate packaging as well as labelling for identification.

All truck drivers (JTL as well as external drivers) are responsible for their cargo. They sign for receiving the cargo and they take care that the client signs the transport-document when the cargo is delivered. Liner-service transport documents are sent to JTL by telefax immediately after return.

Distribution from the JTL depot starts at 7.30 in the morning while the liner-service vehicles arrive to pick up loads at 17.30 hours. Express orders are handed over to Inrumours for transport to France. This process can take place at any time during the day.

In order to realize the quality-project the first thing to do is to get some insight in the goods and information flow of JTL.

The goods flow is given hereafter. Underneath the goods-flow there is a time-schedule displayed. You are now given some information messages. Locate these messages in the time-schedule.

Information messages

1. input information of the products in the stock control system of JTL
2. transmit time for opening the container to Inrumours
3. print packaging labels
4. print route planning
5. delivery confirmation for JTL-drivers
6. print orderpick- and routing lists
7. sign for collection of cargo by external drivers
8. delivery confirmation by external drivers
9. message from planning department to liner-service company
10. message from agent to Inrumours and JTL
11. sign for collection of cargo by JTL drivers
12. message to Rentokil
13. receive order list by JTL

You are now confronted with a number of multiple choice questions relating to the **time-related agreements** between JTL and Inrumours.

1. The liner-service drivers collect the goods the day before departure at 17.30 hours
   A) H → M is 7.5 hours max.
   B) M < 17.30 hours
   C) J → M is exactly 7.5 hours

2. maximum 5 days after delivery of the container the goods need to be administered by JTL
   A) A → F is exactly 5 days
   B) B → F is max. 5 days
   C) E → F is max. 5 days

3. Delivery within the Benelux is at the latest one day after placement of the order. Delivery time is always before 17.00 hours.
   A) H → P is max. 31 hours
   B) H → P is max. 24 hours
   C) J → P is max. 24 hours

4. max. 3 hours after receiving the order from JTL Rentokil completed the disinfection
   A) C → E is 3 hours max.
   B) C → D is 3 hours min.
   C) C → D is 3 hours max.

5. The container can be opened 3 days after disinfection
   A) D → E is 3 days
   B) C → E is 3 days
   C) D → E is 3 days min.

6. Every morning at 10.00 o'clock the order list is send by telefax to JTL
   A) H = 10.00 o'clock
   B) H < 10.00 o'clock
   C) F → H is max. 10 hours

7. Delivery in other countries takes place 3 respectively 7 days after placement of the order. Delivery time is always before 17.00 hours.
   A) H → O is max. 79 resp. 175 hours
   B) J → O is max. 79 resp. 175 hours
   C) H → O is max. 72 resp. 168 hours

Now that the goods and information flows as well as the agreements are reviewed you are able to measure the logistical performance.

1. At what points should delivery time be measured?
   A) P, O, H, M
   B) P, O, L
   C) P, O, M

2. At what points should the lead time be measured if the incoming flow is regarded?
   A) B, D, F
   B) B, F, H
   C) A, F

3. At what points should the lead time be measured if the outgoing flow is regarded?
   A) H, O, P, M, I
   B) J, P, O
   C) H, O, P

4. 21 out of 1000 orders are not delivered on time. 10 of them are delivered too late while the remaining 11 are not delivered at all because the products was not in stock. What is the delivery performance?
   A) 97,9%
   B) 22%
   C) 99%

   (1000-21)/1000*100% = 97,9%; cause of non-deliverance is not relevant for the client

The goods flow is given hereafter. Underneath the goods-flow there is a time-schedule displayed. You are now given some information messages. Locate these messages in the time-schedule.

Information messages (TEACHER)

1. input information of the products in the stock control system of JTL
F
2. transmit time for opening the container to Inrumours
D
3. print packaging labels
K
4. print route planning
L
5. delivery confirmation for JTL-drivers
P
6. print orderpick- and routing lists
J
7. sign for collection of cargo by external drivers
M
8. delivery confirmation by external drivers
O
9. message from planning department to liner-service company
J
10. message from agent to Inrumours and JTL
A
11. sign for collection of cargo by JTL drivers
M
12. message to Rentokil
C
13. receive order list by JTL
H

You are now confronted with a number of multiple choice questions relating to the time-related agreements between JTL and Inrumours. **(TEACHER)**

1. The liner-service drivers collect the goods the day before departure at 17.30 hours

* A) H → M is 7.5 hours max.
B) M < 17.30 hours
C) J → M is exactly 7.5 hours

2. maximum 5 days after delivery of the container the goods need to be administered by JTL

A) A → F is exactly 5 days
* B) B → F is max. 5 days
C) E → F is max. 5 days

3. Delivery within the Benelux is at the latest one day after placement of the order. Delivery time is always before 17.00 hours.

* A) H → P is max. 31 hours
B) H → P is max. 24 hours
C) J → P is max. 24 hours

4. max. 3 hours after receiving the order from JTL Rentokil completed the disinfection

A) C → E is 3 hours max.
B) C → D is 3 hours min.
* C) C → D is 3 hours max.

5. The container can be opened 3 days after disinfection

A) D → E is 3 days
B) C → E is 3 days
* C) D → E is 3 days min.

6. Every morning at 10.00 o'clock the order list is send by telefax to JTL

* A) H = 10.00 o'clock
B) H < 10.00 o'clock
C) F → H is max. 10 hours

7. Delivery in other countries takes place 3 respectively 7 days after placement of the order. Delivery time is always before 17.00 hours.

* A) H → O is max. 79 resp. 175 hours
B) J → O is max. 79 resp. 175 hours
C) H → O is max. 72 resp. 168 hours

Now that the goods and information flows as well as the agreements are reviewed you are able to measure the logistical performance. **(TEACHER)**

1. At what points should delivery time be measured?

* A) P, O, H, M
B) P, O, L
C) P, O, M

2. At what points should the lead time be measured if the incoming flow is regarded?

* A) B, D, F
B) B, F, H
C) A, F

3. At what points should the lead time be measured if the outgoing flow is regarded?

* A) H, O, P, M, I
B) J, P, O
C) H, O, P

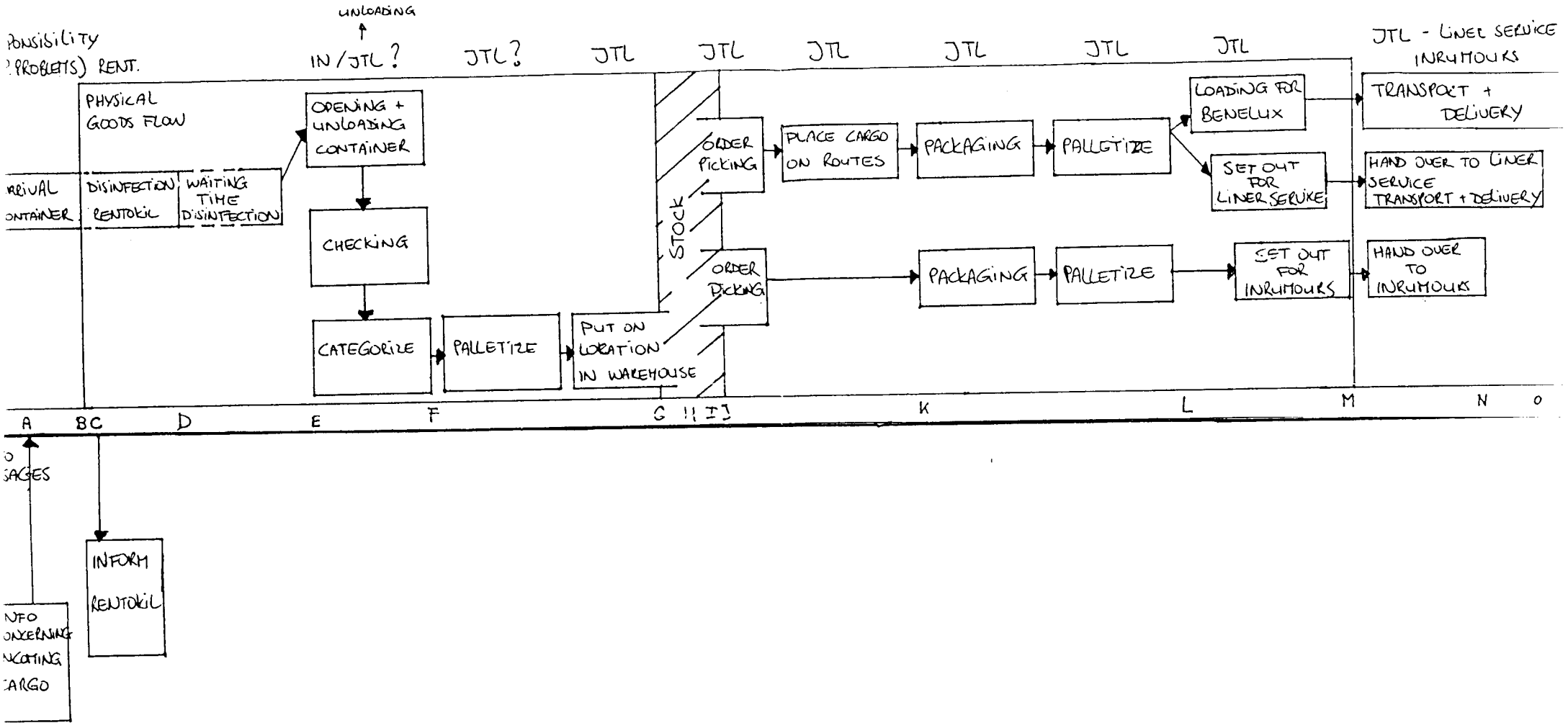
4. 21 out of 1000 orders are not delivered on time. 10 of them are delivered too late while the remaining 11 are not delivered at all because the products was not in stock. What is the delivery performance?

* A) 97,9%
B) 22%
C) 99%

(1000-21)/1000*100% = 97,9%; cause of non-deliverance is not relevant for the client

TIME

JTL - INRUMOURS



IE
LATED
REEMENTS

D MAX
3 hours
AFTER C

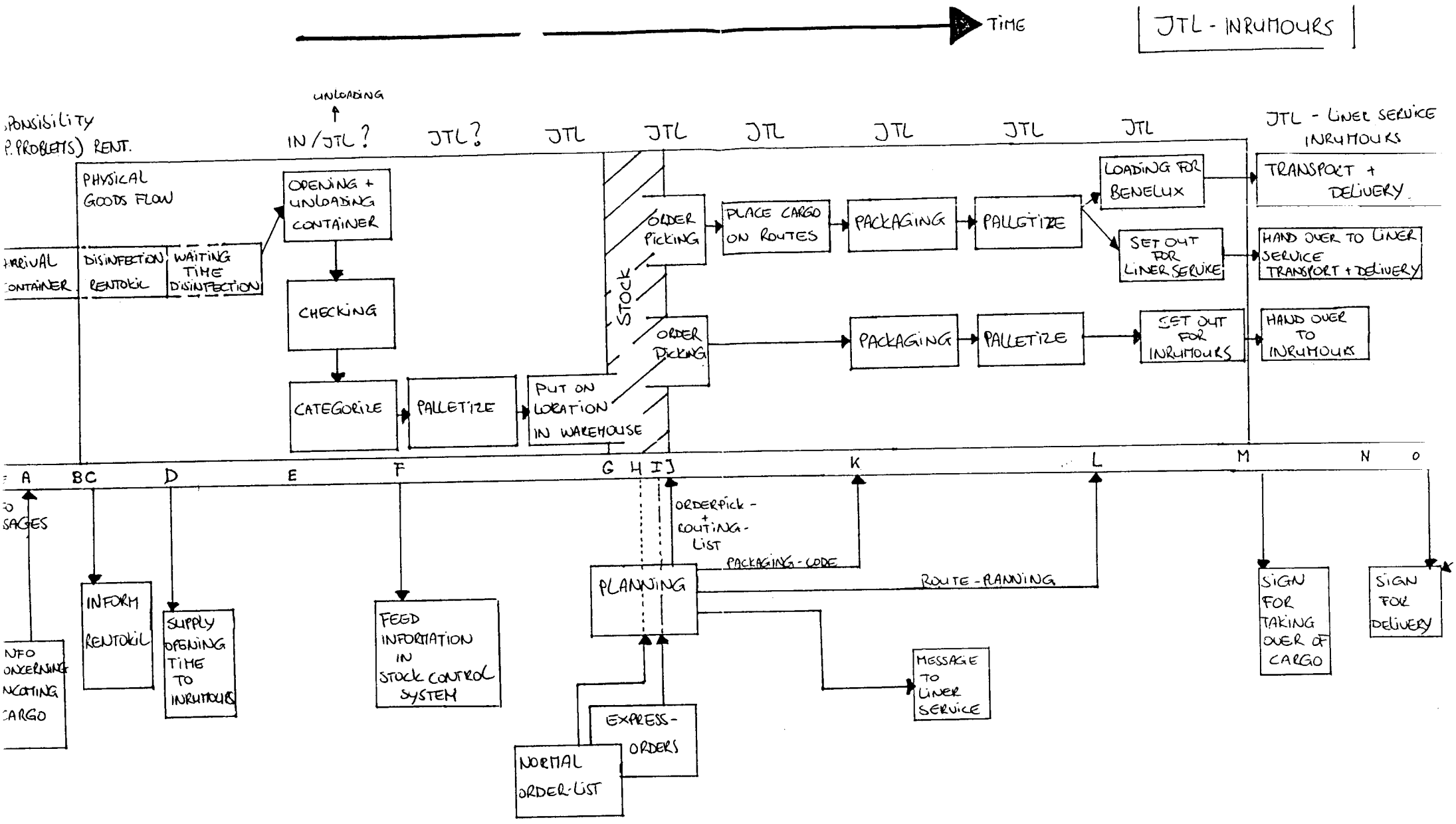
F MAX
5 days
AFTER B

L <
17.30 hrs.

M MAX
1 hour
AFTER I

O MAX
72-168 hrs
AFTER H

P MAX
THE DA
AFTER
H



RESPONSIBILITY
P. PROBLEMS) RENT.

IE
LATED
REEMENTS

D MAX
3 hours
AFTER C

F MAX
5 days
AFTER B

L <
17.30 hrs.

M MAX
1 hour
AFTER I

O MAX
72-168 hrs
AFTER H

P MAX
THE DAY
AFTER
H

WORKSHOP LOGISTICS- THE JIT GAME

CASE STUDY

by: De Leijer

THE JIT-GAME - STOCKLESS PRODUCTION

The objective of the game is to show the differences between 'classical' production methods and JIT.

Classical production can be characterized as a 'push'-system: units are pushed through the production chain. New production philosophies as JIT, have a 'pull'-character: production takes place on request of elements further in the production chain: units are pulled rather than pushed.

The game needs 7 persons and it needs the following material/components:

- 3 tables for production
- 180 tubes (yellow)
- 1 grey tube
- 180 tube ends
- brown elastic bands
- red elastic bands
- 50 small boxes
- 10 large boxes
- a stop watch
- a white board

The production system consists of the following steps:

1 Supply of components
2 Production/assembly
3 Labelling (rapping elastic bands)
4 Quality control
5 Packaging and palletizing

For these 5 functions, five persons are needed:

1 The materials manager
2 The production engineering manager
3 The labelling manager
4 The quality manager
5 The packaging manager

In addition a teacher is needed and one back-stop. The teacher explains what is happening, he is also responsible for introducing errors/special cases. The back-stopper assists where needed, especially he ensures that the 5 persons do not run out of components (pipes, pipe ends, elastic bands and boxes).

Start of the game

Every-one takes his place behind the table, the teacher explains the production process and the role of every element in the production chain.

We are simulating three different production systems:

1 A push system
2 A pull system, batch-wise production of 3 units a time
3 A pull system, production of 1 unit

The three production systems will be compared by the following indicators:

- the space needed
- the working process
- cycle time
- rework quality
- quality problems

Always start the cases with a production chain which is filled: people must be able to start working immediately.

Case 1 A push system

The characteristic of a push system is that every-one produces as much as he can, whether people are ready or not. There is no interaction between the elements.

Note: it is important for the case that the FIFO system is used: first in first out

Start the process.

The teacher takes the following actions:

1. After a few minutes stop the process and count the number of units in the system (the working process)
2. A few minutes later: insert a grey tube and measure the cycle time.
3. Change the colour of the elastic bands (red in stead of brown): the Quality manager finds out that the labelling has made a mistake: they use the wrong colour. Now count the number of units in the chain (the rework quality)
4. Two instead of one pipe-end is fixed to the pipe. The Quality manager finds out and calls an Engineer. He stops working and tries to solve the problem with the engineer. In the meantime the others continue producing as if nothing is happening (the quality problems are hidden).
   The teacher tells him to speed up his work so as to catch in on the others.

Finally make a mess of the whole thing, boxes fall on the ground, people are shouting etc.

Case 2 A pull system with a batch size of 3

The rules have changed, the production system changes. On the table we draw a quadrant. When the quadrant is empty, it this means the unit needs material. Then it is filled with three units. If the quadrant is full, the previous worker does not produce, he stays idle. Everyone in the chain is working at maximum three units in the chain.

Note: before you start fill the quadrants.

Start the process.

First conclusion: the production area is cleaner (perhaps think of space reduction).

The teacher follows the same steps as in the first case:

1. Count the working process.
2. Insert a grey tube and measure the cycle time.
3. Change the colour of the elastic bands and count rework quality.
4. Fix two instead of one pipe-end, and see what is happening. The Quality manager again calls for an engineer.
   After a while people notice that there is a problem and they stop producing. But it takes some time. Quality problems become clear.

Case 3 A pull system with a batch size of 1

The rules have changed again, the batch size goes down to one. From the theoretical point of view this is the ideal JIT-system. It is stockless production.

Start the process.

Reduce the number of tables in the system.

Again the teacher follows the same steps:

1. Count the working process.
2. Insert a grey tube and measure the cycle time.
3. Change the colour of the elastic bands and count rework quality.
4. Fix two instead of one pipe-end, and see what is happening. The Quality manager again calls for an engineer.
   People immediately know that something is wrong and they stop producing. Quality problems are clear.

People should exaggerate a bit in requesting material. Show that production only takes place on request.

Conclusion

The JIT-system as compared to the push system gives the following advantages:

Reduction of inventory levels
Reduction of cycle time
Quality control
Space reduction

BASICS OF THE SETUP AND ORGANISATION OF SMALL ROAD TRANSPORT ENTERPRISES

(951043)

Rijswijk, January 1996

CONTENTS

1 STARTING A TRANSPORT COMPANY

1.1 Elementary Requirements

To start a company with a chance of succeeding, it is necessary that the entrepreneur has the following:

- The expertise and craftsmanship to manage and operate a road transport enterprise.
  To be able to carry out the transportation of goods requires more than just a driver's licence. Besides legal requirements, to be able to run a transport company knowledge of the following is also required:
  - vehicle technique;
  - documents, transportation conditions and the laws that apply to the transportation of goods;
  - administration, finance and the basic rules of business economics;
  - the manner in which this branch of the industry functions and the market for transportation services.

- An market, be it through own customers, through intermediaries or other transport companies who subcontract to third parties.

- The material means needed to be able to serve the potential buyers/clients.
  Depending on the type of goods, the distance to be transported and other characteristics of the transportation to be carried out, the demands on the vehicles will vary dramatically. Furthermore repair and maintenance facilities will also be necessary and for some types of transport transshipment facilities must be available. If a company is started as a more than one-man company, the entrepreneur will also need to hire the necessary drivers and other personnel.

- The financial means to be able to purchase the materials required and to be able to bridge the period between the start of the operational costs and the payment of the transport services to be carried out.
  - Should one start with new vehicles or can second-hand vehicles be purchased?

- Should one own all the materials or can one hire or lease them?
- What is the term of payment that can be agreed upon with the clients?

Furthermore, the necessary means do not necessarily have to be paid by the entrepreneur. It is not unusual to obtain risk bearing capital from private or business relations, under certain conditions of course.
Banks and other creditors can supply a large part of the required finance. Interest and other conditions depend on the own/risk bearing capital, but the chances of succeeding, as judged by the bank, is of a large influence as to the size and conditions of the loan.

1.2 Different Starting Positions

Many transport companies started as one-man companies that had to build up their own market and of which the owner hardly had more expertise than a driver's licence. This was, however, in the pioneering phase of the branch and the number of failures and of businesses barely surviving was great.

One should realize that in the current economy a number of other possibilities are available. A transport company does not have to start with one truck or combination. A transport company can come into being by taking over a company or part thereof, through privatisation of government companies or by the rejection of road transport by other shippers or transportation companies.

Takeover by existing management means that the know-how is already there, but usually the experience to be able to operate independently on the transport market is missing. It is true that when the company is taken over, so are its customers but keeping them and gaining other market segments requires an approach often new to the management.

Taking over material and experienced personnel has many advantages, but the transition to a market and service oriented organisation will cause large problems.

It also occurs that road transport activities are started from within an already existing business in the transport or transport related sector. The company will then also start road transport activities with more than one vehicle. Furthermore, a certain insight into

road transport and the road transport market must be present and also might into the market development and the market segments that are to be conquered.

One vehicle companies that are just starting can for a large part exist because larger road transport companies often pass on a section of the transportation to small independent companies.
Usually this concerns drivers from the big companies who are given starting possibilities, often in the form of a contract. The contract conditions are usually so binding that the independence of the driver is largely show. The self-supporting company has the advantage of having low costs; the self-supporting driver. has no overhead costs and his income is dependent on high productivity.

Independent beginners are fairly rare. The conditions named in 1.1 are especially important for them. It often concerns entrepreneurs who offer a specific type of service. If they can overwin the starting problems, these entrepreneurs have a good chance of succeeding and growing.

1.3 Business Planning

It is obvious that an entrepreneur will not start transportation activities unprepared, but will set up a company according to a clear plan. This business plan is not necessary just for himself but also to be able to convince potential clients and investors.
The business plan begins with an explanation (based on own expertise and means and on the market in mind) in which the possibilities for the new company in the short and medium term are described.

The Business Plan should contain the following elements:

- **Marketing plan**

  This describes the results of the market research. Herein the following are mentioned:
  1. the transport market at which the company will aim, for example specialisation type of transport and potential shippers;
  2. the agreements made with or contacts with clients, specified by name.

It must also be mentioned if new transport or already existing transport is concerned.

- **Investment Plan**

1. Number of vehicles:
   Per vehicle the following must be defined:
   - brand and type;
   - year of construction;
   - purchase price, life span and residual value;
   - the expected number of kilometres on a yearly basis.

2. Housing
   - surface area, contents. Possibilities for storage and transshipment;
   - purchase price, life span and residual value.

3. Inventory and Equipment
   - Types and numbers;
   - purchase price, life span and residual value.

- **Financial Means and Possibilities**

This concerns the means by which the purchases, as listed in the business plan, are financed or will be financed, as well as the time span between costs and payment of transport services, they must at least be split into:

- own capital;
- mortgage - loan on the basis of collateral - property pledged as a guarantee for the repayment of a loan (e.g. real estate);
- loans for a longer period of time;
- short term debt;
- credit from the supplier.

A simple example of a starting balance of the following 2 companies is given:

- a one vehicle company;
- a company with 15 vehicles.

Table 1. *Example of a starting balance of a one vehicle company (2nd hand material)*

Balance as per 31-12-1993

	$		$
Fixed assets		*Own capital*	
tractor	40,000	Capital	15,000
trailer	10,000		
Inventory	2,000	*Long term debts*	
Total	52,000	Bank loan	40,000
Floating assets		*Short term debts*	
Debtors	15,000	Current account bank	18,000[1]
		Creditors	2,000
Advance payments:			20,000
Road tax and			
insurance	3,000		
other	2,000		
	5,000		
Liquid assets	3,000		
	75,000		75,000

[1] Current Account limit is $ 25,000

Table 2. *Example of a starting balance of a 15 vehicle company (2nd hand material)*

Balance as per 31-12-1993

	$		$
Fixed assets		*Own capital*	
tractors	600,000	Capital	125,000
trailers	200,000		
Inventory	75,000	*Long term debts*	
Total	875,000	Bank loan	700,000
Floating assets		*Short term debts*	
Debtors	250,000	Current account bank	175,000[2]
		Creditors	200,000
Advance payments:			375,000
Road tax and			
insurance	60,000		
other	10,000		
	70,000		
Liquid assets	5,000		
	1,200,000		1,200,000

- **Personnel Plan**

  - Educational level and expertise of the entrepreneur;
  - the number of personnel divided into chauffeurs, mechanics and indirect personnel;
  - contracts and wages;
  - the number of required productive hours for the drivers

After this inventory the entrepreneur has an overview of the actual situation of his means. Based on this he can make an estimate of the expected costs and profits. This is the subject of the next paragraph.

[2] Current Account limit is $ 250,000

1.4 Making an Estimate of Operating Costs

When starting a one vehicle company the entrepreneur is dependent, to a large extent, on external information and advice with regard to estimating the necessary means, costs and profits. In the case of the takeover of a company or part thereof, he can to a large extent, make use of the information already available.

In the following some examples are given for estimates of:

- turnover;

and

- costs;

with the expected profit and cash which is then available for payments of loans and investments.

The costs have been grouped in types:

- personnel costs;
- goods and services;
  - · direct costs
  - · workshop
  - · office and general
  - · housing
- depreciation;
- interest.

These are then split into the various manners in which it was utilized (how were the costs made?) and then divided into cost sort.

The relatively most important types of costs can be estimated fairly well through the number of personnel and vehicles and the achievements in hours and kilometres. The entries "other" need to be specified and carefully inventoried on the basis of the intended planning and manner of going to work and on the circumstances (among others rules, regulations and tax laws) under which work has to be carried out.

In the following tables two different examples of Operation Costs balances are given, that is:

1. For a starting one vehicle company.
2. When taking over an existing 15 vehicle company.

Table 3 *Cost calculation for one tractor/trailer combination; basic data/unit costs*

	tractor	trailer
new value	$ 90,000	$ 35,000
residual value	15,000	5,000
life span (West European standard)	5 year	8 years
number of tyres	6	8
kilometres per tyre	110.000	110,000
price per tyre	$ 425	$ 425
fuel consumption (litre p/km)	0,4 l/km	-
fuel price per litre (European average)	$ 0,50	-
repair and maintenance costs at		
120,000 km per year	2,500	500
drivers costs (2 drivers)	12,000	
km per year	120,000	120,000
hours per year per truck	3,000	3,000

Basic Data

Kilometres per year per truck	120,000
hours per driver/year	3,000
hours per truck/year	3,000
number of drivers	2
number of dispositioners	-
administration and management	-
revenue per km	$ 0,75
drivers wages: basic	$ 1,000
and 8 US $ for 100 km/per driver	
Intrest	11%

Table 4 *Example of an Exploitation Prognosis for a One Vehicle Company* (West European Vehicle)

kilometres on yearly basis	120,000	
	costs ($)	revenues ($)
Turnover 120 x $ 0,75		90,000
Personnel costs		
Wages for entrepreneur (driver + codriver)	12,000	
Expenses on route	1,000	
Subtotal personnel costs	13,000	
Goods and services		
Direct costs		
fuel 0,4 litre/km x 120,000 x $ 0,5	24,000	
tyres: 14 tyres à $ 425 x 120,000 / 110.000	5,450	
rep. + maint. contracted out	3,000	
road taxes	500	
vehicle insurance	3,500	
other direct transport costs	2,000	
	38,450	
Workshop		
parts and other small tools	1,000	
	1,000	
Office and general		
office costs	300	
other general costs	200	
	500	
Housing		
rent	100	
other housing costs	100	
	200	
subtotal goods and services	40,150	
Depreciation		
fleet	18,750	
inventory	250	
	19,000	
Intrest incl. intrest for debtors and advance payments	10,000	
Total costs	82,150	
Profit	7,850	
Total	90,000	90,000

Room for implementation/investment

Profit	7,850
Depreciation	19,000
Cash flow	26,850
Bank Payments	10,000
Margin	16,850

Table 5 *Example of an Operation Costs prognosis*
Takeover of an existing company with 15 vehicles.

	$ costs	$ revenues
Turnover own material 1800,000 x $ 0,75		1,350,000
Nett turnover of transports contracted out		20,000
Total turnover		1,370,000
Personnel Costs		
Wages (incl. soc. charges)		
Drivers 45.000 hours à $ 8,-	195,000	
Mechanics	12,000	
Dispositioners	15,000	
Administration & management	20,000	
Fee for expenses en route for drivers	20,000	
Subtotal personnel costs	262,000	
Goods & services		
Direct costs		
Fuel 0,4 litre/km x 1.800.000 x $ 0,50	360,000	
Tyres 15 vehicle combinations 14 x $ 425 x 120,000 / 110,000	97,364	
	45,000	
Rep & maint. contracted out	7,500	
Road taxes	45,000	
Vehicle insurance	30,136	
Other direct transport costs (tolls & ferries)		
Subtotal	585,000	
To carry forward	847,000	1,370,000

Continued

	$	$
Carried forward	847,000	1,370,000
Workshop		
spare parts	14,000	
other (small tools etc.)	1,000	
Subtotal	15,000	
Office and general		
office costs	2,000	
other general costs	1,500	
Subtotal office	3,500	
Housing		
rent	1,000	
other housing costs	1,000	
Subtotal	2,000	
subtotal goods and services	20,500	
Depreciation		
fleet	281,250	
inventory	3,750	
subtotal	285,000	
Interest	130,000	
incl. intrest for debtors and advanced payments		
Total Costs	1,262,000	
Profit	108,000	
Total	1,370,000	1,370,000
room for implementation/investment		
profit	108,000	
depreciation	285,000	
cash flow	393,000	
bank payments	140,000	
margin	253,000	

1.5 Cost Calculation

If a company operates independently in the transport market, it must know the cost price of the transport services it offers.

Even though it is not always possible to get prices that cover the costs, it is a fact that a company cannot exist if the services are sold under the cost covering price over a longer period of time. Transports that do not cover the cost price must be compensated with other transports of which the turnover is above the costs. The cost price is determined beforehand based on with the use of the necessary means (truck and driver) and the necessary hours and km.

The cost calculation is made up of two components, there are the kilometre costs and the time costs.

The kilometre costs are dependant on the number of driven kilometre and are made up of:

- fuel;
- tyres;
- repair and maintenance.

The time costs are independent of the number of driven kilometres and are made up of:

- the costs of the truck/truck combination such as depreciation, interest, insurance, road tax and repair and maintenance;
- the cost of the driver and co-driver;
- overhead costs, that is the remaining company costs that are not directly related to a vehicle or driving personnel, but which are necessary to keep the company going. Amongst others, administration, general management, telephone, fax, postage etc.

In principle time costs are determined on a yearly basis and then expressed in an amount per effective hour. Effective hours per year are all the hours during which a vehicle is actually used for transportation of goods.

The kilometres needed to carry out a transport include the empty kilometres to the loading area and from the destination to the depot or to a next destination. The hours include, beside the driving time (for loaded and empty kilometres), the hours that are spent at loading and unloading areas and the hours involved in delays (for example, delays at borders for international transport).

The kilometres are multiplied by the costs per kilometre and the hours with the costs per hour. In so far there are any direct transport costs (e.g. toll fares), these are also to be added to the hour and kilometre costs of that transport.

Depending on the price basis (for example per ton or per loaded kilometre), the transport costs will be expressed in a sum per ton or per kilometre.

Table 6 *B. Calculation*

Vehicle Costs	kilometre costs ($)	time costs ($)
Vehicle costs		
Fuel 0,4 l x $ 0,50 x 120,000 km	24,000	
Tyres $\frac{14 \text{ tyres x } \$ 425}{110{,}000} \times 120.000$	6,491	
Repair and maintenance	3,000	
Depreciation		
- tractor ($ 90,000 -/- $ 15,000) : 5		15,000
- trailer ($ 35,000 -/- $ 5,000) : 8		3,750
Interest[1)]		7,250
Vehicle insurance		3,500
Road tax		500
Subtotal vehicle costs	33,491	30,000
Drivers costs (2 drivers)		13,000
Subtotal direct costs	33,491	43,000
Overhead costs		
(15% over direct costs)	5,024	6,450
Total costs per year	38,515	49,450
Number of km/hours per year	(120,000 km)	(3,000 hr)
Costs per km resp. per hour	0,32	16,48

The costs per km are $\frac{38{,}515}{120{,}000} = 0{,}32$

or

The costs per hour are $\frac{49{,}450}{3{,}000} = 16{,}48$

The danger when only using tariffs based on kilometres is that when the average kilometrage is relatively low (waiting time is relatively long), the revenue is too low to cover all time costs. Theoretically a truck could be loading or unloading all day and not

earning anything.

When using tariffs based only on hours, there is the risk that at relatively high speed per hour a part of the km costs will not be covered.

In the price offered a profit margin should be included; the margin depends on what the market allows.

Making an offer with both a kilometre and an hour tariff is most preferable.

Example

A price for a transport of 20 tonnes over 400 km which will take 10 hours will cost

400 x 0,32	=	128,00
10 x 16,48	=	164,20
sutbtotal		292,80
Profit Margin 5%		14,64
		$ 307,44

2 ORGANISATION OF THE SMALL FIRM

2.1 Some Basic Needs of an Organisation

Before dealing with the actual organisation of a small transport firm, some basic rules in organisation are mentioned below.

- For every activity a person responsible to carry it out or to see that it is carried out. Each member of the organisation has a clear task field and responsibility.

- The organisational structure has to be logical and based on the way the production process of services is set up. The tasks of a group of persons should be coherent in such a way that they cover a clearly defined part of the firm's process.

- A balance between authority and responsibility is imperative. A person cannot be responsible for activities without having the proper authority. On the other hand authority that has no responsibility leads to wrong decisions or at least to decisions taken at the wrong place.
  A good bookkeeper may easily get the confidence of the manager, but when this leads to his interference in daily operational planning the results may be very negative.

- A person's task may demand qualities that are unlikely to be united in one person. The right man in the right place still counts for every organisation.
  On the other hand the organisation should make maximum use of the qualities of its personnel.

- Communication can be built in, through communication channels and procedures. However, personal contacts from top to bottom are extremely important.

- If the workload of a person is permanently too heavy, he cannot function properly.
  However, a workload far below physical and mental capacities is also frustrating.

The best compensation an employee has - apart from an acceptable salary - is satisfaction in his job.

2.2 Basic Types of Transport

Although there are many different types of transport in the market segments in Western Europe, a number of basic types can be discerned. The various basic types influence the manner in which a company must be organised.

- **Trucking**

  Trucking is transporting the trailers of third parties, for example containers for the sea transport sector and trailers for ferry companies or for large transport companies. During this activity the entrepreneur only provides the tractor and a driver, although sometimes containers are transported with use of equipment of the shipper. Besides the organisation of handling the transport, the client also supplies the invoicing and the transport documents. For the "trucker" the indirect tasks involved are minimal. Although the earlier mentioned independent drivers sometimes also provide the trailers, they can in fact also be considered "truckers".

- **Route Transport**

  Route Transport is carried out for clients in the distribution sector (for example the wholesale trade) who gather the goods to be transported beforehand into groups and supply the necessary documentation. The road haulier provides material and personnel for an hour and kilometre tariff. This kind of transport is generally restricted to national transport.

The indirect activities of the haulier are restricted to the dispositioning of material and drivers and the invoicing of the monthly total of hours and kilometres. Besides this it may occur that the haulier combines routes for more than one client. The more destinations that are close together, the higher the cost savings. The haulier can then gain a larger input in the planning of the completion of the transport and the cost price calculation becomes more complicated. In fact this type of transport quickly evolves into the other basic type, "groupage transport".

- **Groupage transport (scheduled service and pick-up and delivery services)**

  Transports for a large number of clients are collected, divided into the groups for the appropriate destination in the own warehouse and then transported on scheduled service routes (long distances) or with delivery services (short distances). Scheduled service routes end in a transshipment centre, own or belonging to third parties, from which the goods are then distributed to their end destination with delivery services. The relatively large number of parcels require a lot of administrative handling and documentation handling and much attention from the planner (dispositioner).
  Beside this, a lot of time has to be spent on acquisition to increase the load density and the number of assignments. In this market segment companies are usually specialised in certain destinations. To be able to offer shippers a complete package they work together with similar companies nationally as well as internationally.

- **Full Vehicle Load Transport**

  This is the transportation of one or several loads per transport for generally one client per transport.
  The accent of the operational planning here lies on gaining such an amount of assignments that the transport capacity in material and that the driver and the amount of goods transported per vehicle is optimally utilised. It is of great importance to obtain a return transport here, to be able to minimize the amount of empty kilometres.

  It is especially important to get a return load over the longer distances to be able to cover the costs.
  As the load availability can fluctuate, transport companies often swap loads to be able to achieve an optimal transport division as to distance and quantity. Large transport companies will adapt their transport capacity to a base capacity and give the remaining transports to smaller colleagues.

The operational planning activities in these companies are very complicated - the dispositioner determines the company results to a very large extent - also the administrative work is complicated because of the large number of different transports for many different clients.
Although specialisation per goods sort does occur within other sectors, one finds a very

diverse range of specialisation in transported goods within vehicle load transport (tanker transport, refrigerated and frozen transport, bulk goods transport, heavy goods transport etc.).

Combinations of the above basic types are quite common in transport companies.

It will be clear that the differences in type of transport can be of great influence on the organisation. This is also relevant for the number of personnel in comparison with the fleet. But also the content of functions, especially with regard to management functions is to a great extent influenced by the type of transport at which the company aims.

2.3 The Organisational Structure in Practice

Although in the transport industry a firm with 15 motor vehicles is already medium sized it remains, compared to elsewhere in the economy, a small firm with a staff of between 20-25 people.
In such a firm the overview is not too complicated and the director/owner has insight in and expertise of practically all activities within the firm.
Communication lines are short; the director has direct contact with all staff members and the staff members know each other. Each staff member knows his job, instructions can be short and communication lines informal.
Informal meetings with the whole staff give the director the possibility to transfer his ideas and to hear what is going on while the members can exchange views and ideas.

This makes the staff feel like a team in which everyone contributes to the firm and is a strong point of the small firm in general.

Although the demands on organisation are limited and mistakes can easily be corrected by direct communication, basic organisation principals are also valid in the small firm. Imbalance between responsibility and authority, because the director unnecessarily intervenes in task fields that were delegated to certain staff members, can be frustrating and harmful.
Improper fulfilment of basic functions, or vague lines of responsibility and authority can damage the firm and put its continuity at risk.

Short communication lines do not mean that registration and recording are allowed to

lag behind. Control of the company demands following costs, performances and revenues on their heels.

Survival of the firm demands a strong foothold in the market. This implies active marketing, including market development, improving the quality of service and extension of the package of services. In the dynamic and rapidly changing transport market continuity of the firm asks for adaption on and anticipation of developments.

Depending on the type of transport activities the organisation will differ.
A typical basic picture for a firm operating 15 motor vehicles is given in scheme 1.

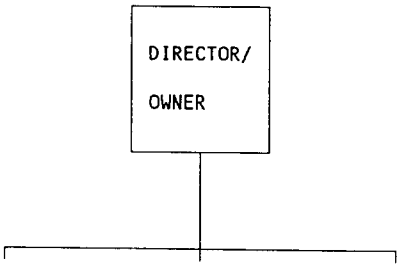
The director/owner
Although these firms have the legal structure of a limited corporation, normally the director is the owner of the shares, sometimes together with other family members.

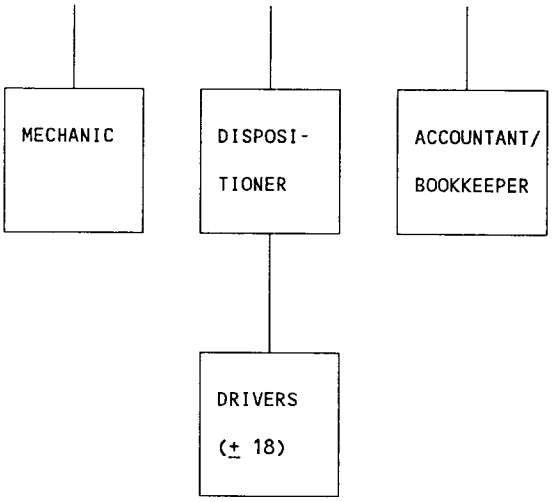
The director is engaged in:

- procurement of capital, personnel, part of the floating goods (fuel, tyres) and of financial means;
- marketing, larger transport contracts, customer service;
- overall co-ordination and control, including planning and checking.

Depending on the structure of the market and the activities engaged in the contents of these task fields will differ in volume and emphasis. The director can delegate a part of his work to the lower level. The degree of delegation is influenced by the work volume, preferences of the director, ambitions and qualities at the lower level, and to a large extend by the director's willingness to delegate.

SCHEME 1 Basic organisation structure in a transport firm operating 15 vehicles





The accountant

Elementary administrative tasks such as invoicing, keeping creditors and debtors up to date, making payments etc. are a necessity in any company. In very small companies the accent of above mentioned activities lies in the carrying out of transport assignments. Administrative tasks are limited to those that are absolutely essential and the actual administration is usually carried out by an external administration office.

When the companies get bigger a well organised administrative department is a must. The administration is then no longer just a requirement to meet the rules set by the law with regard to taxes, but a basic need to be able to control and steer the company. Insight into the liquidity, productivity, the costs and the cost price are of vital importance to the management.

With about 15 motor vehicles an accountant is practically always present but will vary from a low qualified bookkeeper to a high ranking staff member.
The tasks of daily recording and invoicing are mostly combined with the administration of personnel, fleet and stocks. Having the figures on what is going on and being in close contact with the director easily leads to involvement in planning and control of the firm.

The personal preferences of the director and the abilities of the accountant (as recognized by the director) determine to a high degree the authority of the accountant. In many firms the accountant is a key person engaged directly, or as advisor to the director, in running the firm as a whole.

As a rule the accountant is supported by an outside accountancy firm who makes the balance and profit and loss sheet, checks the records and advises on tax matters and on business administration in general.

The Dispositioner

This function lies at the centre of the firm's daily operations in direct contact with marketing and sales on the one hand and availability of fleet and drivers on the other hand.
Normally the function includes the daily management of drivers.

Occasionally there is not a separate dispositioner because of low demand and a low work volume of dispositioning. In these cases the director usually does the dispositioning.

When the operational planning becomes more demanding dispositioning becomes a separate function often entrusted to a former driver because of his insight in transport implementation.

The combination of practical transport know-how, knowledge of cost calculation and commercial feelings is rather difficult and demands talent and training. In many companies, however, the function of the dispositioner is underestimated.
The importance of this function is dependent on the type of activities the company carries out. Especially if the load offers varies per period and if besides this there are many fluctuations in the destination of the goods, much time is necessary to acquire goods to fill the overcapacity. The extra wages that go into a dense planning are earned back many times over by making sure profit yielding loads are planned far ahead of time or through the profits of 5 to 15% for incidental charters.

The Mechanic
As the director is normally engaged in procurement of vehicles, the remaining technical function is mainly restricted to maintenance and repair. More complicated maintenance and repair is, moreover, in most Western European firms left to outside workshops, who are better equipped for the job with regard to experience and facilities.

Until the 80's it was not unusual in Western Europe that each self respecting company

carried out all its repairs itself. At the beginning of the 80's especially when building new buildings, the comparison was made between investing in a new workplace/garage or contracting out the entire repair and maintenance of the fleet to the dealer against a price agreed upon beforehand per kilometre.

Arguments for contracting the work out:

- one does not have to make a large investment in a workshop and in equipment;
- especially during the day there are no costs of mechanics;
- through the technical improvements of the vehicles the number of required mechanic hours decreased steadily per 100.000 km;
- because of the technical improvements of the vehicles and the sharpening of the government's regulations, the equipment needed in the workshop was so great that contracting out a large number of repairs was necessary to improve efficiency;
- the risk of large repairs was placed with the dealer by paying a fixed sum per kilometre;
- dealers were aiming at total use of their capacity. That is why they offered weekend and nighttime service to the transporters without extra costs.

At first it seemed that there were only advantages for putting out all the repairs and maintenance, later the following disadvantages were discovered:

- the location of the dealer was usually situated a number of kilometres from the company. This cost extra variable kilometres and wages;
- when repairs were carried out by the transport company itself, a driver could be sent home whilst the truck was being repaired. When the dealer carries out the repairs the driver has to wait for small repairs to be carried out and this costs wages;
- the repair contracts are usually signed for the tractor. The trailers are therefore incidentally repaired on the basis of complaints or damage. Because of the lack of preventative maintenance the costs for repairs can increase strongly;
- the contracts with the dealers are often restricted to the motor of the tractor. Especially the body work is only minimally maintained, this does not prolong the lifespan of the vehicle. Furthermore, poorly maintained body work (paint damaged, dents and tears in canvas) will not impress (potential) clients.

At this moment the medium sized to large companies use a mix of the above

mentioned methods, where one or more mechanics carry out the minor repairs and maintenance (changing oil, services, maintenance of the body work). The large repairs (testing of brakes, revisions etc.) are carried out by the dealer for fixed prices.

So, the function of the mechanic is rather low key and consists of daily maintenance and small repairs.

The Drivers
With the exception of long distance transports that have to be carried out within a certain time limit (e.g. flowers, fruit and vegetables) the vehicles are always manned by one driver. Co-drivers are not come across that often and are usually put in for the unloading activities.

To avoid heavy physical labour as well as high personnel costs, loading and unloading has been mechanised to a high degree over the last ten years. In vehicle load transport all the loading places have been provided with the necessary unloading facilities. In distribution and transport of packaged goods the large consignors as well as the transshipment centres have loading and unloading docks, forklift trucks and other helpful equipment. If the load has a certain volume, it will be palletised or packaged in other transportable units.

Where there are no loading and unloading facilities (unloading areas for building material, destinations in distribution and groupage transport), the vehicles have been equipped with cranes, loading and unloading bridge, forklift trucks or other means to be able to deliver the goods to the appropriate place.

The restriction in working hours per week, holidays and sick leave means that the number of available hours of a vehicle is higher than those of one driver. Beside this, during the holidays and sick leave of the drivers the company must continue to transport goods. Therefore most companies will employ more drivers than the number of vehicles they have. As paying drivers who do not have work is a costly affair, drivers are often hired in on a temporary basis.

2.4 Differences in Work Force per Function

As has been explained earlier, the type of transport in which a company is active can

be of great influence on the content and number of functions within the organisation. In the following diagram the different functions of a firm with 15 vehicles and 18 drivers is shown by depicting daily tasks.

When there is less than a full day task, functions are combined, for example the director will also do the planning and/or bookkeeping, or the mechanic is also the driver.

type of transport		Function			
		general management marketing	operational planning	accounting	repair & maintenance
I	trucking	0,5	0,5	0,5	1,0
II	routed transport	0,5	0,5	1,0	1,0
III	groupage	1	2-3	2,0	1,0
IV	full carload				
	. general	1	1-2	1,0	1,0
	. specialised vehicles	1	1-2	1,0	2,0

3 PRACTICAL TIPS FOR ENTREPRENEURS IN ROAD TRANSPORT

3.1 Own Material versus Sub-Contracting

Many shippers have to deal with a varying demand for transport which has consequences on the required capacity. If the load assignments change strongly per season one can choose for one of the following possibilities.

- **Maintaining a capacity geared to the peaks in the total supply of freight.**

  The advantage in this is that one is able to undertake the entire transport with one's own equipment also when there is a peak in supply; thus ensuring quality. A big disadvantage is that one has an over-capacity when there is no peak supply. One then has to resort to the so-called open market (shipping offices, etc.) where the tariffs are generally unprofitable.

- **Maintaining a capacity geared to the lowest supply of freight from regular clients.**

  The disadvantage in this is that for a large part of the year equipment has to be hired from third parties. This hiring should be done very carefully, as the quality of the transports contracted out should not be of a lower standard than the shippers are used to. It is desirable therefore to pay reasonable rates for hired charters as this will make them more inclined to perform the required services properly. Hiring against rock-bottom prices will be at the expense of quality and will lead to the loss of clients. It goes without saying that there must be a reasonable margin for one's own haulage company (5 to 10%) to reward any extra efforts and expense. A tremendous advantage to one's own company is, apart from the profit margin on the work contracted out, that one's own equipment is fully utilized all the time and at profitable tariffs.
  Another advantage of partial contracting out is that when a regular client is unexpectedly lost, the loss can be more easily compensated by reducing the work contracted out to charters. Contracting out is specifically done by the larger companies.

The following forms of contracting out can be distinguished:

Regular charters
These are primarily single truck companies who, against rates per kilometre agreed on beforehand, perform services exclusively for the haulier company which in practice with regard to equipment show no difference from one's own equipment. They are not used for peak absorbtion, as they are constantly used throughout the year. The advantage lies in the fact that the level of costs compared to the larger companies is lower for single truck companies. Besides, if the supply of freight remains lower, they can be disposed of quicker and cheaper than one's own equipment.

Incidental charters
These are often switching charters which have to absorb peaks in freight supply.

Because of all the advantages mentioned before, contracting out all work seems the most ideal situation. However, this is not the case. When all work is contracted out, the company is no longer in control of the quality and is too dependent on third parties. Contracting out more than 50 % of the total freight supply is generally considered to be too much. Contracting out 20 to 30 % is considered to be ideal. However, this depends on the degree of seasonal patterns. Moreover, one has to be extremely careful in the choice of charters. By employing them for shippers with relatively simple work there is the danger that the charterer might try to carry out transports directly for this client. Contracting out to so-called single truck companies, which carry out just a slight part of the total operations for a client, is preferred.

3.2 Overloading

A major part of the tariff agreements is based on the number of tons transported. In this case it is lucrative for entrepreneurs if they load as many tons as possible per transport. However, the disadvantages of overloading can be great:

- fines when controlled, especially with cross border transports;
- extreme wear and tear of the equipment, which will increase the item repairs enormously;
- problems and claims from insurance companies in the event of accidents.

It is therefore important to convince the entrepreneur that overloading can only offer

short term gains and that it should therefore not be done.

3.3 Specialisation

Many companies would like to be able to oblige to every offer of work. Because of this, it may occur that companies have more than one segment of the market as their target group. This will result in fragmentation and the company will not be able to build up a strong foothold in one or two market segments. Through specialisation a company can gain an advantage over competitors by building up better knowledge of the market and of the possibilities of being able to live up to the requirements of the shippers within one market segment. Competition with prices is also lower.

3.4 Subsidiary Activities

Companies which are only into truckload transport are sensitive to under quotations by competitors because of the low added value of their package of services. In general the situation is: if the added value is significant, the tariffs charged become less important. Of course, the level of tariffs will always be important, but also the quality of the total package of services plays an important role. If an entrepreneur is able to extend his package of services beside his transport operations, this will strengthen the bond with his clients.
Some examples of such services are:

- warehousing;
- transshipment;
- accepting orders directly from your clients' clients;
- debt collection;
- stock control;
- custom clearance;
- packaging and re-packaging;
- distribution.

3.5 Choice of New or Secondhand Material

Companies are often put in the position of having to choose between investing in new or in secondhand material. The choice is sometimes already made by the limits set by the financiers on the amount to be invested, if the company does not have the funds readily available. Even if the company has a free choice in whether to buy new or secondhand, new material does not always necessarily have first priority. Especially for companies that have a relatively low kilometrage, distributed within a fixed radius around the office, second hand material can be more profitable than new material. The assurance that second hand material is productive is not necessarily less than new material whilst the possible higher repair and maintenance costs are well covered by the lower interest and depreciation costs. For tractors with high kilometrage on a yearly basis and destinations at a large distance from the office, the purchase of new material has preference over second hand material.

3.6 Development of the Company

Many starting entrepreneurs tend to adjust their capacity according to the demands made by their clients and thus have to make large investments. Financing this growth often takes place through loans of shorter duration than the time it takes to write off such an investment. The monthly payments will therefore become very high. Especially if the turnover stagnates or if clients have trouble in paying, a fast growing company can get itself into financial problems. A large number of companies has gone bankrupt because of this problem despite the fact that profits were good.
On the other hand there is a large chance that if the capacity demanded by the clients is not met, the competition will take over a part or all of the work. If the competitor already does work for the client then the chance exists that the competitor will try to gain control over the entire workload offered by the client.
Sometimes one is forced to meet the demands made by the clients event though from the point of view of financial liquidity this may not be desirable. Sub-contracting fixed charters may be a solution to this problem.

3.7 Determining Profitability per Client

To determine the profitability of each client, it is necessary to keep a (weekly or monthly) balance of the costs and profits per hour or per kilometre for that customer

during that period. On the basis of the cost prices that have been calculated beforehand a general impression can be gained. This information is necessary to be able to make the right decision in time. In general companies where the entrepreneur spends a lot of time on this kind of information have a better turnover than companies where decisions and policies are made on the basis of intuition.

3.8 Adapting Capacity

Many entrepreneurs have few problems when it comes to expanding their capacity (quickly) when the demand increases. If the demand for transport against reasonable tariffs decreases, a decrease in material is seldom taken into consideration. If the workload in one segment decreases, other market segments are scoured for loads. In a slump this is only possible by asking a price that does not cover costs. This will in its turn lead to reactions by competitors, this will not improve the profitability of this branch.

A good entrepreneur will consider a (temporary) decrease in capacity as an alternative without being afraid of harming his reputation. This will harm the turnover of the company less than if the overcapacity is put onto the free market where during a slump the direct costs are barely covered.

THE COMPANY PLAN

(951039)

Rijswijk, January 1996

CONTENTS

INTRODUCTION

The entrepreneur who wants to survive in a market oriented economy will have to think strategically, that is, he will have to aim at future developments. If he doesn't have insight into his own company, or hasn't analysed his current situation and have a clear picture of the future, this could lead to large problems. These problems could occur as a result of a swift decline due to unforeseen circumstances. However, a company can also grow too fast and through this growth have problems with liquidity. By setting up a company plan, a number of developments can be recognised and sometimes even anticipated.

1 THE COMPANY PLAN

1.1 What is a Company Plan?

A company plan is a plan which

- tells you your starting position from which you want to start planning;
- will show you a path from this starting position which you will try to follow to reach your goal; and
- will give you the means to achieve this goal.

There are always six simple questions to ask yourself when making a company plan: what, why, when, how, whom and where?
By answering these six questions each time you give an assignment, each time you receive an order and certainly in every plan you make, you will avoid communication problems. Misunderstandings and communication problems will always lead to improvisation, time loss and unnecessary costs. And as you well know, time is money! Solving problems after they have happened is marvellous, but we don't earn anything by doing this and the customer is still not satisfied.

1.2 Why do we need a Company Plan?

A resolute, efficient and purposeful manner of working is one of the most important conditions for the success of a company. Making a company plan is a useful aid to achieving this. Some reasons for this could be:

- deciding about the future now, do not leave the future to chance;
- paying systematic attention to the current situation of the company and the future developments that the company is approaching;
- clarifying the direction in which the company will go. This is important for both internal (general agreement and purposefulness) and external (financiers, clients) use;
- gain insight into what you want to achieve in the various market segments;
- division of goods and people within the company to fit the plans for the future,

instead of following the habits of the past;
- set a standard with which to measure whether the various entrepreneurial activities and the costs thereof provide the required results;

Not only can the end result of a company plan be useful to a company, but especially working on and carrying out such a plan will have an effect on the company. Working on the plan with several people from the company will increase insight, improve co-operation and clarify communication. In practice it has also appeared that being involved in a company plan has a positive influence on wanting to carry the plans out.

This manner of working can also be used to analyse and solve specific problems in one of the entrepreneurial areas named in chapter 3. Even though you may consider setting up a total company plan at this moment is not realistic or necessary, it may still be advisable to use this method for specific problems.

1.3 Approach and Methodology

This is where the questions: when, where, why and how come from.
A plan has to be carried out alongside the everyday tasks. Much of the preparatory work, e.g. gathering and analysing information will have to occur before you can set up a plan.

Before actively beginning, you must ask yourself the following questions:

- Am I able and willing to free time?
  This is necessary for the organisation and co-ordination of the tasks and planning to control the progress of the plans.

- Am I willing to involve my personnel in the investigations and in making plans?
  This is necessary as you will need their knowledge and their ideas. Also, they are the ones who will have to carry out the plan to a large extent. Co-operating in the development of the plan will result in a large part of motivation and involvement.

- Am I prepared to be open?
  An investigation of your company will show both the strengths and the weaknesses of the management. If you cannot take constructive criticism, especially if it is given by personnel, analysing the information will be very difficult.

- Am I prepared to carry out the plans that are chosen?
  If you only consider the company plan worthwhile because "others" think you need one, it is a poor starting point. You must believe in the usefulness of the plans.

If you have answered one of the above questions with"no", it may be better not to start setting up a company plan. We have learnt through experience that in such cases both you and your personnel will not put enough time and effort into the analysis and into finding a solution. The result is often unsatisfactory and everyone involved becomes frustrated and eventually demotivated.

2 INVOLVEMENT AND TASKS OF PERSONNEL

If you have answered all the questions with "yes", you will still have to determine in which manner you wish to investigate your company and make plans. You will have to start considering these two activities as normal activities that will have to take place annually. In practice it often appears that after making a company plan there is no necessity to make another one for a year or two. You can then make do with adapting a three year plan and working on a new action plan for the coming year. A prerequisite is that you have applied the investigation and planning at least once completely.

As the analysis and planning are of importance to every facet of the company, you must involve your personnel as much as possible.
One way to do this is to let the people responsible for a certain area, e.g. department heads or managers investigate their own areas first. You can also include other personnel, but stick to the rule that everyone is chosen on the basis of knowledge, insight and skills. It may be that after long and thoughtful deliberation you come to the conclusion that the skills and knowledge you require are not available within the company and that your personnel have insufficient time to carry out the extra work. It may be advisable to employ an external advisor.

After having gathered all the information per area within the company it is necessary to get all the people involved to agree on the strengths, weaknesses, threats and opportunities per area. Concentrating on the main line (outline) here is very important. By concentrating on the main issues a general impression of the company can be built up. In this phase information and opinions must be collected, no decisions have to be made! Decisions will be made later!
Many people tend to want to find solutions right away. Also fast, superficial solutions are found or excuses are made for weaknesses in the company. Beware of this; we learn from our mistakes, by analysing the possible cause and results thereof.

3 SETTING UP A COMPANY PLAN

3.1 Areas within the Company

To make things clear we have divided company activities into five different areas, these are:

- MARKET
- MONEY
- PRODUCTION
- PEOPLE
- SURROUNDINGS

To set up a Company Plan the following must be established:

- per area within the company;
  - What are our strengths?
  - What are our weaknesses?

and

- which external developments;
  - are a threat?
  - offer opportunities?

Setting up a company plan can be divided into the following steps:

1. summarize the current activities;
2. analyse the strengths/weaknesses and threats/opportunities per area within the company;
3. formulate goals and choose priorities;
4. determine a strategy;
5. set-up and carry out action plans.

3.2 Current Activities

In this first step you will make a description of your company activities in main lines (an outline).

Perhaps you think you know it all and find it unnecessary to write it down. Yet, in reality, having to answer someone's question as to what you do without being prepared can be disappointingly more difficult than you expect. By writing it down it forces us to formulate it well for once.

The best way to do this is to answer the following questions:

- What are our goals in the current management?
  For example:
  - a high profit;
  - to grow into a company with x number of vehicles;
  - growth of our company's share in the national market;
  - growth of our company's share in the international market.

- How do we see our company?
  - Our company transport goods for third parties from A to B, for as low a price as possible.
  - We provide storage and distribution for the products of our clients.
  - We provide an essential link in the production process of our clients and along with our client we keep trying to improve this process from the viewpoint of our specialisation.

- What are our most important activities currently?
  For example:
  - refrigerated transport for the food industry;
  - transport of complete loads;
  - transport in time charter for our clients.

- What are the most important reasons why we have succeeded?
  - our competitive prices;
  - our quality and trustworthiness;
  - extremely fast service;
  - our customer friendly attitude.

The answers to these questions will result in your company's philosophy. This may have been chosen consciously, but may also have developed over the years. Insight into your current philosophy offers the opportunity to determine whether or not it has to be adjusted.

3.3 Analysis of Strengths/Weaknesses and Threats/Opportunities

This analysis can be very in-depth or very superficial. The deeper you dig, the more valuable the resulting plan will be. But also, the more time and energy you will have to put into it. Be realistic and first decide what your company needs.

For some companies concrete norms can be formulated, for example, how many empty, unpaid kilometres are allowed to be made in comparison with loaded kilometres? For other companies they can not be described so precisely. In these cases a qualitative estimate on the strengths and weaknesses of a the company processes would have to be made by yourself.

It is also possible to compare your company with the developments in the branch. Do not waste too much time on whether the answer should be good or very good, or weak or very weak. We only want the main line (outline). The important thing is whether it is a strength or a weakness!

In this phase you must also describe which threats and/or opportunities are likely to arise within the next 3 years. This counts for both internal and external developments.

Once the required information has been gathered, you have to determine the factors that may prove critical to or provide opportunities for the further development of the company, the so-called key factors. These may be internal or external factors. To determine whether or not a factor is a key factor, you could, for example, look at what would happen if the management remained unchanged. If you have made this estimate you can judge whether or not the results are satisfactory.

In any case the analysis will give you a good insight into:

- What is possible: opportunities, strengths and new ideas;
- What has to be done: threats, weaknesses and the necessity of changing in time.

4 FORMULATING GOALS AND OBJECTIVES

4.1 Formulating Objectives

Once the analysis has been made, you can choose from two alternatives:

- continue in the manner to which you are acquainted with some adjustment in minor areas, or
- set up a new policy for the entire company or for important parts thereof.

Whichever you choose, you must be clear and definite in formulating what you want to achieve.

Objectives provide a guideline for the actions of your employees and yourself. By using the objectives they can continually check whether they are making the right choices, and whether they are on the right track and if so how far along they are etc.
For each company area separate main goals must be formulated. With the exception of the area "Market" preferably not more than one main goal per area. More than one goal can lead to unnecessary detail or to wanting to do too much at once.

From the analysis, which gives insight into what is possible and what has to be done, it usually appears that there are more than one possibilities for the future. When choosing from these possibilities, when determining the main goal, you must take the following criteria into consideration:

- Eagerness
  The future activities (also those per area within the company) must be attractive to your employees and yourself, otherwise getting started will take a lot of effort.

- Profit
  Making a profit is a necessary prerequisite for the continuity of a plan. On the one hand to give the shareholders fair payment. On the other hand to strengthen the own capital of the company if, for example it is a growing company or if their is an uneven relation between the own capital and money from outside.

New activities must contribute to profits. When this has to take place depends on the financial situation of the company.

- Philosophy
  The new activities must be in line with the current company philosophy. This does not mean that the philosophy must never change. It does mean that you have to ensure a supple change, during which you must not put aside old factors which have been used successfully in the past too quickly.

- Feasibility
  The new activities must be realistic and attainable. This is, among others, determined by the degree to which the activities are in keeping with:

  - the current company processes;
  - the knowledge and skills that are available;
  - the financial means that are available;
  - the present organisation.

Another important question is whether the new activities do not involve extremely high risks.

From the analysis it may appear that the activities of the company, the production process, must be adapted in more than one area. We often tend to want to do everything at once. Usually this approach does not succeed. This is because we loose the overall view and can no longer see the connections, because production has to continue or because there is a limited amount of manpower that can be utilized for change.

We must make priorities.
When doing so you could be guided by various considerations, for example:

- a major problem is directly taken care of because this is very important for the continuity of the company;
- you start with a less important aspect, because the person who has to carry out the solution has time to do so;
- you start with a less important aspect because in this way everyone who is involved in the project can get used to the manner in which the work will be done.

When making your choice it is important to take into consideration how much your employees can handle, whether they have the capacity to do so, whether they have experience in this manner of working, or even whether they are prepared to work on a project. Sometimes people are rather sceptical about the use of the changes or the manner in which they will have to work. A short project with immediate results can motivate people trmendously.

5 SETTING UP A STRATEGY AND ACTION PLANS

5.1 Strategy

Determining a strategy means paving the way along which you want to realise your goals. "All roads lead to Rome" is the saying. It is up to you to chose which way is the most acceptable or the most feasible. If you don't do this, you could risk coming across unexpected road blocks, or you may be distracted by a road to another destination, equally nice but which turns out to be a detour.

When determining a strategy the following must be taken into consideration:

- which products do we want to bring on the market;
- which market segments do we want to work in;
- what is our fixed price;
- are we going to compete with prices or with quality;
- will we grow autonomously or will we take over other companies;
- what profit is our goal to be able to achieve our goals.

If you have formulated your objectives well, set your priorities and finally, chosen the right strategy, you will be able to determine the means you will need quite specifically.

5.2 Action Plans

If you have used this method for a specific problem, you can suffice with an action plan to solve that particular problem. If a complete company plan is wanted, you will have to make several action plans. The best way to do this is to make an annual work plan in which the various action plans that are to be carried out that year have been taken up.
You will then set up a specific action plan per action area.

An action plan must always contain:

- the goal per action area;
- a description of the actions to be taken;
- the (estimated) costs to be able to carry out the plan;
- start and finishing date;
- name of the person responsible.

ORGANISATIONAL ASPECTS IN ROAD TRANSPORT

(951037)

Rijswijk, January 1996

CONTENTS

1 BASIC PRINCIPLES

1.1 Organisation as a Basis for Co-ordination

The successful operation of a firm depends on a large number of qualities, such as for example:

- entrepreneurial flexibility
- knowledge of markets and marketing skills
- adequate staffing; the right man in the right place and motivation of the personnel
- calculation, accounting and information facilities
- adequate planning know-how

Even if all these requirements are met the firm can only function properly if there is adequate co-ordination between all the activities necessary to produce the goods or services and to sell them to the market.

This co-ordination has to be formalised in the way in which the firm is organised. In the organisational structure all activities to be performed within the firm are grouped into fields and allocated to departments, sub departments, groups and individual persons.

The organisational structure implies:

- definition of task fields
- allocation of tasks, authority and responsibility in accordance with the fields defined
- ranking of authority and responsibility
- communication channels

The organisational structure constitutes the framework for co-ordinated action. This structure has to be supplemented by procedures that detail:

- task description/job description (what to do)

- task/job procedures (how to do it)
- communication procedures

In a stable predictable situation task descriptions and procedures are well defined and communication can be kept to a minimum.

In rather unpredictable situations, as in road transport, the concrete tasks emerge from day-to-day operations. Task descriptions and task procedures will still be important but the precise action to be taken will depend on the operational situation. The heavy burden of co-ordination then lies on communication in order to respond rapidly to the situation of the moment through co-ordinated action.

Organisational structure and task descriptions and procedures are the static part of the organisation, whereas communication is the dynamic part.

From the general demands on the organisational structure some basic rules can be derived:

- The organisational structure has to be complete. For every activity there has to be somebody who is responsible and who has this activity within this area of responsibility.
- The organisational structure has to be logical. The tasks combined for a group, sub department or department should possess logical coherence so that the persons responsible can control the areas for which they are responsible.
- A balance between authority and responsibility is imperative. A person cannot be responsible for activities beyond this authority.
  Authority that goes beyond responsibility leads to wrong decisions and to apathy on the part of those who are actually responsible.
- The organisational structure should make maximum use of those qualities which the firm's staff possess.

As will be seen later on however, the organisational structure has to cope with conflicting requirements. Therefore there is no such thing as an "ideal" organisational structure.

2 BASIC FUNCTIONS AND THE FIRM'S PROCESS OF OPERATION

2.1 Primary and Secondary Functions

Independent of the nature and size of the firm a number of functions to be fulfilled can be distinguished, as indicated in figure 1.

Most of these functions are directly needed in operating the firm. Facilities, complementary goods and services, labour and financial means have to be procured and kept available in order to produce the good or services for the market. The goods/services - to be - produced have to be sold. After sales invoices have to be made, debtors and creditors, as well as resulting incoming and outgoing money flows have to be recorded. These functions are directly connected with the firms running process and are called "primary functions".

However, to have these functions carried out effectively it is not enough that they are fulfilled within the firm, they also need to be co-ordinated. Without co-ordination chaos would exist.
This co-ordination implies:

- planning in advance in order to have clear directions for action
- organisation; who is responsible for which actions?
- checking; are actions carried out properly and what are the results?

Figure 1 Basic functions

Primary Functions

A Procurement of:
- facilities (investment goods)
- floating goods and services
- labour
- finance

B Operational availability
- maintenance of facilities
- stock-keeping floating goods
- training of personnel
- funds available/funds needed

C Production of (transport) services

D Marketing and Sales

E Accounting

Secondary Functions

Co-ordination
- planning
- organisation
- checking on implementation and results

3 ORGANISATIONAL CONCEPTS

3.1 Levels in the Organisation

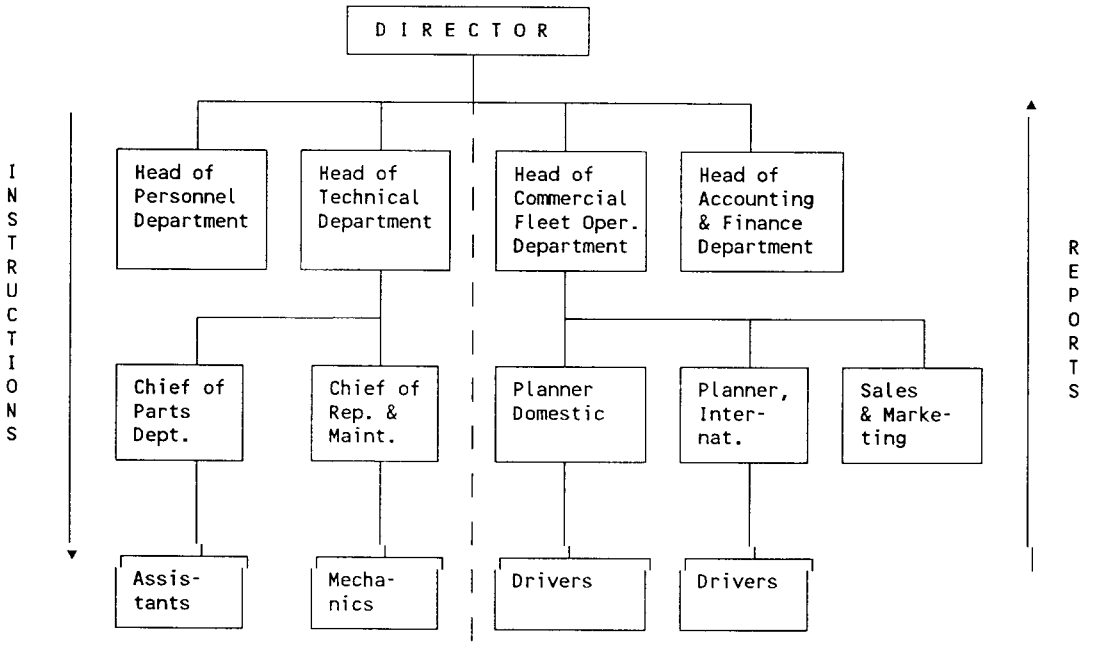
In a one-person firm all activities are carried out by one person and there is hardly any problem of co-ordination. As a firm grows larger the activities have to be divided up in a consistent manner and assigned to staff responsible for implementation. In yet larger firms, a situation soon emerges where a person at the top cannot directly control all these people in charge of implementation.
Task fields have to be combined under managers, subordinated to the general manager, controlling the implementation within these task fields. Further growth leads to sub-division of these task fields with those in positions of responsibility being subordinated to the manager of the task field (figure 2).

Levels in the organisation emerge because there are limits to the extent to which one person can exercise control, as regards:

- the number of subordinates to check up on
- the number of details to master
- the number of checks to be effected

The establishment of levels is an answer to these limitations, but has severe drawbacks. The length of the communication channel from senior management to those actually responsible for implementation is prolonged, involving a number of persons.
This prolongs the reaction time and makes it possible for information to be distorted, which results in inadequate responses.
Moreover, the line of communication between different departments implementation level twice as long. Direct communication at lower levels can diminish the latter problem but increases conflicts with the formal lines of command and checks on implementation at the top level.

Figure 2 Levels in the organisation; co-ordination by instructions downward and reports upward



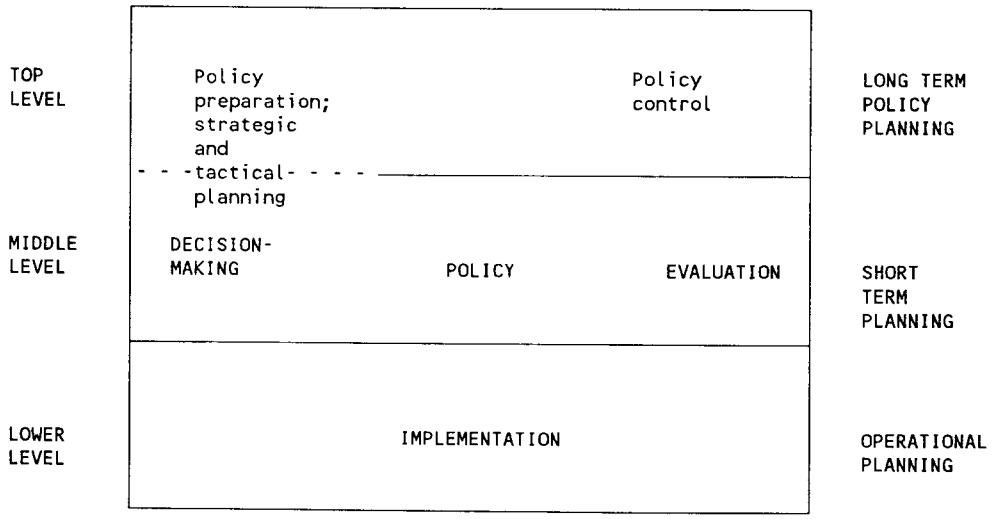
3.2 Phases in the Policy Process at the Different Levels of Organisation

In the firm's policy process the following phases can be distinguished:

i policy preparation (planning)
ii policy decision
iii policy implementation
iv policy control
v evaluation of implementation in the light of the plan

Figure 3 shows how the phases in the policy process are reflected at the different levels of the organisation:

Figure 3 Relative importance of: policy preparation, policy implementation and policy control at the different levels of the organisation



At the top level the emphasis is on planning and checking. Moreover, when it comes to planning, senior management is engaged to a high degree in medium and long term planning.

Implementation is only a small part of the work of senior management, but nevertheless an important one:

- deals with bankers and other financiers
- deals involving large contracts
- corrective action with regard to middle management, etc.

At middle management level, planning and checking still make up a considerable part of the job, but the emphasis in planning moves from the long term to the medium term and especially to short-term planning.

The implementation side of the job, however, becomes much more important, for instance:

- deals involving contracts
- assignment of personnel
- developing maintenance concepts and programs
- formulating requirements for new vehicles
- training, training schemes, etc.

At the lower level, operational planning is an important part of the job but the emphasis for foremen and operating personnel is clearly on the implementation of activities.

3.3 Line and Staff Functions

In order to produce and sell transport services one can imagine a structure entailing various levels in the organisation with a command line from top to bottom.
All activities at these levels are assigned and monitored by the senior manager as shown in figure 2.

The burden of planning, co-ordination and supervision however soon becomes too heavy for one person at the top level and as the firm increases in size the same holds for the "second-in-command" and middle levels of the organisation. Enlarging the number of persons responsible per level is no solution to this problem. It conflicts with the need for one responsible person per area of responsibility and will make co-ordination impossible.

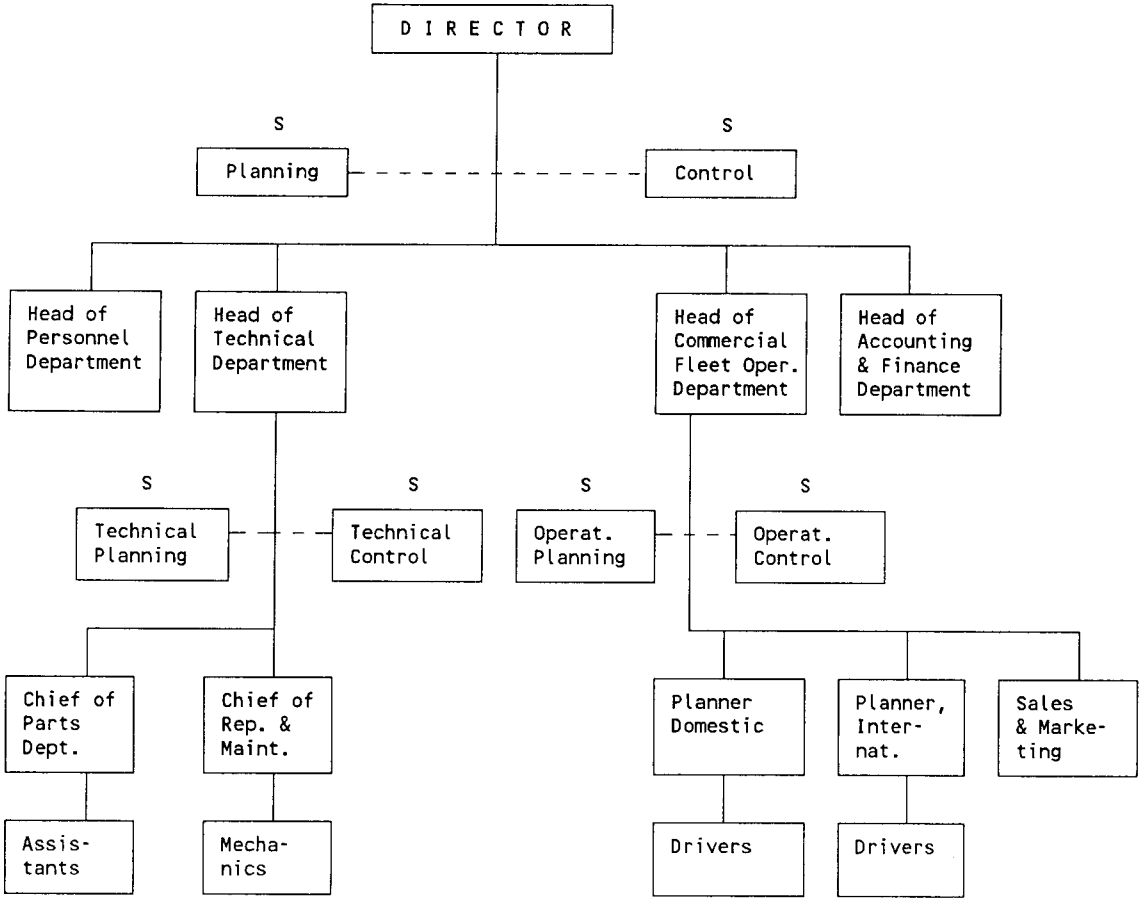
To overcome these problems, staff functions are created. Staff advisors/departments can take over the burden of planning, registration and control from line managers. It should be stressed however that they advise the line manager, who remains responsible for taking decisions. In principle the advisers have no authority over line manager at lower levels.

The structure of line and staff departments is depicted in figure 4. The main tasks of staff departments lie in the field of planning, monitoring and checking but without line authority.

In figure 4 the accounting department and the personnel department can be regarded as staff functions.
The accounting function for example primarily consists in collecting information and presenting it with such frequency and in such detail as is needed at the different levels. In that respect it is a staff function.

The same holds true for the personnel department when it comes to supplying staff to advise on training, etc.

Figure 4 Line and staff functions



Staff function lines indicated by S.

These departments also act as staff departments when they draw up rules on registration and reporting or on labour conditions and training which are passed on by the director.
However, the limited control which the director can exercise in person often leads to formal or informal delegation of authority on the latter subjects to the heads of these departments with the danger of unclear lines of command.

3.3.1 Functional Division

As regards the departmental structure of the organisation the obvious solution seems to be to establish departments in accordance with the functional skills needed and their relative weight in the activities within the firm (figure 5).

In a transport company this could for instance lead to:

i a transport operations department, responsible for:
- marketing and sales of transport services
- fleet operations, including the operational planning of vehicles and drivers

ii a technical department, responsible for:
- maintaining the fleet in operational condition
- planning of mechanics and technical facilities

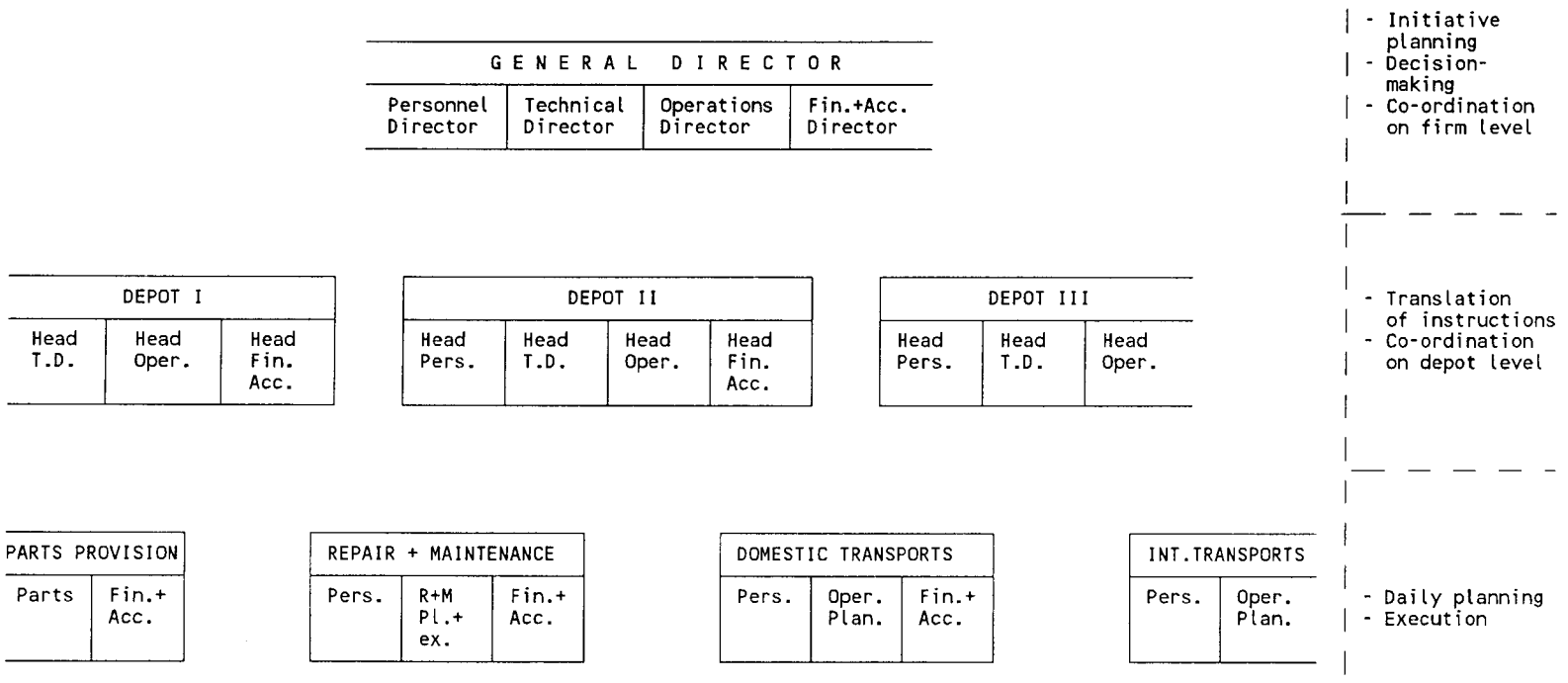
iii a finance and accounting department responsible for:
- proper procurement of financial means
- accounting
- financial and operational control
- purchasing

iv a personnel department, responsible for:
- negotiating terms of employment
- recruitment and training of personnel
- social security and other matters affecting the well-being of the personnel

These departments function under the overall responsibility of the director general.

The skills required per department differ in line with this functional division and can be adapted to the level in the organisation.

Figure 5 Functional division



The departmental division along functional lines of command has the advantage of ensuring the input of adequate skills for the different functions. Moreover it secures optimal co-ordination between the different functions at the top level.

Nevertheless this functional organisation has serious drawbacks. The co-ordination of activities beyond the boundaries of the departments at lower levels is seriously endangered.

The organisation is rigid and cannot respond to changing situations whether internally or externally. The built in tendency towards bureaucracy is demotivating and reinforces the tendency for the organisation malfunctioning.

The drawbacks of a functional division become more serious as the situation becomes less predictable.

A government owned public transport agency/firm with services scheduled ahead and stringent regulations on task performance and procedures can afford to place more emphasis - or needs to place more emphasis - on functional division than a self-supporting firm active in non-scheduled transport of goods.

3.3.2 Operational Division

The demand for co-ordination beyond the boundaries of the functional departments becomes evident in a firm with geographically separate locations.
Nevertheless even if activities are concentrated in one location the problems of horizontal co-ordination as a whole. These problems become more pronounced the larger the firm is (more levels) and the less predictable the situation is.

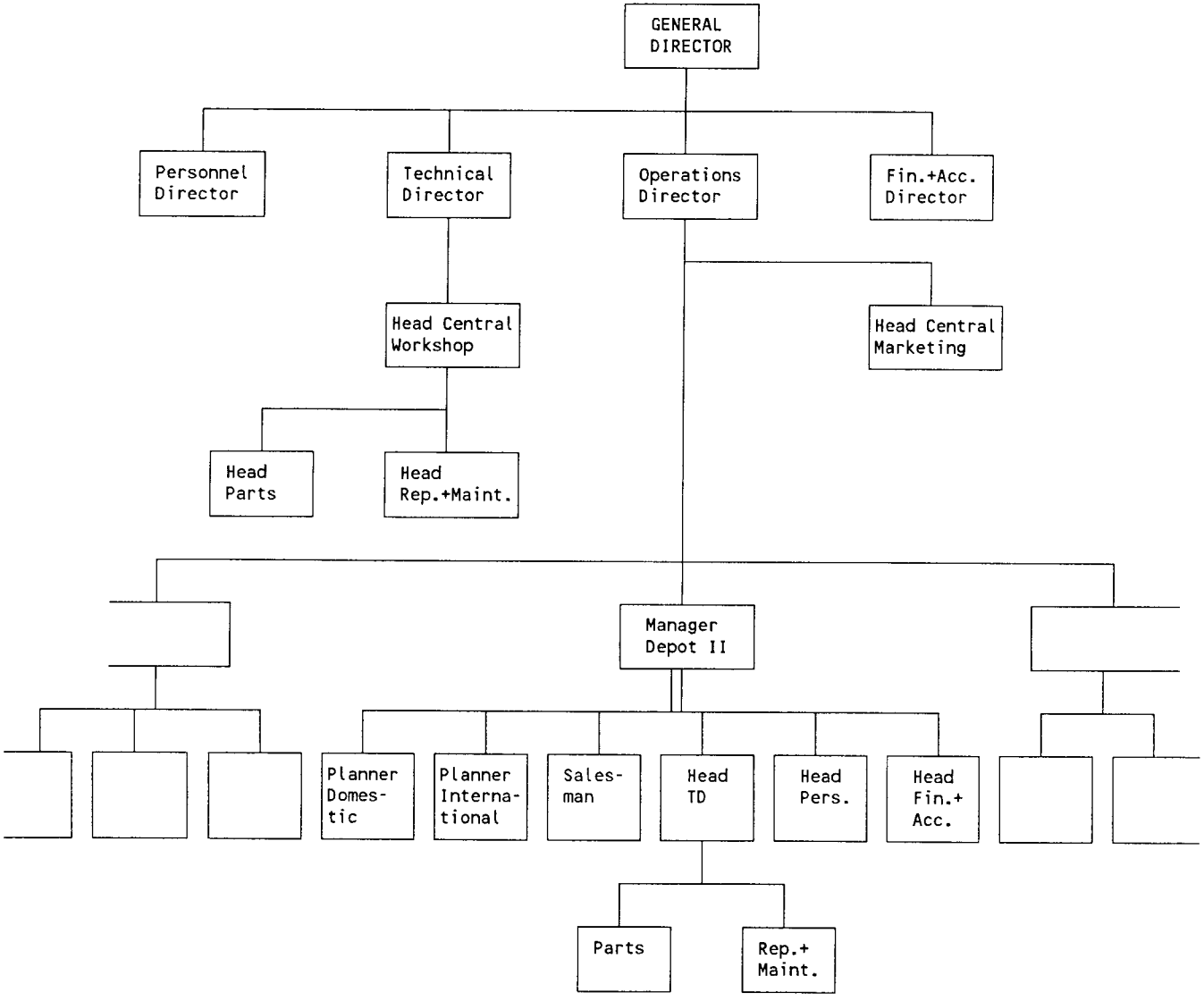
The answer to the problems of horizontal co-ordination seems to be a division of the organisation into operational departments/units (figure 6). Such a division can be made on the basis of location, type of transport, or another grouping of the firms external activities. If one operational manager is responsible for all functions, co-ordination beyond functional boundaries is secured.
Under this system the other functional heads are reduced to advisers.
The drawbacks of this operational structure, however, are immediately evident in comparison with the functional structure (figure 5), i.e.:

- the recruitment and employment of people with a high level of functional skills is hardly possible, or at least severely hampered

- functional co-ordination between the operational units is practically wiped out

In practice neither of the two divisions can be applied in a pure form, and compromises have to be searched for. The drawbacks of a functional division can be diminished by instructions along functional lines that leave some room for horizontal co-operation at lower levels. Making somebody responsible for horizontal co-ordination within the remaining room for manoeuvre can further diminish the drawbacks of a functional division.
Under the operational division, authorising functional heads to give instructions in their field can diminish the drawbacks of an operational division.

Figure 6 Operational division



The question may arise as to the utility of the distinction made when in practice the organisational structure will lie somewhere in between.
Apart from the awareness of the advantages and drawbacks of both divisions a firm has to decide where the emphasis in organisation should be placed.
Moreover such a decision cannot be made on general principles but has to be made on the basis of the situation within the firm and its environment.

3.4 Centralisation versus Decentralisation

Although the abovementioned theme becomes highly relevant in firms with geographically separate locations, opposition to delegation of initiative and authority exists in every organisation at all levels.

Centralisation means that delegation of authority to lower levels is kept to a minimum. Power to take decisions is concentrated at the highest possible levels.
Decentralisation, to take the other extreme, means that maximum initiative and authority is moved downwards in the organisation.

Neither approach can ever be applied 100%; every organisation will contain elements of centralisation and decentralisation but the emphasis on either of them can differ considerably.

The difference between centralisation and decentralisation of initiative and authority is closely linked to the different approaches of functional and operational organisation.

The advantages of a functional division can be strengthened by returning initiative, whereas the disadvantage can be diminished by delegation of initiative. More initiative at lower levels creates better opportunities for horizontal co-operation.
The case for operational division - i.e. horizontal co-ordination at lower levels, calls for delegation of initiative in order to provide scope for co-ordinated action in response to the actual situation.
On the other hand the endangered overall co-ordination can be strengthened by selective centralisation with regard to items that are vital for the firm as whole.

The advantages and drawbacks of centralisation and decentralisation parallel those of functional and operational division to a high degree. Decentralisation strengthens flexibility and motivation, but at the expense of controllability by higher levels, whereas centralisation has the opposite effect.

Centralisation and decentralisation therefore have to be regarded in combination with the basic division within the organisation. In finding a balance between centralisation and decentralisation two elements have to be considered, namely not only how much initiative should be delegated or be moved downwards, but also in what fields initiative should be delegated.

Given the restrictions inherent in functional fields the case for centralisation and decentralisation will differ according to the actual situation. Some factors influencing centralisation and decentralisation are mentioned below.

- The nature of the firm
  In a state-owned firm, which may well be supported by monopolies or subsidies, state control often calls for centralised control within the firm. This is all the truer if the state sets standards as to costs and performances.

- The operational process
  If the operational process is stable and predictable and calls for little high-level expertise, there will be considerable advantages in centralisation. If the operational process is unstable and unpredictable the case for decentralisation is strong, especially if the expertise directly needed for operations can be made available at operational level.

- Division of departments primarily on the basis of functional units or operational units
  Where functional skills are essential and scarce the tendency will be to stress the organisational emphasis on functional skills. The less the emphasis is on functional skills or their scarcity the more it will be on operational skills and so on decentralisation.

- The educational level of employees at the lower levels of the organisation
  As mentioned before the expertise needed influences the scope for decentralisation. The basic level of education plays a role in obtaining this expertise. Training programs are important in every organisation but possibilities partly depend on the basic education of those to be trained.

- The culture within the firm
  Often locally influenced, employees in one company may be eager to participate in decisions and to bear responsibility, whereas in other organisations there may be unconcern about participation in responsibility.

The attitude of management towards delegation of authority has a strong effect on the attitude towards participation in responsibility at lower levels.
Another important factor is the motivation of employees. In the case of road transport and especially road haulage it will be clear that a strong emphasis on decentralisation is imperative. The planner cannot wait until he gets permission from a higher level to accept an assignment and to allocate it to a driver and a vehicle. The opportunity may be lost and/or capacity may be idle unnecessarily.

3.5 Ranking of Functions

Apart from the rare occasion when a purely functional division is appropriate, a operational division with more or less authority at operational level will be necessary. At the same time the question then arises who, with this operational division, is in command.

The question which function is most vital at a certain level must then decide the ranking of functions at that level.

In road transport the production function is to produce transport services and the actual production department is "fleet operations", and given the fact that "fleet operations" lie closer to the market then the technical department (TD) and the personnel department (PD), "fleet operations" should have the lead over both departments. This however should be subject to the constraints established by the functional authority delegated to TD and PD, which are responsible for functional co-ordination in fields.

4 ORGANISATIONAL SUPPORT STRUCTURES

4.1 Job Descriptions and Procedures

The organisational structure is the skeleton of the firm's operational structure, but in itself it is not enough to make it function.

Part of the organisational structure is a job description per department, sub department, group and employee; without such a description the organisational structure is void. The degree of elaboration of this description depends on the kind of tasks involved and the size of the organisation.
Besides the job description, procedures blow life into the organisation. These procedures imply instructions on how to do the job and also on communication, forms and channelling of communication.
The question who reports to whom, who instructs whom, who informs whom and through which channels is by and large already formalised in the organisational structure and the job description.

The next step is to formalise these communications as to:

- means of communication
- form in which instructions, reports and information are to be passed on and when to report and when to inform
- those involved
- further processing and by whom
- what action to be taken by whom

These communications, whether consisting of instructions, reports of information, will differ as to level and organisational unit per level.

4.2 Committees, Informal Organisation

Channels of communication and procedures, whether oral or written, have the limitation that they concentrate on the problems at hand. In order to achieve optimal use of the firm's possibilities, mutual understanding at the planning phase is of great importance. The establishment of committees can greatly contribute to this mutual understanding and co-ordinated action.

An example of such a committee is the management team, consisting of the general manager and the main functionally and operationally responsible managers. Such a management team is not only important for co-ordinated action, but can prepare actions and arrive at decisions. Nevertheless such a management team does not absolve the general manager of his responsibility for final decisions. Furthermore committees at staff and operational levels can contribute to improved functioning of the relationship between employees at these levels. Committees at the same level can impose co-ordination between the different functions involved.

Regular meetings between managers/heads and their personnel can improve the flow of information to lower levels and enable those in charge to explain policy and motivate their personnel.
Such meetings do not in fact entail decision-making but mainly involve a mutual exchange of information.
In addition to the formal organisation an informal organisation based on personal contacts emerges, which is an important complement to the organisational structure. It smooths contacts and communications.

One should however beware of the danger that the informal organisation may lead to sub-goals that contradict the firm's overall goals.

4.3 The Budgeting System and Additional Management Information

The budgeting system is a powerful tool for use in planning and for making planning concrete by means of quantitative figures.

However, the budgeting system also has other functions in the organisation. First of all it is a means of communication. In order to arrive at final budgets by means of a planning process which proceeds to the desired result from a master plan via detailed planning for lower levels and via proposals in the opposite direction, use can be made of the budgeting process to secure intensive co-ordination at all levels in the firm.

As the budget constitutes instructions to those responsible for the different areas of responsibility, in the next phase it serves as the norm for checking implementation in the light of plans. By reporting along the lines of the detailed budget, implementation can be directly evaluated in this way.
In large firms a special controller function is introduced to ensure that implementation is in line with the budget.
The same limitations that hold for accounting hold or the budgeting system as a monitoring tool. There is a time lag and it is not designed to detect deviations on points of detail.

Additional management information systems that do not replace the budget system but complement it can overcome these limitations. Deviations are detected soon after they occur, if not immediately, which makes it possible to intervene and to take corrective action as soon as possible.

5 ORGANISATION PRACTICE IN THE SMALL FIRM

5.1 Introduction

Although in the transport industry a firm with 15 motor vehicles is already medium sized it stays, related to elsewhere in the economy, a small firm with a staff of about 24 persons.
In such a firm the overview is not to complicated and the director/owner has insight in and expertise on practically all activities within the firm.
Communication lines are short; the director has direct contact with all staff members and the staff members know each other. Every member knows his job, instructions can be short and communication lines highly informal. Informal meetings with the whole staff give the director the possibility to transfer his ideas and hear what is going on while the members can exchange views and ideas.
This makes the staff feel like a team in which everyone contributes to the firm and is a strong point of the small firm in general.
Although the demands on organisation are limited and mistakes can easily be corrected by direct communication, basic organisation principals are also valid in the small firm.

Imbalance between responsibility and authority, because the director unnecessarily intervenes in task fields that where delegated to certain staff members, can be frustrating and harmful.
Improper fulfilment of basic functions, or vague lines of responsibility and authority can damage the firm and put its continuity at risk.

Short communication lines do not mean that registration and recording can lag behind. Control of the company demands to follow costs, performances and revenues on the heels.

Survival of the firm demands a foothold in the market. This implies active marketing, including market development, improving quality of service and extension of the package of services. In the dynamic and rapid changing transport market continuity of the firm asks for adaption to and anticipation on developments.

5.2 The Basic Organisation Structure

Depending on the type of transport activities as specialisation, markets served, number of clients and/or principals the organisation will differ.
A typical basic picture for a firm operating 15 motor vehicles is given in figure 7.

The director/owner

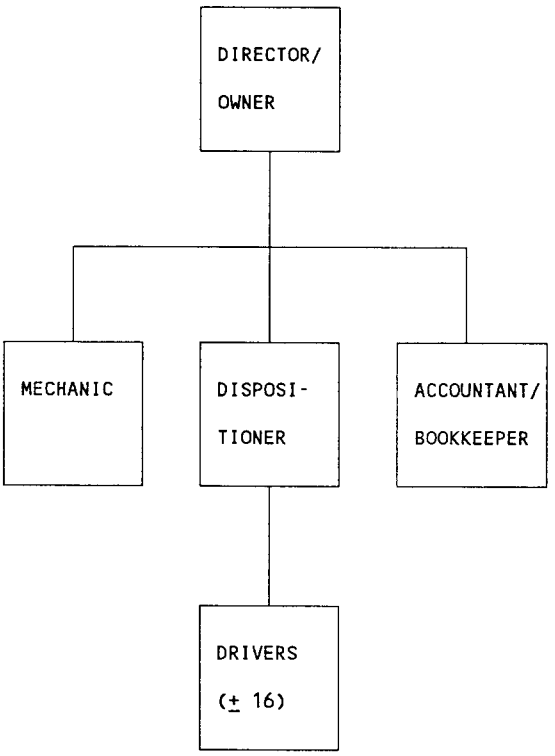
Although these firms have the legal structure of a limited corporation, normally the director is the owner of the shares, sometimes together with family members.

The director is engaged in:

- procurement of capital goods, personnel, part of the floating goods (fuel, tyres) and financial means
- marketing, larger transport contracts, customer service
- overall co-ordination and control, including planning and checking

Depending on the structure of the market and the activities engaged in the contents of these task fields will differ in volume and emphasis. The director can delegate a part of his work to the lower level. The degree of delegation is influenced by the work volume, preferences of the director, ambitions and qualities on the lower level, and to a high degree by his willingness to delegate.

Figure 7 Basic organisation structure in a transport firm operating 15 vehicles



The accountant

An accountant is practically always present but varies from a low qualified bookkeeper to a high ranking staff member.
The tasks of daily recording and invoicing are mostly combined with the administration of personnel, fleet and stocks. Having the figures on what is going on and being in close contact with the director easily leads to involvement in planning and control of the firm.

The personal preferences of the director and the abilities of the accountant (as recognized by the director) determine to a high degree the authority of the accountant. In many firms the accountant is a key person engaged directly, or as advisor to the director, in running the firm as a whole.

As a rule the accountant is supported by an outside accountancy firm who makes the balance - and profit - and loss sheet, checks the recordings and advises on tax matters and on business administration in general.

The dispositioner

This function lies at the centre of the firms daily operations in direct contact with marketing and sales on the at one hand and availability of fleet and drivers on the other hand.
Normally the function includes the daily management of drivers.

Occasionally there is not a separate dispositioner because of low demand on and a low work volume of dispositioning. In these cases the director mostly does the dispositioning.

When the operational planning becomes more demanding the dispositioning becomes a separate function often entrusted to a former driver because of his insight in transport implementation.

The combination of practical transport know-how, knowledge of cost calculation and commercial feelings is rather difficult and demands talent and training. In many companies, however, the function of the dispositioner is underestimated.

The mechanic

As the director is normally engaged in procurement of vehicles, the remaining technical function is mainly restricted to maintenance and repair. More complicated maintenance and repair is, moreover, in most firms left to outside workshops, who are better equipped for the job in experience and facilities.
So, the function of the mechanic is rather low key and implies the daily maintenance and small repairs.

This low key technical function is closely connected to the strongly increased quality of vehicles produced, and the abundant availability of outdoors technical services.
In developing countries with poor road conditions, worn out vehicles, or vehicles not adapted to the local conditions and restricted availability of outdoor services the technical function is much more important.

The drivers

With the exception of long distance transports that have to be carried out within a certain time limit (e.g. flowers, fruit and vegetables) the vehicles are always manned by one driver. Co-drivers are not come across that often and are usually put in for the unloading activities.

The restriction in working hours per week, holidays and sick leave means that the number of available hours of a vehicle is higher than those of one driver. Beside this, during the holidays and sick leave of the drivers the company must continue to transport goods. Therefore most companies will employ more drivers than the number of vehicles they have. As paying drivers who do not have word is a costly affair, drivers are often hired in on a temporary basis.

MARKETING FOR THE ROAD TRANSPORT SECTOR

(951041)

Rijswijk, January 1996

CONTENTS

1 THE MARKETING CONCEPT

> "Marketing for transport is solving the transport problems of shippers in a profitable way."

It is therefore important to think from the market's (that is the shipper's) point of view. The shipper has transport problems which have to be solved. It not only concerns transportation of goods. A flexible attitude is also expected of the transporter with respect to loading goods, delivering goods at requested times, the use of proper equipment, etc. The efforts made by the transporter must lead to a better result than when he would do it himself. It must be attractive for him to contract it out. It should not only cost money, it also should bring money in.

A good balance between demanders and suppliers provides a good relationship, which is in the interest of both parties, and with as a common result a higher profit.

It is possible that marketing is regarded and dealt with as if it were "a box of tricks", in the sense that customers are made to buy things they don't actually need. Although marketing does have some of these "tricks" in store, it is a fact, which certainly applies to transport, that a customer is only a customer if he is content for a long period of time and continues to buy. Then the usage of tricks does not come under discussion.

2 THE MARKET

The market and its opportunities are the "the point of departure" for every professional transporter. Therefore it is necessary for each transporter to have a good insight into these market opportunities. It would be ideal to have knowledge of:

1. the present size and structure of the market;
2. changes that will occur in the future;
3. the wishes, needs and buying-motives of all customers and prospective customers;
4. the company's own market position with respect to its competitors'.

It is impossible to obtain all necessary information about markets, customers and competitors. Fortunately it often suffices to have a restricted amount of data. It is, however, necessary to have at least some insight in the above four categories.
Having many figures about the market without an insight in buying-motives and the company's own strength and weakness does not give a good picture and is not a proper basis for the company's own marketing policy.

2.1 Market demarcation and segmentation

A good description of the market on which is focused and the various groups within it, is of the utmost importance. The more distinctly the markets are described and demarcated, the more specifically they can be worked on. For the professional transporter the market may be demarcated per:

- **area:**
  local, regional, national or international;

- **kind of goods:**
  The fleet of lorries and/or the experience of the company are generally a reason for specialization in a certain product.

- **kind of buyer:**
  - branch;
  - size;
  - availability of a fleet of lorries of their own and/or transport department;
  - import and/or export orientated companies;
  - etc.

Criteria for market segmentation

Applying segmentation can result in the formulation of target groups. With the help of segmentation one pursues the following targets:

- working specifically on shippers;
- being able to offer specific solutions for transport problems;
- being able to develop measurable marketing activities;
- spreading of risks (sometimes);
- arriving at product/market combinations, in which special transport services are related to specific needs of shippers.

In order to carry out segmentation successfully, one must meet a number of conditions. Segments should:

- be large enough;
- differ enough;
- be recognizable;
- be attainable.

2.2 Market Research

Market research

Market research can be described as "collecting and analyzing data through which better founded decisions can be made with regard to marketing policy".

Before starting, the problem should first of all be clear. What does one want to know precisely? To what questions does the entrepreneur want an answer? Next comes the question, as to how one can obtain the necessary information?

Each investigation into the market starts with the inventory of data that one's own company possesses.In practice it appears that the company disposes of more information than the entrepreneur is aware of. In the "heads and drawers" of the employees are many facts that remain unused.
The planning departments and the drivers will have much data about customers. If the

employees are capable of receiving signals and collecting market data and of passing them on to the management, this will already lead to a reasonably good insight. Generally, desk research and field research are distinguished.

Desk research

This concerns information which can be obtained from behind the desk.
For example:

- from the company's own administration
- from publications by interest groups, if available.

Field research

If desk research supplies insufficient information the entrepreneur can investigate the market, amongst others, by means of surveys (oral, written, by telephone)
Especially by means of oral survey it is possible to get to know facts and opinions which might be important for the company.

2.3 Developing a Marketing Strategy

One of the most fundamental aspects of developing a marketing strategy for a company is to ensure that the company's capabilities are matched to the market environment in which it operates. This involves assessing the company's strenghts and weaknesses (your marketing assets) and the opportunities and threats facing it (external factors which will affect the use of your assets. This is known as a SWOT analysis.

Strengths	:	Why do our customers use our services?
Weaknesses	:	Why do people go to our competitors; what can be improved?
Opportunities	:	Is the market for our services expanding; are there new or related services we can offer?
Threats	:	Who are our (potential) competitors; what are possible external threats?

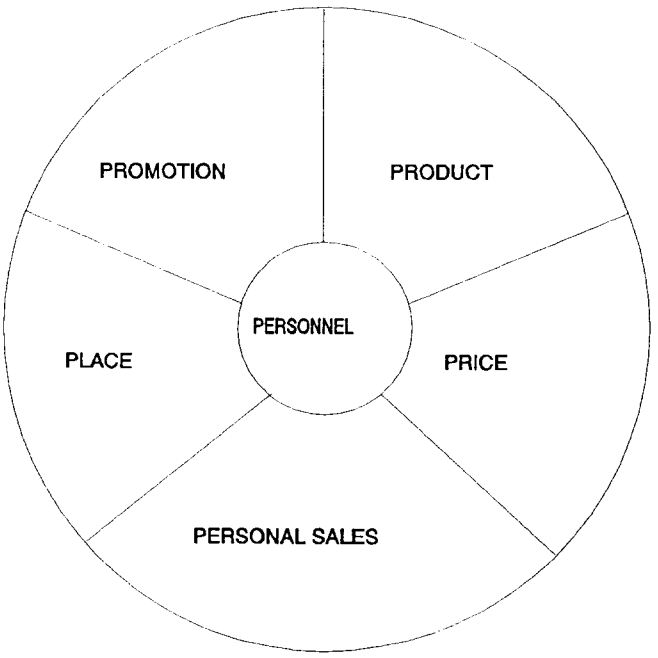
3 THE MARKETING MIX FOR TRANSPORT

The following belong to the marketing mix:

- price
- product
- promotion
- personal sales
- place
- personnel

These are called the six P's. Together they form the marketing-mix. In the following diagram these means are presented together.

Figure 1 *The marketing-mix for services*



In the mix personnel is the central factor.

Building up a good mix is of the utmost importance. When doing this one should consider that:

- the entrepreneur is free to determine the value of the separate instruments. The one entrepreneur will aim especially at the price, whereas the other will consider the product and the quality thereof more important.
- the shipper will assess you on the total marketing-mix. He will not consider just one instrument, though the value per instrument may also differ greatly in his opinion.

3.1 The price of transport

The price is not the only marketing instrument that matters in the transport sector, although it is often suggested that it is. Of course one tries to purchase as profitably as possible in order to compete in prices.
When a sector is confronted with overcapacity pressure on prices will occur rather soon because companies calculate in a variable way. One hour extra of driving costs little; so the yield will quickly improve the trading results.

One should also be aware of the fact that even in markets with a tough price competition there are still companies which succeed in realizing a higher price. By offering other services or by offering the same service in a different way, they still succeed in finding (other?) customers who are willing to pay this higher price.

In the past the success of an enterprise was measured by its turnover. Nowadays people look at the margin which is obtained with the turnover.
This requires a change in attention by the management. They have to look more specifically at the result than at the turnover.

3.2 Product/Service

The product of a professional transporter is always complex.
A regular service from A to B seems to be very simple, but nevertheless even here quite a lot of operations are required. In the transport industry one should not so much think product-orientate, but more process-orientated.

Rendering transport services is a process of successive activities in this respect. One's own activities should be well coordinated (internal coordination). A good integration of all these sub-activities will make the shipper more dependent on his transport supplier.

Product Development

Markets change, techniques change, so also the transport services will change. An active policy on product development is, therefore, a must. Until now the technical developments in transport means have often been the starting point for product development. One should consider the market situation and the needs of the customer more. Using the needs and wishes with regard to transportation processes as a departure point, one can develop the desired means of transport. In this way one can be more certain that a service that has been developed will fit in with the market. If one is only directed by technology, a technically "perfect" product may be developed, however, it may be discovered too late that the market is not (yet) ready for this perfect product.

3.3 Promotion by transport companies

> Promotion offers many means of telling the market "you're there and what you are capable of".

As there is so much contact between shipper and transporter in the transport industry, we should actually not only speak of one-sided promotion, but also more of two-sided communication.

3.4 From Customer to Relation

A successful sales transaction results in signing an order. Successful marketing leads to satisfied customers. Most of the questions about transport services are based on continuity or a certain regularity. This creates the opportunity for building up a relationship. In this respect two things have to be worked out well:

- **system adaptation:**
  The (transport) services should be tuned as well as possible to the processes that take place with the shipper and the shipper's customer.
  It is even possible that these processes flow into each other, through which a better service, but also a stronger dependence will be created.
- **relation network:**
  The customer needs good contact with the transport company at various levels, with the users (warehouse and expedition personnel), as well as with the influentials/deciders (transport and sales department) and the management. Transport means personal service with personal attention from the management.

3.5 Place/Distribution

The vehicle distributes the goods of others, but is also the company's own transport service. The distribution of transport services is expressed, amongst others, in destinations routes and frequencies.
Besides the distribution of the company's own service, the use of agents will be discussed here. Within the transport sector we can see that distribution problems can often be solved by calling in dispatching agents, or by cooperating with other transport companies. Especially in international road transport, a combination of several companies can lead to the desired effect.
For assessing the companies which are to be worked with, it is necessary not only to pay attention to the size of the company, the number of cars, the destination, etcetera, but most of all to the markets this company operates in and what possibilities this will provide.

3.6 Personnel: an extra marketing instrument

Nobody will deny that personnel is very important for transport services. Nevertheless, the fact that personnel is an outstanding marketing instrument will still sound very new to many people. The role and influence the company's own employees play in and have on the service is very important. The supporting role in promotion is important and the contact with sales people often determines, to a large extent the impression of the company and the service which has been rendered. If the company's personnel wants to fulfil these marketing tasks sufficiently, they must:

- be convinced of their task and the importance of the customer. Enthusiasm and a feeling for service are important characteristics of someone whose task it is to render services.

- possess the necessary skills in order to carry out these tasks sufficiently well.

Thinking and acting customer orientated will be possible if personnel is motivated and feels involved with the company.
In order to let the personnel fulfil their task, the personnel policy and the marketing policy must be geared for one another. Marketing will have its influence on personnel policy with respect to:

- recruiting and selection; attention ought to be paid to human relations and commercial talents and skills;
- education and training;
- counselling and consultation with the personnel.

Good internal communication is just as important as professional external communication.
The personnel will have to be checked on their marketing tasks. Not only whether they do their job correctly will be looked at, but also the way they take care of a customer is important. This does not only apply to drivers, planners and operators but also to the administration.

3.7 The Marketing-mix and the small company

Small companies often say: "Marketing is only good for big companies", which expresses that it is not suited to small companies or that there is no money for it. Of course a small company will not be able to extensively explore the market or have the money to put full-size advertisements in national newspapers.

Nevertheless, the marketing-mix can apply to any company. All elements will emerge. In small companies the factors personnel and product are often more important than in large companies. Personal service is often much easier to realize for a small company.

Small transport companies often work for a limited number of customers. Acquisition, sales and promotion will apply to only a small degree in these cases. Especially if the company has guarantees for long term sales (long term contracts) product and personnel will also be very important. Marketing in these cases mainly becomes "doing the job well".
Promotion is also possible for small companies. Direct-mailing can be done by any one-man company, though preparatory work will have to be carried out in the evening.
For a small company it will however be impossible to hire specialists for market research, marketing or advertising. Looking carefully at others (both customers and competitors) forms quite a good basis for one's own activities. Copying indiscriminately, however, forms a poor start in this respect.

4 INTERNAL MARKETING

Marketing is always identified with activities aimed at the market. In the service industry, where organization and personnel are such important factors, internal marketing should precede external marketing. Well, this will be very easy for small companies. The employees are much involved with the company and know precisely what is going on. In bigger companies internal marketing will have to be worked on more consciously and be used a lot more. With the help of the marketing-mix instruments personnel can be made more market orientated. Especially the instrument promotion will be discussed here. In bigger companies there is often a staff magazine which can be very useful in this respect.

The main means for internal marketing are:

- **promotion:**
- **education and training:**
- **information.**

Internal marketing can even go one step further by involving the employees in an active way in policy making, inventing new product ideas etc.

5 THE MARKETING PLAN

In this chapter the background to a marketing plan will be given. This concerns the function of a marketing plan and the conditions such a plan should meet. Finally, some remarks will be made about drafting a plan.

5.1 The function of a marketing plan

A marketing plan is the document in which the operational planning of all marketing activities is laid down and therefore it is the "timetable" for all (commercial) employees.

The above can be looked upon as a definition of a marketing plan. The marketing plan indicates what marketing activities should be carried out, by whom and when. Furthermore, a foundation for these activities is given as well as motives as to why they are necessary.

Basically a marketing plan is a summary of the marketing planning process. This process consists of the following phases.

Diagram 5.1.1 *The Marketing planning process*

VISUALIZE YOUR MARKET
↓
DETERMINE OPPORTUNITIES AND POSSIBILITIES
↓
STATE WHAT YOU WANT TO ACHIEVE
↓
DEVELOP NECESSARY ACTIVITIES
↓
ASSESS AND CHECK THE EFFECT OF THESE ACTIVITIES

All these phases should be found in the plan.
The arrangement of a marketing plan should be derived from this planning process and consist of three elements:

- **Insight** into:
  - current market situation;
  - competition and market position; **KNOWING**
  - restrictions and possibilities of the company;
- **Choices** with regard to:
  - product/market combinations;
  - objectives; **CHOOSING**
- **Activities**:
  - description of the marketing-mix With elaboration with regard to : WHAT.... WHEN.... WHO.... HOW.... HOW MUCH/MANY.... **ACTING**

A good marketing plan provides an insight into the market situation, the possibilities, the things the company wants to achieve, and in what way it wants to achieve them. Because attaining goals and carrying out transport services is human work done by all employees, they should all be informed about the marketing plan. That does not necessarily mean that all employees should know the complete plan.

Objectives

A few observations about objectives. Objectives should:

- be attainable
- be realistic
- be motivating
- set tasks

for the organisation. Therefore, objectives should be quantified. Only then will they be clear and will tasks be able to be set.

Adjustment

Drafting and carrying out of plans involves many uncertainties. We know one thing for sure, namely that the original plan will never become reality. Therefore it is necessary to keep a close track of the results in order to compare these with the original plan. Regular adjustment may be necessary in some cases.

Budget/Costs

A marketing plan without a budget is like "a paper tiger". The plan should include costs and proceeds so future checking and adjusting is possible.

Planning of actions

A timetable which shows clearly who does what and when must be included in any marketing plan.

Conditions of a Marketing plan

> "Drafting a marketing plan is not that difficult, but ensuring that it is implemented properly will cost a lot of energy and attention from the management."

The above certainly applies to companies which have been largely decentralized and where many people are involved in carrying out the work. In order to undertake a successful marketing "operation", to which end a marketing plan is a means, it is necessary that:

a. the plan is good
b. there is a good follow-up and support.

A Good Plan

A good plan is not judged by its size, but by its contents. Again, we distinguish three elements of the plan:

- **KNOWING** Is enough reliable information about the market, the company's position and the turnover progress available?
- **CHOOSING** Are the objectives setting tasks and are they motivating the employees.
- **ACTING** Have the activities been clearly formulated so that everybody knows what is expected of them?

A good plan meets all these aspects: but there is one even more important aspect:

> **"The plan must really be accepted by the management whose task it is to execute the plan."**

The plan and its objectives must be believed in. Furthermore, a number of pitfalls which can occur must be kept in mind.

Pitfalls while drafting a marketing plan

1. No (good) planning
2. No (good) division of tasks/responsibilities.
3. Objectives are lacking.
4. Insufficiently supported by the management.
5. Function and/or purpose is not clear.
6. False expectations.
7. Insufficient capacity.
8. Marketing plan does not fit in with the organizational structure.

Pitfalls while implementing the Marketing Plan

1. Staff is not good enough.
2. Objectives are not clear.
3. Tasks are set insufficiently.
4. Poorly introduced into the company.
5. Progress control is lacking.

A marketing plan for the slightly bigger companies might have the following table of contents:

I Introduction
II Summary
III Situation analysis
  a. Opportunities and threats of the market
  b. Competition
  c. Strength/weakness analysis
  d. The Government, legislation and rules.
IV Objectives
V Marketing Strategy
VI Marketing Mix
  a. Price
  b. Promotion
  c. Sales and acquisition
  d. Maintaining relations
  e. Service Management (quality) and Product Development
  f. Personnel
VII Budget
VIII Action Plan
  A. Summarizing schemes with concrete information about what, who and when
IX Implementation, Control and Adjustment.

COST CALCULATIONS IN ROAD TRANSPORT

(951044)

Rijswijk, January 1996

CONTENTS

INTRODUCTION

The proper calculation of the cost price is very important to entrepreneurs working in a market economy.

1 For an entrepreneur the cost price is the basis for the determination of the sales price. Usually the sales price is not a fixed sum and is dependent on supply and demand, the market circumstances. Furthermore, it is to him important to know how his cost price is constructed, which cost categories determine the cost price and what a change in, for example, the price of fuel can do to the cost price.

2 The cost price is an aid for efficiency control and for the company policy. Strongly increasing or decreasing costs influence the profitability. It is therefore important to know what the causes are hereof. The company policy can then be adapted (usually for a maximum profit over a long term).
Ultimately each decision taken within a commercial company is taken on the basis of the costs.

A cost calculation based on the correct information will lead to the allocation of means of production, labour, capital and natural resources in such a manner that economically the maximum result will be achieved. Within a commercial company this usually means optimalisation of the profits.

Within companies run by the government (e.g. railways and bus companies) the goal is not necessarily to make a profit. It is mostly their policy to provide for the social needs. But, even though the goals are different the endeavour to provide a continuous and efficient product is also present. This is only possible by keeping an eye on costs and turnover. The material treated here can therefore for the greater part be applied to both sectors.

Cost Calculation in Road Transport is treated as practically as possible in the following pages.In chapter 1 attention is paid to cost calculation for non-scheduled transports of one shipment. The calculation of the cost price per ton of transported goods is discussed here.

1 COST CALCULATION FOR NON-SCHEDULED TRANSPORTS OF ONE SHIPMENT

1.1 The Basic Formula

The basic formula for the calculation of transport costs per ton is rather simple. It consists of:

-	km x variable costs per km	= $	
-	hours x time costs per hour	= $	
-	direct transport costs	= $	
-	total costs per transport	= $	
-	tons transported	:	tons
-	transport costs per ton	= $	
		= = = = = =	

Apart from direct transport costs (if any) the formula contains four basic elements, namely:

1 km attributable to the transport
2 hours attributable to the transport
3 costs per km
4 costs per hour

The identification and calculation of these elements is the subject of the next sections.

1.2 Kilometres per transport

A major problem in transport is imbalance in transport flows. This results in empty kms, often with considerable driving time and km costs.

The question arises:

1. how to reduce empty km
2. how to allocate empty km to the relevant transport.

ad 1. Try to make round trips, i.e. combine loads in the same area

ad 2. In order to carry out a transport, a vehicle has not only to travel the loaded distance from the loading place to the unloading place, but it must also travel a number of empty kilometres to reach the loading place and to get from the unloading place to the next destination.

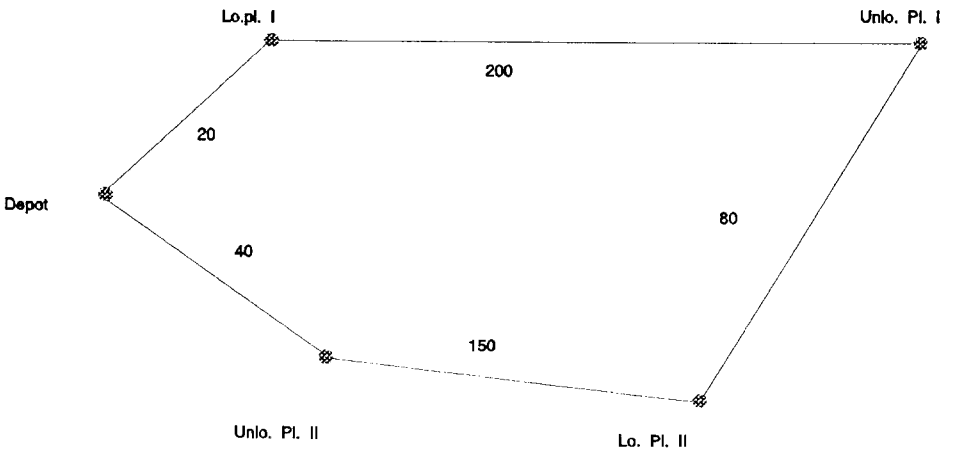
In the case of a transport without a return load, the km attributable to a transport are:

- empty km from depot to loading place
- loaded km from loading place to unloading place
- empty km from unloading place to depot.

As the distance increases, the costs of the empty km (and the time costs incurred by covering these empty km) become a major element in the total transport costs.
In order to cope with this problem transporters seek return loads, and the urgency of finding one increases with the distance.

The most common pattern is then as depicted in figure 1.

Figure 1: Round Trip Pattern



The total distance for the round trip is calculated as follows:

	kilometres		total km	total as % of loaded km
	empty	loaded		
depot to loading place 1	20		20	
loading place 1 /unloading place 1		200	200	
unloading place 1/loading place 2	80		80	
loading place 2/unloading place 2		150	150	
unloading place 2/depot	40		40	
	140	350	490	140

1.4

On the basis of equal costing for both transports, total kms can be attributed as:

- transport 1 200 x 1.4 = 280 km 490 Total km
- transport 2 150 x 1.4 = 210 km. 350 = loaded kms = 1.4

In practice a transporter accepting transport 1 cannot exactly foresee the total round trip or, in many cases, whether a return load will come up. Moreover, each round trip has its specific route. The calculation of total kms is therefore based on what is a "normal" pattern. Cost price calculations are based on normal patterns - averages - and not on incidental transport situations. A transport firm cannot charge $ 300,-- today where it charged $ 200,-- yesterday, just because today it was unlucky in its search for a return load.

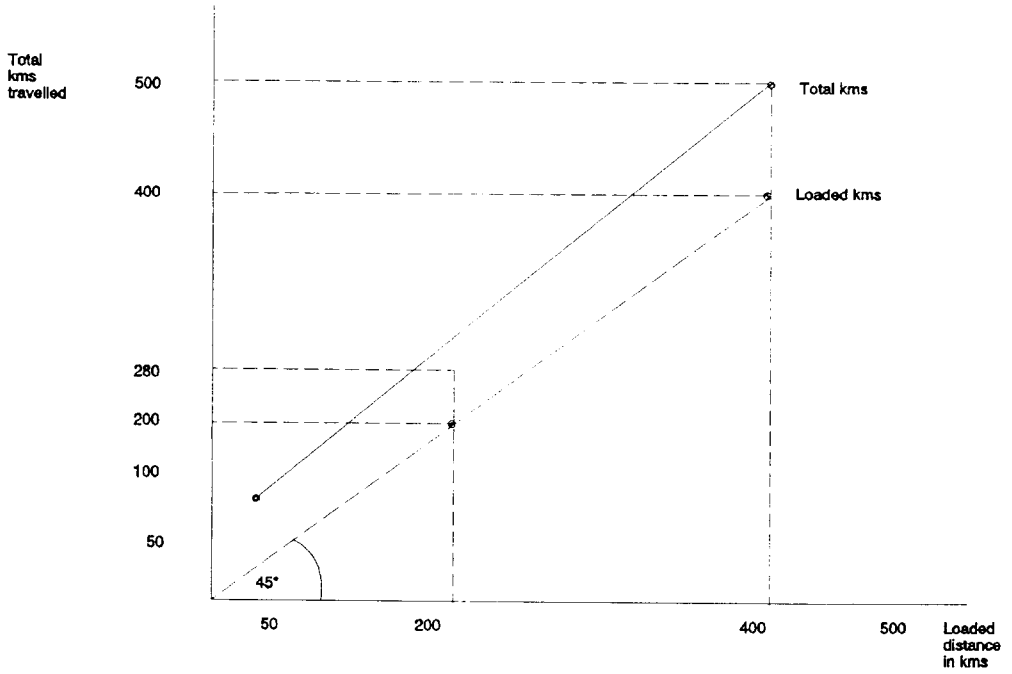
As the urgency of finding a return load increases over longer distances, the average relationship between loaded km and total km will as a rule improve as distance grows, as depicted in figure 2.

In road transport in the Netherlands the total km travelled rises from about 100 km at 50 km loaded distance to about 500 km at 400 km loaded distance. Loaded km as a percentage of total km (utilisation of distance) accordingly rise from 50% at 50 km to 80% at 400 km.

The graph depicted in figure 2 represents an overall average. Levels and curves differ according to type of transport, geographical relationship, etc., with consequences for the cost price in these difference market segments.

Having once stated the relationship between total km and loaded km, the distance to be travelled can be derived directly form the loaded distance.

Figure 2: Relationship between total kms travelled and loaded kms



Differential costing

The approach as mentioned above is known as equal costing. Market conditions or uncertainty about return loads can give rise to a policy of differential costing, in the attribution of km. One can reason that in the case of no return load the outgoing transport is charged with the loaded and unloaded km of the trip and consequently if there is return load, this return load only causes the extra km of the roundtrip. It will be clear that less km attributed to the return trip will demand more km to be attributed to the outgoing trip because the total km in the roundtrip stay the same.
The danger of different costing is that there is a large chance on spoiling the market for return loads and that shippers on the outgoing tansports are not prepared to pay the resulting high price for their transports. They normally consider the problem of the return load as a problem for the transport company,and not as a problem for themselves.

ALLOCATION OF KMS ON DIFFERENTIAL COST BASE

-	EMPTY KMS TO LOADING PLACE 1:	20 KMS	
-	LOADED KMS TRANSPORT 1:	200 KMS +	
-	KMS; IF EMPTY BACKHAUL:	220 KMS	
-	TOTAL KMS TRANSPORT 1		440 KMS
-	EXTRA KMS TRANSPORT 2 (490-440):		50 KMS +
-	TOTAL ROUNDTRIP KMS:		490 KMS

1.3 Hours per transport

The hours per transport are composed of the following phases:
- driving time
- loading time including waiting at the loading place
- unloading time
- delays during the transport inevitably connected with the transport (delay at borders, ferries etc.)

As with the calculation of km per transport, the hours per transport are calculated on the basis of averages, given the characteristics of the transport. Using a sample of round trips, the hours per phase of the transport can be analyzed.

Driving time

There may be a difference in speed between loaded and empty driving which would affect driving times. For Dutch carriers such a difference was not found. There the driving time is a function of the distance; from observations one might find for example an average speed of 50 km per hour.

$$\text{or} \quad \frac{60 \text{ minutes}}{50 \text{ km}} = 1{,}2 \text{ minute per km.}$$

In many countries the driving time depends, to a large extent, on road conditions, which will differ according to the route. In these circumstances driving times have to be differentiated according to the routes to be travelled, based on the speed differences observed in the analysis.

Loading and Unloading

Although waiting times may often be longer than actual loading time, analysis will show that there is mainly a relationship between total loading or unloading time and the tons transported. Individual observations show a wide distribution around the average curve and different curves are found according to the type of commodity, the way the goods are packed, type of vehicle etc.

Insofar as explanatory differences can be identified for submarkets, different curves are used for different sub-markets. The nature of the relationship between loading or unloading time and tons loaded or unloaded is generally a function as follows:

$$\text{loading or unloading time} = 1 \text{ h} + 0.1 \text{ h} \times \text{tons loaded or unloaded}$$

Delay

Hours of delay may be caused by the necessity of crossing frontiers, using ferries, etc. Depending on the geographical relationship (i.e. origin/destination) the delay is expressed as an average number of hours per transport.

Total Transport Time

For a transport of 20 tons over a loaded distance of 200 km the total km and the time in hours can be calculated, given the aforementioned relationships. From figure 1 it follows that at 200 loaded km the total km to allocate are 280 km.

The total transport time in hours can be calculated as:

-	driving time:		280 x 0.02	=	5.6	hrs
-	loading time:	1 +	20 x 0.1	=	3	hrs
-	unloading time:	1 +	20 x 0.1	=	3	hrs
-	delay (average for the geographical relationship)				0.6	hrs
	total				12.2	hrs

In this example it is assumed that there is no time difference between loading and unloading. In practice there may be differences between these and between empty and loaded driving time, and even between different parts of the journey.
In many cases the total transport time can be checked by noting the time lapse between departure from the depot and return to the depot.
Often however, there are differences between the two times.

When a round trip takes more than 1 day it has to be borne in mind that after allowance for rest time of crew a vehicle cannot be used for more than for example 12 hours per day.

Moreover, after unloading transport 1 the driver sometimes has to wait for instructions until a return load becomes available. This time loss should not be attributed to a specific transport. By deduction from total effective hours per year, these time losses are offset against all transport carried out.

PHASES IN THE TRANSPORTS AND THE ROUNDTRIP

EXAMPLE FIGURE 1
DATA: TRANSPORT 1 20 TONS
TRANSPORT 2 15 TONS
DELAY PER TRANSPORT 0,6 HOURS

	DATE/CLOCK TIME	
TRANSPORT 1	BEGIN	END
- DRIVING DEPOT TO LO.PL. 1	—	—
- LOADING	—	—
- DRIVING LO.PL.1 TO UNLO. PL. 1	—	—
- UNLOADING AT PLACE 1	—	—
- TOTAL DELAY TRANSPORT 1	—	—
TRANSPORT 1/TRANSPORT 2		
- DRIVING UNLO. PL. 1 TO LO. PL. 2	—	—
TRANSPORT 2		
- LOADING	—	—
- DRIVING LO.PL.2. TO UNLO. PL. 2	—	—
- UNLOADING AT PL. 2	—	—
- DRIVING UNLO. PL. 2 TO DEPOT	—	—
- TOTAL DELAY TRANSPORT 2	—	—
	—	—

NEA

CALCULATION OF TRANSPORT TIME IN HOURS

EXAMPLE FIGURE 1

DATA: TRANSPORT 1 :	A transport of 20 tons over a distance of 200 km. The ratio between total km and loaded km is 1.4.
TRANSPORT 2 :	A transport of 15 tons over a distance of 150 km; The ratio between total km and loaded km is 1.4.
DELAY PER TRANSPORT	0,6 HOURS

TRANSPORT 1

DRIVING	=	
LOADING	=	
UNLOADING	=	
DELAY (CALCULATED)	=	+
TOTAL HOURS PER TRANSPORT 1		

TRANSPORT 2

DRIVING	=	
LOADING	=	
UNLOADING	=	
DELAY (CALCULATED)	=	+
TOTAL HOURS TRANSPORT 2	=	
TOTAL HOURS ROUNDTRIP	=	

1.4 Costs per kilometre

Cost categories

The cost per km can be categorised as:

- depreciation
- fuel costs
- tyres
- repair and maintenance.

These categories are explained in the following sections.

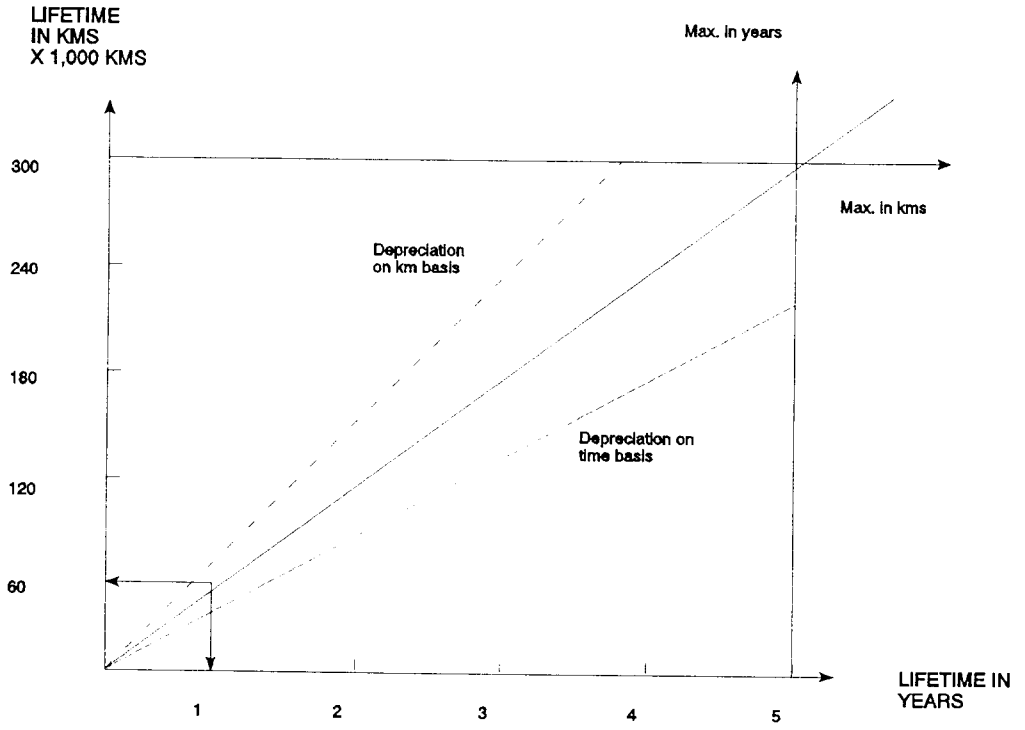
Depreciation

It may seem strange to find depreciation under km costs, as we ware used to calculating depreciation on a time basis. The point is, however, that often long before the effects of age end the life of a vehicle, the wear and tear of distance travelled has brought the useful life of the vehicle to an end.

The basis of depreciation should be whichever factor terminates the vehicle' life first: time or distance (figure 3).

Assuming that the maximum life in years is 5 and in km 300,000 it makes no difference whether depreciation is based on years or on km if the vehicle travels 60,000 km per year.

FIGURE 3: Depreciation on km basis an on time basis, as a function of km per year



If the vehicle travels 70,000 km per year, distance sets the limit, whereas at 50,000 km per year age sets the limit.
Vehicles used for short distances will therefore be deemed to depreciate with age and vehicles used over long distances, covering a very large annual kilometrage, will be deemed to depreciate according to distance travelled.
As many factors influence the life in years and in km we are left uncertain as to which method should be used for most vehicles. In practice therefore 50% of depreciation is often calculated per year and 50% according to kilometrage.

In calculating depreciation the amount to be written off over the total life is calculated as:

new value -/- rolling tyres -/- residual value.

The value of rolling tyres has to be deducted because tyres have a much shorter life than the vehicle. Tyre costs are therefore calculated separately.
At the end of the vehicle's life with the company there is often a residual value for which the vehicle can be sold. This should be deducted from the new value.

The formula for calculating depreciation per km can then be stated as:

$$0.5 \times \frac{\text{(NEW VALUE -/- TYRES -/- RESIDUAL VALUE)}}{\text{DURATION OF LIFE IN KM}}$$

Fuel costs

Fuel consumption per km can be calculated on the basis of past experience. Although high fuel prices have made it important to economise on fuel, unfortunately often only the cost of fuel is recorded, sometimes mixed up with other items.

This makes it necessary to conduct a thorough analysis of fuel costs in order to determine fuel consumption per litre.
Once the fuel consumption per km (or per 100 km) is known, fuel costs can be calculated by multiplying consumption per km (or per 100 km) by the current price per litre.
Much information on fuel costs, and indeed on other costs too, can often be provided by the vehicle manufacturer, importer or dealer.

Tyres

The tyre costs are calculated as:

$$\frac{\text{NUMBER OF ROLLING TYRES ON THE VEHICLE X COST PER TYRE}}{\text{LIFE IN KM PER TYRE}}$$

The number of tyres is restricted to the tyres actually rolling. Spare tyres carried on the vehicle are excluded from tyre costs. The spare tyres are not deducted from the new value and they are deemed to depreciate along with the vehicle.

Often tyres are remoulded after the tread is worn out. In that case the costs of remoulding are added to the tyre costs. Consequently the extra life is added to the life in km.

Repair and maintenance

Despite the fact that even if the vehicle is not used, some maintenance is necessary and there is some time element in repair and maintenance, the vast majority of these costs are dependent on km travelled. In practice the costs of repair and maintenance are therefore calculated as an amount per km.

Repair and maintenance costs are composed of:

- costs of hours labour by mechanics
- costs of spare parts and materials

Costs of repair and maintenance per km are not constant over the vehicle's life, but tend to rise with age. In principle the costs of repair and maintenance, when depicted in relation to life, display an "S"- shaped curve (figure 4). The level and the age where these costs become strongly progressive depends on the operational conditions, quality of technical service and treatment by the driver.

As the costs of repair and maintenance per km are not constant, but increase during the lifetime, they have to be calculated as an average over the total life of the vehicle.

The progressive increase in costs of repair and maintenance indicates that beyond a certain lifetime it is no longer economic to keep the vehicle in operation. In order to

determine the optimal life one should however not only look into the costs of repair and maintenance, but also include complementary costs such as increased fuel consumption in comparison with new vehicles and fewer effective hours per period.

The increase in costs of repair and maintenance and in the complementary costs are partly compensated by a decrease in costs of depreciation with prolonged operational lifetime. Addition of both elements gives the average total costs to be considered in determining the optimal lifetime (figure 5).

This graph only shows the elements determining life: the actual curves differ per company. Policies of preventive maintenance, driver training etc., can prolong life considerably.
On the other hand the hardly quantifiable risk of breakdowns during transport gives rise to a safety margin, i.e. replacing the vehicle before the theoretical minimum costs are reached.

FIGURE 4 Cost of repairs and maintenance in relation to age in km

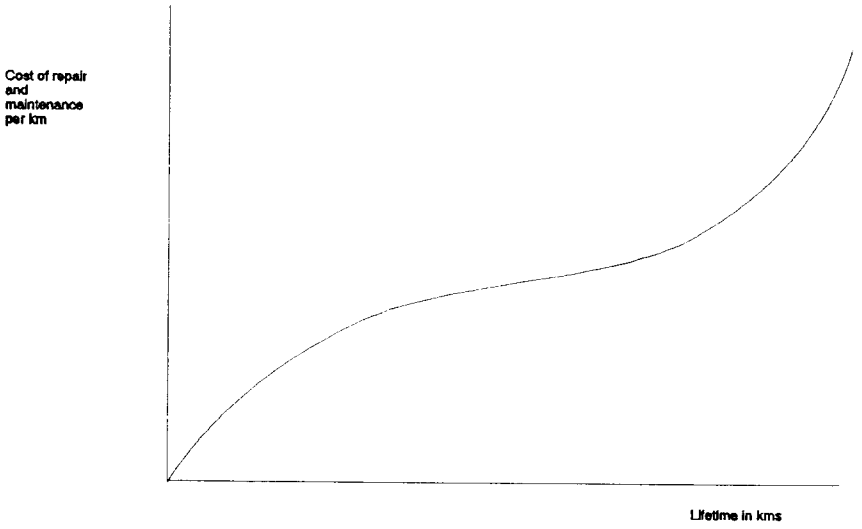
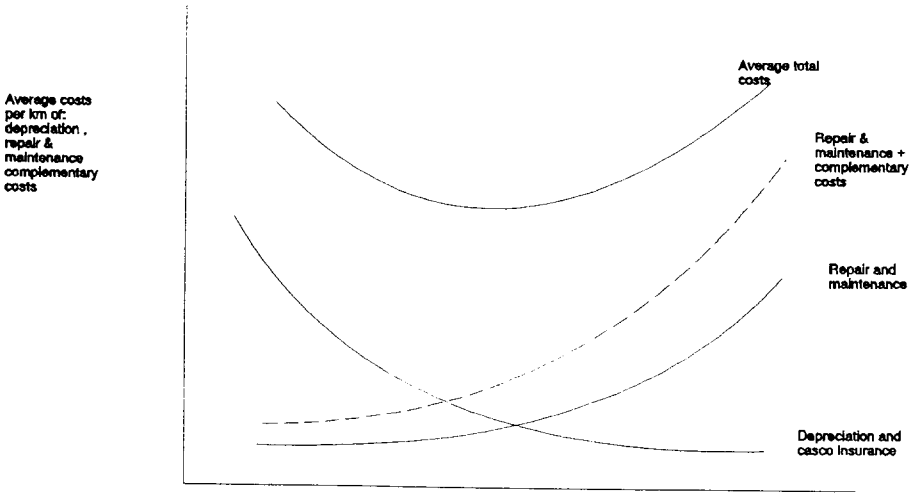


FIGURE 5: Elements in determining optimal lifetime



1.5 Fixed vehicle costs

Cost categories

The fixed vehicle costs excluding overheads generally comprise:

- interest
- depreciation
- insurance of the vehicle
- vehicle tax
- garaging

These components are discussed in the following sections:

Interest

The interest is calculated on the average amount invested in the vehicle during its life within the company at the prevailing interest rate. On the assumption that depreciation is equally distributed throughout the life of the vehicle the average amount invested can be calculated as:

$$\text{AVERAGE AMOUNT INVESTED} = \frac{\text{NEW VALUE -/- RESIDUAL VALUE}}{2} + \text{RESIDUAL VALUE}$$

or:

$$\text{AVERAGE AMOUNT INVESTED} = \frac{\text{NEW VALUE + RESIDUAL VALUE}}{2}$$

The procedure differs from that for depreciation in that tyres are included in the interest calculation because, regardless of their life, there is always a set of tyres on the vehicle and money invested therein.

So the costs of interest are $\frac{\text{new value + residual value}}{2} \times i\%$

Wth i = interest rate

Depreciation

Depreciation costs were already mentioned in section 1.3. In the case of 50% depreciation on a distance basis and 50% depreciation on a time basis, the calculation is:

$$\frac{0.5\ (\text{NEW VALUE -/- ROLLING TYRES -/- RESIDUAL VALUE})}{\text{LIFE IN YEARS}}$$

Vehicle insurance

Vehicle insurance comprises the insurance of the vehicle itself (against loss or damage) as well as third party liability.

Insurance for damage to the cargo is mostly not accounted for as part of vehicle insurance but as an overhead. This is because this risk is in general insured for the company as a whole, depending on the type of transport effected.

Vehicle tax (road tax)

In most countries a road tax has to be paid for permission to use road infrastructure. Other vehicle-based taxes may however occur.

Garaging

If a vehicle is garaged on company premises or on ground owned or rented by the company, part of the costs resulting should be attributed to the vehicle.

Fixed vehicle costs per hour

At the fixed vehicle cost per year the vehicle is in principle available 365 days a year and 24 hours a day less repair and maintenance time.

In practice the usable time is limited to about a quarter of the nominal time available by labour conditions, times of access to loading and unloading places, the necessity of waiting for transport assignments etc.

Accurate calculation of the effective time to be used for transportation (so called normative hours) is of great importance. Time costs per hour depend on the number

of effective hours per year as well as ons costs per year. Records of past performance are the ideal starting point for estimating the effective hours in the period ahead.

If these records are not available or incomplete, reconstruction can be undertaken from two angles:

- starting with 365 days, leaving out Sundays, holidays, days for repair and maintenance, days waiting for instructions and days non-effective for other reasons, the number of effective days is calculated.
- from recent information the average effective hours per effective day are calculated.

In principle the number of effective hours per year equals the sum of the effective hours to be spent on the transports to be carried out.

1.6 Overhead costs

The overhead costs comprise all costs that cannot be directly connected with vehicle km, vehicle years or drivers or attributed to specific transport services on other grounds. These costs are necessary to run the company and relate to availability rather than to performance.
Overheads are therefore mainly expressed as an amount per vehicle hour or as a percentage of the other costs.

1.7 Driver costs

Driver costs comprise wages, overtime pay, social security contributions, taxes, allowances for expenses en route, etc.
Driver costs per year primarily depend on the number of hours per driver and can be expressed as an amount per driver-hour.
As driver hours and effective hours per vehicle are generally closely related, driver costs are frequently expressed as an amount per vehicle hour, which simplifies calculation.

CASE STUDY 1
COST CALCULATION IN ROAD FREIGHT TRANSPORT
(POWER UNIT AND SEMI-TRAILER; UNSCHEDULED TRANSPORT)

D951044.AME
30 januari 1996

CASE STUDY 2
COST CALCULATION IN ROAD FREIGHT TRANSPORT

(truck-trailer combination; unscheduled transport)

PLANNING IN THE TRANSPORT FIRM

(951040)

Rijswijk, January 1996

NIEA

CONTENTS

1 INTRODUCTION

1.1 The necessity to plan

It is argued that the transport world is too uncertain to plan and it is better to react flexibly on situations as they arise. They do have a point here. Situations change, flexibility is of vital importance. Nevertheless, without planning there is a tendency to drift around in circles between opportunities and threats, with the risk of shipwrecking somewhere. Real opportunities may pass for ever for lack of timely action and there is no basis for coordinated actions, delegation and control.

Planning, cost calculation and adequate up to date accounting is a weak point in namely the small and medium sized transport companies. However, the experience of rentability inquiries is that firms who have timely and accurate figures on results tend to be those with the best results.

Planning in the small firm does not need to be very detailed, it does, however, demand clear goals and a coherent plan of action.

1.2 Planning horizons

Often planning is restricted to an extrapolation by the bookkeeper of last year's figures to the next year, sometimes translated into budgets. However, managing a firm is not following the course of events, but steering the firm and its development.

Planning starts with identification of the long term goals some 5 or more years ahead. These long term goals have to be translated in coherent sub-goals for fleet, personnel, markets, finance, etc., in order to arrive at coordinated action.

The course to achieve long term goals must not only be marked in sub-goals but also in course of time for which medium term plans have to be drawn up.

The medium term plan has to be supplemented by the short term plan based on the current situation - the starting point for all planning activities - and the goals in medium and long term. The short term plan results in detailed instruction finalized in budgets for costs and revenues for the period - mostly one year - to come.

The actual daily operations are ruled/managed by the operational planning for instance in dispositioning vehicles and drivers to round-trips and constructing round--trips. The operational planning has a very short horizon and is focused on running actual operations rather than on the future course of the firm.

The horizon of planning leads to a large difference in the contents and the framework of planning. In the long term there is on the one hand a great deal of uncertainty but on the other hand a large degree of freedom to set the course and goal and the planning has to be rather global. In the short term the margin of uncertainty is much smaller and at the same time the degree of freedom is restricted, as the firm is tied up by earlier decisions.
Moreover the short term plan has to be rather detailed as it is the guideline for actions.
Although in operational planning one has to cope with unforeseen events and often has some alternatives as to the implementation, it focuses on the effective/efficient way to implement concrete jobs.

There is a clear hierarchy in planning horizons descending from the long term plan to the operational planning. However, the actual situation as met/observed in operational and short term planning may often demand revision of medium and long term planning.

As stated before, planning starts by making an inventory of the current situation, internal as well as external.

Internal topics are:

- the markets served, by client, type of transport service, geographical relation, etc.;
- the firm's position in these markets;
- facilities (personal and material) at disposition;
- costs and cost structure;
- revenue and revenue structure as to sub-markets.

External topics are:

- the demand for transport services and its composition as to type of client, type of goods, geographical relation, etc.;
- the competitors; who are they, where do we meet them, and what are their qualifications.

A second step in planning is to make a best possible prognosis of external developments such as:

- what will be the changes in demand for transport services, in volume, structure level of service and package of service to be offered. These changes will, to a great extent, be caused by:
  - economic developments;
  - technical developments;
  - governmental policy, overall policy, economic policy and transport policy.

- what developments can be expected from competitors, these being in the first place other road transport firms but secondly road transport on own account and other transport modes.

On basis of the foregoing data and analysis the firm's relative position and its possibilities can be judged, for instance on the basis of a SWOT analysis involving:

- strengths, what are the firm's strong points that can be used
- weaknesses, what are the firm's weak points, can they be improved,or can their effects be avoided;
- opportunities, what opportunities are there in the market for the firm and the expected developments for the firm;

- threats, what threats to the firm will evolve from external developments? Can they be avoided or can the firm weapon itself against there threats?

From this analysis follows the long term goals and the course to achieve them, with regard to:

- improvements in efficiency, productivity and quality of service;
- markets to be served, and volume of services there;
- facilities (personnel and material);
- financing and financial structure;
- costs and cost structure;
- revenues and revenue structure.

It will be clear that, even if the necessity of planning is felt, the small firm as a rule does not have the information nor the analytical knowledge to make this planning. It is one of the basic tasks of branch situations to offer the necessary data and know-how to the firms in order to arrive at a feasible planning.

Given the fact that the job of managing a firm involves not following the course of events but steering the firm and its development, it is the primary task of management:

- to set goals
- to lay down a schedule for their achievement

In order to do this in an operational way, goals have to be translated into sub-goals or tasks throughout the organisation, leading to a coordinated plan of action in accordance with the set schedule.

This planning process involves not only determining sub-goals or tasks but also determining and allocating resources in terms of finance, facilities and personnel.

As stated earlier, the emphasis in planning will differ according to the planning horizon.

In long term planning the degree of freedom is large, as are the uncertainties to cope with. The emphasis is on optimal use of the firm's potential given the external developments anticipated. Uncertainties and the need for flexible responses in changing situations will result in rather general goals and derived sub-goals in the long term.

As the planning horizon comes nearer the firm is increasingly tied to its existing possibilities - mainly resulting from former discussions - but the uncertainties decrease. The shortening distance between the actual situation and the planning horizon calls for increasing specification of plans with a growing emphasis on the actual situation, while long term objectives must not be lost sight of. In the short term therefore, coordinated action requires a detailed translation of goals and sub-goals into concrete tasks throughout the organisation as well as a corresponding allocation of resources.

In specifying sub-goals or tasks, planning is not only a guideline for action, it is at the same time the basis for:

- delegation,
- co-ordination,
- checking on implementation,

within the framework of the organisational structure. This organisational framework is not a given date, but in its turn liable to - planned - development.

Delegation of responsibilities/tasks is only possible once they have been defined qualitatively and quantitatively, and their definition emerges from planning.

Co-ordination is a consequence of planning. As planning implies the translation of overall goals into sub-goals or tasks, co-ordination is implicit.

Checking on implementation is the counterpart of delegation; without checks on implementation, management has no control over the firm. However, the results checked cannot be evaluated without a yardstick, which again emerges from planning.

As to the distinction between goals, sub-goals and tasks, the tasks consist of the activities to be carried out in order to attain the goals and sub-goals. Job descriptions will be increasingly detailed and specific at lower levels of the organisation and as one proceeds from long term planning to operational planning.

The planning process - after decision-making - results in instructions on implementation which are channelled downwards and followed - after a time lag - by reports on implementation.
In comparing the reports with instructions, deviations from planning are identified and have to be evaluated.
The evaluation will lead to corrective action/instructions and/or adaptation of the plan. So planning is not an incidental activity but a continuous process in response to changing situations or differences between expectations and actuality.

Planning occurs at every level in the organisation. It involves the translation of the goals/sub-goals/tasks per area of responsibility per level into sub-goals/tasks at lower levels. The emphasis in planning however moves from long term planning to operational planning on the way from top to bottom.
Moreover, planning is not one-way process from top to bottom but involves consultation between the levels in the organisation.

Objectives laid down at higher levels must be feasible and must be accepted at lower levels.

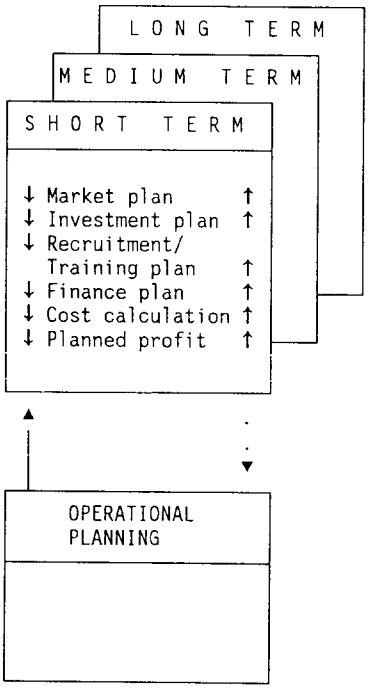
Starting from the current situation and short term limitations and opportunities, short term planning is not only directed by medium term and long term objectives. It also serves as a basis for the performance and adaptation of medium term and long term planning, which cannot be carried out without adequate knowledge of the current situation as laid down in short term planning. On the other hand short term planning serves as a guideline for actual operations and operational decisions.

2 ELEMENTS IN SHORT TERM PLANNING

2.1 Hierarchy in Planning

As depicted in figure 1, short term planning consists of a range of interrelated plans ranging from the market plan via the allocation of sub-goals/tasks and resources to planned costs, revenues and profit.

FIGURE 1 Hierarchy in planning



Within the planning there is a hierarchy as to planning term, as well as among the elements of short term planning. However, this hierarchy is not absolute, but subject to feedback. For instance to carry out the investment plan, financial resources are

needed.
If, however, the resources available do not permit the desired procurement, the investment plan has to be revised, within possible consequences for the market plan.

The elements in short term planning will be more or less detailed according to the size and structure of the firm. It is however essential that short term planning covers the range from market to costs and revenues and in this sequence.

Short term planning starts with a master plan stating in aggregate terms objectives, performances, resources, costs and revenues for the firm as a whole and the major fields of responsibility.
These terms are interpreted, detailed and examined for feasibility at lower levels, resulting in proposals which are channelled upwards within the organisation and evaluated there.
Via an iterative process the master plan is detailed and specified throughout the organisation and formalised in budgets.
Some general remarks on the elements in short term planning are made in the next sections.

2.2 The Market Plan

On the basis of the firm's transport capacity, medium and long term goals, recent experience and short term expectations, targets are set for the market performance. These targets comprise:

- the volume of transport services to be sold, their price level and the resulting revenue, detailed as to sub-market (type of transport, client, client group, etc.);
- qualitative targets, such as improvement of the level of service.

This market plan is the starting point for the other plans, but must take into account costs and constraints elsewhere in the firm.

Closely connected to the market plan is the acquisition plan, indicating which clients have to be approached for which services and on what terms in order to achieve the

planned sales.
The market plan and the acquisition plan involve co-ordination between market and transport operations.
The firm's financial results depend to a high degree on optimal combination of transport demands, reducing empty km and empty capacity. If the acquisition target is to sell as much as possible this is often counter productive, increasing the imbalance in transport operations.

The market plan, the acquisition plan and transport operation plan should therefor be drawn up in conjunction.

Given the market plan, the volume of performances throughout the firm and the personnel, equipment and materials and funds needed can be calculated.

2.3 The Investment Plan

Given the volume of transport services, the performances at individual department level can be calculated, as can the equipment and materials needed. Comparison of the equipment and materials available, after deduction of necessary replacements, with equipment and materials needed, leads to an investment plan for their replacement and expansion.

At the master plan stage the investment plan will be rather rough. The investment plan - as well as other plans - will be decided in detail during the budgeting procedures.

2.4 The Financial Plan

In order to finance investments, increased operations and obligations arising from earlier financial commitments (repaying loans, etc.), funds are needed.
Apart from possible liquidity reserves funds become available from operations (depreciation, profits). In so far as these sources do not provide the funds needed, loans/credit will have to be obtained from outside the firm.

In order to balance the need for funds and their availability, the financial plan is made, comprising:

- a forecast of the need for funds (in the course of the planning period) to pay for operations and investments and to make repayments;
- a forecast of the funds available during the planning period;
- arrangements for outside sources to finance the difference between funds needed and funds available. These must be made in such a way that the resulting future repayment obligations do not exceed anticipated resources.

Financial planning can hardly be separated from financing, although the emphasis differs.
Financial planning is primarily aimed at balancing funds needed and funds available during the planning period. Financing is aimed at achieving a structural balance between funds needed and funds available.

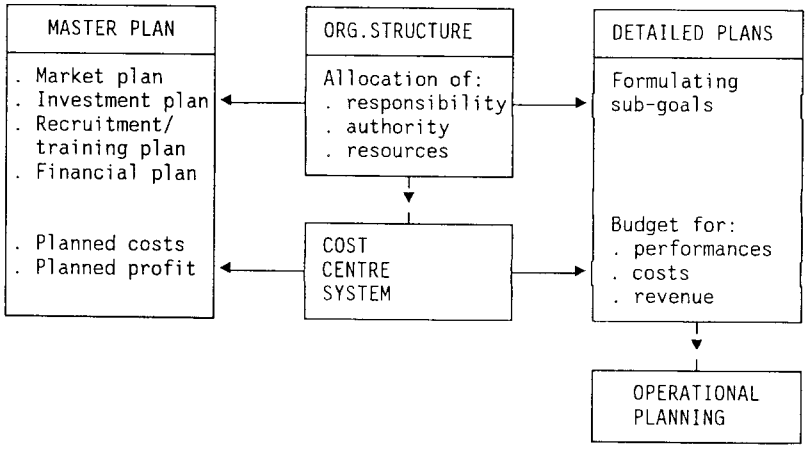
2.5 Detailed Plans, Budgets

Using approximate data, the master plan can be translated into cost consequences, enabling the firm's management to evaluate major planning alternatives. However, to establish performance goals and make them operational, the plans have to be detailed according to the responsibility structure within the firm. The plans are laid down in budgets and each level translates its budgets into budgets for lower levels.
Each budget contains:

- the facilities available,
- the costs of facilities and the complementary operating costs,
- performances,
- revenue (for the sales department).

At the first stage these budgets are not binding: they primarily contain the quantified directives from the master plan. After careful consideration and in accordance with the actual situation, alterations are proposed, channelled upwards and evaluated at higher levels. After a number of iterations this leads finally to approved budgets as a basis for delegation, co-ordination and control.
At the same time this procedure leads to correction and finalisation of the master plan.
The main lines of this planning procedure are depicted in figure 2.

FIGURE 2



The specification of the planning as to type of plan cost centres etc. will of course depend on the size of the firm. In small firms the short term planning will be condensed but implicitly it contains the elements mentioned.

3 OPERATIONAL PLANNING IN NON-SCHEDULED TRANSPORT FREIGHT TRANSPORT

3.1 Operational planning

Given the fact that in planning for the future there may be questions about why and what, the necessity of operational planning is obvious. If one did not organize the job and indicate "who does what" there would be chaos.
The formal organisation of the firm describes areas of responsibility and allocates responsibilities to people but within this organisation the carrying out of the actual operation has to be organised on a daily basis. Assuming that there is a technical department responsible for the actual fleet available, a personnel department for the drivers and a commercial department for acquisition of clients, operational planning focuses on optimising the following elements:

- utilisation of transport capacity (effective hours of vehicles and drivers);
- utilisation of loading capacity and km travelled per transport and per round-trip;
- selling price of transport performances (within the discretion of the planner);
- quality of service to the client.

"Optimal" means on the demand side that the client is served to his satisfaction. On the facility side "optimal" means that the transport capacity available is used at the best possible freight rates.

In a company of some size with different clients, operational planning is the nucleus of the company. In this planning process transport potential is transformed into transport performances, and costs into revenues.
Without underestimating the significance of proper cost control one can say that the key to success lies in the transformation of costs into revenues by operational planning.
It might be worthwhile to look into this function.

3.2 The "dispositioner"

In reality the organisational structure in terms of departments may differ from the assumptions in section 1. Nevertheless the operational planning function will exist in every transport company.

Operational planning is linked directly to the commercial function and the dispositioners will as a rule be placed under this function. In many companies the dispositioner has commercial competencies. This because operational planning is more than just coordinating transport demand and transport facilities.
Apart from the fact that there is flexibility in the available facilities (timing of repair and maintenance for example) there is often too some flexibility in timing the transports or in the acceptance of transport assignments.
More important is that the dispositioner should not passively wait for transport assignments. By using his contacts with clients, intermediaries and other hauliers he actively looks for supplementary payloads and return transports.

The overall commercial function is search for new markets and clients, maintain existing relations and make general price deals. Within this framework, daily planning involves not only acquisition of assignments but often also price deals for specific assignments.

Operational planning is an art that calls for special talents, for instance:

- Geographical knowledge
  distances, routes, road conditions

- Knowledge of transport in practice
  Special demands of the goods/clients, loading and unloading conditions, driving times, etc.

- Insight into the market
  Where to get what assignments, prevailing prices and other conditions.

- Insight into costs
  How do costs vary with different planning alternatives?
  What are the costs of extra services?

- Knowledge of capacities of drivers and vehicles
  By what vehicles and what drivers can particular assignments be performed?

With the help of simplified rules and procedures the dispositioner has to make decisions directly or at very short notice.
Rule and procedures can be a very important support, but it is the special talent of the dispositioner that leads to optimal co-ordination.
In his every day work he cannot perform extensive calculations but must make very short term decisions. When he obtains results with relatively little delay he can review his decisions and learn for the future, but he remains in the situation of having to consider a large number of elements in very short term decisions.

Given the vital importance of operational planning, the dispositioner or the head of operational planning has to rank high in the organisation. This has consequences for the interrelations between departments. The technical department for instance is a service department responsible for ensuring that vehicles are available as planned. With the aid of its technical knowledge it sets limits as to the km or points in time when preventive maintenance has to be carried out, and thus to availability.
Within these limits however the dispositioner has to decide on the actual use. It stands to reason that contacts between the dispositioner and technical departments are necessary in order to plan maintenance efficiently.

The same reasoning counts for the personnel department and for the accounting.
The latter department however often has ambiguous functions, i.e.:

- a service function in collecting information, selecting it and presenting it in due form and at the required time to those needing it;
- a registration and control function.

As a service department the accounting should respond to the needs of the dispositioner. Under its registration and control function however the accounting department has to stick to the rules set by general management.

3.3 The operational planning process

The operational planning process starts with drivers and vehicles available on the one hand and transport demand on the other hand.

On a list per day, the vehicles grouped as to type and capacity, are stated as a first entry. A vehicle can be:

- unavailable because of repair work for the whole day or part of the day, which is indicated in a second column;
- already planned before the beginning of the day and so not available for today's demand. This is indicated by a definite transport code number in the second column;
- provisionally planned as indicated for instance by a transport code in pencil that can be rubbed out if final plans differs from the provisional ones;
- free for planning, indicated by the fact that there is no transport number entered.
  The question then remains whether the vehicle is available at the firm's premises or elsewhere. The answer can be derived by looking at foregoing transport, or is explicitly stated in a separate column.

Transport demands are selected according to their acceptability in the light of capacity available, date and clock time for loading, payload, freight prices, etc. The basic criteria are whether they fit in the planning and the amount of freight revenue.
These criteria have to be considered in combination. On the basis of this selection, the assignments are dealt with.

The assignments are listed separately and during the day or at the end of the day combined to arrive at transports to be allocated to the fleet. Full-loaded transport assignments can often be directly allocated to a vehicle.
The lists of assignments is not generally pre-printed; assignments, with their details, are recorded in the order in which the deals are made.
On the basis of the assignments the planning is further completed. A preliminary transport number is allocated to the vehicles followed by details of the transport:

- client(s)
- loading place(s)
- tons to be loaded
- unloading place(s) and tons to be unloaded per unloading place
- time of arrival at (first) loading place
- time of completion of unloading at (last) unloading place, or arrival at next place where it is available for dispatching
- loaded km (per shipment in the case of combined transport)
- transport price, or price basis if definite details can only be stated afterwards
- driver for the transport
- trailer or semi-trailer and truck or tractor to be used

During the day planning can be changed as long as transports have only been preliminarily planned, but at the end of the day the planning is finalized, so that instructions for the next day can be completed.

A specimen planning form is show in table 1.

The form for 5-6-1992 has to be seen in conjunction with foregoing dates, or if vehicles were already planned for this date, this has to be indicated on this form.
In practice the dispositioner has a number of forms, for example one for each day from 5-6-1992 to 19-6-1992, in order to facilitate planning for the near future. Contacts with customers can lead to the planning of a series of transports for a considerable time ahead.
In carrying out planning on 4-6-1992 the emphasis will normally be on the form for the 5th, dealing with idle capacity left on the 4th and assignments still open on account of capacity shortage on the 4th.
From an operational point of view it is important not only to avoid idle capacity or too many empty km but also to give instructions for the 5th before the day actually starts.

The form cannot be too exactly delineated, as different situations have to be anticipated. For example shipments in combination, availability of capacity for part of the day, more than one transport per vehicle per day etc. It is therefore important that the form leaves ample space. The format of the planning form is therefore rather large (about 50 cm x 50 cm).

TABLE 1 Planning form
date: 5-6-1992

vehicle number	transp. number	client	loading place	tons	clock time	unload. place	tons	loaded km	avail. at	date/ clock time	total km	freight amount/ price basis	code of driver	code of trailer/ semi-trailer
1	876515	G.T.C.	ARU	25	0.700	NAI	15	350	NAI	5/8	360	20.-/t	BME	7518
						NAI	10			18.00				
2	876410	(planned, details on form 4/6/'85)												
3	876411	(planned until 12,00 details on form 4/6/'85)												
4	IN REPAIR													
5	open for planning													

3.4 The Planning Board

Especially when there are a number of different dispositioners who handle interchangeable parts of the fleet, a planning board is a means of co-ordination. It contains condensed information from the planning list, such as:

i vehicle number (fixed date),
ii availability,
iii planned/preliminarily planned/when and where available,
iv code of driver of the planned transports,
v code of truck, tractor,
vi code of trailer/semi-trailer.

The space needed for this information can be reduced by using coloured stickers:

- black = unavailable because of maintenance
- red = planned
- pink = preliminarily planned
- white = available

On the sticker for the truck/tractor the code of the driver and the trailer/semi-trailer can be attached or written.
On the white sticker it can be indicated where the vehicle (or vehicle combination) is available.

The brief overall information the board contains not only gives a direct overview of capacity available and assignments to be searched for. It also makes it possible to give an overview for the longer term (for example 14 days).

The planning board however cannot replace the planning form, and discipline is needed to keep it up to date.

3.5 Uses Made of the Planning Form

3.5.1 Introduction

It will be clear that notwithstanding its size, the planning form cannot contain detailed information.
Together with the assignment list however it is the starting point for proceeding further.
A number of uses made of the planning form are mentioned in the following subsections.

3.5.2 Drivers' instructions

After completion of the planning a short instruction/information sheet for the drivers is drawn up for the next day; which vehicle, at what time, where to load for what destination.

The next day the driver gets any detailed instructions that may be necessary. Generally he knows shipper(s) and destination(s). He is briefed and provided with the necessary documents.

In most companies the instructions are a small part of a larger document, i.e. the driver's report, which will be discussed in section 3.6.

3.5.3 Documents

After planning, the dispositioner completes the necessary documents, which especially in international transport can be manifold and extensive. Moreover he sees to it that if necessary special licences/permits are made available.

3.5.4 Invoicing

Although in some companies the dispositioner invoices the freight to the clients, normally invoicing is a task of the accounting department.
The dispositioner then has to supply the necessary information on which to base the invoicing, such as:

- date of the transport; code number of the transport;
- client;
- agreed freight price or price basis;
- other conditions influencing the freight bill;
- tons and km (in the case of a price basis on tons and/or km);
- reference code for the client, so that he can trace the assignment.

It is only in exceptional cases that the data from the planning form and the assignment list are sufficient for invoicing. Normally the driver's report and the bill of lading signed for due delivery have to be available. This is in order to base the invoice on the real performance for the shipper and proven delivery according to quantity and condition of the goods in the bill of lading.

3.6 The Driver's Report

The driver's report is not part of the planning process but is an important element in daily operations. Normally the drivers report start with brief instructions:

- vehicle/vehicle combination to use
- date and clock time and location of departure
- loading address(es)/tons to load, clock time of loading
- unloading address(es) tons to unload
- next destination (if known) and planned time of arrival

Detailed instructions — if necessary — are written on a separate paper. The driver starts by filling in the data and clock time of departure and the km (last figures) on the km counter. He also provides information about the carrying out of the trip in

more or less detail depending on the significance of the information to the firm and its operating process.

As with the planning form, the structure of the driver's report is different from firm to firm. An example is given in table 2 on the basis of a single transport.

The code number of the transport is identical to the code number in the planning. The dispositioner indicates the locations of departure and the loading and unloading places in time sequence. If the return trip is not yet known, the vehicle is often sent to a place in the neighbourhood of which a return load is expected, as the final destination for the journey.
Normally the dispositioner only indicates the time of departure from a location and expected time of arrival at the final destination. The dispositioner also fills in the quantity to be loaded and unloaded.

TABLE 2 Driver's instructions / report

code driver .....
code motor vehicle .....
code trailer/semi-trailer.....
Date .....

	INSTRUCTIONS		PERFORMANCE			
	date/ clock time	tons	date/ clock time	tons	time used	ind. km counter
departure from location	5/8 06.00		5/8 06.00			1565
loading at	5/8 07.00	25	5/8 07.00	24[1])	2 h	
loading at						
loading at						
unloading at		15	5/8 14.00	14	2 h	
unloading at		10	5/8 17.00	10	1 h	
arrival at	5/8 18.00		5/8 19.00			1755
driving time					6 h	
delays/cause:						
repair					0.5 h	
.....						
.....						
.....						
rests	1 h		1.5 h		1.5 h	
total time/km	(12 h)		(13 h)		13 h	190

EXPENSES EN ROUTE	$
- Fuel	-
- Repairs [2])	20
-	
-	
-	
- driver's expenses	5
Total expenses	25

REMARKS:

[1]) bulky goods
[2]) provisional repair of fuel injection; needs attention

The driver fills in the date and clock time (or one-day journeys only the clock time) of arrival at loading and unloading places, as well as the time spent there. He also fills in the driving time, delay times and rests in such a way that the total time accounted for equals the time which elapses between starting out and arrival at the final destination. By stating the km on the km-counter at departure and arrival the km of the journey are accounted for. Interim indications of the km counter can give more detailed information on the composition of km driven. This might be necessary if the freight amount is (partly) based on loaded km per shipment.

On the same form the driver gives a specification of costs en route. When he collects the freight amount this amount as well as the balance (freight amount less expenses) are stated in the report.

On the form room is left for remarks by the driver.

In practice the form is completed and checked at the office. If there is a return load that was not yet known about at the time of departure, the data on the return load only refer to performance. The report is then passed to the dispositioner afterwards. The reports per journey in sequential order give the data on the round-trip.

The driver's report is the basis for:

i checking performance in relation to planning
ii invoicing
iii administration of costs incurred en route
iv wage cost administration (number of normal hours' overtime, etc.)
v short term management information

As stated earlier, the drivers report has to be developed according to the needs of the individual firm. In scheduled services for instance the individual shipments are not indicated in the report but on a loading list per collection centre.
In local transport the report will not be based on specific transports but on daily or sometimes weekly performance.
Total time and km per day/week form the bottom line and the transports are indicated in terms of client, tons and km.

STRUCTURE OF THE AIR FREIGHT MARKET

The following parties are engaged in the air freight process:
- shipper/receiver;
- air freight forwarder;
- airline;
- integrator;
- airport;
- air freight handling agency;
- customs;
- road carrier.

The shipper/receiver is the party giving order to transport the goods. He is the one paying the air freight charges, indicates the routing (way of shipment, engaging agents, etc.) The shipper/receiver can be in direct contact with the airline or employ the services of an air freight forwarder. The air freight forwarder is the intermediary between the shipper (sender) or the addressee (receiver) on the one hand and the carrier (road carrier, airline) on the other. The forwarder can act as intermediary, taking care of all handling on behalf of the shipper, or only preparing the necessary documents. According to the NVI, forwarders handled about 50% of outgoing and incoming air freight volumes (excluding transfer) in terms of weight, in the early 1980s [1]. Owing to the strong rise of express freight transport by integrators and the fact that shippers increasingly work direct with the carrier (tendency to cut out forwarders), this percentage has been going down since the middle 1980s. Although the market share of forwarders is under pres-sure, the turnover of IATA-connected, in the Netherlands established, forwarders, went up by 13.3% in 1989, as compared to 1988. Total turnover in 1989 was roughly 750 mil-lion guilders.

The strong growth of express freight transport by integrators has not only put pressure on the position of forwarders; airlines have also seen their share in the segment of packa-ges up to about 25 kg go down over the last few years. Only recently, growth percenta-ges of 50% annually were the rule rather than the exception in express freight transport. Although the growth of express freight transport is currently declining, it still represents some 30% annually. On the other hand, the traditional European air freight market went up by about 7% a year in the 1980s. Currently, the express transport share of the air freight market amounts to approx. 50% in shipments. Present turnover figures in this market segment in Holland are estimated at approx. 500 million guilders, against overall European turnover figures being estimated at approx. 15 thousand million guilders.

The great difference between traditional air freight transport and express freight transport is that express freight transport employs the 'door-to-door' concept, whereas traditional air

freight transport usually employs the 'airport-to-airport' principle. The express freight services use their own means of transport and advanced tracking & tracing systems to be able to control the entire transport process. Traditional air freight transport involves several parties, each of whom taking care of part of the transport process and assuming part of the responsibility. Consequently, mutual agreement and control processes run less smoothly than with express freight services. Express freight services are therefore often speedier and more reliable than traditional air freight transport.

The working method of integrators like TNT and Federal Express (high-quality service, reliable delivery, employment of tracking & tracing systems and sole control of transport) seems to becoming the standard in transport [4]. Express transport will continue to grow, owing to the autonomous growth of transport demand on the one hand, and increased substitution of conventional transport with express freight transport on the other. By the end of this century about 70 to 80% of the total air freight market is expected to be controlled by integrators, the function of airlines being limited to airport-to-airport transport as part of the integrators' transport chain [5].

A striking phenomenon in European air freight transport is the development of air freight trucking between European airports under airway bill (transport based on air freight conditions generally used in air freight transport; IATA conditions). Air freight that used to be flown between airports is now largely carried by road (air freight trucking).

With air freight trucking, air freight for some destination, e.g. Singapore (airport of destination) is cleared at Schiphol Airport (airport of origin), after which the shipment, under flight number, is carried by truck to Frankfurt Airport from where it is flown to Singapore. From the moment the shipment is cleared, nothing must be changed about it. Clearing the shipment at Schiphol Airport greatly reduces transit handling time at Frankfurt. Air freight transported under flight number has already been cleared in the Netherlands and needs no further clearing at Frankfurt (fewer Customs formalities). These shipments can be transferred almost immediately at Frankfurt. If a shipper wishes to employ a trucking service of an airline, the consolidated shipment must be assembled or disassembled at an airport.

From a legal point of view, carrying air freight under airway bill can only take place between airports as they are officially marked as airport sites with Customs officials having the IATA status (transport under IATA conditions).

The high cost of air transport and the fact that road transport is faster than the plane in terms of total transport time on nearly all European destinations, are some of the reasons for substition of "flown" air freight to "trucked" air freight. Another important reason for the rise of air freight trucking by airlines was the possibility in this way to attract air

freight from foreign airports to the home airport, thus enlarging their catchment area. After all, international haulage between airports is hardly subject to restrictions. This is quite unlike international air freight transport, where frequency and capacity of airlines are the result of (slow) bilateral negotiations between national governments.
Besides, from a competitive point of view, airlines often charge tariffs based on air freight transport from the home airport, which hardly includes connecting road transport.

Robert Cleton

TRACECA PROJECT

IMMEDIATE TRAINING ACTION IN THE TRADE AND TRANSPORT SECTOR

TRANSPORT LEGISLATION

THE CONTRACT FOR THE CARRIAGE OF GOODS

This part of the lecture will deal with the contract for the carriage of goods. Attention will be given in particular to the following international conventions:

*1. Convention on the contract for the international carriage of goods by road (CMR), Geneva 19th May 1956 (herinafter referred to as **CMR**);*

*2. Appendix B to the Convention concerning international carriage of goods by rail (COTIF) of 9 May 1980: Uniform rules concerning the contract for international carriage of goods by rail (CIM) (hereinafter referred to as **CIM**);*

*3. International Convention for the Unification of Certain Rules of Law relating to Bills of Lading (Brussels 1924), as amended by the Protocol done at Brussels of 1968 (hereinafter referred to as **Hague-Visby Rules**);*

*4. United Nations Convention on the Carriage of Goods by Sea, Hamburg 1978 (hereinafter referred to as **Hamburg Rules**);*

*5. Convention for the Unification of Certain Rules relating to International Carriage by Air, Warsaw 1929 (hereinafter referred to as **Warsaw Convention**).*

There are no international conventions in force with respect to the international carriage of goods by inland waterway and with respect to international multimodal transport of goods. In 1988 a UN Convention on International Multimodal Transport of Goods has been concluded in Geneva. This Convention received only 7 ratifications and has never entered into force. With respect to international multimodal transport various international standard contracts are being used such as UNCTAD/ICC RULES for Multimodal Transport Documents, Combined Transport Document of FIATA and COMBIDOC issued by BIMCO/INSA.

1. CMR CONVENTION

This Convention, established in 1956, is a regional European Convention, applicable to contracts for the carriage of goods by road in vehicles for reward, when the place of taking over of the goods and the place designated for delivery, as specified in the contract, are situated in two different countries, of which at least one is a Party to CMR, irrespective of the place of residence and the nationality of the parties. The Convention is

applicable to international transport of goods by road if such transport has been agreed upon by the parties involved. The CMR is not applicable to carriage under one of the postal Conventions, to funeral consignments and to furniture removal. Most European countries have adopted the CMR Convention.

2. COTIF-CIM

The first CIM Convention dates already from 1890 and is the oldest international Convention in the field of international transport. It has been amended several times. In 1980 both the CIM on transport of goods and the CIV on transport of passengers have been integrated into one COTIF Convention with two annexes: CIM for transport of goods (Annex B) and CIV for transport of passengers (Annex A). The CORTF Convention has been adopted by all European States and some Staes in North Africa and Asia. The CIM is applicable to the transport of goods by rail under a through consignment note made out for a route over the territories of at least two States and exclusively over railway lines included in a list kept by the OTIF (International Organization for International Carriage by Rail, which has its office in Bern - Switzerland).

3. HAGUE RULES AND HAGUE-VISBY RULES

3a. In 1924 the Hague Rules were agreed upon during a Diplomatic Conference held in Brussels and included in the Brussels Bill od Lading Convention. The Hague Rules received a world wide acceptance by maritime nations, although some of these nations did not actually become a Party to the Brussels Bills of Lading Convention, but included its provisions into their national legislations. The Hague-Rules were amended in 1968 by a Protocol to the Brussels Bills of Lading Convention (the so-called Visby Rules). The amended Hague Rules are referred to as HAGUE-VISBY RULES. Only a limited number of States Party to the Hague-Rules have adopted the Visby Rules. Nevertheless I will only discuss the Hague-Visby Rules.

3b. The Hague-Visby Rules are applicable to contracts of carriage of goods by sea covered by a bill of lading or a similar document of title. The Rules will also apply when a bill of lading has been issued under a charterparty from the moment at which the bill of lading (*further referred to as b/l*) or similar document regulates the relations between the carrier and the holder of the document. In other words the Rules are applicable when the b/l has been transferred by the charterer to a third party. The Rules are not applicable to charterparties or other contracts of carriage when for such carriage no b/l has been issued.

3c. With respect to the territorial scope of application Article 10 of the Hague-Visby Rules provides that the Rules are applicable to transport between ports in two different States in the following cases:
a. the b/l is issued in a Contracting State;
b. the carriage is from a port of a Contracting State;
c. the b/l contains a so-called *Paramount Clause*, providing that the contract of carriage is governed by the Rules or by the legislation of any State giving effect to the Rules.
Any Contracting State may apply the Rules to other cases, for instance to carriage to a port situated in such Contracting State.

4. HAMBURG RULES

4a. The Hamburg Rules were the first UN Convention on international maritime transport of goods. They have been prepared by UNCITRAL (United Nations Commission on International Trade Law) and were adopted during a Diplomatic Conference held in Hamburg in 1978. They have been subject to much controversy and have been opposed in particular by the traditional maritime States. The Hamburg Rules entered into force only in November 1992 after having been adopted by 20 States (most of them developping countries with small carrier's interest.

4b. The Hamburg Rules have a much wider scope of application than the Hague-Visby Rules:

- The Hamburg Rules are not only applicable to international carriage of goods by sea under a b/l, but to any contract for such international carriage (for instance under a sea waybill), with the exception of carriage under a charterparty. However, the Hamburg Rules will apply, if a b/l has been issued under a charterparty.
- also the territorial scope of the Hamburg Rules is much wider than the scope of the Hague-Visby Rules. The following additional references have been included: the port of loading or the port of discharge as provided in the contract are situated in a Contracting State, or an optional port of discharge, provided that such optional port is the actual port of discharge.

5. WARSAW CONVENTION

5a. The Warsaw Convention was established in 1929. It has been accepted worldwide. In 1955 the Warsaw Convention was amended by the Hague Protocol and supplemented in 1961 by the Convention of Guadalajara. In 1975 another 4 Protocols have been accepted. These Protocols included further amendments to the Warsaw and the Hague Protocol, but these Protocols have never entered into force. The Convention applies to all international carriage of persons, luggage and goods by air. *International carriage* has been defined as carriage which according to the contract takes place between two Contracting States. The Convention is also applicable to carriage within the territory of a Contracting State and there is an agreed stopping place within the territory of another State, even if such State is not a Party to the Convention.

DIFFERENT TYPES OF TRANSPORT CONTRACTS

Unimodal and multimodal transport

The traditional transport contract is a contract for the carriage of goods from one place to another by one mode of transport (sea, air, road, rail, inland navigation: in maritime transport the so-called *port-to-port* approach). Containerization and other methods of unitization, roll-on/roll-off transport and so-called "*piggy-back*" transport have been responsible for farreaching changes in shipping practices. These changes have also affected transport law. In short one may say that the commercial parties who needed to have their containers carried from "door to door" did not want to have to deal any longer with separate contracts and separate carriers, but with one carrier and one contract for the entire operation only. In multimodal transport, including maritime transport, the *Non Vessel Operating Common Carrier (NVOCC)* offers "door to door" transport without being the owner or charterer of a ship.

Definition of multimodal transport:

The carriage of goods by at least two different modes of transport on the basis of one (multimodal) transport contract.
A special form of multimodal transport is the so-called "piggy-back"transport: the vehicle containing the goods is carried over part of the journey by another mode of transport and on board of another vehicle and the goods are not unloaded from the first mentioned vehicle (art. 2 CMR). Very common forms of "piggy-back" transport are the road trailer crossing the sea on board of a ferry-boat and the road trailer carried by rail over a long distance.

Oncarriage or successive carriage
Also in unimodal transport operations the transport may be carried out by more than one carrier. A carrier may operate a liner transport service from place A to B and may agree with the shipper that the goods will handed over to another carrier who will take care of the oncarriage to final destination C.
A distinction must be made between successive carriage and sub-carriage, although in practice this distinction is not easy to ascertain:
In case of successive carriage there is a chain of subsequent transports carried out under one and the same contract, where each successive carrier becomes a party to the contract concluded with the shipper/consignor.
Sub-carriage is a different form, whereby a contractual carrier has engaged another carrier (the actual carrier) to perform the whole or a part of the contract of carriage.

Different types of charters

A. Bareboat- or demise charterparties
The charterer hires the ship or the aircraft from the owner and takes over the navigational and commercial operation of the ship or aircraft and employes the crew in his service. This type of contract is a lease contract and not a transport contract. In air transport these charters are also called *dry lease* or *bare hull* charterparties.

B. Charterparties not by demise (time- and voyage charterparties)
Under these charterparties the owner (or disponent owner in case of sub-charters) not only delivers the ship or aircraft but also the services of the crew. He remains the operator of the ship or aircraft. Under a time charterparty the charterer charters the ship for a certain period of time and pays hire calculated over that period. Under a voyage charterparty the ship or aircraft (or part of it) is put at the disposal of the charterer for the transport of goods for one or more defined voyages. Freight is being paid on the voyage and the amount of freight does not depend from the time the voyage has actually taken.

Towage and pushing contracts (ships) or contracts for hauling of laden vehicles (trucking) in road transport
In such cases there is a separation of the vehicle providing the motive power from vehicle used for the loading of the goods to be carried. It is not always easy to know whether such contracts are to be considered as transport contracts. Where the operator of the tug or pushing vessel or truck is the master of the transport operation there may be a transport contract. However, where for instance a tug renders services to assist a sea-going vessel to enter or leave a port, the tug renders its services under the instructions of the master of the vessel assisted and such contract cannot be regarded as a contract for

transport of goods but as a contract for the employment of a vessel. When a tug renders services to assist a vessel in danger the contract is to be considered as a contract for salvage. The haulage of laden trailers is a common feature in road transport. The trans-channel traffic of trailers, either on board of ferry-boats or through the new Channeltunnel on railway wagons - both are forms of piggy-back transport - is based on the availability of a local truck on both sides of the Channel. The owner or operator of the truck, providing the locomotive power puts at the disposal of the owner/operator of the trailer a vehicle with a driver.

Transport contracts versus freight forwarding contracts
The freight forwarder acts as an intermediary between the shipper/consignor and the carrier or between a consignee and the carrier. His primary obligation is to conclude on behalf of the shipper the necessary transport contracts with the carriers in order to effect the transportation of the goods, but he is not a carrier who assumes the obligation to move the goods from the place of departure to the place of destination. In practice, however, the distinction between the two contracts is not always very clear due to the fact that in practice many forwarding agents also act as carriers and that many contracts concluded orally or by letters of confirmation are not very clear on this particular issue. A freight forwarder who performs the transport himself assumes the liability of a carrier.

PARTIES TO THE CONTRACT OF CARRIAGE

Consignor - carrier - consignee
The contract of carriage is concluded between a consignor and a carrier. In some Conventions the term "sender" or "shipper" has been used for the consignor. It should be kept in mind that the goods may be delivered for carriage to the carrier by another person than the consignor. Such person should not be considered as a consignor. In most transport contracts the carrier assumes the obligation to deliver the goods to a third person, named in the contract (the consignee). The consignee becomes a party to the contract of carriage when he exercises his right under the contract of carriage to take delivery of the goods after their arrival at their place of destination and the the consignor looses his right to dispose of the goods by stopping them in transit or to name another consignee.
If the document is made out not to a named consignee, but to the order of the consignor, making the document transferable by endorsement, or to the bearer of the document, the transport document becomes a negotiable document of title (in most cases a bill of lading).
The carrier may perform the carriage of the goods himself but he may also engage other (sub)carriers. The carrier who has concluded the contract of carriage with the consignor remains however responsible for the performance of the contract as a *contractual carrier.* The carrier performing the carriage is the *performing or actual carrier.*

TRANSPORT DOCUMENTS

The contract for the transport of goods can be made in any form, in a written form or orally. However, for the majority of transport contracts a document will be issued. Those documents may have one or more of the following functions:
a. receipt for the taking over by the carrier of the goods as described in the document;

b. evidence of the contract of carriage concluded and of the terms of that contract;
c. a document of title entitling its lawful holder to demand delivery of the goods and to claim damages from the carrier in case of incorrect delivery by the carrier; the original of the document must be presented to the carrier in order to obtain delivery of the goods. Made out in negotiable form (to order of the shipper or to bearer of the b/l) or in non-negotiable form ("straight b/l").

Documents most commonly used:
maritime transport:
a. liner trade: bill of lading or sea waybill (always non-negotiable); in exchange for a b/l a carrier may issue delivery orders.
b. chartertrade: charterparty.
road and railtransport: waybill (non negotiable);
airtransport: air waybill (in practice always in non negotiable form, although under Warsaw Convention as amended by Hague Protocol an air waybill in negotiable form may be issued); for charters: charterparty
multimodal transport: multimodal transport document (MT document), issued in a negotiable form or in a non-negotiable form indicating a named consignee).
Charterparties serve only as evidence of the charter concluded and its conditions; bills of lading and waybills are receipts of the goods received by the carrier and evidence of the contract concluded; bills of lading and negotiable MT documents are documents of title as well.

Evidentiary effect of the documents
Bills of lading and waybills must contain among others particulars concerning the goods to be carried (general nature, leading marks and number of packages, weight or quantity and their apparent condition at the time of delivery to the carrier). If the carrier establishes that the goods have not been delivered to him in an apparent good condition or that the number, weight or quantity do not correspond with the particulars provided by the consignor, he must include reservations to this effect into the document. Failing to do so may result in a presumption that the the goods have been partially lost or damaged during their carriage (a bill of lading without reservations is called a *clean bill of lading*). The Hague-Visby Rules and the Hamburg Rules provide that the bill of lading is *prima facie* evidence of taking over the goods by the maritime carrier as described in the b/l, but that proof to the contrary is not admissable if the b/l has been transferred to a third party who has in good faith acted in reliance of the contents of the b/l.

LIABILITY OF THE CARRIER

Basis of liability
The carrier is responsible for the safe and timely arrival and delivery of the goods at their place of destination. The relevant transport conventions and many national laws provide for a mandatory or semi-mandatory system of liability: they do not permit the parties to deviate in the contract of carriage from any provision of the Convention or law or they do not permit the insertion of any contractual clause to the detriment of the consignor/consignee.
The claimant has to proof the loss, damage or delay and that such loss, damage or delay occurred during the period that the goods were in the custody of the carrier. If the

claimant is able to provide such proof, the carrier will be liable to pay damages, unless he is entitled to invoke one of exceptions of liability permitted by the applicable international convention or national law. General grounds for exoneration of liability are the wrongful act or neglect of the claimant, instructions given to the carrier otherwise than resulting from a wrongful act or neglect of the carrier, inherent vice of the goods or *force majeure* (circumstances which the carrier could not avoid and the consequences of which he was unable to prevent). Moreover certain conventions and national laws provide for so-called special grounds of exoneration, such as: lack or defective packing of the goods; handling, loading, stowage or unloading of the goods by the sender, consignee or any person acting on their behalf; nature of the goods; insuffiency or inadequacy of marks or numbers on the packages.
The carrier is liable for the acts of his servants and agents and for any defects of the vehicles used by him or his sub-carriers. However, according to the Hague Rules and Hague-Visby Rules the carrier is not liable for nautical faults of the crew, the pilot or other servants or agents. Moreover, under these Rules the carrier has only an obligation to exercise due diligence before and at the beginning of the voyage to make the ship seaworthy and to properly man and supply the ship and make it fit for the reception, carriage and preservation of the goods.

Period of liability
Liability of the carrier commences at the time of taking over by him of the goods for carriage and it ends at the moment that he delivers them to the consignee at the place of destination. However, the Hague Rules and Hague-Visby Rules provide that the carriage of goods covers the period from the time that the goods are loaded on board the ship on to the time of their discharge drom the ship (*"tackle-to-tackle rule"*). The maritime carrier is under those Rules free to insert any clause into the b/l which relieve him from all liability for loss or damage during the periods before loading or after discharge.

Computation of damages
The Hague-Visby Rules and the CMR Convention contain provisions which limit the kind of damages for which compensation may be claimed and which fix the value of the goods to the current market value or to any other objective standard. These Conventions only allow compensation of physical loss of the goods and extra expenses made in connexion with their condition (for instance repacking or reconditioning), but no compensation any further economical loss (for instance loss of market).

Limitation of liability by amount
Limitation of liability is a well known and traditional feature in transport law. Most Conventions allow the carrier to limit the amount of compensation to be paid by him to a certain amount per kilogramme of the goods carried. The Hague-Visby Rules also include a reference to the units of goods carried. In the International Transport Conventions the limitation amounts have been expressed in SDR's (Special Drawing Rights of the International Monetary Fund) and/or in so-called Gold Francs. The amounts calculated in such international monetary units must be converted into the applicable national currency. The carrier will not be entitled to invoke limitation of his liability if the loss, damage or delay has been caused by his intentional or reckless act or by such acts committed by his servants or agents.

II. GLOBAL LIMITATION OF SHIPOWNER'S LIABILITY

Concept and justification of global limitation

Global limitation refers to the entitlement of the shipownerby law to limit his liability for all limitable claims (contractual and non-contractual) arising out of one specific incident and made against a shipowner or other person connected with the operation or exploitation of the ship. *Unit limitation* refers to the right of a carrier to limit his liability in respect of one specific claim arising from a contract of carriage (see also under THE CONTRACT OF CARRIAGE).
The main justification of global limitation of liability is an economical one: to protect the shipping industry against claims for which no sufficient insurance cover against a reasonable premium can be obtained in the current insurance market ("commercial insurability").

The London Convention of 1976 on limitation of liability for maritime claim (LLMC 1976)

LLMC 1976, which has replaced the Brussels Convention of 1957 on limitation of liability of shipowners, is applicable on sea-going ships, also when they are sailing on inland waters. During a diplomatic conference to be held in April/May of this year (1996) in London under the auspices of the International Maritime Organization (IMO) LLMC 1976 will probably be revised. Article 15 LLMC 1976 includes some exceptions to the scope: the Convention is not applicable to air cushion vehicles and floating platforms constructed for the exploration or exploitation of oil or other natural resources in the seabed. Furthermore a State Party to the Convention may regulate in its national law by specific provisions the limitation of liability of small sea-going vessels under 300 tons and of inland navigation vessels.

According to art. 15 LLMC 1976 is applicable whenever a shipowner or other person entitled to limitation seeks to limit his liability before a court of a State Party to LLMC 1976 or seeks the release of his vessel after its arrest. However, he may seek limitation only with a court in which legal proceedings have been instituted in respect of claims subject to limitation under LLMC 1976. This provision has been included to avoid "forum shopping" by shipowners.

Persons entitled to limitation are the shipowner, the charterer, manager or operator of the ship, members of the crew, the pilot, the salvor of a ship, the liability insurer and any person for whose acts the owner, charterer, manager, operator or salvor are responsible (article 1). If several persons entitled to limitation are held responsible for the same damage, only one of such persons must establish a limitation fund (article 9).

Article 2 enumerates the claims which are subject to limitation, including among others claims for loss of life or personal injury, loss of or damage to property on board the ship or in direct connexion with the operation or salvage of the ship, wreck removal and preventive measures. According to article 3 the following claims are not limitable under LLMC 1976: claims for salvage, general average, claims of servants and agents of the shipowner and the salvor, if limitation for such claims is under the law applicable not

permitted or only to a greater amount than provided for by the Convention. Also excluded are: claims for oil pollution, claims for nuclear damgage subject to any international Convention or national legislation governing or prohibiting limitation of liability and claims against the owner of a nuclear ship for nuclear damage.

A shipowner or other person invoking limitation of liability will be barred from the right of limitation if it is proved that the damage was caused by his personal act or omission, committed with the intent to cause such loss, or recklessly and with knowledge that such loss would probably result (art. 4).

The limitation system and the limitation amounts are dealt with in articles 6 and 7. Article 6 provides for two general limitation funds, one limitation fund for the compensation of personal claims and one for the compensation of other claims (in practice mainly, but not exclusively, property claims). However the balance of unpaid claims under the personal damage fund shall also rank ratebly with the claims made against the property fund (the so-called "overflow from the personal claims fund to the property fund). The system according to which the general limitation funds must be calculated is rather complex. It is related to the gross tonnage of the ship. There is a minimum-limit up to 500 tons and a degressive scale of amounts to be added for each ton of the ship's tonnage exceeding 500 tons. This system results in relatively higher limitation funds for smaller ships. The limitation of liability of a salvor who is not operating from a ship or is operating on board of the ship in respect of which he has rendered salvage services must be calculated according to a tonnage of 1.500 tons.
Article 7 provides for a special fund for the compensation of claims for loss of life or personal injury caused to the passengers of a ship. The limit of liability for such claims shall be an amount of 46,666 units of account multplied with the number of passengers which the ship is authorized to carry according to the ship's certificate, but with an absolute maximum of 25 million units of account. The limitation amounts have been expressed in so-called units of account. The unit of account used in LLMC 1976 is the Special Drawing Right (SDR) of the International Monetary Fund.

Articles 11-13 LLMC 1976 deal with the constitution and distribution of the limitation funds. A limitation fund may be constituted either by depositing the sum or by producing a guarantee acceptable under the legislation of the State Party where the fund is constituted and considered adequate by the court. The general rule is that each fund shall be distributed among the claimants in proportion to their established claims. There are a few exceptions to this rule.

The Rhine States and Luxemburg have adopted in 1989 the so-called CLNI Convention with respect to inland navigation vessels, which is based on similar principles as LLMC 1976. This Convention applies to navigation of inland navigation vessels on the rivers Rhine and Moselle.

III. LIABILITY FOR DAMAGE CAUSED BY TRANSPORT OF DANGEROUS AND NOXIOUS SUBSTANCES

Introductory remarks
The ever increasing transport of dangerous and noxious goods and the growing public

interest in the protection of the environment has stimulated a tendency to introduce special rules for compensation of damage caused during the transport of oil, chemicals and other dangerous and noxious products by sea or by other modes of transport (in particular by road, rail or inland navigation vessel). Efforts to agree on international conventions in this field of law have, however, up to now only been partially succesfull. The main reasons are the complexity of the legal questions involved and the possibility of huge claims under such compensation schemes and related insurance problems.

COMPENSATION FOR OIL POLLUTION DAMAGE

The history of the international conventions regarding compensation for oil pollution damage proves that efforts made by govermnents under public pressure can be succesfull. In 1969 the Civil Liability Convention on pollution damage (**CLC**) was established in the aftermath of the accident of the oiltanker "Torrey Canyon" near the Scilly islands, followed in 1971 by a supplementary Convention which created the International Oil Pollution Compensation Fund (the **Fund Convention**). Both Conventions were revised in 1992 and these amended Conventions will enter into force in the course of this year (1996). I will refer to these Conventions as CLC 1992 and Fund Convention 1992. The latter Convention will establish a new IOPC Fund. Eventually the CLC and Fund Convention will cease to exist after the State Parties to these Conventions have adhered to the 1992 Conventions and have derogated the old CLC and Fund Convention.

CLC and CLC 1992

Principal features of CLC and CLC 1992 are the following:
1. strict liablity of the shipowner; the shipowner can rely only on a limited number of exceptions to this liability;
2. limitation of this liability, separate from the limitation provided for in LLMC 1976;
3. obligation of the shipowner to take out insurance to cover his liability under CLC; this obligation is only applicable in respect of ships carrying more than 2,000 tons of oil in bulk as cargo.

Claimants have a direct action for compensation for oil pollution damage against the insurer of the shipowner. In most cases the shipowner is insured for this liability risk with a Protection & Indemnity (P&I) Club.

The liability for oil pollution damage under CLC 1992 has been channelled to the shipowner and a number of persons connected with the operation of the ship (such as crew members, charterers, operators and managers of the ship and salvors and persons taking preventive measures cannot be held liable for oil pollution damage, even according to general rules of national law, unless they have committed the damage with intent or recklessly.

CLC only applied to sea-going ships carrying oil in bulk as cargo. CLC 1992 has extended the scope of application to unladen tankers and to combination tankers when carrying oil in bulk as cargo or during a subsequent voyage, unless it is proved that during such voyage there are no residues of the oil previously carried on board. CLC is not applicable to oil pollution caused by the bunkers of other ships. "Oil" has been

defined in CLC 1992 as persistent hydrocarbon mineral oil, "pollution damage" as loss or damage caused outside the ship by contamination resulting from the escape or discharge of oil from the ship. However, compensation for impairment of the environment other than loss of profit is limited to costs of reasonable measures for the reinstatement actually undertaken. Preventive measures, i.e. reasonable measures to prevent to prevent or minimize pollution damage are also compensated.

CLC 1992 has widened the geographical scope of application of the Convention: it shall apply not only to the territory, including the territorial sea, of a State Party but also to the EEZ (Exclusive Economic Zone) of such State, or in the absence of an EEZ, to an area beyond and adjacent to the territorial sea of that State determined by that State in accordance with international law and extending not more than 200 miles from the baselines.

The limitation amounts of CLC have been raised considerably in CLC 1992: a flat limit of 3 million SDR for all ships up to 5,000 tons (gross tonnage), for ships above 5,000 tons 420 SDR for each ton exceeding 5,000 tons must be added, up to an absolute maximum of 59,7 million SDR, which will be reached at 140,000 tons.

Fund Convention and Fund Convention 1992

The Fund Conventions are supplementary to the the respective CLC's. Only a State which is a Party to CLC 1992 can become a Party to Fund Convention 1992 and the same applies in respect of the old CLC and Fund Convention. Under each Fund Convention an International Fund for the compensation or Oil Pollution Damage (**IOPC FUND**) has been established, whith its head office in the IMO building in Londen. The IOPC FUND must be recognized in each State Party as a legal person capable under the law of that State of assuming rights and obligations and of being a party in legal proceedings before the courts of that State.

The IOPC FUND must pay compensation to any person who has suffered oil pollution damage and has not been able to obtain full and adequate compensation from the shipowner. In the majority of cases the 1971 Fund had to pay supplementary compensation because the amount of damage caused exceeded the shipowner's limitation under CLC. The Fund Convention 1992 provides for a ceiling of 135 million SDR per incident which, however, includes the compensation to be paid under CLC 1992 by the shipowner. This ceiling will be raised to 200 million SDR when there are 3 Parties to the Convention in respect of which the quantity of contributing oil received in their territories equals or exceeds 600 million tons per year.

The IOPC FUND is financed by contributions to be made by persons who have received oil carried by sea to ports or terminal installations situated in the territory of a State Party or received in any installation situated in the territory of a State Party and carried on (for instance by pipeline) from a port or installation in a non State Party. Only persons who have received a quantity of oil exceeding 150,000 tons per year have to contribute to the IOPC FUND. This system, whereby the first tier of compensation has to be paid by the shipowers and the second (supplementary) tier by the oil companies and storage companies was a compromise reached with the oil and shipping industry during the diplomatic

conference held in Brussels in 1969.

The IOPC FUND 1992 will be governed by an Assembly of State Parties. The Director is the head of the Secretariat and the legal representative of the Fund.

LIABILITY AND COMPENSATION FOR DAMAGE CAUSED BY OTHER DANGEROUS AND HAZARDOUS AND NOXIOUS CARGOES

Introductory remarks
The efforts made to bring about other international conventions relating to the carriage of hazardous and noxious substances have sofar not been succesfull. Since the early 70's after the establishment of CLC (1969) and the Fund Convention (1971) the International Maritime Organization (IMO) has been engaged in the preparation of a so-called **HNS** (Hazardous and Noxious Substances) Convention. A draft HNS convention submitted to a diplomatic conference in 1984 was not accepted and has been returned to the Legal Committee of IMO. In April of this year (1996) a new diplomatic conference will be held in London. Under the auspices of ECE (Economic Commission for Europe of the United Nations) the CRTD Convention was established in 1989 for inland transport, but this Convnetion has not entered into force.

CRTD Convention

The full title of this Convention is *Convention on Civil Liability for Damage caused during Carriage of Dangerous Goods by Road, Rail and Inland Navigation Vessel (CRTD).*This Convention has been used by the Dutch Legislator as a model for the provisions in the Dutch Civil Code with respect to liability for damage caused during transportation of dangerous goods by sea, inland navigation vessel, road and rail.

Although there are certain differences between the CRTD and CLC 1992, the basic pattern of the liability system of both Convention is the same (strict liability, limitation of this liability and compulsory liability insurance). However, there is no supplementary Convention to CRTD, establishing an international compensation fund. The whole burden of compensation rests upon the operator of the vehicle carrying the dangerous goods. Damage to be compensated includes loss of life, personal injury, environmental damage (but compensation for this type of damage is restricted in the same way as in CLC 1992) and preventive measures. "Carrier" has been defined in CRTD with respect to carriage by road and by inland navigation vessel as the person who at the time of the incident controls the use of the vehicle on board which the danagerous goods are carried, with respect to rail transport as the company or companies operating the railway line on which the incident occurred. In cases of so-called "piggy back"-transport, when the vehicle carrying the dangerous goods is during a part of the journey carried on board of another vehicle and the dangerous goods are not unloaded from the first mentioned vehicle, the operator of the vehicle carrying the first mentioned vehicle with the dangerous on board will be deemed to be the liable carrier under the CRTD.

The CRTD does not contain a general definition of "dangerous goods" but refers in this respect to the list and classification of dangerous goods in the European Agreement

Concerning International Carriage of Dangerous Goods by Road (ADR), which Agreement is used as a reference list for the three modes of transport covered by CRTD.

CRTD does not apply if the claimant has a contractual relationship with the CRDT carrier, for instance under a contract for the transport of goods or passengers. Also other persons whose goods are carried on board the same vehicle with the dangerous goods cannot claim damages on the basis of CRTD: in the definition of "property damage" damage to property carried in the same vehicle or train of vehicles has been excluded.

HNS Convention
Although the outcome of the diplomatic conference to be held in April of this year is not yet known I may give a rough outline of the draft HNS Convention.
Although many other alternatives have been studied and debated within the IMO Legal Committee, the present draft follows the same pattern as CLC 1992 and Fund Convention 1992: a "two tier" system of compensation, but included into one Convention. The first "tier" relates to a strict liability with only limited defences which shall rest upon the shipowner carrying the hazardous and dangerous goods. The provisions are more or less similar to those of CLC 1992. The amount of limitation of liability of the shipowner has yet to be fixed by the Diplomatic Conference. The second "tier" will provide for supplementary compensation to be provided by an international compensation fund which will be financed by contributions by HNS cargo interests. There will be a ceiling in the amount of compensation to be paid out for each incident by the HNS Fund, also te be fixed by the Diplomatic Conference. Contributions are to be made by cargo *receivers* according to a rather complex "HNS points" system on the basis of a number of market sectors, divided into separate accounts (for instance a separate LNG-account) and to be assessed on a post-event collection basis.
There was a substantial debate about the system to be followed with respect to the list of HNS substances. The choice was between a reference to existing IMO lists of HNS (such as MARPOL, IMDG CODE and Bulk Chemical Code) and a separate free standing HNS Convention list. The final choice will be made by the Diplomatic Conference.

IV. SALVAGE

The concept of salvage with its basic principle of "no cure, no pay" has its roots in the traditional maritime law. It has been accepted in certain countries also in inland navigation law. During a period of over 70 years the *Brussels Convention of 1910 for the unification of certain rules of law relating to assistance and salvage at sea* has provided for the basic international uniform rules relating to the law of salvage. Also a number of standard agreements do play an important role in this respect. The most commonly used international agreement is Lloyd's standard form of salvage agreement (*Lloyd's Open Form*); other standard agreements often used are the "Moscow Form", the "Peking Form" and the "Japanese Form". The Brussel Convention has been replaced in 1989 by a new Convention: *the International Convention on Salvage, 1989*, which will enter into force in the course of this year (1996).

A salvage operation is a voluntary activity undertaken to assist a vessel or other property in danger in navigable waters or in any waters whatsoever. If the salvage operation has had a useful result (the ship or other property is salved), the salvor is entitled to a

reasonable reward (a *salvage award*), whether or not the operation has been carried out under a salvage contract. Article 13 of the 1989 Salvage Convention provides that the reward shall be fixed with a view to encouraging salvage operations and it enumerates a number of criteria which the courts or abitrators may take into account when fixing the reward (such as the salved value of ship and other property, the skill and efforts of the salvors, time used and expenses made, etc.). The reward, exclusive of any interest and recoverable legal costs that may be payable thereon, may not exceed the salved value of the vessel and other property. The parties who have an interest in the vessel and in the other salved property are liable for the payment of the reward, each in proportion to their respective salved values. The parties to a salvage contract may of course agree on a specific award. However, article 7 of the Salvage Convention provides that a contract or any terms thereof may be anulled or modified 1. if the contract has been entered into by undue influence or the influence of danger and its terms are inequitable and, 2. the payment under the contract is in an excessive degree too large or too small for the services rendered.

Article 8 of the 1989 Salvage Convention sums up the duties of the salvor on the one hand and of the shipowner, master and owner of the property on the other hand. One of their duties is to take due care to prevent or minimize damage to the environment.

The 1989 Salvage Convention introduces a new form of award, the *special compensation* (art. 14). Often the ship itself or its cargo pose a serious threat to the environment and this factor will complicate the salvage operation and will be the cause of considerable extra expenses to be made by the salvor. He may even be obliged to take the burning tanker out to open sea where it will be lost and which will result in the loss of salved property and the loss of a salvage award. In order to encourage salvors to make sufficient efforts in the interest of the protection of the environment the salvor may be entitled to special compensation by the shipowner for his expenses if he has failed to earn a sufficient reward. If the salvor has been succesfull in his efforts to protect the environment, the special compensation may be increased up to a maximum of 30%, in special cases even to 100 %.

V. GENERAL AVERAGE

Also general average is a traditional particularity of shipping law. It dates back to the ancient Greeks and may be even to the Phoenicians. The oldest law on general average known is the law of the Rhodians which was reproduced in the Digest of the old Roman Emperor Justinian. The law has become part of the law of the maritime states.

In cases of *particular average* the expenses or losses occurred in relation a transport as a result from an incident those expenses and losses shall fall on the person who suffered them, unless such person has a recourse action against another person liable for the loss or damage or expenses. In *general average* the losses or sacrifices and expenses intentionally and reasonably made for the common safety for the purpose of preserving from peril the property involved in a common adventure are to be borne by the interests (ship, cargo and freight), involved in the common adventure, in proportion to their actual net values at the termination of the adventure (*contributing interests*). The underlying philosophy of general average is that the voyage of the ship poses a common adventure for all interests

involved in the voyage. A classical example of general average is the jettison of deck cargo after the stranding of the ship in order to refloat the ship. Salvage operations may give rise to general average as well if the salvage operation is carried out for the common safety of the interests involved. However, Rule VI of the York-Antwerp Rules 1994 provides that special compensation payable to a salvor by the shipowner under article 14 of the 1989 Salvage Convention or under any other similar provision shall not be allowed in general average.

General Average is governed not by the provisions of an international Convention but by worldwide accepted contractual standard rules (York-Antwerp Rules). Reference to these rules are included in nearly every, bill of lading, charterparty or any other document used in the transport of goods at sea. The first York_Antwerp Rules date from 1890, the latest version from 1994.

In order to accept that there is a general average act the following conditions must have been fulfilled:

a. there must be an extraordinary sacrifice or expenditure;
b. the sacrfice or expenditure must be intentionally and reasonably made or incurred;
c. for the common safety for the purpose of preserving from peril the property involved in the common maritime adventure.

Robert Cleton

TRACECA PROJECT

IMMEDIATE TRAINING ACTION IN THE TRADE AND TRANSPORT SECTOR

INSURANCE

1. Introduction

Persons engaged in international trade and transport incur constantly considerable risks. The owner of a ship, aircraft or other vehicle may loose his vehicle or become liable to pay damage to passengers or property carried on board of his vehicle or to third persons. Presently the risk of causing environmental damage may result in huge financial compensation. Cargo-owners may loose their cargo as a consequence of transport related perils (in the maritime industry called "*marine perils*"). In particular marine insurance may claim that it has a long tradition, dating probably back to early times, when merchants tried to protect the capital which they had invested in ship and cargo against the risks posed by the maritime adventure by forming mutual protecting societies or clubs and shared their financial risks. The early insurers were not professional insurers and the mutual societies or clubs were small affairs with limited membership of merchants who knew each other well and could trust each other. Insurance on such a small and non-professional scale is nowadays inconceivable.

2. The marine insurance industry; Lloyd's of London

2.1 The marine industry in general

The heading "marine insurance" in general coveres most forms of transport insurance which can be divided into three main categories: cargo insurance, hull insurance , freight insurance and liability insurance. The first category (cargo insurance) covers, generally spoken, the risks of loss of or damage to the goods and related costs, but it may include certain well defined liabilities of the cargo owner resulting from the contract of carriage (for instance for contributions in general average or claims for salvage charges). Hull insurance covers the risks of loss of or damage to the vehicle and with respect to the insurance of ships also a part of the collision liability. Liability insurance covers the risk of liability incurred by an owner, operator or a charterer of a vehicle.

Marine insurance law has sofar not been regulated in an international convention but it is subject to national law. The marine insurance business is conducted by private or state-owned insurance companies, operating often in an international insurance market. Lloyd's of London and the so-called Protection & Indemnity (P&I) clubs have however their own particular legal and organizational structure. In order to ensure a sufficient risk-spreading insurance companies will reinsure risks accepted by them with reinsurance companies. Insurance brokers act as intermediaries between the insured and the insurer (also called "*underwriter*") and also between insurers.

The international organization of the national associations of marine insurers is the

I.U.M.I. (International Union of Marine Insurers). IUMI includes cargo and hull insurers, but not the P&I Clubs.

2.2 Lloyd's of London

Lloyd's of London is not in insurance company but an international insurance market, a place where underwriters accept insurance and carry on their business for their individual profit or loss and in competition with each other. Lloyd's was incorporated only in 1871 by an Act of Parliament. Lloyd's started in the coffeehouse of Edward Lloyd (opened in 1688) in Tower Street in London which was the informal meeting place of ship's captains, merchants, bankers and others with a maritime interest.[1] At that time the practice was for insurance on ships and their cargoes to be accepted by undividual merchants as a sideline, each of whom would take a share of any particular risk on a vessel's vyage. In 1771 a committee of customers of Lloyd's coffehouse was elected to find a new meeting place and in 1774 they moved to the Royal Exchange. Lloyd's provides to its members the premises, the organization and the staff. Only the "underwriting members" (or the so-called *names*) of Lloyd's are entitled to underwrite insurance policies. The names are members of *syndicates,* each syndicate has its own number and is managed by an "underwriting agent". It is the underwriting agent who is acting on behalf of the names of his syndicate. The names are personally liable to an unlimited amount for claims made against their syndicate. The non-underwriting members only provide the necessary capital. All insurance contracts must be concluded through Lloyd's Brokers.
Lloyd's is governed by a Committee if 16 members, elected by the members of Lloyd's for 4 years. There are within Lloyd's four main sectors of insurance: marine insurance, non-marine insurance, aviation insurance and motor-vehicle insurance.

3. Some general aspects of insurance law

An assured can only recover from an insurance policy if he has an *insurable interest*, i.e. an interest which the law declares to be capable of being insured. The assured must for instance have an interest in the ship or in the goods as its owner. But also a mortgagee or a charterer may have an insurable interest in a ship. The insurable interest must exist at the time of the loss, not necessarily at the time the insurance is effected.
Cargo and hull insurance are examples of *indemnity insurance*. The principle of indemnity means that the insurer must indemnify his assured for the loss or damage actually suffered by the assured who should not make a profit out of the insurance contract. On the contrary, if the insured value is lower than the actual value of the insured property, the assured shall receive less compensation out of the insurance policy than his financial loss.
Parties to the insurance contract must act in the *utmost good faith*. The assured must when concluding the contract not only refrain from making any active misrepresentation but he must also disclose to the insurer any material circumstance which would influence the insurer in the judgement of the risks involved and in fixing the premium.
The cargo or hull insurer who has imdemnified his assured for a financial loss will be

[1] The first insurance companies (The Royal Exchange Assurance and The London Assurance) were founded only in 1720. These companies received by an Act of Parliament (the Bubble Act) a monopoly for contracting of insurance policies.

subrogated in any right of recourse of the assured against the person who is liable for the loss or damage caused. On the other hand the person liable (for instance a carrier or a shipowner) may be insured against this liability. As a consequence there will be a certain overlap of two types of insurance and recourse actions are often between insurers.

4. Cargo insurance

Since insurance law is based on national laws of the countries and specific insurance conditions which may also vary from one country to another it is difficult to give a specific picture. The picture in this paper will be very global. In view of the fact that the English Institute Clauses are rather broadly used in international insurance transactions these clauses are taken as an example.
The policy will provide cover for all or certain perils to which the goods may be subjected during their journey. Most cargo policies insure by the voyage. The English Marine Insurance Act provides in article 1 that the marine insurance covers marine losses, i.e losses incident to a marine adventure. Such losses are caused by *perils of the sea: fortuitous accidents or casualties of the sea.* There are also other maritime perils such as fire, warrisks, pirates and thieves. But the enumeration of insurable perils has an open end.
The London Market offers three forms for *standard insurance clauses: A, B and C.* These *Cargo Institute Clauses* have been revised in 1983 in order to bring them in line with the model clauses accepted by UNCTAD (United Nations Conference on Trade and Development). The English insurance market offers with respect to the risks of strikes and for warrisks special Institute Strike Clauses (Cargo) and Institute War Clauses (Cargo). These risks are never included as insured risks in the normal policies and they have to be covered under a separate policy. Institute Clauses A provide for an "all risks" cover (however, these clauses contains several exclusions from the cover (among others stike and warrisks, delay in the transport). Institute Clauses B provide only cover for the perils specifically mentioned, *such as*: fire or explosion; stranding, grounding, sinking or capzizing of the vessel; collision; overturning or derailment of land conveyance; general average and jettison of cargo. Clauses C also provides cover for specific perils but the number of perils covered by these clauses is restricted.

5. Freight insurance

Owners or charterers of ships and aircraft can take out insurance against the risk of the loss of freight because of loss of or damage to their ship or aircraft as a result of an insured peril. As an example the case may be mentioned the case of a ship under timecharter which after a collision has to be repaired at a shipyard. During the time necessary for the repair of the ship the shipowner will not earn hire for his ship.

6. Hull insurance

Most commonly used clauses for the insurance of ships are the *Institute Time Clauses (Hulls)* and the *Institute Voyage Clauses (Hulls).* Under the Time Clauses the ship is insured for a certain period, under the Voyage Clauses for a voyage. Clause 2 of the Voyage Clauses provide that should the ship at the expiration of the insurance be at sea or in distress or at a port of refuge or of call, she shall provided previous notice be given to

the Underwriters, be held covered at a pro rata monthly premium to her port of destination ("continuation clause"). Insured perils are among others: perils of the seas rivers lakes or other navigable waters; fire and explosion; violent theft by persons from outside the vessel; jettison; piracy; breakdown of or accidents to nuclear installations or reactors; contact with aircraft or similar objects or objects falling therefrom, land conveyance, dock or harbour equipment or installation; accidents in loading, discharging or shifting of cargo or fuel; bursting of boilers; negligence, default or error in judgement of master officer, crew or pilot and barratry of master officers and crew.
The following special clauses should be mentioned: pollution hazard, collision liability (running down clause) and general average and salvage. The *Pollution Hazard Clause* covers loss or damage to the ship caused by any governmental authority acting under the powers vested in it to prevent or mitigate a pollution hazard or threat thereof, provided that the act undertaken by the Authority did not result from want of diligence by the assured, the owners or managers of the ship to prevent or mitigate such hazard or threat. Under the *Collision Clause* the liability of the assured for damage caused by collision of his ship with other ships and goods carried on board these ships, delay caused to such ships and goods resulting from the collision and general average or salvage charges of such ships. The compensation for this liability risk is, however, limited to three quarters of the insured value of the ship. The *General Average Clause* covers the ship's proportion of salvage charges and/or general average.

7. Liability insurance

7.1 General observations

The owner, operator, manager or charterer of a ship, aircraft or other means of transport may run the risks of being held liable under a contract or on an extra-contractual basis for any loss or damge caused to other person, property or the environment as a result of the exploitation of his vehicle. The amounts of compensation to be paid can be huge, even if one of the legal systems of limitation of liability would be apply to him. The primary function of liability insurance is to protect the financial interests of owner and other persons mentioned and to prevent his bankruptcy. Liability insurance of the party held liable is of course in the interest of the claimants as well. A liable but bankrupt counterpart does not pay off since he offers no possible recourse. For this reason the compulsory isurance of persons who may become liable for certain events has been introduced by national laws and international conventions for the benefit of the victims. The most commonly known form of compulsory insurance is the compulsory motor liability insurance. With respect to maritime law I may refer to the Civil Liability Convention for Oil Pollution Damage (CLC) which obligates the owners of oiltankers and combination carriers to take out insurance cover for their liability under the Convention. In order to give further protection to the claimant those legal systems of compulsory insurance provide for a direct action of the claimant against the liability insurer who is not allowed to invoke any clauses in the liability insurance contract which would reduce his responsability *viz-à-viz* the claimant.

7.2 Protection and Indemnity Insurance (P&I)

The protection and indemnity insurance is a special type of marine liability insurance. The

P&I insurance business is not conducted by commercial insurance companies, but by so-called P&I Clubs. P&I Clubs are non-profit mutual insurance associations whose members are shipowners, charterers, operators or managers of sea-going ships[2]. The members share their liabilities equitably among each other. Another important aspect of the P&I Clubs is that the members can obtain unlimited cover for their liabilities, save in respect of oil pollution liability. The P&I Clubs have originated in England during the 19th century from the mutual hull clubs which dealt with hull insurance.[3] The old hull clubs lost their business to commercial insurance companies and to Lloyd's of London after the Bubble Act was withdrawn by British Parliament in 1824 which ended the monopoly of the two insurance companies. The first clubs were "protection" clubs only covering the part of the collision liability not taken care of by the hull insurance (which is still limited to 3/4 of the insured sum of the ship) and also liability for loss of life and personal injury of passengers and members of the crew. The range of liability risks accepted by the clubs was extended, in particular when new liabilities for shipowners were introduced by legislation. In 1874 a new class of liability risks was added, the indemnity insurance i.e. protection against claims for loss of or damage to cargo. From thereon the Protection clubs became Protection and Indemnity Clubs. Presently the P&I Clubs cover a large range of liability risks, not only of ships but of offshore installations as well. The clubs provide cover not on an all risks basis but only for named perils. The shipowner or other member must agree with his club about the specific risks for which he wishes to be covered. Most clubs have included, however, a so-called "omnibus rule" into their clubrules (which have more or less the same function as the clauses of an insurance policy). This clause allows the club's committee some flexibility and discretion by admitting in special cases a claim for a risk not explictly covered.

Members of a P&I Club choose a committee who acts as a board of directors and control the club. The day-to-day conduct of the club's business is taken care of by the manager, who is either an employee of the club or a separate professional firm which may be managing other clubs as well.

Each club has its own rules which contain the terms upon which the club conducts its business and the terms of the insurance cover provided to the members. The member receives a certificate of entry stating the ship or ships covered and the date of entry and in case of fixed period entries (for instance for timecharterers) the date at which the insurance of the ship shall cease. The policy year of the clubs runs from 20th February to 20th February.

Only in exceptional cases the Club will underwrite on a fixed premium basis, since one of the basic principles of the clubs is that of mutual rating. Members do not pay a fixed premium but a *call* which may vary from year to year depending on the financial results of the club. In most cases the members have to pay an *advance call* at the beginning of the policy year. After the final fincial results of a particular policy year have been established, which may take some years, members may be required to pay a *supplementary call.*

In view of the large sums which may be involved with respect to maritime risks and the

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[2] Although there are a few P&I Clubs for inland navigation vessels.

[3] Most P&I Clubs are still of Englis origin, although some of them have moved their domicile outside the United Kingdom.

unlimited cover (save pollution risks) rendered the clubs must take out reinsurance. This is effected is in several layers. Most of the larger P&I Clubs are members of the International Group of P&I Clubs by way of a pooling agreement. Of each claim the P&I Club must cover the first layer of US$ 4 million. For any amount in excess thereof the International Group will cover under a second layer US$ 30 million per incident and for any further excess there is a third layer of US$ 1.6 billion available through reinsurance taken out by the International Group of P&I Clubs in the international commercial insurance market.

Some P&I clubs have specialised in the insurance of particular classes of risks, such as "warrisks"[4], the risk of labour conflicts[5] , clubs which provide legal assistance [6]. The Charterers Mutual Assurance Association is a club of time and voyage charterers and there is a special club for "through (multimodal) transport operators", which also covers non-marine risks.

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[4] Most clubs do not provide cover for warrisks.

[5] So-called "Strike Clubs": Transmarine Mutual Strike Club.

[6] FD&D: freight demurrage and defence, providing legal assistance with repect to disputes about charterparties, between shipowner and shipyards and other disputes.

Prof. Dr. Wolfgang Marschall
Junker-Jörg-Str. 4
10318 Berlin

Berlin, den 06.02.1996

Personalmanagement - Eine zentrale Aufgabe der Unternehmensführung

Personalmanagement umfaßt alle Aktivitäten eines Unternehmers, die dazu dienen, die unternehmerischen Ziele gegenüber den Arbeitnehmern durchzusetzen. Das Personalmanagement wird in kleinen Unternehmen direkt vom Kapitaleigner wahrgenommen, in großen Unternehmen (Aktiengesellschaften, Konzernen) in der Regel von sehr gut bezahlten hauptberuflichen Managern, die bereit sind, ihre gesamte Kraft in den Dienst der Unternehmens zu stellen. Personalmanagement zählt auch in hochautomatisierten Betrieben zu den wichtigsten Elementen der Unternehmensführung. Personalmanagement wirkt nach innen, also gegenüber den Arbeitnehmern, administrativ, nach außen, also gegenüber Geschäftspartnern, kooperativ.

Die wichtigsten Ziele des Personalmanagements sind in Bild 1 dargestellt:

Bild 1: Ziele des Personalmanagements

- Unternehmerische Ziele als Ganzes durchsetzen, das Personal auf diese Ziele ausrichten
- So wenig wie möglich, aber auch so viel wie nötig Personal einsetzen
- Geeignete Fach- und Hilfskräfte auswählen
- Personal für die sich verändernden Aufgaben qualifizieren
- Personal für die Erfüllung der gestellten Aufgaben motivieren
- Bei Personalüberschuß Entlassungen vorbereiten und durchführen, Abfindungen zahlen

Eine zentrale Aufgabe des Personalmanagements ist die Senkung der **Personalkosten**, die sich aus direkten Lohnkosten und Lohnnebenkosten zusammensetzen. Lohnnebenkosten sind Beiträge zur Kranken-, Renten-, und Arbeitslosen- und Pflegeversicherung, die in Deutschland je zur Hälfte von den Arbeitgebern und den Arbeitnehmern getragen werden. Eine auf den Arbeitsprozeß bezogene Unfallversicherung bezahlt nur der Arbeitgeber. Zusätzlich ist derzeit in Deutschland von allen Arbeitnehmern und Arbeitgebern ein Solidaritätszuschlag zur Finanzierung der Kosten der deutschen Einheit zu leisten. Die hohen Lohn- und Lohnnebenkosten werden derzeit als eine wesentliche Ursache für die drastisch gestiegene Arbeitslosigkeit in Deutschland gewertet. In vielen Fällen führte sie zur Verlagerung der Produktion in andere Länder.

Ein wichtiger Weg zur Senkung der Personalkosten ist die permanente Reorganisation des Unternehmens nach dem Motto **„Das einzig Beständige ist der Wandel".** Durch Innovationen, technisch-organisatorische Verbesserungen und Rationalisierung der Arbeitsprozesse, Sortimentsveränderungen, Suche nach neuen Kunden und Absatzmöglichkeiten sind Wege der Entwicklung des Unternehmens zu ebnen, auf denen es

möglich ist, die Personalkosten pro erbrachter Leistungseinheit zu vermindern. Im konkreten Einzelfall kann das mit einer Senkung, Steigerung oder Konstanz der Arbeitnehmerzahlen verbunden sein. **Die Schaffung neuer Arbeitsplätze ist für einen Unternehmer kein primäres unternehmerisches Ziel**. Der Unternehmer beschäftigt nur dann und in dem Maße Arbeitskräfte, wie es seinem eigentlichen Ziel, mit dem Unternehmen Geld zu verdienen, dient.

Arbeitslosigkeit ist kein unternehmerisches Problem, sondern ein gesellschaftliches Problem. Der Staat hat durch steuerliche Gesetzgebung, Zinsregelungen und mittels der Arbeitsämter Bedingungen zu schaffen, die den Unternehmer veranlassen, möglichst viele Arbeitskräfte zu beschäftigen. Das weltweite Lohn- und Sozialgefälle zwischen hochentwickelten kapitalistischen Industriestaaten und den Entwicklungsländern hat dazu geführt, daß im Verlauf der vergangenen Jahrzehnte große Produktionsfelder in Entwicklungsländer verlagert wurden, was für diese einerseits ein Entwicklungschance darstellt, andererseits aber die einseitige Abhängigkeit von den Industriestaaten vergrößern kann. Die Staaten Osteuropas und die südlichen GUS-Staaten haben in diesem Kontext durchaus günstige Chancen für einen ökonomisch-sozialen Neustart nach dem Zerfall der Sowjetunion und des sozialistischen Weltsystems. Diese Chancen sind um so größer, als seitens der Europäischen Union bedeutende Fördermittel für diese Zwecke bereitgestellt werden.

Die **Gewerkschaften** als Interessenvertreter der Arbeitnehmer stellen in der kapitalistischen Welt, vor allem in Westeuropa, eine große Kraft dar. Ihre in der Tendenz maximalistischen Forderungen sind jedoch immer nur partiell realisierbar. Vier Forderungsfelder stehen im Mittelpunkt gewerkschaftlicher Aktivitäten:

- Lohnsteigerung, in der Regel als Prozentsatz zum bislang gültigen Tariflohn
- Sicherung der Arbeitsplätze, Kündigungsschutz
- Garantie des Branchenerhalts bzw. der Sicherung von Produktionsstandorten, gegebenenfalls Subventionierung veralteter bzw. nicht rentabler Produktionen
- Gute soziale Konditionen

Diese Ziele werden ggf. mittels Streiks durchzusetzen gesucht. Die Forderungsfelder machen offensichtlich, daß die von den Gewerkschaften vertretenen Interessen der Arbeitnehmer in direktem Widerspruch zu den Interessen der Arbeitnehmer stehen. Nur durch die Bereitschaft zu Kompromissen können konsensfähige Lösungen gefunden werden.

In Deutschland haben sich in den vergangenen Jahren die Widersprüche zwischen den Interessen der Arbeitgeber und der Arbeitnehmer in elementarer Weise zugespitzt. Die Verlagerung von Produktionen in das Ausland, die Schließung von Betrieben und die Entlassung von Arbeitskräften in Ost und West haben dramatische Dimensionen angenommen. Durch ein Bündnis für Arbeit soll die Zahl der Arbeitslosen von derzeit 4Mio. bis zu Jahr 2000 auf 2Mio. vermindert werden. Die Gewerkschaften sind im Gegenzug bereit, sich in ihren sozialen Forderungen zu bescheiden.

Die Entwicklung einer hohen Leistungsfähigkeit und einer hohen Leistungsbereitschaft zählen zu den vorrangigen Aufgaben des Personalmanagements. Je höher die Arbeitsproduktivität und je geringer die wöchentliche / jährliche Arbeitszeit, desto größer wird die Bedeutung der maximalen Ausnutzung des Leistungspotentials der eingesetzten Arbeitskräfte. Die Erfahrungen zeigen, daß die mittlere Arbeitsintensität heute deutlich höher ist, als in der früheren DDR. Dazu führt die nominelle Steigerung der Arbeitsintensität der tatsächlich Beschäftigten und die Aussonderung all jener Arbeitskräfte aus den Arbeitsprozessen, deren Leistungsbereitschaft und Leistungsfähigkeit eine kritische

Mindestgrenze nicht erreicht. Die deutlich geringere Wochenstundenzahl (oft nur 35 bis 38 Stunden) und der höhere Urlaub (oft 30 Wochentage) lassen die höhere Arbeitsleistung zu. In den ostdeutschen Betrieben ist derzeit die wöchentliche Arbeitszeit(in der Regel 40 Stunden) im Allgemeinen noch höher als in den westdeutschen. Die Ursache ist der oft noch nicht restlos überwundene Produktivitätsrückstand. Wichtige Kriterien der Leistungsbereitschaft und der Leistungsfähigkeit sind in Bild 2 dargestellt:

Bild 2: Leistungsbereitschaft - Leistungsfähigkeit

- Solides, aktuelles Fachwissen ist das Fundament der Leistungsfähigkeit
- Spezifische Leistungskriterien bei Managern, Ingenieuren, Verkaufspersonal, Facharbeitern, Sekretärinnen.
- Bei einem breiten Verantwortungfeld (Manager) sind Generalisten gefragt, bei engem Verantwortungsfeld (Facharbeiter, Fachingenieure) Spezialisten mit hoher Detailkenntnis
- Besondere Anforderungen bei Kommunikation nach außen: Umgangsformen, Höflichkeit, Verbindlichkeit
- Fremdsprachen, Auslandserfahrungen, Computerkenntnisse

Rolle und Funktion des Personalmanagements im kapitalistischen Unternehmen werden ganz wesentlich vom **Verhältnis des Arbeitgebers zum Arbeitnehmer** geprägt. Der Arbeitgeber, also der Kapitaleigner hat grundsätzlich das Sagen im Unternehmen, der Arbeitnehmer hat die Weisungen zu befolgen. Der Arbeitnehmer trägt die volle Verantwortung für das gesamte Unternehmen, der Arbeitnehmer trägt die Verantwortung für die Erfüllung der ihm gestellten Aufgabe. Selbstverständlich bedeutet das nicht, daß gestellte Aufgaben nur formal zu erfüllen wären. In einem gut geführten Unternehmen impliziert das übertragene Aufgabenspektrum immer den generellen Auftrag, ideenreich und schöpferisch an die zu lösenden Aufgaben heranzugehen, Verbesserungen vorzuschlagen, nicht vorhersehbare Störungen eigenverantwortlich zu beheben bzw. notwendige Aktivitäten zum Schutz von Menschen, Technik und Umwelt einzuleiten. Kreativität und strenge Pflichterfüllung sind durchaus vereinbar.

Die Organisation der systematischen **Weiterbildung des Personals**, vor allem des Stammpersonals, zählt zu den wichtigsten Aufgaben innerhalb des Personalmanagements. Die orientiert sich auf folgende Ziele:

- Vermittlung neuesten technisch-technologischen Wissens, resp. neuester gesetzlicher Bestimmungen, Regulierungen (z.B. Steuerrecht, Rechtsnormen innerhalb der Europäischen Union)
- Entwicklung von Fähigkeiten und Fertigkeiten, z.B. zur Beherrschung von Fremdsprachen, zur Beherrschung der Computertechnik oder anderer neuer Techniken und der vollen Ausnutzung der Leistungspotenzen der Technik
- Entwicklung des Verhaltens im Team bzw. gegenüber dem Geschäftspartner/Kunden des Unternehmens, der Bereitschaft zu überdurchschnittlichen Leistungen, des Empfindens von unregulären Situationen, die eine besondere Reaktion erfordern, des richtigen Reagierens, z.B. im Fall von Havarien und Betriebsstörungen

Zwischen dem Arbeitgeber und dem Arbeitnehmer besteht ein individuelles einseitiges Abhängigkeitsverhältnis. Anders als in der früheren sozialistischen Gesellschaft gibt es keine Arbeitskollektive. Teamarbeit, wie sie in vielen Unternehmen praktiziert wird, ist keine Kollektivarbeit. Im Team wird zwar auch das Ziel verfolgt, daß jedes Teammitglied nach Möglichkeit jedes andere Teammitglied ersetzen kann, um unter allen Umständen die maximale Leistung des Teams zu gewährleisten. Aber anders als im Kollektiv wirkt im Team jeder in letzter Hinsicht für sich selbst. Er verfolgt das Ziel, seine Position im Team zu stärken, ein höheres Gehalt zu bekommen und im Falle von Entlassungen im Betrieb eine solche Position errungen zu haben, daß er selbst nach Möglichkeit nicht zu den Entlassenen zählt. Jeder versucht, seine individuelle Position gegenüber dem Unternehmer aufzubauen und aufzubessern. Der Unternehmer fördert ein solches Verhalten in dem er beispielsweise Diskussionen über Löhne und Gehälter unter den Kollegen verbietet (solche Diskussionen können ein Kündigungsgrund sein!).

Ohne diese Beziehungen prinzipiell in Frage zu stellen, haben sich in Deutschland in den vergangenen Jahrzehnten durch den sozialen Kampf der Gewerkschaften und die Einführung der Prinzipien der sozialen Marktwirtschaft (vgl. Bild 3) gewisse Modifizierungen ergeben, z.B. durch die Einführung garantierter Tariflöhne für bestimmte Beschäftigtengruppen, Regelungen zum Kündigungsschutz, zur Zahlung von Abfindungen im Falle von Kündigungen, der Frühberentung. Bild 3 kennzeichnet in verallgemeinerter Form das Wesen der sozialen Marktwirtschaft

Bild 3: Soziale Marktwirtschaft

- Ist ein Wirtschaftsmodell, bei dem die Grundgesetze der freien Marktwirtschaft erhalten bleiben, aber mittels gesetzlicher Regelungen den Arbeitnehmern, gewisse soziale Rechte und Ansprüche zugesichert sind, die der einzelne Arbeitgeber von Rechts wegen nicht in Frage stellen darf.
- Soziale Marktwirtschaft ist ein Modell der Marktwirtschaft mit staatlichen Eingriffen. Der soziale Rechtsraum des Arbeitnehmers ist größer als in der freien Marktwirtschaft. Der Rechtsraum des Arbeitgebers ist eingeschräkt.

Prof. Dr. Wolfgang Marschall
Junker-Jörg-Str. 4
10318 Berlin

Berlin, den 03.01.1996

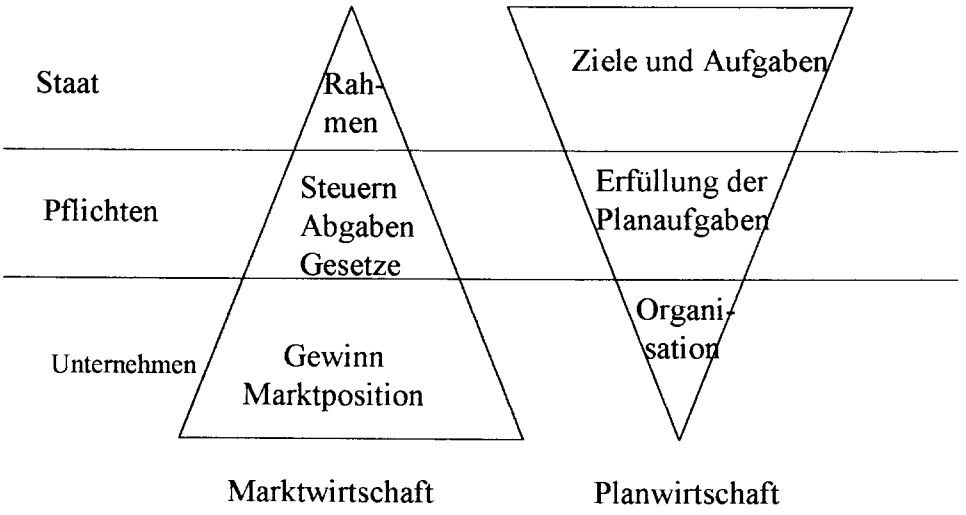
Strukturwandel und technisch-organisatorische Erneuerung der Unternehmen im Transformationsprozeß von der Plan- zur Marktwirtschaft

In der gegenwärtigen Entwicklungsetappe vollziehen sich im Osten Deutschlands sowie in allen osteuropäischen Staaten grundlegende strukturelle Wandlungen. Diese sind durch **zwei einander überlagernde Faktoren** bedingt.

- 1. Faktor: Übergang von der zentralistischen Planwirtschaft zur Marktwirtschaft;
- 2. Faktor: Übergang von der klassischen Wirtschaftsstruktur, die vor allem durch die industrielle Produktion geprägt war, zur Informationsgesellschaft. Dieser Prozeß verläuft weltweit.

1. Faktor: Der Übergang zur Marktwirtschaft ist mit grundlegenden strukturellen Veränderungen verbunden, vgl. Bild 1:

Bild 1: Unternehmen in der Gesellschaft



Marktwirtschaft bedeutet Dominanz des Unternehmens und Primat der Ökonomie. Zu den zentralen Aufgaben des Übergangs zu Marktwirtschaft gehören die Entflechtung der Großunternehmen, die Herausbildung mittelständischer Unternehmen und die weitgehende Privatisierung der Wirtschaft. Diese Prozesse sind mit der Entlassung von Arbeitskräften verbunden. Ihre Wiederbeschäftigung ist an die Gründung neuer Unternehmen geknüpft:

- Neue Unternehmensarten entstehen, vor allem Banken und Versicherungen, Reisebüros, Unternehmensberaterfirmen, Architekturbüros, Steuerberater, Bürodienstleiter (z.B. Unternehmen, die für andere Unternehmen die Buchhaltung durchführen, Kopierdienste, Faxdienste für die Bevölkerung).

- Neue Unternehmensformen, vor allem mittelständische Betriebe, Handwerksbetriebe. Es bilden sich Gewerbeparks heraus, in denen oft 10 bis 100 kleine Firmen tätig sind. Die Leitung des Parks organisiert Koordinierungs- und Dienstleistungsaufgaben für die Unternehmen.
- Neue Ziele der Unternehmensführung: Gewinn, Marktpositionen, Konkurrenzfähigkeit.

Die **Beziehungen zwischen Staat und Unternehmen in der Marktwirtschaft sind durch folgende Faktoren charakterisiert:**

- Der Staat steckt den Rahmen für die unternehmerische Tätigkeit ab.
- Durch Gesetze, Steuern und Abgaben wirkt der Staat auf die Betriebe ein, fördernd oder hemmend. Die unternehmerischen Freiheiten sind in einzelnen Staaten sehr unterschiedlich. In **Deutschland** gibt es eine soziale Marktwirtschaft, dementsprechend eine Reihe von Abgaben, z.B. für Sozialversicherung, Pflegeversicherung, Arbeitslosenversicherung, Rentenversicherung, die je zur Hälfte von Arbeitgebern und Arbeitnehmern finanziert werden. Einschließlich der Lohnsteuern zahlen die Berufstätigen in Deutschland bis zu 50 Prozent ihres Bruttoeinkommens an den Staat. Gegenwärtig gibt es seitens der Regierung und der Unternehmerverbände massive Angriffe auf das System der sozialen Sicherung für die Arbeitnehmer. In den **USA** gibt es viele dieser Versicherungen in direkter Bindung an den Arbeitsvertrag nicht. Die Arbeitnehmer versichern sich privat. Der Einfluß des Staates auf die Unternehmen ist viel geringer.
- Das Unternehmen legt seine unternehmerischen Ziele selbst fest, vor allem bezüglich Gewinn, Marktposition, Innovationen, Investitionen, Forschung und Entwicklung, Werbung und Marketing

In der **Planwirtschaft** war die Wirtschaft gerade umgekehrt organisiert:

- Der Staat legte die Ziele und Aufgaben der Unternehmen fest, die Produktionsmengen, weitestgehend sogar die Sortimente, die Kooperationsbeziehungen, die Preise, die planmäßig zu erwirtschaftenden Gewinne, die Zahl der zu beschäftigenden Arbeitskräfte, die Investitionen, die Aufwendungen für Forschung und Entwicklung. Der Plan war Gesetz und mußte erfüllt werden.
- Die Betriebe hatten die Pflicht der Planerfüllung in allen Bestandteilen (Produktion, Absatz, Forschung und Entwicklung, Investitionen etc.). Sie waren an der Festlegung von Planaufgaben beteiligt. Sie haben Planvorschläge unterbreitet. Üblicherweise wurden bei diesen Planvorschlägen Reserven eingearbeitet, um die Erfüllung des Plans vom Planansatz her zu gewährleisten.
- Die Hauptaufgabe der Betriebe war die Organisation der Planerfüllung, die Herstellung der inneren Proportionen, die Harmonisierung der staatlichen Vorgaben mit den betrieblichen Möglichkeiten (Kapazitäten, Materialaufkommen u.a.).

2. Faktor: Der Übergang zur Informationsgesellschaft erfolgt weltweit

Bild 2 vermittelt einen Überblick über **grundlegende Tendenzen der strukturellen Entwicklung**, bei der Herausbildung der modernen Informationsgesellschaft.

Bild 2: Strukturen der Informationsgesellschaft

- Primärer Sektor — Stagnation auf geringem Niveau
  - Landwirtschaft
  - Forstwirtschaft
  - Bauwesen (teilweise Verlagerung in den sekundären Sektor)
  - Fischereiwesen
- Sekundärer Sektor — Sinkende Tendenz
  - Industrie
  - Bauwesen
- Tertiärer Sektor — Steigende Tendenz
  - Handel/Verkehr/Infrastruktur
  - Post- und Fernmeldewesen,Telekommunikation
  - Dienstleistungen

Bild 3 macht aber deutlich, **daß dieser Prozeß keineswegs erst in der jüngsten Vergangenheit begonnen hat**. Der globale Strukturwandel zwischen den großen Sektoren begann bereits im vorigen Jahrhundert. Neu ist heute einerseits die durch Mikroelektronik, Computertechnik und moderne Nachrichtentechnik ausgelöste neue Qualität der Informationsverarbeitung und der Informationsübertragung, und neu sind hiervon ausgehend die Dimensionen, in denen sich informationelle Strukturelemente in der Gesellschaft herausbilden. Bei der Erfüllung dieser Aufgabe ist **in allen ehemaligen sozialistischen Staaten ein signifikanter Rückstand** zu überwinden. Die Bundesrepublik Deutschland hatte bereits 1971 fast so viele Beschäftigte in informationellen Tätigkeiten (struktureller Anteil) wie die DDR 1988.

Bild 3 Beschäftigung in Deutschland

- Landwirtschaft
  - 1800 80 % kontinuierliches Sinken bis 2000 auf 10 %
- Industrielle Produktion
  - 1850 10 %, Anstieg bis 1950 auf 40 %, Sinken bis 2000 auf 25%
- Dienstleistungen
  - 1800 10%, Anstieg bis 2000 auf 25 %
- Informationsdienstleistungen
  - 1800 10 %, Konstanz bis 1930, Anstieg bis 2000 auf 40%

Ursachen für den Rückstand beim Übergang zur Informationsgesellschaft:

- Geringeres Produktivitätsniveau, der Rückstand betrug 1989 in der DDR etwa 40%;
- Technologischer Rückstand in der volkswirtschaftlichen Breite;

- Ideologische Grundpositionen der marxistischen Wirtschaftspolitik, wie sie in allen RGW-Ländern betrieben wurde, vor allem die grundlegende Überbewertung der Rolle der materiellen Produktion, sie allein galt als produktiv, informationelle Strukturen eher als eine Art luxuriöses Beiwerk der Gesellschaft.
- Fehlende Einordnung der nationalen Wirtschaft in die Weltwirtschaft, Abkopplung vom Weltmarkt.

Die **beiden Aufgaben des strukturellen Wandels müssen parallel gelöst werden**, die Lösung einer Aufgabe ist ohne die gleichzeitige Bewältigung der anderen nicht möglich. Entscheidend ist die schnelle Herstellung der internationalen Wettbewerbsfähigkeit der Unternehmen:

- Ein **privater Betrieb**, der keinen Gewinn erwirtschaftet, geht ein. Der Gewinn respektive der alternativ drohende Konkurs wirken als stimulierende und wettbewerbsfördernde Kraft.
- Ein **staatlicher Betrieb der keinen Gewinn macht**, kann durch Subventionen künstlich am Leben gehalten werden, auf Kosten der Gesellschaft. Die Belastungen mit Steuern steigen dadurch. In der Bundesrepublik gibt es heute viele Betriebe, die ständig subventioniert werden, vor allem in den Branchen: Steinkohle, Schiffbau, Landwirtschaft. Die Subventionierung erfolgt hier ausschließlich aus sozialen Erwägungen, ökonomisch spricht alles dagegen. Besonders problematisch ist, daß die Subventionierungen in der Landwirtschaft EU-weit geregelt sind.
- Die **Subventionierung unrentabler Produktionen in den früheren RGW-Staaten** war die Hauptursache für deren wirtschaftlichen Verfall.

Im **Osten Deutschlands** wird die Lösung der strukturellen Wandlungen durch bedeutende Transferleistungen (Personal, Finanzen, das gesamte bundesdeutsche Rechtssystem, unternehmerisches know how) nachhaltig gefördert. Die neuen Bundesländer befinden sich damit gegenüber allen anderem ehemaligen RGW-Ländern **in einer besonderen Lage**. Durch den Anschluß an die Bundesrepublik, einem vergleichsweise großen und wirtschaftlich sehr starken Land, erfolgten ein nahezu schlagartiger Übergang zur Marktwirtschaft und die sehr schnelle Privatisierung der Wirtschaft. Das hatte für viele Menschen enorme psychisch-moralische Konsequenzen, z.T. auch ökonomische. Alle Mitarbeiter des Staatsapparates wurden schlagartig arbeitslos, die Akademien der Wissenschaften wurden aufgelöst, die Institute abgewickelt, die Mehrzahl der Forscher aus den Kombinaten und auch viele Wissenschaftler aus den Universitäten und Hochschulen verloren ihre Arbeit, desgleichen hunderttausende von Facharbeitern aus allen Bereichen der Wirtschaft. Aber sie wurden dank der sozialen Transferleistungen in der Regel nicht in eine hoffnungslose soziale Lage gedrängt.

In den **osteuropäischen Ländern verläuft der Privatisierungsprozeß viel langsamer, eher qualvoll**. Auch die Liquidierung der Staatsapparate verlief nicht so vollständig wie in der DDR. Eine große Zahl von Politikern „von früher", aber auch viele bekannte Wissenschaftler sind noch in Amt und Würden. Die Länder haben ihre Staatlichkeit nicht aufgegeben. Im Gegenteil, vielfach haben sie diese erst zurückerhalten.

Die Tatsache des langsameren Übergangs zu einer auf Privateigentum beruhenden Marktwirtschaft **bedeutet nicht, daß die Aufgaben der Privatisierung nicht genau so dringend stehen würden wie in Deutschland**. Aber eine übereilte Privatisierung würde sicher größere Probleme mit sich bringen als eine maßvolle aber zielstrebige. Durch den großen staatlichen Sektor in der Wirtschaft werden zwar weiterhin viele Subventionen notwendig, aber

es wird auch möglich, ärgste soziale Konflikte in Grenzen zu halten. Geringe Produktivität wird erhalten, aber die Löhne sind auch sehr gering, damit sind die Kosten niedrig. **Strategisches Ziel muß es sein, Wettbewerbsfähigkeit dadurch zu erreichen**, daß die wirtschaftlichen Stärken der Länder deutlich herausgearbeitet werden. Das sind heute oft „nur" Rohstoffexporte, aber für die Zukunft reicht das nicht. Spezifische Felder der verarbeitenden Industrie sind nötig, um die Wirtschaft schrittweise international wettbewerbsfähig zu machen.

Wichtig: Je mehr Betriebe rentabel arbeiten, desto geringer ist die Belastung für den Staat, um so größer wird das Steueraufkommen, desto größer wird auch der Freiraum für soziale Leistungen.

Aus eigener Kraft allein wird die historische Aufgabe nicht zu lösen sein. Transferleistungen für soziale Zwecke in einem Maße wie in Deutschland wird es nicht geben. Ziel muß es daher sein, **Investoren** in das Land zu holen, ihnen unbürokratisch gute Arbeitsmöglichkeiten zu bieten. Das ist derzeit oft nicht der Fall. Viel zu oft werden Investoren dadurch verprellt, daß sie defacto nur als „melkende Kühe" genutzt werden: Hohe Steuern, fehlende oder unvorteilhafte Gesetzgebung, Straßenbenutzungsgebühren etc. behindern die Arbeit der Investoren.

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TRADEMCO

Transportation, Development, Engineering and Management Consultants Ltd.
4, Papadiamantopoulou str., 115 28 Athens, Greece, Tel.: 7248048-9, Fax: 7237415

Part 1: Management Information Systems (MIS)

1 Information Technology for Transport - An Introduction

We start from a simple and indisputable observation. Transportation - by road or rail, public or private - has to become intelligent if it is to continue to meet the demands of society, business and the individual without either overburdening them with taxes or strangling them with legislation. There is no other realistic way forward.
Transportation telematics offers the most cost-effective method of maximizing the use of existing infrastructures and the return on investment in new ones. At the same time, unprecedented traffic demand and volumes are being generated by rising international competitiveness, lower trade barriers (as in the European Community and the North American Free Trade Area), and the emergence of the newly industrializing economies of Asia. These will inevitably be joined, in due course, by new powerhouses in Latin America and ultimately, perhaps, Africa.
Rationalizing the use of long-haul surface transport is just as vital as the preservation of natural resources. So is achieving the most beneficial balance between road, rail and - where the potential exists - waterways. Transport telematics concern not only technological issues but also political, administrative and legal matters as well.

2 The Tools of MIS

We shall try to present some highlights of the tools used today, their history and the latest developing trends. This is a short, simplified but up-to-date description of some of the most popular tools to facilitate better information influx and productivity to businesses.

2.1 Computers and Operating Systems

A computer is made up of many parts called *hardware*. Hardware uses *software* to make the computer work. Software refers to sets of stored instructions most commonly called *programs*. Programs translate the information one sends to the computer into language that the computer can understand. Some examples of software are *operating systems* and *application software*. An operating system directs the flow of information to an from the various parts of the computer (DOS and UNIX are two of the most widely used operating systems). An application program does a specific task, such as word processing or accounting. A computer needs an operating system to *run* (use) programs.
The computer *system unit* contains the computer's processor, memory, disk storage and other electronics. The *processor* is the brain of the computer. This is where the computer interprets and processes information. The computer *memory*, also referred to as RAM (Random Access Memory), keeps, during work sessions, instructions that the computer receives and information that it processes. The memory is not a permanent storage place for information, as it is only active when the computer is on. Permanent data storage is achieved with disk drives. A computer usually has a removable *diskette* drive (also called a *floppy*) and a *hard disk* drive, which is faster than a floppy and can hold large amounts of data (called *files*). Recently, computers are equipped with *CD-ROM* drives (read-only optical disks, similar to audio CDs that can also store data) and *MO-drives* (Magneto-optical disks that are read/write,

removable and used as alternatives to tape backup). The computer needs also a *video monitor* (a display screen), a *keyboard* and a *mouse* (a pointing-device).

2.2 Networks

When two or more computers are connected together, a *network* is formed. To connect computers together, cables, connectors and network adapters are needed. A network adapter (or card) fits inside the computer and enables information exchange between computers. A network can contain one or more workgroups. A *workgroup* is a group of connected computers that is organized for a purpose. Each computer in a network is identified by a *computer name*. This can be any name, but it usually matches the name of the person operating the computer, its physical location in the department or the specific project that runs on it.
By using a network, sharing information is easy. The users can share files without leaving their desks or passing around floppy disks. A network also allows the sharing of resources. A *resource* is an item such as a printer or directory that can be made available to others in the network. *Client-server* networks are the latest trend, where personal computers (PCs), are connected to server computers (small to medium size machines configured with large storage and memory). Application software is run on both machines thus off-loading the server, taking advantage of the low-cost power of PCs, reducing network flow and enhancing program execution speed. Computers may be connected in a Local Area Network (LAN), such as an office or building, or in a Wide Area Network (WAN) where remote LANs are connected together through computers running additional communication software and equipped with *routers*, special devices that permit the routing of data to be transmitted. In the recent years, the use of wireless communication technology is employed to simplify network connections, get rid of kilometers of cabling and introduce a portability property to the location of computing resources.
Security is very important in networks and there exist various levels of it, starting from simple password lists to military specifications for network security, depending on the value of information to be protected.

2.3 Multimedia

Multimedia combine the simultaneous display, transmission, conversion and storage of sound, stereo music, graphics, animation and video data in addition to traditional text applications. An analogous to intelligent, interactive television, it is an explosive market that helps introduce computers to home users, especially now that the market is been flooded with low-cost but extremely powerful personal computers with graphical operating systems, such as Microsoft Windows or Apple Macintosh. Multimedia has created a strong user awareness for new technologies and the need for fast and efficient telecommunication network services. Non-expert home users are familiar with technological terms such as multimedia, mobile telephony, Internet and satellite communications. All over the world, public and private organizations have been rushing to get on the multimedia wave by upgrading to client-server computing, user friendly interfaces and wideband communication networks.
Today, there exist a tremendous variety and infinite possibilities for multimedia services and applications both for home and business use. For example,

Home applications:
- recreation (video-on demand, advanced pay-per-view, electronic games)
- education (electronic interactive TV, navigation and information retrieval, distant learning)
- transactions (teleshopping, telebanking, tourism and travel, etc.)
- communications (video telephony, homeworking)

Business applications:
- communications (video telephony, multimedia mail, joint editing, videoconferencing, telecounceling)
- education (distant training, CBT-computer based training)

2.4 Databases

Database systems first began to appear in the 1960's. A *database management system* (DBMS) consists of a collection of data and a set of programs to access that data. The collection of data is usually referred to as the *database*. The database contains information about a particular enterprise. The primary goal of a DBMS is to provide an environment that is both convenient and efficient to use in retrieving information from and storing information into the database.
Database systems are designed to manage large bodies of information. The management of data involves both the definition of structures for the storage of information and the provision for mechanisms for the manipulation of information. In addition, the database system must provide for the safety of information stored in the database, despite system crashes or attempts at unauthorized access. If data is to be shared among several users, the system must avoid possible anomalous results.
A database management system is a collection of interrelated files and a set of programs that allow several users to access and modify these files. A major purpose of a database system is to provide users with an abstract view of the data. That is, the system hides certain details of how the data is stored and maintained. However, in order for the system to be usable, data must be retrieved efficiently.
In order to describe the structure of a database, we define the concept of a *data model*. A data model is a collection of conceptual tools for describing data, data relationships, data semantics and data constraints. The *relational* model is the most widely used, hence the term RDBMS (relational database management system). Here, the data and the relationships among data are represented by a collection of tables each of which has a number of columns with unique names.
SQL (Structured Query Language) is a formal, English-like language to facilitate database querying. Today it is an ANSI standard and platform-independent.

2.4.1 Application Development Tools

The basic need is to extract meaningful business information such as ranking, statistics, and trends from gigantic relational tables. SQL is for specialist programmers only. But one of client/server's biggest selling point is easy access to relational databases. The latest ad hoc query and reporting tools for client/server SQL databases are aiming to give business users the ability to browse, consolidate, analyze and meaningfully present the information that resides in large relational databases. By providing a database abstraction layer, they address the needs of non-technical users by letting them query familiar business entities instead of raw tables and columns. Report writers generate printouts and can provide ad-hoc analysis and features such as trends, statistics and forecasting as well. With the proliferation of database engines running on different hardware platforms, client/server computing addresses database connectivity problems as well. While many packages offer ODBC drivers (Open Data Base Connect), some offer native connections as well (to popular DBMS such as Oracle, Ingres, Informix, Sybase, SQL Server).
Flowcharting packages help build diagrams of processes and organizational hierarchies and other business and technical diagrams. They can be used for business planning, quality control and a variety of other diagramming purposes such as organization charts, network diagrams, space planning and even mapping. *Case tools* combine the power of flowcharting tools and database design tools to produce very large, complex, mission-critical database applications, which can also be easily modified.
The traditional program development tools have also been constantly changing and improving. Visual tools such as Borland's Delphi or Microsoft's Visual Basic are RAD (Rapid Application Development) tools that allow for fast coding, testing and debugging of new software without the steep learning curve and with far fewer opportunities for error than more traditional C/C++ development systems.

2.5 Teamcomputing/Groupware

Not long ago, much of our writing, editing and printing was handled quite slowly by the typewriter. Those days, however, are history now that computers and *word processing* applications become more widespread and advanced, doing the job both better and faster. They not only handle text more elegantly, but also easily integrate multimedia features and link easily with other application software, such as graphics or *spreadsheets* (a spreadsheet is a two-dimensional array of cells. Programming with a spreadsheet involves the definition of mathematical relationships among cells. The spreadsheet maintains these relationships as data is entered. Thus, each cell may have associated with it a formula of a value).
Word processors of today integrate even more features, such as spell-checkers, addressers and outliners. Web browsers may be the next to go. As Internet access becomes folded into operating systems, storing the information via the word processor begins to make sense. Natural-language help systems development will undoubtedly escalate. Increased flexibility in document management is the trend of all word processing application software. Enhanced integration with the operating system is yet another area in word processors.
Teamcomputing and *groupware* are terms that start making sense once we install one of today's word processors on a network. More than one persons can work *simultaneously* on the same file, make changes, revisions and write comments. The software can mark revisions using color or italics, comments as sticky notes marked with the user's initials and changes are consolidated automatically into a single document under the supervision of the editor. Of course, security issues are considered are taken and a user can decide who can access a document and whether specific users can make changes or only comments.
Group discussion software is another enhancement to e-mail. It transforms on-line discussions of users in an organization into incredibly useful databases that one can search, sort and archive. On-line group discussions are threaded, i.e. presented in some kind of outline-like format that lets you see the context of messages up front, helping you to respond to specific points at any time.

2.6 Electronic Archiving Systems

Most business information is in the form of paper documents. Industry analysts report that about 94 percent of business information is on paper and 2.7 billion new sheets of paper are filed into folders every day. Paper has obvious advantages, such as portability, ease of use, and cost. So while there will be a rise in the use of digital business documents (word processing, spreadsheets, and electronic memos), paper will still predominate for many years.
However, paper also has its drawbacks. At any given time, between three and five percent of a company's files are lost or misplaced. The average cost of recreating a document is $180. The annual loss to a Fortune 1000 corporation with one million files exceeds $5 million. A second, and perhaps more serious drawback, is that paper does not integrate well with computer systems; paper is best used and managed by manual business processes, not automated ones. For example, computers can track large amounts of customer data. Computer-based data can be used to easily locate customers' account profiles and shipment records, while signed, paper-based, bills of lading are often misplaced when most needed. Paper documents and information reside outside of the computer, separate from other data and companion documents in the information base.
In today's increasingly information-based and automation-driven business world, paper represents a serious dilemma. Paper is the major information base of a business, but because it cannot be easily automated, it remains outside of the business information system. A paper-based manual process makes it difficult and costly to obtain "information at your finger tips" or "the right information to the right person at the right time."
When users are unable to join paper information with computer information, they lose the ability to treat it as a valuable asset. In fact, investments in computers and technology to date have addressed only a scant four to six percent of the information in today's office. New investments based on reengineering and process automation are less effective when information appears only on paper and cannot be incorporated into an automated process.

Document imaging is a technology that converts paper into an electronic form, where it can be automated using standard computer technology. By capturing paper documents as electronic images stored by the computer, all the benefits and power of database, e-mail, networking, fax, and storage technology can be applied to what was once manually processed information. Image documents can be electronically filed using multiple indexes and filing methods, and can then be quickly and easily searched and retrieved. Image documents can be shared among multiple users that are both local and distributed -- across the hall or halfway around the world -- with equal ease.

This cost-effective, easy-to-use technology removes barriers that formerly discouraged users. With this software, an individual can use a PC to transform any paper- or fax-based information into an electronic image document that can be stored, filed, retrieved, edited, printed, faxed, and shared. This eliminates the need to manage and store paper documents, such as handwritten meeting notes, memoranda, letters, personal medical and insurance records, receipts, business cards, and newsclips.

Users can create image documents in a variety of ways. For example, scanners can be used to create images directly from the original paper document.
Faxing is another way to create image documents. Fax machines are, in many ways, scanners that take a paper document and convert it into an electronic image for transmission. Most computer-based fax products' "Print to Fax" capability makes the fax device look like a printer to PC applications. The electronic document is directly converted to an image, bypassing the need to first appear on paper. The imaging software supports standard black and white, grayscale, and color image documents. The pages of an image document can be seen in several different modes. Full Page mode provides a view of an entire image page. Thumbnail mode provides a view of multiple pages as small, high-quality images. Combination mode allows quick browsing of the pages and page details by showing both thumbnails and a full page. While viewing pages, users can scroll, pan, rotate, scale, and zoom the image page. Pages can be deleted and reordered, as well as inserted and appended.

The imaging software combines the benefits of digital technology with the best attributes of paper. Users can annotate and highlight documents in a free-style manner. Users can add critical business information to the document by choosing lines, hollow rectangles, and filled rectangles to mark and highlight information in user-definable colors and widths. Lines can be freehand or straight. Text-based annotations can be added directly on the image page or as part of a "yellow-sticky" overlay. Text can be brought in from text files, integrating the image document with other applications. User defined text or bitmaps, such as "Approved" or "Rejected," can be quickly placed on an image to speed processing. Image documents can be added to e-mail. Image documents can also be sent via almost any fax system through print-to-fax technology. Image documents can easily be incorporated in other applications such as Microsoft Word and Excel, Lotus Notes, and database applications ranging from Access and Paradox to Oracle and Microsoft SQL Server.

2.7 Videophone/Video Conference

The videophone offers a new dimension to telephony. Two users can see each other while they converse. The videophone is made up of the telephone, display screen, camera and a codec (which codes and decodes the video signal). Fast links are needed though and ISDN, as we shall later see, is an ideal communications network.
Video conference can bring together people from different locations around the world as though they were all in the same building. This is valuable for executive board discussions, business presentations, product design updates as well as conferences, practical demonstrations and client consultations. Again, the need for adequate bandwidth to carry the video signal (even if it is compressed), requires fast transmission links, such as ISDN.

3 The Internet

The Internet started in the 1960s as project of the US Department of Defense. The network, ARPAnet, was created to survive an occasional nuclear war. In the process, the "IP" (Internet Protocol) technology was developed. IP defined how electronic messages were to be packaged and addressed so they could be sent and received over the net. The ARPAnet split to form the rival military DARPAnet, but then the National Science Foundation (NSF) stepped in and using the existing ARPAnet created their own network, NFSNET, in the 1980s. This was a huge success and in 1987, a new, improved network was built (with the help of Merit, IBM and MCI). In April 1995, NSF officially withdrew and left the Net to be *managed* by private consortia, because actually *no-one* owns the Net.

The Net is a "network of networks", a collection of thousands of smaller computer networks, all interconnected to form a high speed link spanning the planet. At the moment, the Internet explosion is still taking place and a recent survey calculated that over 350 million people had access. Forecasts show that by the year 2003, everyone in the world will have an Internet e-mail address, assuming that everyone has access to a telephone line of course.

Users "tap into" the Net in two ways: either their computers are permanently connected or they use a modem (a device which hooks your computer to a telephone line) to dial into a "service provider" (a company which connects you to the Net).

3.1 Internet Tools

Besides the hardware required to use the Internet (a computer and a modem, or a dedicated high speed link), a large collection of software tools is necessary to actually do achieve anything useful.

The first of these is the TCP/IP system itself, the Internet equivalent of an operating system. TCP (Transmission Control Protocol) uses IP, and its job is to make sure that transmitted information is divided into smaller addressed packets of information, and received information is re-assembled in the correct order.

Here is a quick summary of Internet's tools, application programs handy for communicating information around the world:

- **World Wide Web:** Also known as WWW or 3W, the Web is the trendy, graphical part of the Net which also happens to be the fastest growing. Uses hypertext (an entire network of electronic pages, one pointing to another) to link together Web pages from all over the world.
- **E-mail:** Virtually instantaneous, world wide communication between two parties is what "electronic mail" is all about. One can get an E-mail account and thus a unique Internet address and anyone can send and receive mail from any other E-mail account on the Internet.
- **Usenet:** In E-mail only two people are involved each time, but Usenet is a public discussion system, huge and sprawling. It is made up of many newsgroups on some 12000 subject matters which are rising at the rate of several hundred a month.
- **IRC:** Internet Relay Chat adds a real time element to E-mail. It is almost the Net equivalent of CB Radio. Talk to people keyboard-to-keyboard in real time
- **Gopher, Veronica:** Search the entire Internet for information using these two programs. One can select options from menus and enter words with which to perform searches.
- **Telnet:** A program used for logging on to computers elsewhere in the world. It is a text-based program.
- **FTP:** The "File Transfer Protocol" is an extremely useful program for transferring files from one computer on the Net to another. There are many "FTP sites" which are large collections of software and other files freely available to anyone.

One of the most popular Internet tools is Netscape. Its popularity stems from the opulence of its pages and the ease of bringing them to the screen. Netscape combines a "Web browser", a part of the Internet rich in multimedia features to other parts as well that are often text-based such as E-mail, FTP, Gopher and Usenet, all in one package. The newest version of it, Netscape Gold, even includes tools to edit "Web pages". Netscape also supports JAVA, which enables on-screen animation among other dynamic applications, as well "plug-ins" for extra software, for example VRML, a 3-Dimensional Virtual-Reality application environment.

3.2 Telecommunication networks

PSTN: The normal telephone network as we all know it, operating over copper cables. It was not designed for data transmission, but advances in modem technology, that produced the V.34 (28800 bps) modems of today, make it the most popular way to access the Net. Even faster modems are on their way and the ITU is working on agreeing the V.34bis standard (57600 bps), with V.34bis modems arriving during the second quarter of this year.
ISDN: Integrated Services Digital Network, is a globally accepted standard. In 1983, Euro-ISDN was introduced, itself a part of a worldwide CCITT conformant ISDN network. ISDN has the key benefit that it works over a variety of wired connections (copper, coaxial, fiber-optic). The standard allows for two 64000 bps data channels (the `B' channels) plus a single 16000bps signalling channel (the `D' channel) to be supported over a standard ISDN link which, in most cases, is the copper cabling. However, the speed advantage that ISDN had over modems in the early 1980s when it was proposed, is nowadays almost non-existent. ISDN's main advantage, now that speed is of lesser importance alongside the benefits of soon to arrive V.34bis modems, are that connections can be opened and closed nearly instantaneously, since there are no modem handshakes or dialing delays involved. That makes ISDN very useful for short `bursty' data calls.
Leased Lines: Installed as point-to-point direct links, they are "leased" from the Telecom Service. If the Internet calls are all to the same host system of the Internet provider, then short haul leased lines, i.e. leased lines of 50 or less km, tend to break even with high speed modem links into Internet service providers, where the line is in use for two or more hours a day.
ATM: An extremely fast data transport is possible using "Asynchronous Transfer Mode". This is the latest protocol developed for data transport over fiber optic links and can support audio and video communications directly as well as the more traditional digital data transfers. It accomplishes this by offering a combination of real-time data links as well as the more familiar non-real-time packet based data-transfer mechanisms.

Despite fast links, some Internet calls, particularly to US-based computers at peak times, can be reduced to a crawl, often due to network congestion. Allocating more dynamic bandwidth, if the Internet service provider allows this, may be of some help, although the truth is that if too many people try to access the same section of the Internet at once, then, like the roads, the Net starts to clog up.

4 New Technologies for Transport Applications

A summary of some of the newest technologies with applications to international transport are described next.

4.1 Satellite communications, GPS, GIS

The Global Positioning System (GPS) is, as the name implies, a system capable of reporting exact position with the help of satellites. The GPS passive sets include all electronics needed in a small housing and with the help of 18 terrestrial satellites can operate continuously on a 24-hour basis.

For example, a truck used in international freight, may be equipped with a GPS receiver which may then broadcast its exact position (with the help of an on-board terminal and satellite antenna) to an operations center, that belongs to the transport company. This is accomplished by relaying the output signal to Inmarsat communications satellites (Inmarsat is the international association governing these satellites, which are different from the ones used by GPS) and then back down to another part of the earth where the center is located.
The position, therefore, of any truck in the fleet of the transport company may be requested through any computer which is connected to the main server at the operations center.
Furthermore, if the operations center is equipped with the an electronic map of the area in question, then the truck's exact position may be displayed on it. These electronic maps can be drawn from a CD-ROM for example. They can be bitmap images of actual maps, scanned at different scales. Alternatively, a GIS (Geographical Information System), can be employed. A GIS is a vector-based graphical system in contrast to the bitmap images. A GIS digitizes points of a map and thus permits automatic scaling and displaying of map details at the user's option. A GIS is more "dynamic" compared to the "static" bitmap.
The truck's on-board terminal, permits also two-way communication between the driver and the operations center in the form of messages. Hence the transporter is able to communicate with his driver anywhere in the world. These messages can be saved and referred to at a later time. This messaging system can be enhanced, rather than replaced, by the use of GSM to permit verbal conversation between driver and base. GSM (Global System Mobile) is rapidly gaining in popularity as the wireless communications medium alternative but it is not available world wide.

4.2 Smart-cards and sensors

The on-board computer terminal in the above example can also be used to monitor vital information pertaining to the actual trip of the truck. It can be connected to various sensors that measure time and distance traveled, number of stops and duration, fuel capacity, number of fuel stops and their duration, fuel consumption and other engine data. This data can be saved on a smart-card which occupies a slot in the terminal and downloaded at the home computer when the truck returns to its base. A smart-card with its on-board microprocessor and relatively large memory, functions as a low-cost, re-usable, portable data storage which is also very secure. Its contents cannot be altered because it can perform checks not only on who has access to reading and writing data on it but also which card readers are allowed to operate on it.

4.3 Special Applications

In the case of special freight (chemicals, toxic waste, nuclear loads), technology can also come to aid. For example, electronic smart tags can be placed on the side of containers transporting hazardous goods. Then at certain points (e.g. customs, ports, railway stations, etc.) special sensors can remotely read information from the containers as they pass in front of them, and transmit this information to those interested in monitoring the transport of dangerous materials.

Perishable food automated life-tracking systems have also been used lately thanks to sensor and smart-card technology. Sensors and smart-cards can be employed to help monitor and control the environment inside trucks and containers transporting fresh, perishable goods (i.e., fruit, fish, meat, etc.). Sensors can be employed to monitor the environment characteristics (temperature, humidity, etc.) and control it. Special molecular sensors can even "sniff" fruit remotely, log the sampled data onto a smart-card, which after it is downloaded at the end of the trip, it can drive some special software to determine the rate and state of fruit decay and even give an estimate of the fruit's remaining life.

Part 2:
EDI - Electronic Data Interchange

1 Introduction To EDI

1.1 What is EDI?

"EDI, Electronic Data Interchange, is the interchange of *standard formatted* data between the computer application systems of the trading partners with minimal manual intervention".

EDI is paperless trading, combining the powers of computing and telecommunications to replace the paper document as data carrier for trade-related activities and services. In operation, EDI is the interchange of agreed messages between trading partners. These messages cover applications in trading, transport, customs, insurance, manufacturing. The interchange itself takes place across telecommunication networks provided by public or private telecommunication or value added network services.

These benefits are available to companies and organizations whatever their size or type. They are not limited to national boundaries nor to particular industries. EDI is based on international standards and UN recommendations. EDI started over 30 years ago with the transport industry looking for a solution to the strangling effect of paperwork.

1.2 Why use EDI?

EDI has none of the disadvantages of paper documents as data-carrier. These are some of the reasons why business is making use of EDI:

- **accuracy:** data received directly from computer files and applications is more accurate than manually re-entered data
- **speed:** data transmitted by telecommunications and processed by computer without manual intervention is processed more quickly than data sent by post and re-entered manually
- **savings:** direct savings on the cost of mailing, copying, filing, distribution and data capture
- **real benefits:** through reduction in stocks and storage space, shorter lead times and the consequent release of working capital
- **customer satisfaction:** through prompt deliveries, advance notification of dispatch, minimization of delays in transportation and customs clearance

1.3 Where is EDI used?

The field of application of EDI extends to all trade and trade-related activities:

- **commerce:** trade and industry, manufacturing, finance, banking, insurance, construction industry, tourism and travel
- **transport:** road, rail, air, sea, forwarding, dispatching, handling, warehousing
- **governmental:** customs and excise in both national and international trade, statistics

All these areas of application are reflected in the definition of data elements and the definition of specific EDI messages. The implementation of international messages will expand through migration from existing sector and national standards to international standards and through an increase in the awareness of EDI in countries that have not yet been involved.

On a technical level, the resources EDI requires in terms of a company's personnel, computer hardware, software and telecommunications facilities to implement EDI are within reach of every organization. The minimum requirement is a computer and telecommunication facilities, e.g. a personal computer, a telephone line and a modem. There are several ready-made EDI software packages available and already being used by large and small organizations.

1.4 An Example in International Trade and Transport

A few simple scenarios are presented here to indicate the span of trading by means of EDI messages, e.g. invoice, purchase order, customs declaration, transport order, etc.
The main partners involved in international trade are indicated in Diagram 1. The individual transactions are presented in subsequent diagrams to reflect the interchanges from the point of view of the seller, buyer, carrier, customs, banks, etc.

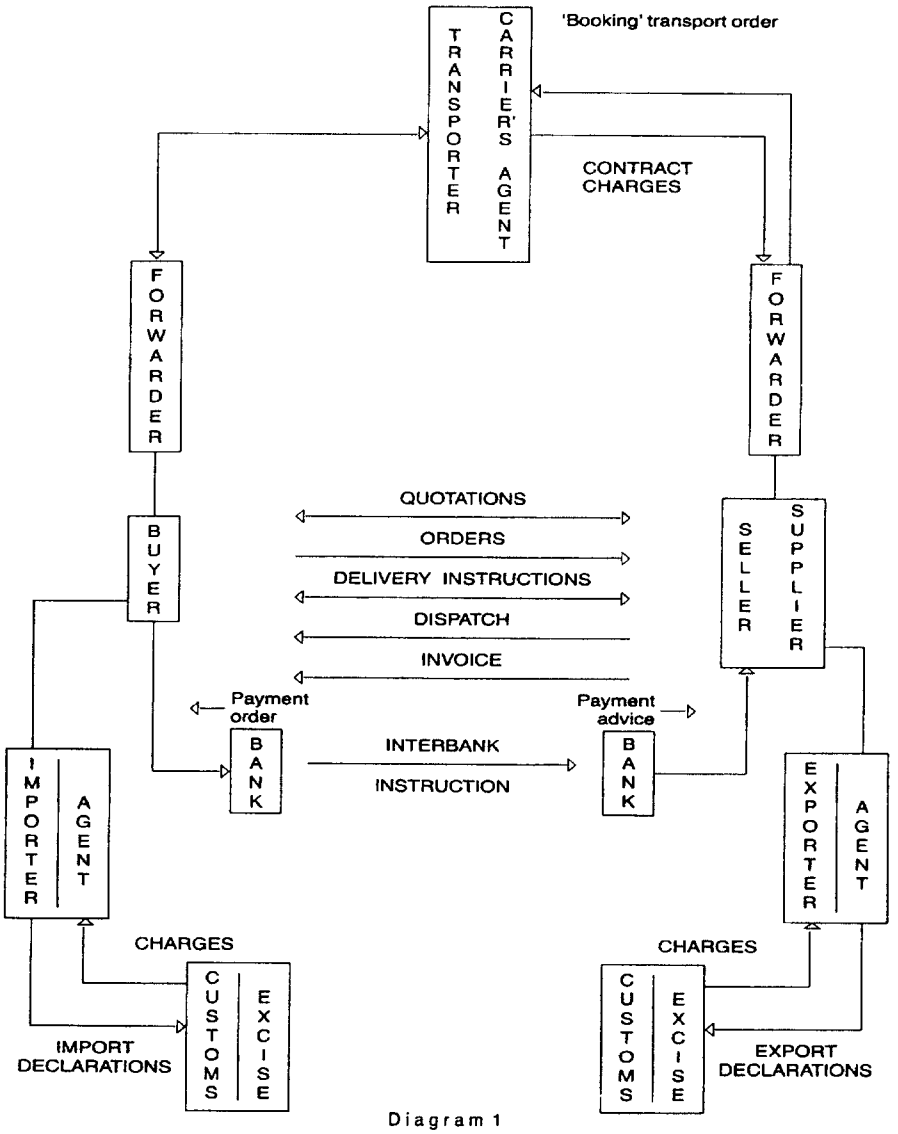


Diagram 1

1.4.1 Quotation to contract

A party wishing to buy a product may send a request for quotation to one or more suppliers/sellers indicating the details, such as:

- parties involved
- product required
- quantity and delivery date
- terms of deliveries
- place of delivery

The sellers/suppliers may respond with "Quotations" to the buyer. Based on quotations received, the buyer and seller are able to arrive at a contract or order issued either by the seller or the buyer.

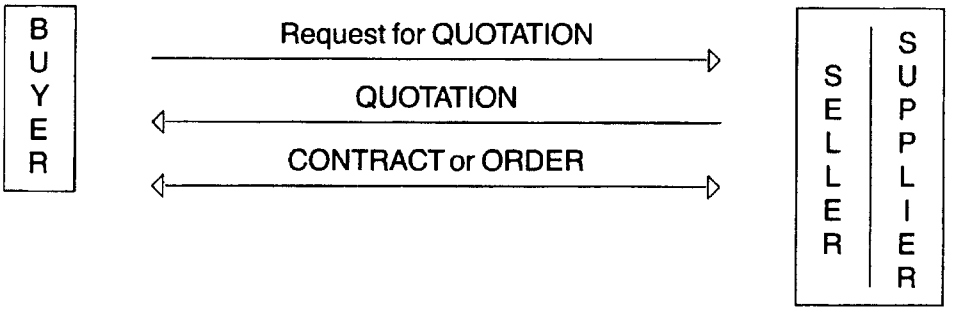


Diagram 2

Following the contract/order, the supplier would be requested to deliver on the basis of delivery instructions or firm orders.

1.4.2 Ordering/Delivery instructions

A buyer may detail his request for deliveries through delivery instruction messages or directly through orders. Delivery instruction messages are common in manufacturing industry where the manufacturer provides a long term picture of the deliveries required in order to permit the supplier to plan his production and delivery schedules. Delivery instruction messages interchanged through EDI facilitate the synchronization of scheduling and production between the manufacturer and his supplier when implementing JIT (just in time) manufacturing techniques.

In response, the supplier/seller may confirm or change the buyer's order, e.g. delivery date changes. Similarly, the buyer may request changes to an already placed order.

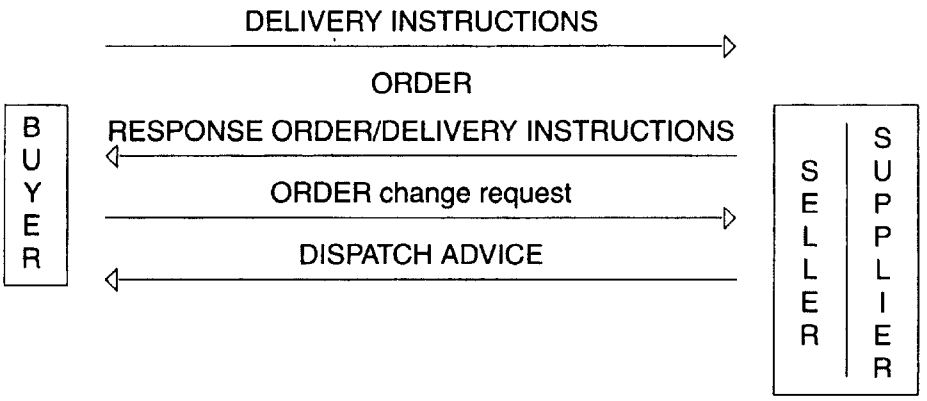


Diagram 3

When the goods are ready, the supplier/seller can now send a dispatch advice message to the buyer, providing exact details of the products, quantities, packages and transport.

1.4.3 Invoice to payments

Following the delivery of goods, the supplier/seller will send the buyer an invoice message detailing goods and services provided , quantities, prices, terms of deliveries and payments, etc. An invoice message may cover one or more deliveries. It is also possible to send periodic statements of account indicating outstanding payments. Credit note or debit note invoice messages can be used to correct errors in invoices.

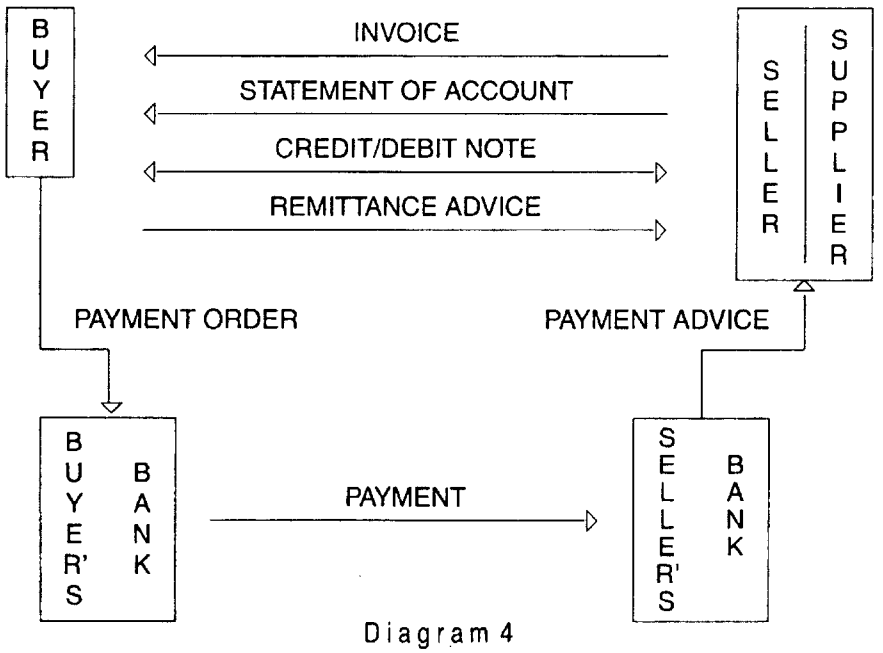


Diagram 4

Payments can be made through a payment order message to the buyer's bank giving details of the supplier's bank, invoices to be paid, and the relevant amounts. At the same time, the buyer may send the seller a remittance advice to tell him the payment is on its way. On notification of receipt of funds, the seller's bank notifies the seller with a payment advice message giving details of invoices that have been paid.

1.4.4 Transport order

At a particular moment in a trade cycle, the shipper (the party requesting the transport of the goods) or his forwarder is able to make a request for a provisional booking of transport services from a transporter or a carrier's agent based on initial details of a consignment. This would follow on to a firm booking as more exact details of the consignment are known, leading to the booking instruction finalizing the agreement between shipper/forwarder and transporter/carrier's agent.

The transporter/carrier's agent is able to confirm the request for booking at the different stages of agreement: provisional, firm and contract (instructions). Furthermore, is able to keep the shipper informed about the status of the transport and advise on any changes in the schedule. In line with contractual agreements, is able to send the shipper/forwarder a charge message listing the transport and related services rendered as well as the request for payment.

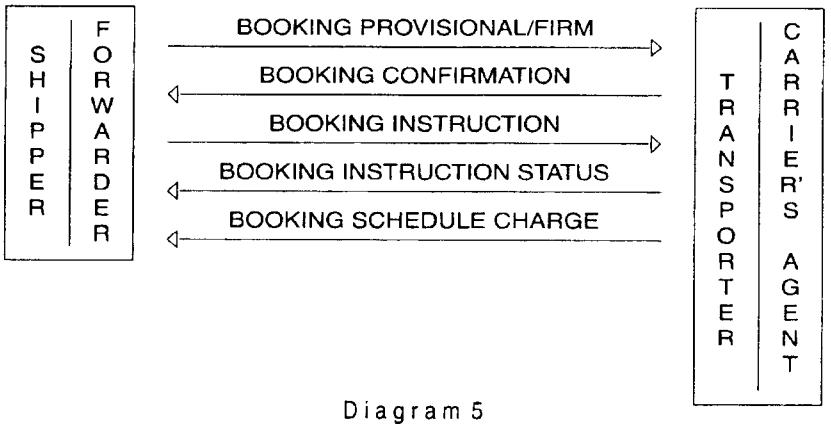


Diagram 5

The payment order message from the shipper/forwarder to the bank authorizing payment to the transporter or his agent is exchanged in the same way as in Diagram 4.

1.4.5 Customs clearance

Where a transaction involves export or import, the respective customs authorities will receive notification from the exporter, importer and carrier or their respective agents concerning the cross border movement of goods. These declarations may be presented prior to the arrival of the goods at customs.

The exporter/importer or their agents, will submit details of the partners and summarized details of the goods by commodity group, transport and package details, import and other duties to be paid, import/export license, etc. The carrier or his agent will submit the carrier's declaration message for the consignment based on the manifest and waybill detail.

Based on these two EDI messages, customs are able to control the flow of goods. Notification of the clearance status of a consignment and individual shipments may be sent to the exporter/importer or carrier with details of duty charges to be paid. Payment of duty charges by the importer or his agent to customs may take place through the payment order procedures as in Diagram 4.

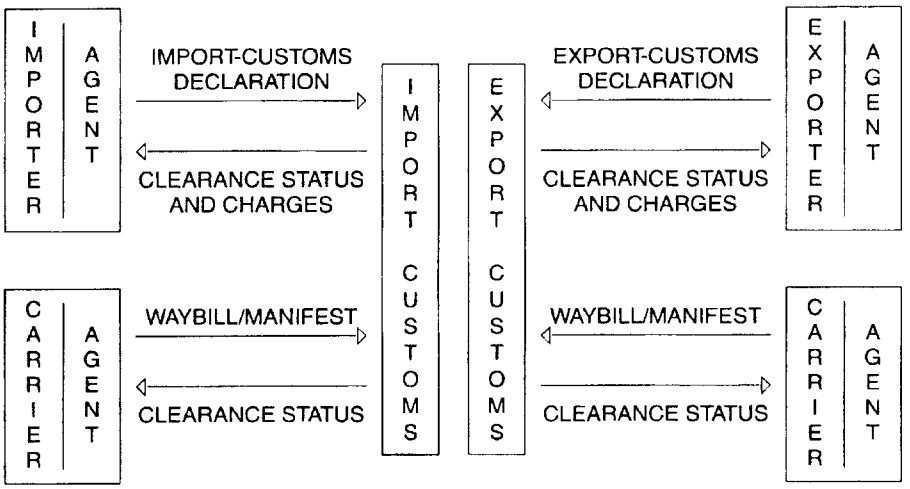


Diagram 6

Customs, may request the importer, if required, to resubmit a detailed declaration message at item level to permit the inspection of the goods in a shipment.

2 The Organization And The Procedures Of UN/EDIFACT

EDI and standards are synonymous. EDI standards, similar to a language, consist of a grammar (syntax, rules for structuring data elements in segments eithin a message), and a vocabulary of words (data element directory, segment directory and message directory). Communication would break down if interchanging partners did not follow agreed standards.

National customs administrations, by defining their information requirements, have, as a consequence, imposed standards on industry and trade. These standards in a manual system of document exchange were self-regulatory. However, each administration imposed its own requirements, often in an arbitrary manner on traders who were of necessity required to interface with more than one administration. Customs have statutory requirements to exchange accurate and prompt information. Data transfer between customs and trade in the form of declarations and clearances is the obvious one, but with the growth of EDI port systems in the air and maritime sectors, the need for common interfaces becomes more important. In addition, there are requirements for the transfer of data between administrative bodies.

An attempt to resolve this problem commenced in 1986 in the form of ECE/WP4. This work has now matured into UN/EDIFACT (EDI For Administration, Commerce and Transport) Standard (ISO 9735). The international standards and supporting directories are:

- **UN-EDIFACT syntax rules (ISO 9735),** for structuring data into messages. This standard has also been adopted by CEN (the European Committee for Standardization) as EN 29735
- **UN-Trade data element directory (ISO 7372),** the building blocks used for the definition of standard EDI messages
- **UN-EDIFACT segment directory,** standard segments e.g. name and address, interchange header or trailer segments
- **UN-EDIFACT standard message directory,** standard messages fulfilling specific trading functions, e.g. invoicing, ordering, customs clearance, bills of lading, etc.
- **UN-EDIFACT code sets,** internationally agreed codes for countries, currencies, terms of deliveries, terms of payments, modes of transport, type of packages

2.1 UN/EDIFACT Standards: Development and Maintenance

UN/ECE WP4, which has representation and observers from more than 60 countries and many international organizations (European Commission, IATA, International Chamber of Commerce, International Chamber of Shipping, ISO), appointed rapporteurs (RT) for different regions in the world. With the support of international experts drawn from industry and national groups, these rapporteurs have the task of progressing the developments of EDI standards under the guidance of the UN/ECE WP4. The structure of the activities of the EDIFACT Board of Western Europe is given here:

- EDIFACT Board Steering Committee
- Message development groups
- Maintenance advisory group
- Technical assessment group
- Secretariat

Although the structure and composition of an EDI association will reflect its industry's requirements and trading relations, the role and responsibility of the association with regard to EDI message development must be within the EDIFACT development framework in order to avoid further duplication of effort or confusion of standards.

2.2 Design concepts of UN/EDIFACT messages

A message is a collection of sequenced segments within a defined section. The segments consist of data elements that together, define a precise concept. A segment and data element can occur several times in a message, for example the same definition of the NAD-segment (Name and ADdress) in an invoice is used to identify the seller and the buyer (including data elements like street, city, county, postal code, etc.). The same segment/concept may be used in different messages. Within a message, segments are organized into groups that define larger concepts or functions, such as delivery information. These segment groups may then be organized into sections:

- the header section contains information taht applies to the whole message
- the detail section contains information taht may be repeated, such as product descriptions
- the summary section contains information such as totals

2.3 Message development process

The message development process encompasses a series of broad steps from concept to publication as a UN recommendation:

- **Submission:** Submission by any organization through the local RT Secretariat
- **Review:** By the local RT. Other interested RTs invited to participate
- **Status 0:** Draft Document submitted to WP4 for information purposes
- **Status 1:** Draft recommendation approved by WP4 for formal trial
- **Status 2:** Recommendation approved by WP4 and registered as UNSM (United Nations Standard Message)

UNSMs are collections of data values conveying general business functions, applicable to all need (multi-sectoral). In certain industries, the partners may agree not to use certain conditional possibilities. In such cases we talk about defining a subset of a UN/EDIFACT message.

2.4 Legal Aspects

Legal acceptance of EDI is vital. The UN General Assembly has made a request for countries to review their legal requirements for "handwritten signatures" and "paper documents". The functions (fulfilled by the paper document) of identification, fault finding and evidence can be satisfied as well or better by electronic means.

The UNCID rules, uniform rules of conduct for interchange of trade data by tele-transmission, consist of 11 clear and concise articles. They were prepared by a committee established by the ICC. Parties and user groups, intending to proceed with EDI implementation are strongly recommended to consult the UNCID rules and incorporate them in their interchange agreements.

3 EDI Message Design Guidelines

3.1 Management commitment

Management commitment and approval are vital to the success of the implementation. The costs of implentation must be clearly defined in the initial stages and may include:

- the purchase of computer hardware, software and network service
- the cost of participation in EDI activities within the industry sector group or in other standards work
- the cost of human resources that will be involved

Prior to going live, the management of both parties must sign "interchange agreements". This should cover the aspects of the participants' business relationship which might be affected or require new guidelines. EDI is more a business matter than a technical problem.

3.2 Project organization

The project should be controlled by a steering group from the data processing, administration and management departments that will ultimately be responsible for the operation. They will make decisions:

- in the short term to meet immediate requirements for the trials and initial implementation
- in the long term based on the results from the trials and formulation of the strategic goals of the organization

Project teams, reporting to the steering group, will be required to implement the different messages for such applications as purchasing, payments, transportation, etc., and for the overall technical environment.

This formal structure presented here may not be appropriate in all organizations.

3.3 Message implementation

It is essential that all participants interpret the EDI messages in the same way, since they interface with their internal "in-house" systems. Other aspects that must be considered are:

- the checking of any legal requirements

- the detailed implementation of the message by both interchanging organizations at segment and data element level and where relevant the coded values of data elements
- the identification of the screening and processing that will be required
- the timing and frequency of the intarchanges
- the user contacts and back-up procedures
- the carrying out of parallel tests and check results
- the identification of change procedures and preparation of user documentation and training material

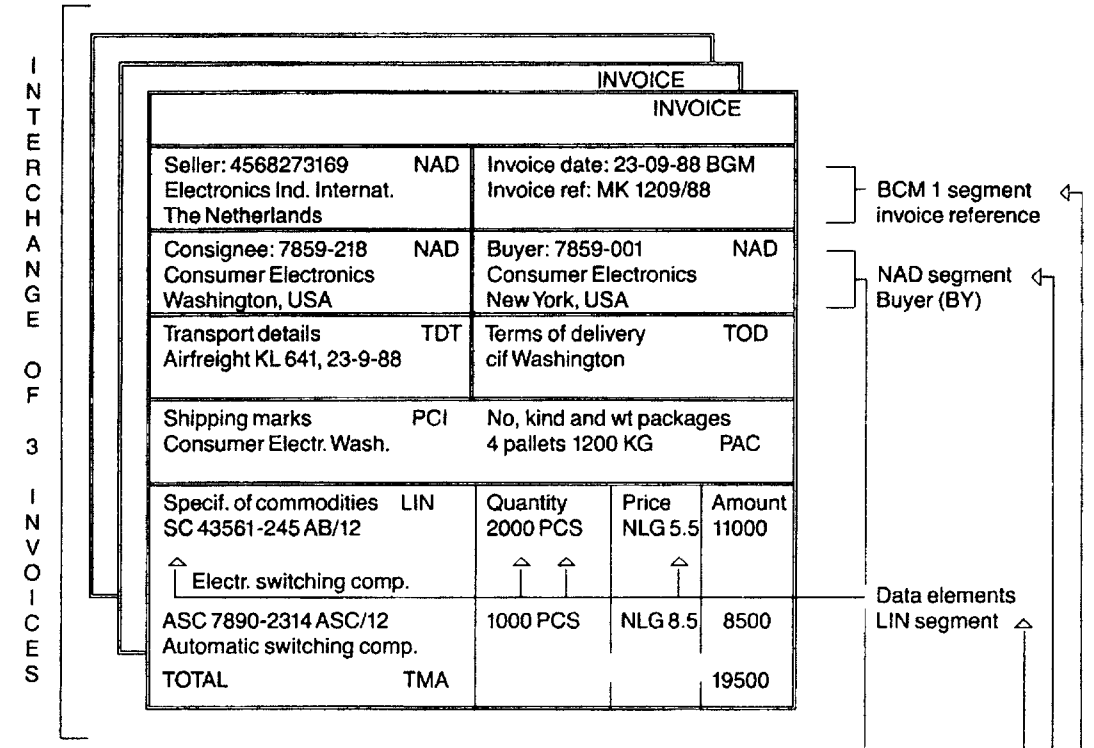
3.4 Technical upgrading

The technical group can proceed in parallel with the message implementation group to upgrade the technical capabilities of the organization to meet the requirements for EDI. The main points to be considered are:

- should the syntax translation and telecommunications software be bought or produced in-house?
- does additional hardware need to be procured or the existing systems upgraded?
- the telecommunication facilities required for the trials and also for the log term operation

4 Messages Used In Trade And Transport

Here is shown a paper invoice with equivalent EDI message. Mostly coded identifiers are used in EDI messages.



Syntax delimiters	UNA:+.?'
Interchange header	UNB+UNQA:1+501234:14+586421:91+881023+CE145'
Message header	UNH+1025+INVOIC:88:1'
Message ref.	BGM+380+MK1209/88+88102'
Seller ident.	NAD+SE+4568273169'
Seller ref.	RFF+CT+EII/88-4561'
Consignee ident.	NAD+CN+7859-218'
Purchase order ref.	RFF+PO+CE4539/HP659/003'
Buyer ident.	NAD+BY+7859-001'
Contract ref.	RFF+CR+IMP-1489/374/032'
Invoice currency	CUX+NLG:IN'
Payment terms	PAT+01+++05:03:1:60++++PAYMENT 60 DAYS FROM INVOICE DATE'
Transp. details	TDT++40+KL 641, 23-09-88'
Terms of delivery	TOD+++CIF WASHINGTON'
Package details	PAC+4++:PALLETS'
Package weight	MEA+PD+04+KG:1200'
Markings	PCI++CONSUMER ELECTR. WASH.'
Detail delim.	UNS+D'
Article line details	LIN+++SC 43561245AB/12:SA++21:2000:PCS+5.5:CT:1'
Article line details	LIN+++ASC7890-2314ASC/12:SA++21:1000:PCS+8.5:CT:1'
Summary delimiter	UNS+S'
Total invoice	TMA+19500'
Message control	UNT+21+1025'
Second message	.....
Third message	.....
Interchange control	UNZ+3+CE145'

4.1 Acronyms used in doing business in EDI

The following table, gives an overview of UN/EDIFACT messages used in Trade, Transport, Finance and Government, as of October 1995 (9th Revision).

		MESSAGES :	STATUS
APERAK	+	Application Error and Acknowledgment Messages	1
AUTHOR		Authorisation Message	1

BALANC			Trial Balance	0
BANSTA			Banking Status Message	1
BAPLIE		UNSM	Bayplan / Stowage Plan -	
BAPLTE			Occupied and Empty Locations Message	2
BAPLTE		UNSM	Bayplan / Stowage Plan -	
			Total Numbers Message	2
BOPBNK			Bank Transactions and Portfolio	
			Transactions Report	1
BOPCUS			Balance of Payment Customer Transaction Report	1
BOPDIR			Direct Balance of Payment Declaration Message	1
BOPINF			Balance of Payment Information from Customer	1
BOPSTA			Exchange of Balance of Payment Statistics	0
CALINF	+		Call Info Message	1
CASINT			Case Initiation (Request for Legal Action)	0
CASRES			Case Response (Legal Response)	0
CHACCO			Chart of Accounts	0
CLAREQ			Classification General Request	0
CLASET			Classification Information Set	0
COACOR	|		Container Acceptance Order	Withdr.
COACSU	*		Commercial Account Summary	0
COARCO	|		Container Arrival Confirmation	Withdr.
COARIN	|		Container Arrival Information	Withdr.
COARNO	|		Container Arrival Notice	Withdr.
COARRI	+		Container Discharge/Loading Report	1
CODECO	+		Container Gate -in/Gate-out Report	1
CODENO	+		Permit Expiration/clearance Ready Notice	1
CODEPA	|		Container Departure Message	Withdr.
COEDOR	+		Container Stock Report	1
COHAOR	+		Container Special handling Order	1
COITON	|		Container Inland Transport Order Notice	Withdr.
COITOR	|		Container Inland Transport Order	Withdr.
COITOS	|		Container Inland Transport Order Response	Withdr.
COITSR	|		Container Eland Transport space Request	Withdr.
COLADV			Advice of a Documentary Collection	0
COLREQ			Request for a Documentary Collection	0
COMCON			Component Parts Content Message	0
COMDIS			Commercial Dispute Message	1
COOVLA	|		Container Overlanded Message	Withdr.
COPARN	+		Container Announcement Message	1
COPDEM	|		Container Predeparture with Guidelines Message	Withdr.
COPINF	|		Container Pick-up Information	Withdr.
COPINO	+		Container Pre-notification Message	1
COPRAR	+		Container Discharge/Loading Order Message	1
COPRDP	|		Container Predeparture Message	Withdr.
COREOR	+		Container Release Order	1
COSHLA	|		Container Shortlanded Message	Withdr.
COSTCO	+		Container Stuffing/Stripping confirmation	1
COSTOR	+		Container Stuffing/Stripping Order	1
CREADV		UNSM	Credit Advice Message	2
CREEXT		UNSM	Extended Credit Advice Message	2
CREMUL	+		Multiple Credit Advice Message	1
CURRAC			Current Account Message	0
CUSCAR		UNSM	Customs Cargo Report Message	2
CUSDEC		UNSM	Customs Declaration Message	2
CUSEXP			Customs Express Consignment Declaration Message	1
CUSREP		UNSM	Customs Conveyance Report Message	2
CUSRES		UNSM	Customs Response Message	2
DEBADV		UNSM	Debit Advice Message	2

DEBMUL	+		Multiple Debit Advice Message	1
DELFOR		UNSM	Delivery Schedule Message	2
DELJIT		UNSM	Delivery Just In Time Message	2
DESADV		UNSM	Despatch Advice Message	2
DESTIM			Equipment Damage/Repair Estimate Message	0
DIRDEB			Direct Debit Message	1
DIRDEF	+		Directory Definition Message	1
DOCACV			Documentary Credit Advice Message	1
DOCAMA	+		Advice of an Amendment of a Documentary Credit	1
DOCAMD			Direct Amendment of a Documentary Credit	0
DOCAMI	+		Documentary Credit Amendment Information	1
DOCAMR	+		Request for an Amendment of a Documentary Credit	1
DOCAPP			Documentary Credit Application Message	1
DOCARE	+		Response to an Amendment of a Documentary Credit	1
DOCINF			Documentary Credit Issuance Information	1
DOCISD			Direct Documentary Credit Issuance	0
DOCTRD			Direct Transfer of a Documentary Credit	0
DOCTRI			Documentary Credit Transfer Information	0
DOCTRR			Request to Transfer a Documentary Credit	0
ENREC			Accounting Entries	0
FINCAN	+		Financial Cancellation Message	1
FINSTA	+		Financial Statement of an Account Message	1
FUNACK	|		Functional Acknowledgment	Withdr.
GATEAC	|		Gate and Intermodal Ramp Activities Message	Withdr.
GENRAL			General Purpose Message	0
GESMES	+		General Statistical Message	1
HANMOV			Cargo/goods Handling and Movement Message	1
ICASRQ	*		Loss Assessment Request Message	0
ICNOMO			Insurance Claims Notification Message	0
IFCSUM		UNSM	Forwarding and Consolidation Summary Message	2
IFTCCA			Forwarding and Transport Shipment Charge Calculation Message	1
IFTDGN			Dangerous goods Notification Message	1
IFTFCC			International Freight Costs and Other Charges	0
IFTIAG	+		Dangerous Cargo List Message	1
IFTMAN		UNSM	Arrival Notice Message	2
IFTMBC		UNSM	Booking Confirmation Message	2
IFTMBF		UNSM	Firm Booking Message	2
IFTMBP		UNSM	Provisional booking Message	2
IFTMCS		UNSM	Instruction Contract Status Message	2
IFTMIN		UNSM	Instruction Message	2
IFTRIN			Forwarding and Transport Rate Information	1
IFTSAI			Forwarding and Transport Schedule and Availability Information	1
IFTSTA			International Multimodal Status Report Message	1
IFTSTQ			International Multimodal Status Request	1
INFENT			Enterprise Information	0
INSPRE			Insurance Premium Message	1
INVOIC		UNSM	Invoice Message	2
INVRPT		UNSM	Inventory Report	2
IPPOMO	*		Motor Insurance Policy Message	0
ITRGRP			In Transit Groupage Message	0
ITRRPT			In Transit Report Detail Message	0
MOVINS			Stowage Instruction Message	1
ORDCHG		UNSM	Purchase Order Change Request Message	2
ORDERS		UNSM	Purchase Order Message	2
ORDRSP		UNSM	Purchase Order Response Message	2
OSTENQ			Order Status Enquiry Message	0

PARTIN		UNSM	Party Information Message (Trading partner profile data)	2
PAXLST		UNSM	Passenger List Message	2
PAYEXT		UNSM	Extended Payment Order Message	2
PAYMUL			Multiple Payment Order Message	1
PAYORD		UNSM	Payment Order Message	2
PRICAT			Price/Sales Catalogue Message	1
PRODAT			Product Data Message	0
PRODEX			Product Exchange Reconciliation Message	1
PROINQ	*		Product Inquiry Message	0
PROTAP			Project Tasks Planning Message	0
PRPAID			Insurance Premium Payment Message	1
QUOTES		UNSM	Quote Message	2
RDRMES			Raw Data Reporting Message	0
REACTR	|		Equipment Reservation, Release, Acceptance and Termination Message	Withdr.
RECADV			Receiving Advice Message	0
RECECO			Credit Risk Cover Message	1
RECLAM			Reinsurance Claims Message	0
REINAC			Reinsurance Account Message	0
REMADV		UNSM	Remittance Advice Message	2
REQDOC			Request for Document Message	1
REQOTE		UNSM	Request for Quote Message	2
RESETT			Reinsurance Settlement Message	0
RETACC			Reinsurance Technical Account Message	0
SAFHAZ	+		Safety and Hazard Data Sheet	0
SANCRT			Sanitary/Phytosanitary Certificate	1
SLSFCT			Sales forecast Message	1
SLSRPT			Sales Data Report Message	1
STATAC		UNSM	Statement of Account Message	1
SUPCOT		UNSM	Superannuation Contributions Advice Message	2
SUPMAN		UNSM	Superannuation Maintenance Message	2
TANSTA			Tank Status Report Message	0
TAXCON	*		Tax Control Message	0
TESTEX			Test Message Explicit Mode	0
TESTIM			Test Message Implicit Mode	0
TRADES	*		Traffic or Travel Description Definition Message	0
TRAILS	*		Traffic or Travel Route Guidance and Planning Message	0
TRALOC	*		Traffic or Travel Location Definition Message	0
TRAREQ	*		Traffic of Travel Information Request Message	0
TRAVIN	*		Traffic or Travel Situation Information Message	0
VATDEC	*		Value Added Tax Message	0
VESDEP	+		Vessel Departure Message	1

EXPLANATION :

*	new Status 0 Message
|	Status 0 Message withdrawn (reason : merged into other message)
+	new Status 1 Message
o	new Status 2 Message

STATUS : 0 = Draft Document, 1 = Draft Recommendation, 2 = Recommendation

5 Telecommunication Network Facilities

Telecommunication network facilities are an integral part of EDI operation, but the actual means of transporting the data and their protocols are at the user's option. The most common facilities open to a user are:

5.1 Direct dialing

Here the communication parties use modems over normal telephone lines. The sender dials the receiver's telephone number and data exchange can start when the link with the receiver is made. Normal telephone charges are involved.

The use of direct dialing has advantages when a small user group wish to test the interconnectivity of their applications systems, because of its simplicity and the limited investment in hardware and software. For normal daily operation, however, it is unacceptable because of speed limitations and incompatibility problems. In the long term, the availability of ISDN will make it possible to send data at very high speeds.

5.2 Public data networks

Public data networks, either circuit switched, packet switched or both, are provided by national PTTs as a national and international service.

The sender sets up a connection to his local point of access to the public data network and transmits his data addressed to the receiver. At the exit point, the network system sets up a connection to the receiving partner and transmits the data addressed to him. Apart from fixed rental charges, the network service provider charges on the basis of the duration of the connection to the network system and the volume of the data transmitted.

Problems may arise if the users are not careful to restrict themselves to the facilities that are common or bridged across all international networks involved.

5.3 Private Networks

Private networks are set up by renting leased lines between the required user sites from the national telecommunication authorities, in one country or, if necessary, several countries.

The costs of private networks are based on the cost of the leased lines rather than the volume of data transmitted. That is why private networks are preferred by large multinational organizations with large volumes of data. The sensitivity or security of the data may be a further justification. Apart from the high cost of dedicated lines, an organization should also bear the cost of specialists needed to set up, maintain and support the network and its users at all points.

5.4 Managed Networks

Managed networks are a cross between public data networks and private leased lines. A third party sets up a network by leasing lines from national networks with the purpose of providing a service to it contracting users. The services of network providers are often referred to as VANS (value added network services) or VADS (value added data services).

To use the service, the sender connects to an access point of the network and transmits his data. Similarly, the receiver connects to the network and collects the data. As with public networks, the route chosen for transporting the data and the security are the responsibility of the service provider.

The advantages of managed networks are:
- transparency across the whole network
- the ease of access to the network
- the range of services provided
- support provided to users at all locations of the network
- complete communication and data processing services to a user
- ability to take care of problems of international interconnection

However, the main disadvantage is, in general, a much higher charging structure.

6. Secure EDI - An Overview

In EDI the security of messages is of the utmost importance. The dangers threatening EDI messages in transit are many. International communications standards, encryption algorithms and state-of-the-art technology solutions help ensure secure transmissions.

6.1 International communication standards

- **OSI (open systems interconnection):** are a set of standards that computer equipment and software produced by different suppliers should be capable of communicating with each other. The foundation standard is ISO 7498 which defines the architecture, a consistent terminology and the requirements for OSI to work.
- **X.25 packet switching systems:** This is the most commonly used OSI medium. Encryption techniques may be used but must be implemented extra.
  X.400 message handling systems: This is intended for electronic mail and over the past few years has also been identified as the ideal OSI medium for EDI. The 1988 version of recommendations includes the optional provision of a wide range of security services, such as data origin authentification, data integrity facilities, data confidentiality, access control services.
- **FTAM (file transfer access and management):** This is the area of OSI (ISO 8571) which controls the transfer of data files and the accessing of files from remote systems. FTAM is likely to be used for the transfer of large volumes of EDI messages.
- **X.500 directory services:** These CCITT's recommendations define the electronic directory services which X.400, FTAM and other communication systems will use for routing messages.

6.2 Security mechanisms and procedures

6.2.1 Encryption

Encryption is the scrambling of data or messages to prevent them from being understood by unauthorized persons or organizations. It may be used for:
- user authentification
- message authentification
- confidentiality
- error detection
- proof of origin

In simple terms encryption normally works in the following way:
- a message (or part of a message) in its original form (*plaintext*) is transformed (*encrypted*) into an unintelligible form (*ciphertext*) by a set of procedures known as an encryption algorithm and a variable, called key

- the cipher text is transformed (*decrypted*) back into plaintext using the encryption algorithm and a key.

The level of protection may depend upon, among other things:
- the size of the keyspace
- the adequacy of key management; the procedures for generating, storing, exchanging, archiving and deleting keys

There are two main types of encryption:
- private key systems: also known as "symmetric", here the same key is used for encryption and decryption. The most well known symmetric system is the DES (data encryption standard)
- public key systems: also known as "asymmetric", with a public key, which may be known to many people and a secret key, which is unique and known only to the sender. The best known public key system is RSA (Rivest, Shamir & Adelman).

Because of the complexity of asymmetric encryption it is more suited as an authentification mechanism while symmetric encryption is more appropriate for ensuring confidentiality. The choice of encryption system may be restricted by government constraints on their use, particularly when transmitted over public networks.

6.2.2 Digital signatures

Digital signatures use asymmetric encryption to provide assurance of authentification of the origin of the message and, sometimes, the integrity of its contents. They can also prevent epudiation as they can be used to prove that, providing the private key has not been disclosed, the signature is that of the sender. A typical digital signature works like this:
- a signature in the form of a code is generated by applying an algorithm, such as RSA, and the sender's private key to some or all of the message contents
- the recipient verifies the signature by decrypting it using the sender's public key

6.2.3 Key management

These are the procedures for generating, storing, exchanging archiving and deleting keys. Key management must be secure but not overly burdensome.

Third parties, trusted by senders and receivers, called certification authorities, can be used to certify the authenticity of public keys.

6.2.4 Traffic padding

This is the transmission of dummy traffic to prevent an eavesdropper analysing the flow of encrypted traffic on a communications link. It is expensive to implement and is only necessary where very high levels of security are required.

6.2.5 Routing control

It is used to ensure that messages are not directed via communications links which have insufficient security.

6.2.6 Electronic notary

It is a trusted intermediary who provides proof that a message was sent and received and also, if required, confirmation of the contents of the message.

6.2.7 Certification

Certification is not only restricted to key management. It can be used to certify that an organization has the authority to access a database or even that it is sufficiently noteworthy to place a specific order.

6.2.8 Sealing

Messages can be "sealed" to show that the contents have not been accidentally or intentionally changed. This is normally done using a checksum which is appended to the message or sent separately. A checksum is the result of a calculation which uses data from the message. Most seals use encryption to increase security.

6.3 Technology

6.3.1 Smart cards

They look like credit cards and contain a microchip memory instead of a magnetic strip. Thay can store relatively large volume of data. Its on-board microprocessor can check that the device reading the card is authorized to do so. Smart cards can be used for:

- identification and authentification of EDI users
- controlling access to data and othe resources
- sealing and signing transactions

6.3.2 WORM disks

These write once read many times storage devices are marginally more secure than traditional media (e.g. magnetic tape).

6.3.3 Biometrics

Biometric techniques use unique human attributes to provide high levels of assurance of identity and authentification. These attributes originate from military applications and may include voice, fingerprints and hand-shape.

7 Benefits through EDI

7.1 Benefits in the transport chain

Through the implemantation of EDI in the transport chain with international standard messages between shipper, forwarder, transporter their respective agents and customs, it should be possible to replace 30-40 paper-based transactions, each repeating the same data. Since error rates of 50% in manual transcription are common as well as delays and bottlenecks in the information, the benefits of EDI become clear. The major benefits that are aimed for in the transport chain are:

- prompt booking of transport services and changes in schedules; better control over the movements of shipments and consignments, especially over multi-modal transport
- improved traffic planning and forecasting leads to improved utilization of equipment and capacity
- prompt clearance of payments due to correct and detailed billing

- language independence through the use of international standard messages and codes (e.g for modes of transport, commodity codes, transport equipment, etc.)
- better customer service
- reduction in the clerical overload, paper handling

7.2 Benefits in the customs sector interface

The use of EDI at the interface with customs authorities for the declaration of cross-border goods flow will benefit the customs authorities and the expoter, importer, transporter, forwarders and their respective agents. Customs will receive more precise information in the declaration without relinquishing any of their control. Marked benefits in this area:

- prompt declaration gives customs authorities time to examine it or the goods, if necessary, with minimal delays to the goods flow.
- declarations can be cross-checked without re-entering data to calculate import duties, quotas, anti-dumping duties, etc.
- more reliable import and export statistics can be collected
- simpler procedures for the reclamation of import duties following re-export of goods
- reduction of congestion at cross-border points (even though shorter lead times may attract customers to place smaller orders that may result in more frequent deliveries)

7.3 EDI for international trade

EDI is beneficial mainly because of the following factors:

- the standard messages that are being developed are both for national and international trade
- standard procedures being introduced to support the implementation of the messages
- the hardware, software and network services required are not restricted to national boundaries
- language independence is built-in through the use of UN data elements and international code sets
- the reduction of the paperwork required in cross-border trade and across the transport chain

8 Industry specific Associations

UN/EDIFACT is widespread in companies and public departments in the sectors noted below:

- Aerospace
- Automotive
- Banking
- Chemicals
- Construction
- Cosmetics
- Electronics
- Customs
- Health
- Insurance and Re-insurance
- Leisure
- Manufacturing
- Oil and Gas
- Paper, Printing and Publishing
- Retail
- Social Administration
- Telecommunications
- Textiles
- Transport
- Travel and Tourism

In addition, the TEDIS program facilitates the co-ordination of European EDI implementation. It includes various EDI transport and transport related services covering rail, road, air, sea and deep-sea transport.

DG I - TACIS PROGRAMME

TRACECA TRAINING ACTION

MARITIME / WATER TRANSPORT

Author : Dr. Stratos Papadimitriou

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TRADEMCO Transportation, Development, Engineering and Management Consultants Ltd.
4, Papadiamantopoulou str., 115 28 Athens, Greece, Tel.: 7248048-9, Fax: 7237415

1. RECENT TRENDS IN THE FIELS OF PORTS AND THEIR ENVIRONMENT[1]

1.1 Economic Aspects

The need to develop foreign trade and contribute to national economic growth places a heavy burder of responsibility on the ports of all countries and especially the ports of many developing countries. It is essential that ports function efficiently. An examination of the latest classification of world ports by tonnage of goods handled or number of containers received, shows that, more and more frequently, certain ports of developing countries and regions appear in the top rank. It will also be found that the ports recording the most spectacular progress in recent years are generally those of developing countries and regions, particularly in Asia. These same countries have also recorded high rates of economic growth. Conversely, there is no known developing country that has recorded substantial economic growth without a sustained increase in its foreign trade, based on efficient ports. Ports play a special role in the development of foreign trade.

In many countries foreign trade shows a rate of growth exceeding that of the industrial gross national product. This has been evident for more than 40 years in both industrialized and developing countries. This trend has been accompanied by a change in the role of the trading port, which, within a few decades, has become less a compulsory point of changeover from maritime transport to some other mode of transport (land, air or inland waterway) and a strategy point in the organization of foreign trade, a principal link In the integrated transport chain and the economic, and often industrial development, pole for the region concerned.

Several major trends in the economic development of port environments should be mentioned. These are : the general trend towards liberalization, or "deregulation", of transport services, the growth of multimodal transport, the reorganization of shipping fleets, the specialization and the increasing size of vessels and the new requirements of shippers.

In certain regions, such as North America, "Deregulation" of transport Policy has been an important factor for change and restructuring, which has affected ports as well. The "liberalization" of shipping which can be seen, for example, in South America (abandonment of the cargo reservation system), is profoundly altering the bases of maritime policies and has a direct impact on ports. An increasing number of ports, including those in developing countries, are being affected by the introduction of multimodal transport, which is leading to accelerated containerization of the transport of their general cargo and is accompanied by modification of port procedures and methods, with changes at both the legal and administrative levels. The shipowners concerned have used the flexibility and the modularization made possible by the introduction of containers to reorganize their shipping services by replacing direct lines from port to port by networks of services organized around transshipment ports. By grouping cargo traffic, they have been able to increase the size of vessels and to make full use of their capacity and also to reduce unit costs and shipping times.

The tendency to use specialized vessels is observed in almost all bulk traffic (oil tankers, liquid gas carries, etc.), the neo-bulk traffic (sawnwood, etc.) and special traffic (e.g. , integral cellular container carriers, motor vehicle carriers). These vessels ensure a high level of performance for specific types of traffic or packaging. There is also increased use of multi-purpose and roll-on/roll-off vessels, which have a lower performance level but carry a greater variety of goods packed in different ways.

[1] Excerpts from "Development and Improvement of Ports" by UNCTAD

With the reorganization of various traffic, the most efficient vessels are assigned to the high-density sea routes and the smaller or multi-purpose vessels devoted to feeder activities or to routes with less traffic. The internationalization of markets and the increase in competition have led shippers to make greater demands on international transport and to require better port services. In addition to a demand for the lowest possible port costs, they are also concerned about other matters : lower total port costs (including ship and cargo transit time), a steady flow of goods (no requirement to hold skocks), delivery of goods in sound condition, and extension of the group of services offered, such as distribution or assembly or processing of raw materials.

There has thus been a change in the role of ports. Port activity is no longer confined to the harbour proper and the area of Land around it. Onshore, it now takes place all around the starting point of the transport chain. In the case of some ports these new activities generate more than a third of the port income.

Progressively, during the 1950s and 1960s, some traditional ports (which had previously been mere transport centres) have developed into commercial and industrial service centres which in some cases add considerable value to the goods they handle. During the last 10 years this process has accelerated in some very busy ports. There has been a diversification of port services, which now extend beyond the conventional port boundaries. Distribution activities constitute one example. Superimposed on the physical infrastructure of ports there is now also a veritable information infrastructure (to which some have given the name "infostructure". Ports which have moved in this direction are thus becoming veritable logistic platforms for international trade. These three types of port may be viewed as ports of the first, second and third generation (see table 1). These concepts will be described in greater detail in the UNCTAD study "Port marketing and the challenge of the third generation port".

Table 1

THREE GENERATIONS OF PORTS

A. First generation	Sea approach, transfer of goods, temporary storage, delivery. (prior to 1950)
B. Second generation	Includes A plus industrial and commercial activities which give added value to the goods. The port is a handling and services centre.
C. Third generation	Includes A plus B structuring of the port community, plus strengthening links between town and Port and between port users, plus extension of the range of services offered beyond the port boundary, plus an integrated system of data collection and processing ("infostructure"). The port has become a logistics platform for trade.

1.2. Technological Aspects

Port organization and management cannot be without considering the "policy" of the service-providers, whose activities are vital to the port's existence. Among the most important of these are the shipowners. The latter's activity is largely determined by the possibilities offered by shipbuilding technology.

Although there are still today, on the lines serving developing countries in particular, many conventional general cargo vessels, it is likely that in the future there will be only three major categories of cargo ships : bulk carriers (for dry or liquid cargoes), container ships and conventional specialized ships or roll-on/roll-off vessels (which carry heavy or bulky consignments, specific products, motor-vehicles, neo-bulk consignments - in other words goods which cannot be containerized). What will be the size of these ships ? This question is a key parameter for port development. It is not expected that there will be a race to build ships of ever greater size, as much for technological and economic reasons as for reasons of safety and protection of the environment. As far as liquid bulk cargoes are concerned, oil tankers now range in size from 20,000 to 85,000 tons deadweight for refined petroleum and from 100,000 to more than 300,000 tons deadweight for crude petroleum, while liquefied petroleum gas carriers can be of up to 80,000 cubic metres. As for dry bulk cargoes, vessels of 200,000 to 250,000 tons deadweight are useful for carrying coal, slightly larger ones (250,000 to 325,000 tons deadweight) for iron one, and smaller units (less than 50,000 tons deadweight) for phosphate and agro-food products. For containers transport, fourth generation container ships of 4,400 tons equivalent units (TEU) have been introduced and feeder line ships have been of 1,000 to 1,200 TEU, or 2,000 TEU on routes linking major shipping lines.

These technological developments make it necessary for ports to follow this trend and equip themselves according, particularly as regards infrastructure and port equipment, but also in the area of other support or associated services. Thus large bulk carries proceed to berths where the equipment permits their unloading in only a few hours (the 240hour rule), but it is often necessary to provide large storage facilities for goods awaiting reshipment. The reduction in the size of crews has to an increase incertain maintenance activities carried out in the port. The growth of the use of containers makes it necessary to provide not only for their handling but also for their repair. The requirement for collection, processing and circulating of data is steadily increasing.

1.3. Social and Environmental Aspects

No port policy can ignore the sociological phenomena characteristic of the present period. Even with rising living standards, the need to ensure the safety of persons and of goods is increasing. This is true in regard to both workplaces and the human elements of all port activities. It affects port approach operations, transshipment and storage of goods, embarkation of passengers and the movement of equipment and vehicles within ports.

Another concern is respect for the environment : environmental harm or damage is less and less tolerated and there is widespread increasing recognition that degradation of the natural heritage is placing the survival of humanity at risk. The environment may be threatened by harm caused in port areas : pollution of the sea, of water or of land areas, air pollution and noise and vibration caused by equipment and vehicles or by port construction work.

More generally, there is a three-fold requirement reflecting respect for the human person : the need for personal freedom, the need for physical and mental security and the need to understand. This applies in relations between employers and employees, in commercial relations and, more broadly, in all the activities of everyday life, where any form of domination is less and less tolerated.

1.4. Consequences for Port Organization and Management

These new economic, technological and social developments represent a challenge for ports, not only as regards their infrastructure and equipment, but also in the areas of organization and management. In the field of shipping there has already been an improvement in organization and management methods so as better to meet the requirements of the market. Emphasis is placed on efficiency, i.e. on speed of decision-making, speed of adaptation to change, the elimination of the slightest deficiencies in operation, and therefore on cost reduction. Ports cannot ignore these changes or the requirements of their partners in the transport chain and they therefore need to modernize their organization and management. A good example of this will be seen in an examination of the operation of the "just-in-time" delivery system. This system, which has been applied in industry, is based on a very high degree of punctuality in deliveries, making it possible to reduce or even eliminate the holding of stocks. Hence the slightest delay in the transport chain can involve serious consequences. Sea carriers have taken measures of adaptation, modifying their organization and management so as to offer multimodal transport and thus guarantee close control of operations from starting point to destination. Ports are an essential link in this system and their organization and management must be commensurate with that of the other parties involved in transport operations if they are not to lose traffic through lack of competivity.

1.5. Port Management

Management consists of decision-making. Where management is mentioned, it refers to the existence of an enterprise or organization headed by a manager (or managers) who takes decisions on behalf of and "managers" the body concerned. This chapter is therefore addressed to managers, in this instance the managers of port authorities or port operators.

1.5.1. Some general principles of management

1.5.1.1. The theory of total quality-control management

It is reasonable to assume that general principles of management apply equally to ports. In the study of the theory of management there are several schools of thought. "Total quality control management" (TQCM) is a theory aimed at improving quality of services, lowering costs and eliminating waste. This theory has already been successfully applied in many areas and it seems well suited to the requirements of the port sector. This modern management method comprises five aspects, as discussed below.

1.5.1.2. The system approach

The problems of quality are dealt with from the standpoint of the quality of the system. The operations carried out in ports are today so complex and involve such a level of technology that the best results and the best performances are achieved by defining specific working methods and procedures. The main procedures of the operational systems (e.g. goods handling, storage, etc.) are thus defined and must then be scrupulously applied. Failure or deficiency of any equipment or of any worker and any problem encountered in the course of the operations must be perceived in terms of the effect it will have on the system involved. It is imperative that all the parties involved in the operation of a system apply strictly the instructions they have received and that they play correctly the role in the system which they have been assigned.

This involves a radical change from the past when port workers and gang foremen could, and even had to, improvise and adapt their working methods to the requirements of the port traffic. This system approach also means that there must be coordination and coherence among the various systems, all of which ultimately contribute to the proper functioning of the transport chain. Thus the cargo handling system must be harmonized and coordinated with the storage system, while the overall data collection and exchange system cannot function unless all their part. This coherence and coordination will be all the better ensured for the port as a whole if there is a well-organized, structured port community.

Emphasis on preventive measures

Supervision and checking are carried out not only at the end of the process of production of port services, but throughout the entire production phase. The quality of the end product must be ensured by eliminating the causes of any deficiencies. In practice, this means that there must be information feedback, supplemented by a system of examination and diagnosis for identifying and rectifying the cause of problems.

"The customer is king"

All the decisions taken must be taken in order to satisfy the port customer, who is at the end of the port services production process. In a port, it is the port users (goods or passengers) who are "the real customers". Their demands must therefore be the principal concern of those in charge of the various phases of production of port services. The same idea must apply within the organization : in the port services production process, the last phase is always the customer of the preceding phase, which must therefore furnish products or services that will fully satisfy its client. In ports, as in other economic sectors, the sales and marketing service is always the last stage in the port services production phase, which has its origin in the very planning of the port works. It is the sales department that makes the first contacts with the customers and offers them the port services. From the time when the port works are designed and throughout their use, the port and its management must have as their aim to satisfy the port sales and marketing department's requirements. Modern port management has three important aspects : sales considerations have priority; there is rapid transfer of information from customers; there is a rapid and effective response by the port in order to satisfy the customer.

The principle of integration

All the staff of the enterprise must participate fully in its management. This permits integrated management of all phases of the production process. Management of the enterprise is no longer the prerogative of a new top managers; it is the responsibility of the entire personnel, from the general manager down to the workers; each one must have his own objectives within his particular field of competence. The staff thus identifies itself with the enterprise and helps to ensure that it is soundly managed. This principle, which is simply the principle of staff motivation, is vital for good port management. Genuine participation always means giving responsibility, but this alone does not suffice and must be accompanied by the delegation of certain powers. The responsibility and the powers - of each port employee and of each port department - must be clearly defined in the objectives assigned to them. Management by objectives enables the port to be directed in such a way as to enable it to come as close as possible to attainment of its assigned purposes.

The modern "management circles" method

This method proceeds by several successive stages - planning, organizing, executing, checking, altering, planning, etc.

These phases are repeated systematically, with greater and greater perfection being achieved and apply at different levels. There are thus many circles to be defined in the same organization : the management circle of the enterprise, the management circle of the various departments and the management circle of the work gangs. All circles are interdependent : the quality of one depends on the quality of the others, which cannot exist by themselves. In following this method the port can develop harmoniously. It is particularly useful for certain developing countries which are still dependent on foreign aid. The port must have a capacity for self-improvement, self-adjustment and self-development, for such a capacity is of primary strategy value.

1.5.2. Types of port Planning [2]

The confusion with regard to the purpose and value of strategic planning results from three factors. First, the concept of strategic planning has been developed for use by manufacturing industries. Its adaptation to service industries has been difficult because of the lack of a physical product which competes directly with other products. It is necessary to adapt this planning concept to the needs of the port industry which, like other logistics services, is concerned with the type and quality of service provided to individual markets. Second, strategic planning focuses on the requirements of specific markets. However, the demand by these markets for port services are devired from a demand for good-to-door logistics service which is itself devired from the demand for the products being transported. Therefore the markets may be composed of producers, consumers, wholesalers, retailers or traders of commodities, or the operators of transport services and providers of logistics services. Third, it is often difficult to distinguish the strategic planning process from the other planning activities performed by port management. The primary planning activities include :

(a) operational planning for short-term allocation of the services and resources provided to individual port users,
(b) recurrent budgeting for the annual allocation of the port's resources to specific activities,
(c) capital budgeting for the acquisition of resources over a period of several years, and
(d) master planning for the development of port infrastructure for period of one or more decades.

Strategic planning differs from these activities in its medium-term focus on the markets served by the port and the use of existing resources to increase the demand from these markets. The output of strategic planning is a series of strategies for achieving competitive advantage so as to achieve specific marketing and financial objectives. This approach differs from the tactical decisions which characterize operational planning and recurrent budgeting and the more visionary decisions which are incorporated into physical master plans.

There are also two planning activities which closely resemble strategic planning. Corporate planning involves the preparation of multi-year plan to guide a port management's decisions concerning the development of the different business activities of the port.

[2] Excerpts from "Strategic Planning for Port Authorities" by UNCTAD

Market planning produces a plan for the type of service to be provided to specific markets and the methods for promoting these services. Both focus on competitive advantage and will produce strategies. The former tends to focus on what the corporation is capable of doing while the latter looks at what the market requires. Strategic planning attempts to bridge the gap by focusing on what the corporation is able to do to meet the requirements of the market.

1.5.3. Planning horizon

Port management is typically involved in a variety of planning activities which focus on the use of resources to serve the needs of users. These can be broadly grouped into short, medium and long-term planning efforts. Short-term planning tends to be tactical. Medium-term planning focuses on strategic issues. Long-term planning is more visionary. A graphical representation of the time horizons of the various planning efforts.

In order to clearly distinguish among the three categories, it is important to understand the differences in :

(a) the situation requiring this type of planning,
(b) the types of information used, and
(c) the outputs produced and the benefits to be obtained.

Short-term planning efforts involve the current allocation of the port's facilities, equipment and manpower to meet the needs of the vessels and cargo in the port. This planning is in response to the short-term needs of the port users. The information used includes requests from ships' agents and the status reports relative to the port berths, equipment and storage areas. Typical outputs are the daily assignments of labour and equipment, the daily or weekly berth assignments and the weekly or monthly maintenance schedule. The goal of this planning is to insure efficient cargo-handling operations, rapid vessel turnaround, and reasonable levels of utilization of equipment and facilities.

Long-term planning, generally included under the rubric of master planning, concerns the development of facilities and equisition of equipment to handle the future demands for port services. Since new facilities require time to develop and have a useful life of several decades, the long-term planning horizon is 10 to 25 years. This planning activity analyzes the current trends in the types and amounts of vessels and cargoes served by the port and produces a forecast of future demand for port services. Although this planning includes a financial component, its basic, and arguably its most durable, output is a physical plan for the development of the port infrastructure. This activity tends to be performed by planning groups. The plan is forwarded to senior management or the appropriate ministry for approval. Long-range planning is particularly useful where there is strong growth in traffic and fairly predictable trends in the demand for individual services. It is essential where there are a few dominant business but relatively little competition. To facilitate future port extensions, it is also essential to undertake appropriate measures such as land acquisition or control at the proper time.

The medium-term planning activities are of two types, financial and strategic. Financial planning is concerned with adjusting to the potential changes in costs and revenues by changing resource allocations for serving the projected demand. It is performed each year as part of the annual budgeting cycle. This activity extrapolates from the revenues and expenditures of the previous year and makes adjustments where major changes are anticipated. It is done with varying degrees of sophistication in all ports, regardless of their size and the markets they serve.

The budget and the subsequent comparison of actual and budgeted revenues and expenditures are used as mechanisms for controlling costs, revising port tariffs and managing cash flow. The budget includes not only recurrent costs but also capital expenditures. In the more capital-intensive ports, capital expenditures are included in multiple-year budgets which are updated yearly. In less capital-intensive ports, the capital budget is contained in the master plan as a multiple-year investment schedule.

Strategic plans are prepared every two to five years but reviewed on an annual basis. In these plans, existing port resources are allocated to different activities in order to meet specific marketing objectives. Both financial and strategic planning focus on the allocation of the port's existing resources as well as on the resources to be acquired in the medium term. However, financial planning assumes relatively stable market conditions, whereas strategic planning assumes a competitive environment in which the allocation of resources will affect the demand. A strategic plan may include a limited amount of capital investment, but the primary focus is on the use of existing physical, financial and human resources.

Strategic planning requires senior management to anticipate and, where possible, direct change. Objectives must be formalized and the changes occurring in the internal and external environment assessed. The process begins with a review of existing market trends and an analysis of the sensitivity of individual markets to changes in the price and quality of services provided. It then examines the organization's strengths and weaknesses and encourages positive action rather than reaction. Next, strategies are developed to modify these market trends and achieve specific goals related to future market share or traffic volume. Management must then select from among the possible strategies, implement those which are selected, evaluate their success and, where necessary, select and implement complementary or alternative strategies.

As part of strategic planning, port management must consider questions such as :

(a) Should the port develop general--purpose or specialized facilities?

(b) Should the port diversify into other businesses, such as specialized bulk handling and storage, trans-shipment or distribution?

(c) Should the port focus on generating employment through promotion of trade, and, if so, what should be the role of the central government in covering the cost?

(d) Should the port lease out facilities and if so for what period and under what conditions?

(e) Should the port change from an operating to a landlord authority, and if so, should the whole port be privatized or only some of its businesses?

(f) Should the port revent to an operating status in order to meet the demand for efficient common-user services at a reasonable price?

2. DEVELOPMENT OF PORTS IN EUROPEAN UNION

2.1. Trade Evolution and Port Development[3]

The overall trend in trade evolution is one of increasing demand for port services, but some sectors are currently of dominating importance.

Crude oil and its products remain the most important bulk grouping (26% of total EC port volumes), but demand has remained fairly static. For ports, the major area of interest for these commodities centres on environmental protection and safety concerns. There are no forecast requirements to increase capacity or significantly modernize ports.

Steam coal demand is increasing very rapidly, although the required port facilities to handle it are already established or planned. The current dependence on long-haul imports in large bulk and ore carries will continue and no revolutionary changes are anticipated. Steady incremental annual growth and larger typical vassel sizes will progress steadily, but a piecemeal development of bulk facilities an economic basis (as is the current practice) will be sufficient to accommodate demand. It is not felt that bulk trade flows are currently distorted as a result of unfair port practices. As such the interest for ports will be focused on questions of safety and environmental protection.

Container traffic has been and will remain the most dynamic sector, with a forecast growth of some 158% by 2010. In the same period total EC port demand is forecast to increase by some 23% over 1990 levels. Although massive investment has been committed to the container sector - by private and state interests - the current process of rapid growth is still underway. The current trends of strong growth and steady increases in vessel sizes are currently the most significant factors shaping forward port planning.

Considering that vessels of 6000 TEU capacity are likely to be introduced in the 1990s (compared to a current maximum of some 4200 TEU) the trend towards a concentration of liner services in major ports having suitable infrastructures for operating such vessels (water depth of at least 14 metres and a suitable number of high speed berth cranes with an outreach to operate post-panamax vessels) is likely to accelerate. Therefore, there will be a growing pressure towards new investments, with the danger that over-capacity will emerge, and towards higher efficiency and quality of service.

The effort to improve efficiency and quality of services will be based more and more upon the development of automation. This can happen at three different levels :

- At the port equipment level, with an higher automation degree of its various elements (berth cranes, stacking cranes, etc.)

- At the terminal level, where informatics can allow a more efficient management and planning of cargo and areas - provided that suitable infrastructures are present

- At the transport chain management level, where the availability of information systems offers various opportunities to connect and integrate seaports in the intermodal transport network. The quality of service offered by ports that will be excluded from the integration into communication networks due to managerial problems will be heavily affected.

[3] Excerpts from European Parliament Working Paper "European Sea Port Policy"

2.2. Institutional Features of Ports

It is generally known that the legal status of ports is very different in the Community's member countries and even within a single country. The diversity concerns not only the institutional features but also the basic port management policy.

From a formal point of view, the current situation shows a wide range of differences. There are :

- State administered ports,
- Municipally-administered ports
- Ports managed by dedicated public bodies (Port Authorities)
- Privately managed ports.

Furthermore, the different legal status doesn't always explain completely the different port management philosophy. In fact, formal similarities can hide substantial differences and vice versa.

Neglecting some formal differences and concentrating on the substantial topics, we must stress the difference between :

- Ports in which the concept of port activities as public service is prevalent. This approach justifies a preeminent role of the public powers also in regulating and in directly managing cargo handling activities,

- Ports in which the commercial side of port activities has the priority. According to this approach, the public intervention - by a formal Port authority, by a port Administration or by other bodies - is limited to the land planning and other matters of general interest, as pollution control, safety, pilotage and other services, control of fair competition, etc.

In the first case the port managing body (Port Authority *lato sensu*) can be defined as "Comprehensive Port Authority", that tends to manage the port as a whole, in opposition to a "Landlord Port Authority" (second case).

With a certain degree of simplification, we can say that the first approach is still prevalent in Latin countries and in Greece, while the second one is prevalent in continental northern Europe, where cargo handling activities and many services are in private hands. Irish, British and Danish ports are often managed by comprehensive port authorities, but on a quite different ideological basis than Latin ports, because they tend to manage ports as private undertakings.

It must be noted that these pattern are a "*Idealtypus*" (typical-ideal) in Weber's sense, that is they can not be found altogether in actual reality. In fact, most ports lie more or less near to one of the two extreme patterns described above.

Recent evolutionary trends show a tendency towards a common philosophy of port management. In particular, due to the pressure for competitiveness, even the ports characterized by a Comprehensive Port Authority approach reveal a growing presence of private undertakings.

2.3. Port Policy Within a Global Transport Policy

The problem regarding the existence of sound reasons for a specific Community port policy has long been an object of discussion at the communitarian level. In fact, some doubt about the formulation of port policy may derive from article 84.1, which excludes sea navigation from the specific regulation of the common transport policy.

Nevertheless, many arguments can be advanced for the legitimacy and the opportunity of a common port policy :

- The Community has full right to intervene in port matters whenever the general principles of the Treaty are in question (Court of justice, 4 April 1974, case 167/73).

- Ports are essential parts of the European transport system and are therefore involved both in the common transport policy and in creation of trans-European networks.

- The target of a trans-European network, embracing also countries at this moment not Community members (see Prague Conference on 29/31-10-91) enforces the need for planning a port strategy.

- The aim to promote the use of shipping as an alternative mode to road and rail justifies an appropriate of the port's role.

The coming into force of the Maastricht Treaty will stress the objective to operate for improving the European transport network and the links with the peripheral countries. At the same time, it emphasizes the need for a clear indication about the criteria for selecting and evaluating the projects admitted to benefit from communitarian contribution.

Traffic shares entering/leaving Europe show an unbalanced North-South situation. The reason for the traffic diversion can be basically explained by different factors concerning the ports efficiency : cost of services, productivity and speed of operations.

2.4. Safety and the Environment

The regulations effecting port safety are many and variously assessed, particular areas of concern are the standards regulating :

- Waterway access to ports (keel clearances, power and number of lights, beacons, width of channels and radius of bends, etc.)
- Night maneuvering in port
- Tugs and mooring systems
- Handling of dangerous cargoes
- Cargo handling equipment
- Fire detection and fighting
- Pollution abatement systems.

The construction and maintenance standards of ships differ from country to country and the implementation of ships safety control rules in ports is not uniform.

Health and safety regulations for port work are also varying in different nations.

Measures to protect the environment and control marine pollution during vessels' operations in ports were agreed at a world level in 1973 (MARPOL convention), but they can be applied at each country's discretion according to different interpretation. Moreover, many ports of the Community still lack the compulsory facilities to collect and eliminate pollutants, such as incinerators, settling tanks, waste disposal plants and collecting drains, costs and efficiency of such facilities vary significantly among the Community's major ports.

Concerns with regard to safety and environment are of increasing importance at the political and social level within the EC. At present, although each nation operates significant control measures, there are seen to be widespread differences in the regulatory environment and further differences between the degree of application of rules - even where the actual regimes are similar.

The Maastricht Treaty empowers the Community to lay down measures to improve transport safety. However, the relation between the principle stated in art. 75.c and art 84.2 has to be clarified.

2.5. Main Options

A realistic combination of communitarian impulses and information actions should be the recommended option of port policy, as the most appropriate for the institutional role of the Community and because it is the best means for insuring the requirement of flexible intervention. However, it should be noted that the Community - even if its powers are limited in various ways (as they would be in any federal state) - does not lack powers to steer, stimulate and even intervene directly.

It is possible to formulate four basic principles implicity suggesting the guidelines that must be developed to direct the various possible types of communitarian intervention.

2.5.1. Availability and modernization of port capacity

The prime goal of a community - wide port policy must be the availability of an adequate and modern port capacity to handle required import and export flows of the Community on a competitive basis with other markets. A common policy in this field must be flexible enough to allow a market-led response to changes in shipping and port structures.

2.5.2. Free and fair competition

The basic principle of a communitarian port policy must be to promote the free and fair competition among ports and undertaking operating in ports. In evaluating the conditions in which competition takes place, as well as its possible distortions, the role performed by the logistic - legal - organizational system in which ports and port undertakings are included must be thoroughly examined.

2.5.3. Integration of ports in a common transport policy

Ports must be considered as an integral part of a European transport system. The communitarian seaport policy must, therefore, be consistent with the goals of the common transport policy.

2.5.4. Social acceptance

The development of ports must always be compatible with the needs for environmental protection. As far as the employment factor is concerned, current modernization processes must be combined with measures - at the training and organizational levels - aiming at favouring the required changes.

3. DEVELOPMENTS OF PORTS IN U.S.A.

3.1. Port Capital Expenditures U.S.A.[4]

From 1946 through 1992, the U.S. public port industry has invested $12.5 billion in capital improvements for new facilities and the modernization and rehabilitation of existing ones.

Expenditures for the four year period 1989 - 1992 were in excess of $2.7 billion with 63% of such expenditure used for new construction and 37% used for modernization / rehabilitation. Container and specialized cargo facilities accounted for 31.8% of the total expenditures and 23.9% was used for general cargo facilities.

Projected port expenditures for the period 1993 through 1997 are $5.25 billion, of which 32.6% is for container and specialized facilities and 14.6% is for general cargo facilities. Of particular interest is the projected $609 million in off-terminal infrastructure expenditures, a large part of which cannot be financed with tax exempt bonds under the present tax laws.

The pattern of financing port construction and improvements has changed materially since the 1978 MARAD Port Expenditure Survey as shown in the chart below :

CHANGES IN FINANCING PATTERN FOR PUBLIC PORT FACILITIES
(Percentage of Total)

Description	1973-1978 Survey	1979-1989 Survey	1990-1992 Survey	Projected 1993-1997
Port Revenues	26.7	27.0	39.0	32.8
Revenue Bonds	29.1	47.7	28.9	29.4
Sub-total	55.8	74.7	67.9	62.2
G. O. Bonds	30.6	10.5	12.5	16.5
Other	13.6	14.8	19.6	21.3
Total	**100.0**	**100.0**	**100.0**	**100.0**

The projected $5.25 billion in capital expenditures will require public port management to carefully prioritize capital projects for the next five years.

3.2. Privatization Procedures in U.S. Ports

Privatization is taking many different forms, including the categories listed below :

- Sale of shares. This method has been used very successfully in the United Kingdom.
- Sales of assets. This method involves the sale of assets through competitive bidding which is the method that is now being attempted in Columbia through the formation of regional port societies.
- Lease or concessions of terminals. This involves taking bids or direct negotiations for lease or concession of terminal areas but allows the authority to continue to retain title to the assets. This method is widely used in the United States and Canada.
- Licensing. This method contemplates licensing certain private functions such as stevedoring, towing, and piloting to qualified parties who in return for the license will make a payment which is generally a percentage of gross revenue to the authority.

[4] Excerpts from "Public Port Financing in the United States", U.S. Maritime Administration, U.S. Department of Transportation

- Lease of land for development by terminal operator. This contemplates the lease of land adjoining a deep water harbor. The terminal operator is then responsible for the total costs of the development of the infrastructure and its equipment.
- Management contracts. Privatization of certain specialized terminals, such as container terminals can be accomplished through a management contract with a private party which is based upon either a flat or a percentage fee for providing such services.
- Decentralization. This basically is the method that was used in Venezuela when the determination was made that the assets of the national port authority would be transferred to state operation of such facilities and the cost of providing improvements thereto.

4. CONTAINERSHIPS

Containerships carry general cargo, and in some cases bulk, in intermodal containers that can be transferred between vessel and truck, rail or air. Containership operation is a very efficient ocean transport method for general cargo. It permits fast vessel turnaround, allowing operators to achieve maximum vessel ultization. The intermodal aspect of the container is very useful to shippers, and containership operation suits their requirements for speed, efficiency, security and low cost.

Fully Cellular Containers. Fully cellular containerships carry containers, but have no provision for carrying containers on chassis or for carrying any non-containerized cargo. The latter is carried on deck as breakbulk or on flatracks. Carriage of containers sometimes is referred to as lo/lo (lift-on/lift-off) when compared to the ro/ro (roll-on/roll-off) system.

In 1993, an estimated 5,200 container vessels capable of carrying 3.7 million TEUs (twenty-foot equivalent units) were in operation. Individual vessel sizes range from less than 100 TEUs, which are used mainly for coastal services, to those of the post-Panamax size carrying as many as 4,500 to 5,000 TEUs. Post-Panamax vessels cannot pass through the Panama Canal, which has a vessel beam limitation of 105 feet. Except for special instances, containerships are captive to ports that have adequate channel depths (up to 45 feet) and marine container handling facilities, including container cranes that reach as far out as 152 feet to reach all container slots aboard post-Panamax.

Ro/Ro Vessels. Roll-on/roll-off (ro/ro) vessels are built to accommodate all types of cargo on wheels and truck; cargo is moved on and off the vessel on wheels attached to the cargo. During the sea voyage, cargo remains on its wheeled chassis and is secured to the vessel by tiedown and/or locking mechanisms. Ro/ro vessels accommodate containerized cargo (on wheeled chassis) and also all sorts of wheeled vehicles and outsized cargo on wheels or wheeld platforms, such as automobiles, trucks, tractors, mining and agricultural machinery.

Ro/ro vessels became an influence on maritime transport less than 30 years ago. Today, there are more than 2,000 vessels in operation and include the following types.
Short-sea ro/ro ships is the category with the largest number of ro/ro ships with more than 1,300 currently in operation. They are freight-only vessels with accommodations for no more than 12 passengers, thus precluding this large scale carriage of accompanying drivers. They carry trailers, containers, fork loaded cargo, export cars, and include vessels that use the drive through system with access both forward and aft, and on both sides of the vessel.

Deep-sea ro/ro ships were first introduced in 1967 by Atlantic Container Lines. These very large capacity ships are designed specifically for longer ocean voyages. They are of two main types : the "pure" ro/ro ships and those in which cellular container space is provided for lift-on/lift-off (lo/lo) operations.

Driver accompanied ro/ro ships handle both passenger and commercial vehicles and their drivers. Most have overnight accommodations and other amenities. They usually have drive-through capabilities, allowing for uncomplicated and speedy passenger car and commercial cargo handling operations.

Container ro/ro ships are able to handle their own container load, and accommodate a certain amount of non-containerizable cargo in ro/ro form on trade routes that are relatively short or ports that have limited container crane facilities. They are usually smaller in size than deep-sea ro/ro ships.

Conventional ro/ro ships, a close relative of the ro/ro containership, have typical cargo holds and hatches capable of carrying container and breakbulk cargoes with the ships own gear, but also a ramp for ro/ro cargo.

Car carries were developed originally by Wallenius Lines in 1995, these vessels are specially designed "floating garages" capable of carrying up to 5,000 smaller cars.

Forest product ro/ro ships have extra wide cargo hatches to load forest products for one direction of the voyage and, on the return trip, accommodate ro/ro traffic to make up for the otherwise empty back haul to the original forest product loading port.

Passenger / car ferries are usually very large "floating highways" with hotel and other facilities on board. Smaller versions of these vessels offer much simpler services to ferry vehicles and passengers short distances.

Coastal, feeder and river craft represent the smallest of ro/ro types and range from tiny deck ferries, which transport a few cars and light trucks across narrow stretches of water, to much larger craft capable of working In the open sea. They have open decks and load their ro/ro cargo from the bow.

Rail ferries are considered to be the first of the ro/ro type of vessel - the first one was used on Lake Huron in North America nearly 150 years ago. These vessels carry almost exclusively rail cars, but on certain routes and ship design, these vessels can also carry highway vehicles and passengers.

Ro/ro barges, often with several decks, sometimes larger than a football field (100x300 feet versus 100 feet x 400 feet for the barge), are the lowest cost types of operation for the number of vehicles and ro/ro cargo volume they carry.

Merits of Ro/Ro and Lo/Lo. There is continuing debate regarding the merits of ro/ro and lo/lo. Ship designs in both categories, as well as port handling methods, are steadily improving. Use of combination ro/ro-lo/lo vessels is an attempt to combine the benefits of both systems.

The following circumstances might cause a ro/ro operation to be performed on either an exclusive or combination basis.

1. *Where port facilities are not equipped with cranes and other machinery to load and unload ships.* In these cases the ro/ro operator simply lowers or places a ramp between ship and pier, and rolls cargo off and on the vessel. This makes ro/ro especially helpful in countries still developing intermodal systems.

2. *Where there is a volume of outsized cargo.* This type of cargo is easily rolled on and off; and ro/ro have greater capacity, along with moveable bulkheads to create more space for outsized pieces. Ability to carry outsized pieces and containerized cargo gives ro/ro operators a wider range of customers - those with containerized cargo, those with outsized pieces, and those with both.

3. *Where there is military requirement.* The armed services were early supporters of ro/ro vessels because they can accommodate large military vehicles such as tanks, wheeled cannons and troop carries, as well as bulk supplies for desiring a military contract has an advantage with a ro/ro vessel.

4. *In a multi-port operation.* Ro/ro vessels provide flexibility for moving cargo on and off at intermediate ports while simultaneously allowing movement of cargo within the ship to adjust for changed cargo "mix". This can reduce time in port to improve ship utilization, a very important consideration.

5. *Where there is port congestion.* Most ro/ro vessels can back in or move perpendicular to a pier, taking up little space, and then discharge and load quickly without tying up port equipment or facilities.

6. *In an effort to obtain higher rates on some commodities.* Ro/ros attract better freight rates for their specialty - rolling cargo - than for goods that any container line could handle. For easily block-stowed commodities like wool, rubber or forest products, the concept makes high-cost container stuffing, handling and stripping inefficient.

7. *On domestic routes where short water trips are combined with truck hauls.* The ro/ro system provides fast vessel loading and discharge, combined with fast through intermodal movement - unhampered by customs delays because it is domestic transportation. Two examples are U.S.-Puerto Rico and Alaska.

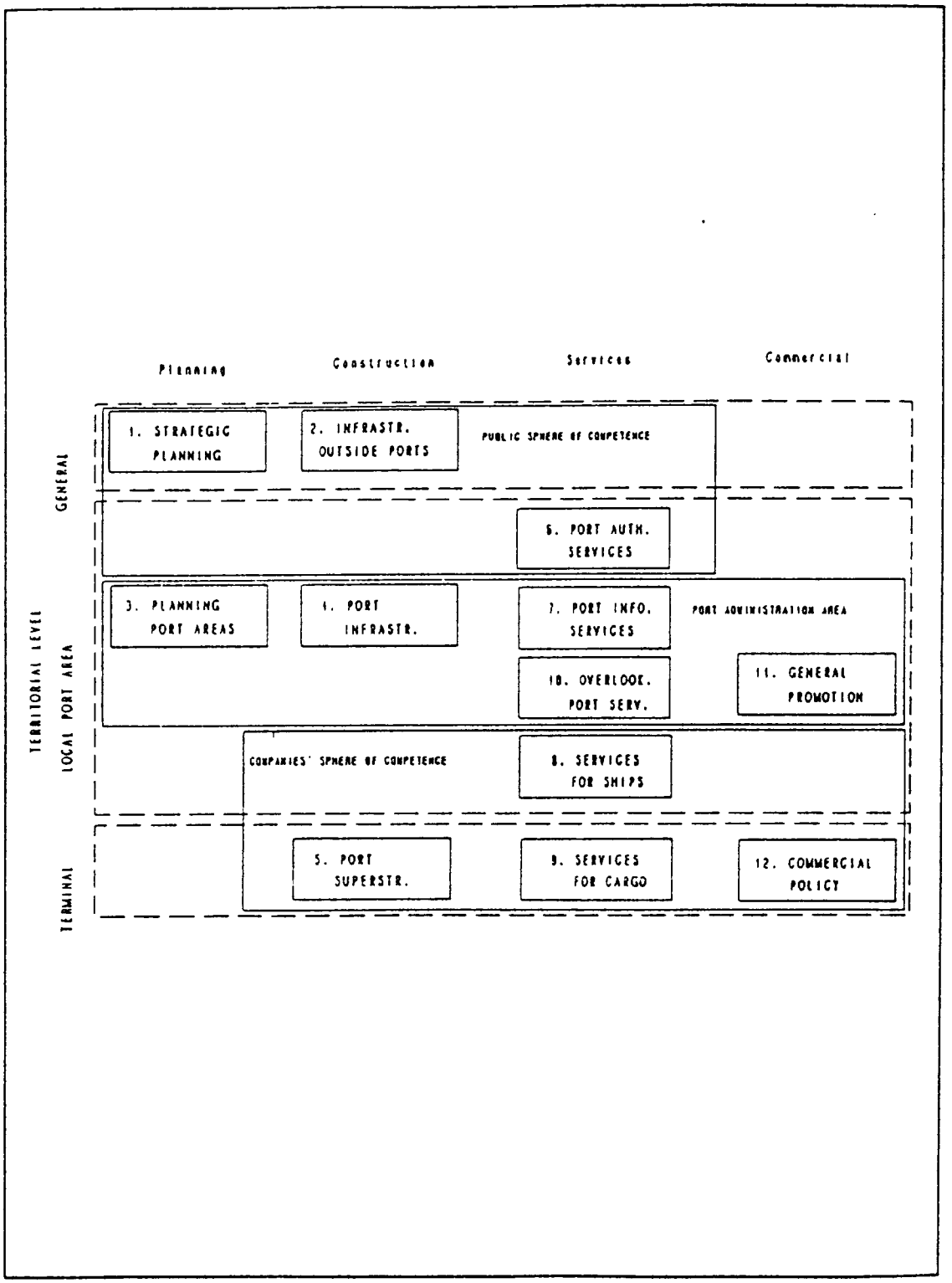
8. *To speed vessel turnaround.* When the entire on/off load is mobile, a ro/ro ship can make a relatively fast port turnaround.

On the other hand, there are two major ro/ro disadvantages : (1) space inefficiency because extra room is needed for chassis, wheels and outsized cargo; and, (2) ship safety due to lack of subdivision within the ship. Both of these disadvantages are receiving increasing attention in ship design.

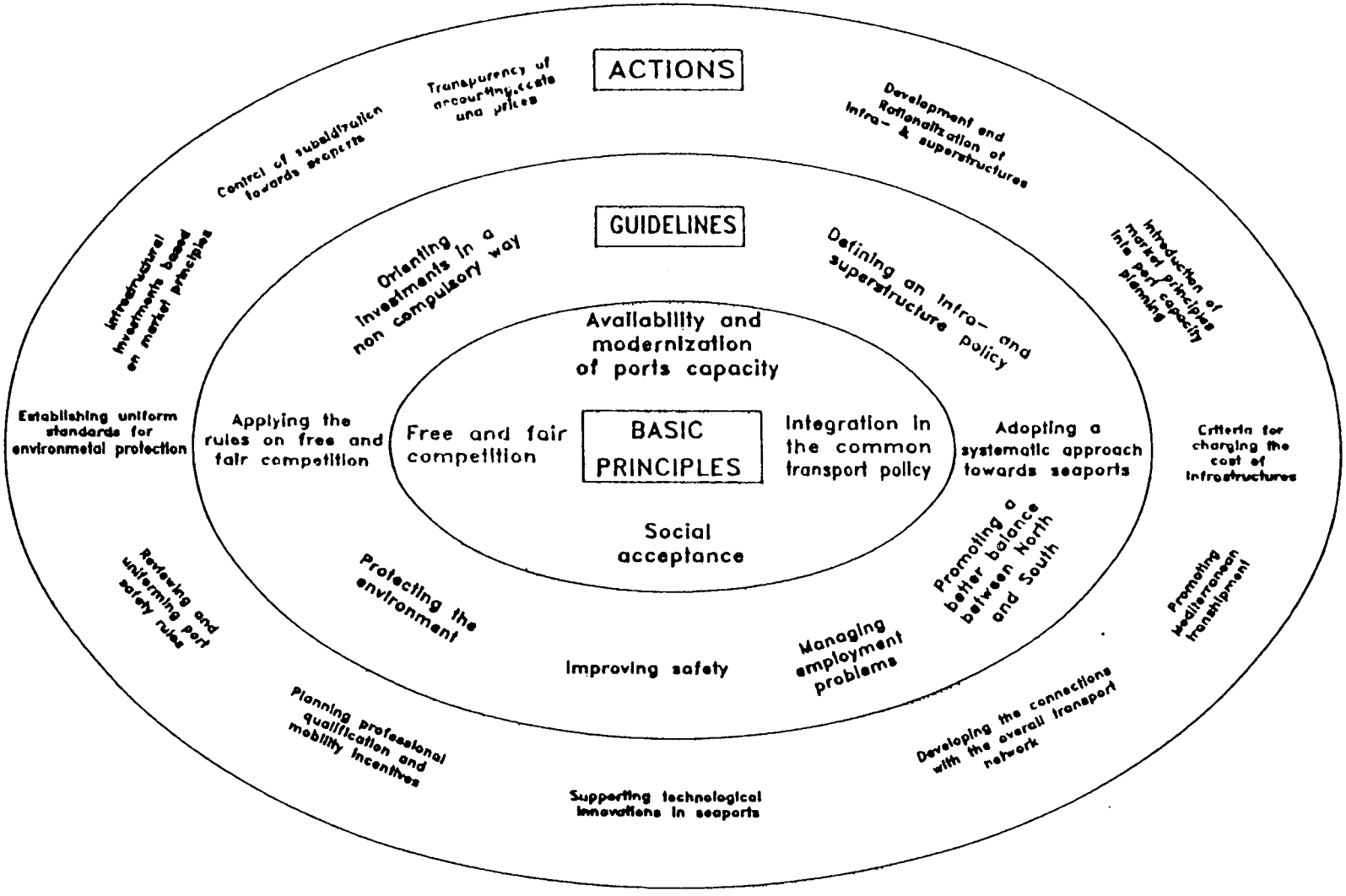
Different attitudes towards financial issues in the sea - ports of the member countries

(1)	Port manag. body (2)	Type (4) of port mangm.	Maritime access financing (5)	Port infrastr. financing (9)	Port superstr. financing (11)	Collection of port charges (13)	Collection of other taxes (14)	Other state contrib. (15)
B	munic.	landl.	state (6)	municip.	stevedor.	yes	yes	no
DK	PA	compr.	PA	PA	PA/stev.	yes	no	no
F	PA	compr.	state/PA	state/PA	PA/stev.	yes	no	no
D	munic. (3)	landl.	state/ munic.(7)	municip.	stevedor.	yes	yes	no
GR	PA	compr.	PA	PA	PA	yes	no	no
IRL	PA	compr.	PA	PA	PA/stev.	yes	no	no
I	PA	compr.	state	state (10)	state/PA /stev.(12)	partial	no	yes
NL	munic.	landl.	state/ munic.	municip.	stevedor.	yes	yes	no
P	PA	compr.	state/PA (8)	state/PA (8)	PA/stev.	yes	no	no
E	PA	compr.	state/PA (8)	state/PA (8)	PA/stev.	yes	no	no
UK	PA	compr.	PA	PA	PA/stev.	yes	no	no

Port activities functional diagram - public and private sphere of competence

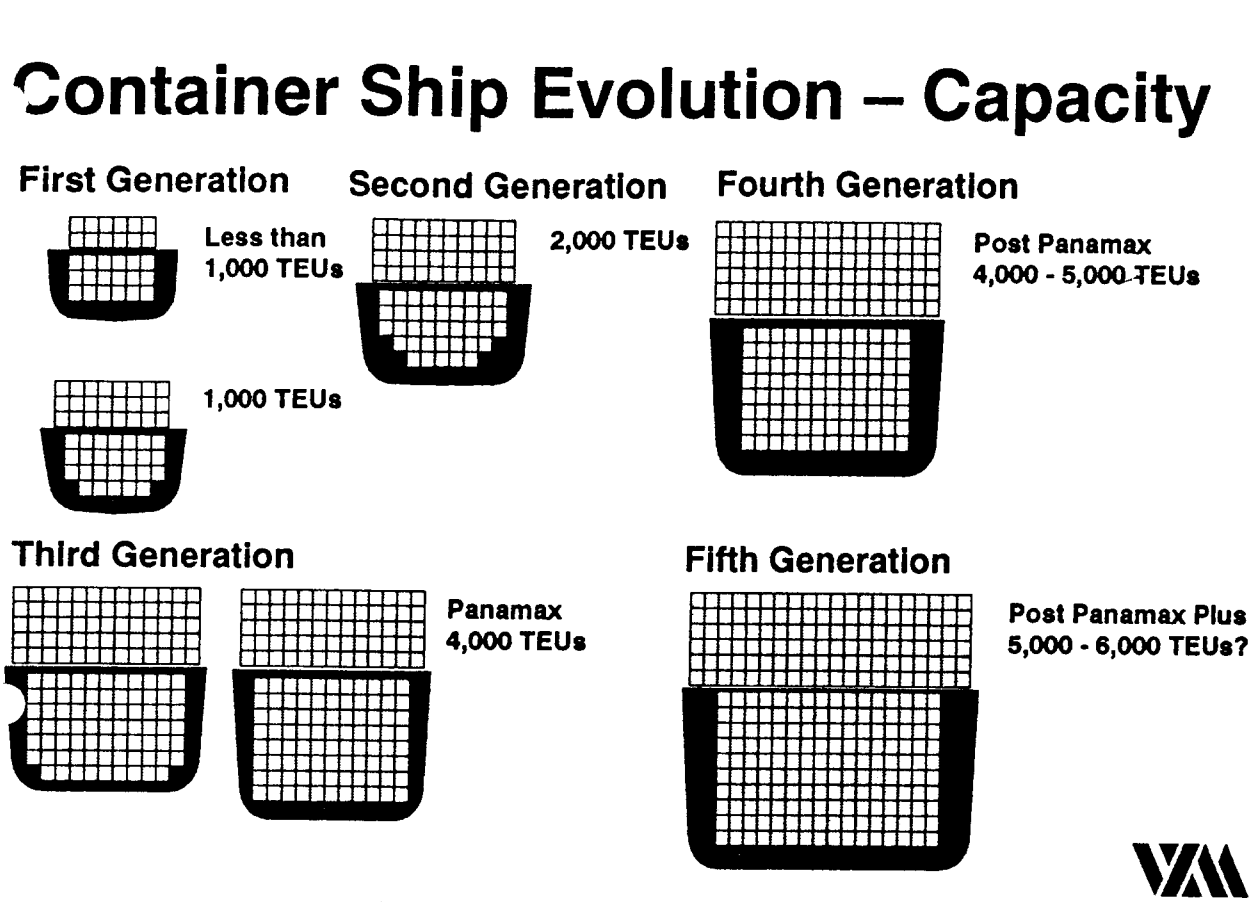


From port policy principles to guidelines and actions



Definition of port infrastructures and superstructures

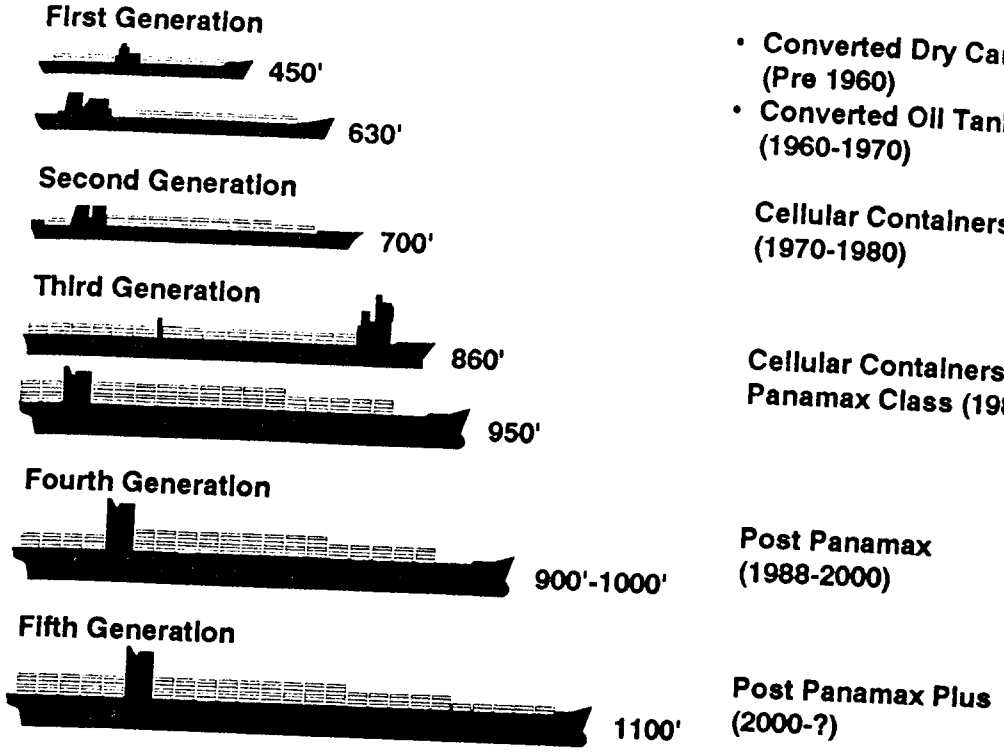
a)	Access and defence infrastructures all those infrastructures that allow sea and land access to a port area; the latter may be defined as a limited area (a complex of water basins and land areas) where port activities are carried out; the latter are defined as services to ships (pilotage, towing, berthing, bunkering, catering, supply of utilities such as water and power, repair, etc.) and to the cargo (loading/unloading, storage, stuffing and stripping, container repair, etc.).
a.1	Maritime access and defence navigable channels, locks, dikes and breakwaters, navigation aids (beacons, buoys, etc.) up to the boundaries of the above defined port area.
a.2	Land access national road and rail network and connection with the local network of the port area as defined above.
b)	Port infrastructures civil works within the above defined port area that allow the supply of services to ships and cargo: berths, channels, yards, port road and rail network, port information and EDI system. The boundary for port infrastructures can be defined as the extremes of reinforced-concrete structures; canalizations would, thus, be included and pavements and surface arrangement excluded
c)	Port superstructures surface arrangement, buildings (warehouses, workshops, office buildings), as well as mobile and fixed equipment needed to produce services. Information and automation systems of the terminal activities.



Evolution of increasing containership capacity

Source: Vickerman, Zachary, Miller

Container Ship Evolution – Length



- Converted Dry Cargo Vessel (Pre 1960)
- Converted Oil Tanker (1960-1970)

Cellular Containership (1970-1980)

Cellular Containership Panamax Class (1985)

Post Panamax (1988-2000)

Post Panamax Plus (2000-?)

Source: Vickerman · Zachary · Miller

Evolution of containership lengths

Source: Vickerman, Zachary, Miller

Figure IV-3
Extracts from the "Tariff Book 1990" of the Port of Singapore Authority
(1 Singapore dollar = approx. US$ 0.53)

MAIN CHARGES FOR CONTAINER OPERATIONS AT TANJONG PAGAR TERMINAL

STEVEDORAGE CHARGE

	20'	40'
FCL-Loaded	$155.00	$220.00
FCL-Empty	$ 85.00	$123.00
LCL	$326.00	$452.00
*Transhipment	$100.00	$145.00
Overheight/Overwidth		
FCL	$300.00	$500.00
LCL	$400.00	$600.00
Transhipment	$200.00	$300.00

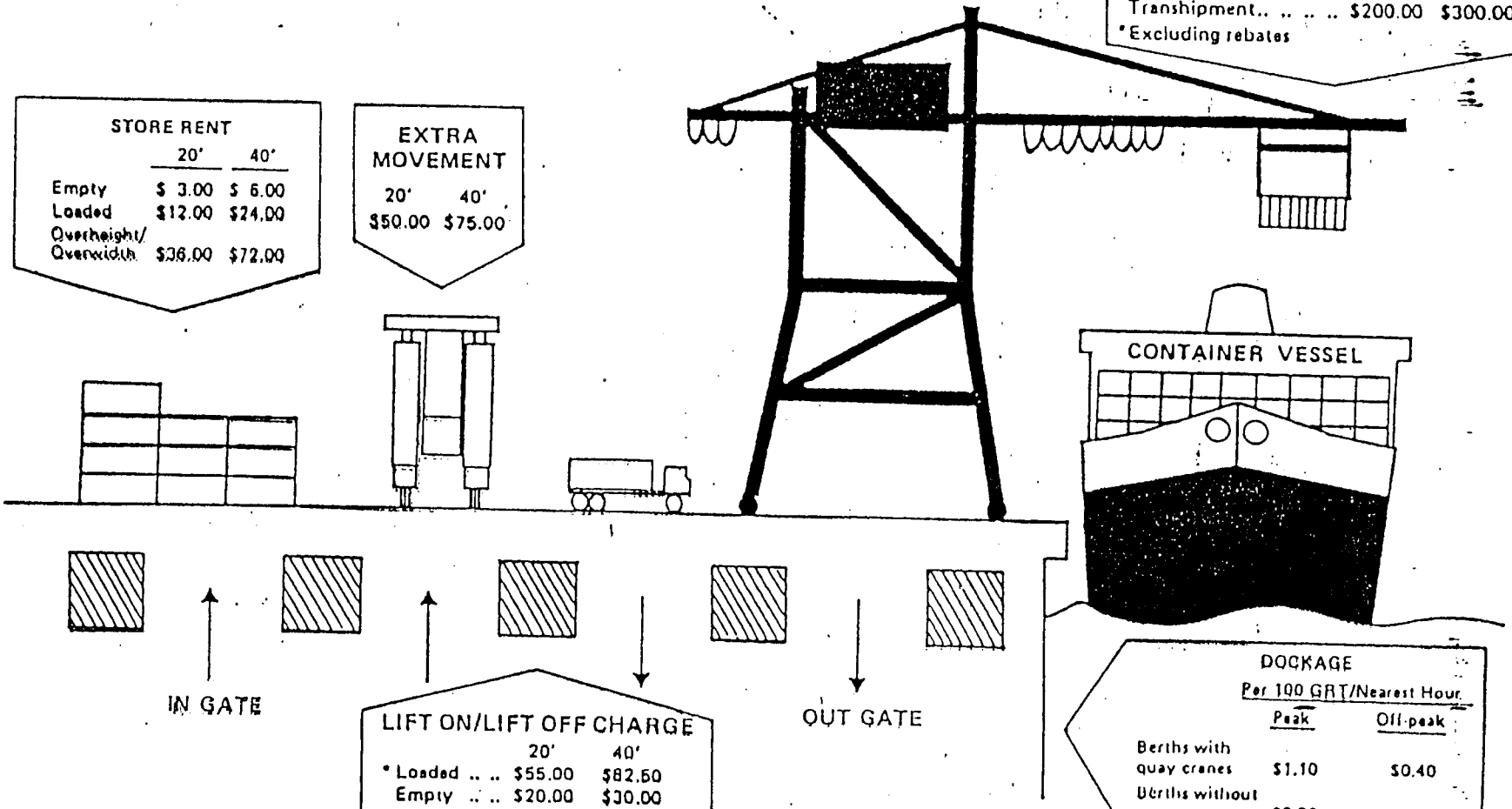
*Excluding rebates

STORE RENT

	20'	40'
Empty	$ 3.00	$ 6.00
Loaded	$12.00	$24.00
Overheight/ Overwidth	$36.00	$72.00

EXTRA MOVEMENT

20'	40'
$50.00	$75.00



LIFT ON/LIFT OFF CHARGE

	20'	40'
*Loaded	$55.00	$82.50
Empty	$20.00	$30.00

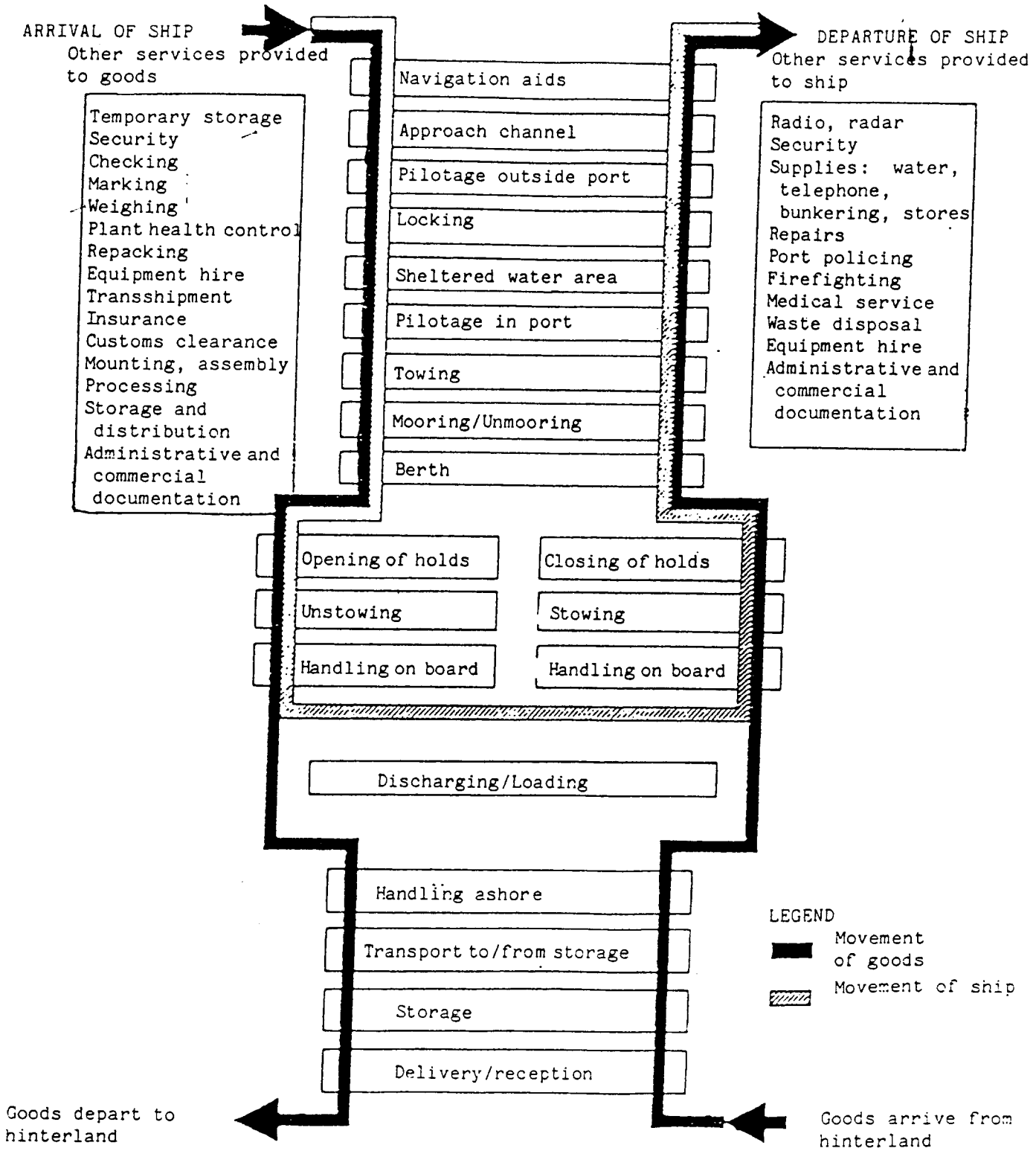
*Excluding rebates

DOCKAGE

Per 100 GRT/Nearest Hour

	Peak	Off-peak
Berths with quay cranes	$1.10	$0.40
Berths without quay cranes	$0.80	$0.80

Principal operational and administrative functions of a port



Sustainability of Competitive Advantage

Strategies	Advantage Provided	Estimated Time to Emulate (yers)
Change in Corporate Identity and Mission	Overall Efficiency, Market Focus	3 - 5
New Site or Infrastructure	Increase in Capacity, Location	2 - 3
Management Reorganization	Overall Efficiency, Reduction in Operating Costs	1 - 2
Provision of New Cargo-Handling Services	Market Focus, Reduced Costs for Vessels and Cargo	1 - 2
Provision of Value-Added Services for Cargo and Vessels (not Cargo Handling)	Reduced Costs for Vessels and Cargo	1 - 3
Downsizing and/or Specializing	Market Focus, Reduction in Costs	2 - 4
Development of New Facilities	Increase in Efficiency, throughput and Capacity	3 - 7
Acquisition of New Equipment	Increase in Efficiency, Throughput and Capacity	1 - 2
Free Trade Zone or Free Port Status	Market Focus, Reduced Cargo Costs	3 - 5
Improvements in Cargo Clearance	Reduced Delays, Increased throughput	2 - 4
Sales and Promotion	Market Focus	1 - 3
Upgrading Labor Skills	Increase in Efficiency and Capacity	2 - 3
Reducing Labor Requirements	Increase in Efficiency	1 - 5
Increasing Equipment Utilization	Reduction in Costs	5 - 1

Benefits and Risks When Increasing the Role of the Private Sector

- BENEFITS
  - IMPROVING MANAGEMENT
    - labour negotiations removed from political arena
    - political/bureaucratic limits on operations eliminated
    - sufficient compensation provided to attract good managers
    - incentives provided in the form of promotion and bonuses
    - more efficient and cost-effective maintenance
    - increased industrial management expertise
    - market - oriented pricing introduced
  - REDUCING PORT LIABILITIES
    - responsibility for safety or cargo
    - responsibility for safety and health of labour
    - responsibility for damage to structures
  - PROMOTING THE PORT
    - marketing responsibility transferred to partners
    - long-term investment in the port encouraged
  - REDUCING BUSINESS RISK
    - private-sector equity participation encouraged
    - long - term contract signed
    - risk shared with private sector
- RISKS
  - Establishment of a private monopoly
  - Priority given to corporate goals over public service objectives
  - Loss of control of port infrastructure development

Tasks Involved in Evaluating the External Environment

- Market Identification

  - Determined Strategic business, Their Markets and Clients
  - Identify Emerging Markets and Other Potential markets
  - Classify Markets as Growing, Stable or Declining
  - Identify major Clients in Each Market, Both Existing and Potential
  - Compute market Share of the Port and its Competitors in Their Different Markets

- Assessment of the Port's Clients Value Chain (Identify)

  - Classify Logistics Activities
  - Identify Inputs to These Activities
  - Identify Outputs to the Activities
  - Categorize Value Produced
  - Identify Port's Contribution to these Activities
  - Select Performance Measures to Quantify Value Provided by the Port
  - Determine Relative Values of Theses Performance Measures for the port and its Competitors

- Technological Assessment (Identify Trends)

  - Vessel Size and Type
  - Cargo Presentation
  - Cargo Handling Equipment
  - Labour Productivity
  - Facility Design
  - Berth Productivity and utilization
  - Land-Based Activities (Warehousing, Distribution etc.)

- Legal and Regulatory Assessment (Identify Changes)

  - Role of Government in Port Activities
  - Regulations Affecting Trade and Transport
  - Specific Regulations Affecting Ports and Shipping
  - Environmental Regulations Affecting Ports and Shipping
  - Safety Regulations Affecting Ports and Shipping
  - Workers Rights and Work Rules

- Social Assessment (Identify Concerns of the Port Community)

  - Port Operations
  - Port-related Noise, Pollution and Safety
  - Land Use
  - Trade and Transportation
  - Economic Growth

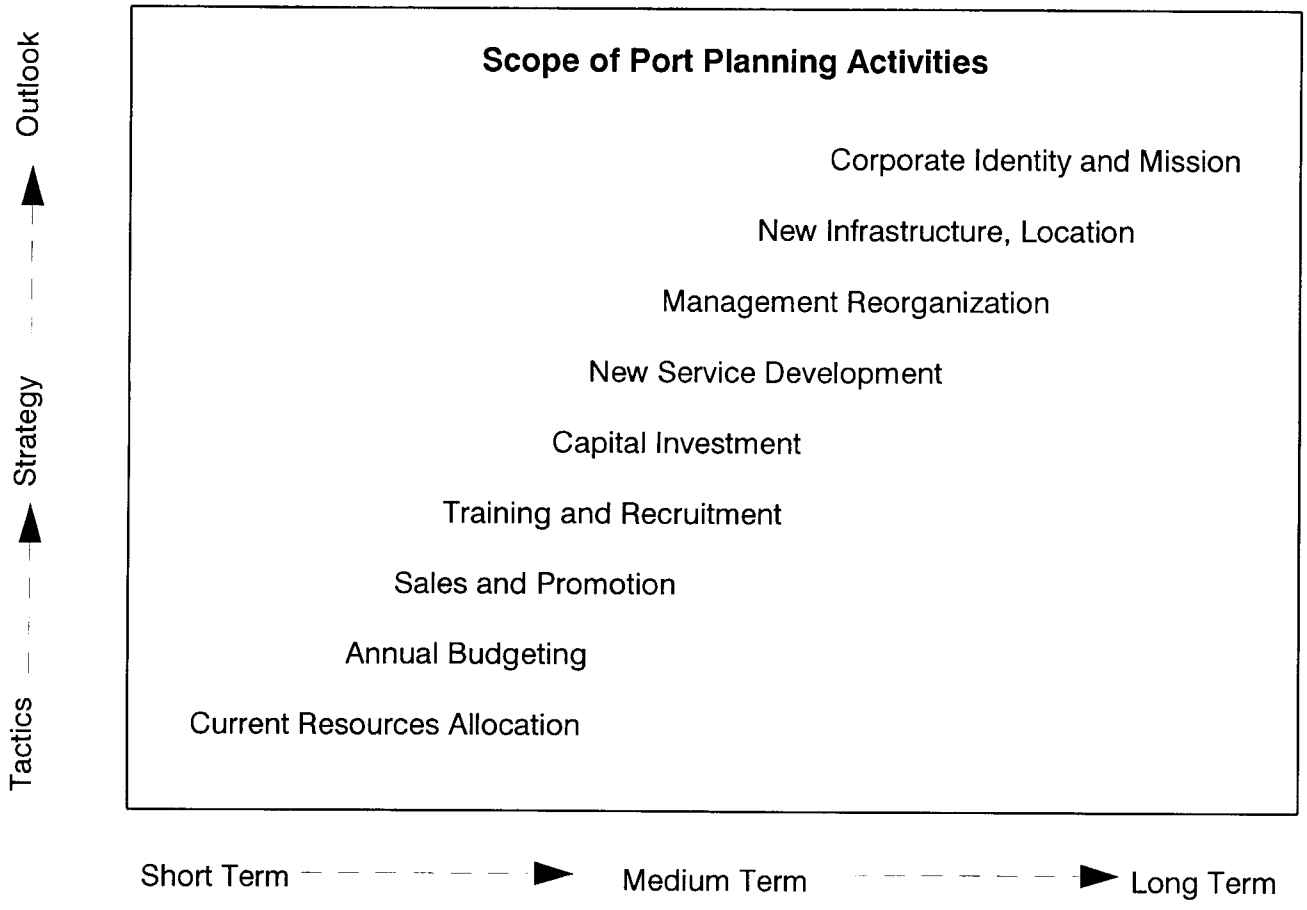
Strategies to Take Advantage of Institutional Strengths and Overcome Weaknesses

- Facilities and Equipment
  - invest in new assets
  - renew existing assets
  - improve utilization of existing assets
  - increase productivity of existing assets

- Manpower
  - develop services which take advantage of experience and skills
  - allocate skilled personnel to priority businesses and activities
    - reassignment of key personnel
    - secondment of key personnel
    - introduction of flexible task-oriented management
    - out-sourcing activities
  - improve formal training by
    - additional staff time for training
    - better internal training capability
    - additional budget for external training
  - provide performance-based remuneration and incentive pay
  - improve human-resources management
    - skills assessment
    - performance evaluations
    - personnel matching
    - changes in work rules
    - indemnization of excess labour
  - establish quality circles

- Financial Conditions
  - access new sources of funds
  - allow direct private-sector investment
  - enter into joint ventures
  - create commercial subsidiaries

- Regulatory Constraints
  - monitor regulatory changes
  - improve legal representation
  - increase involvement in legislative and regulatory activities
  - respond more rapidly to regulatory changes
  - introduce measures to mitigate environmental damage
  - provide specific environmental services
  - take advantage of competitors' regulatory constraints

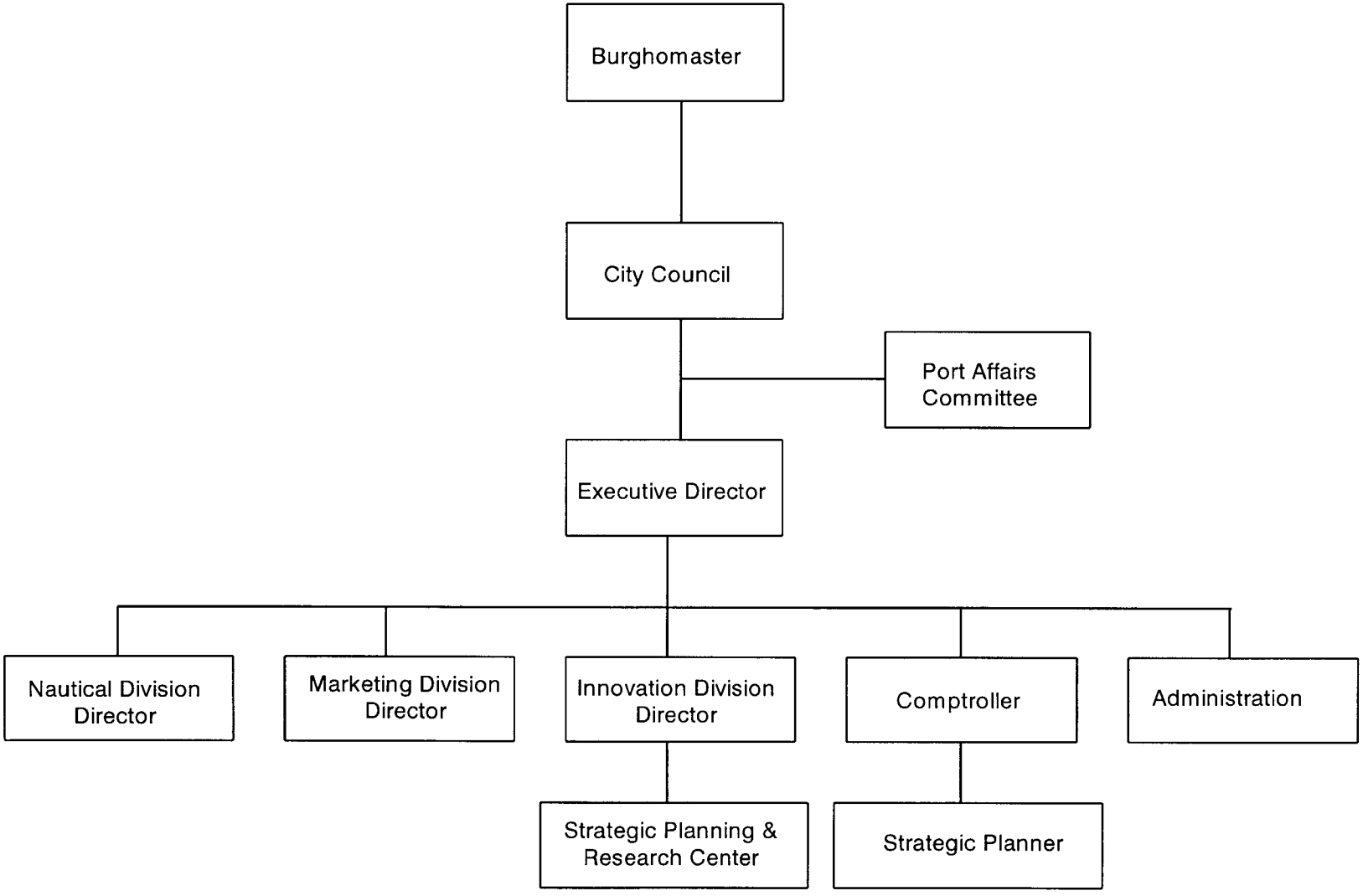

Scope of Port Planning Activities
Corporate Identity and Mission
New Infrastructure, Location
Management Reorganization
New Service Development
Capital Investment
Training and Recruitment
Sales and Promotion
Annual Budgeting
Current Resources Allocation
Outlook
Strategy
Tactics
Short Term
Medium Term
Long Term

SOURCES OF COMPETITIVE ADVANTAGE

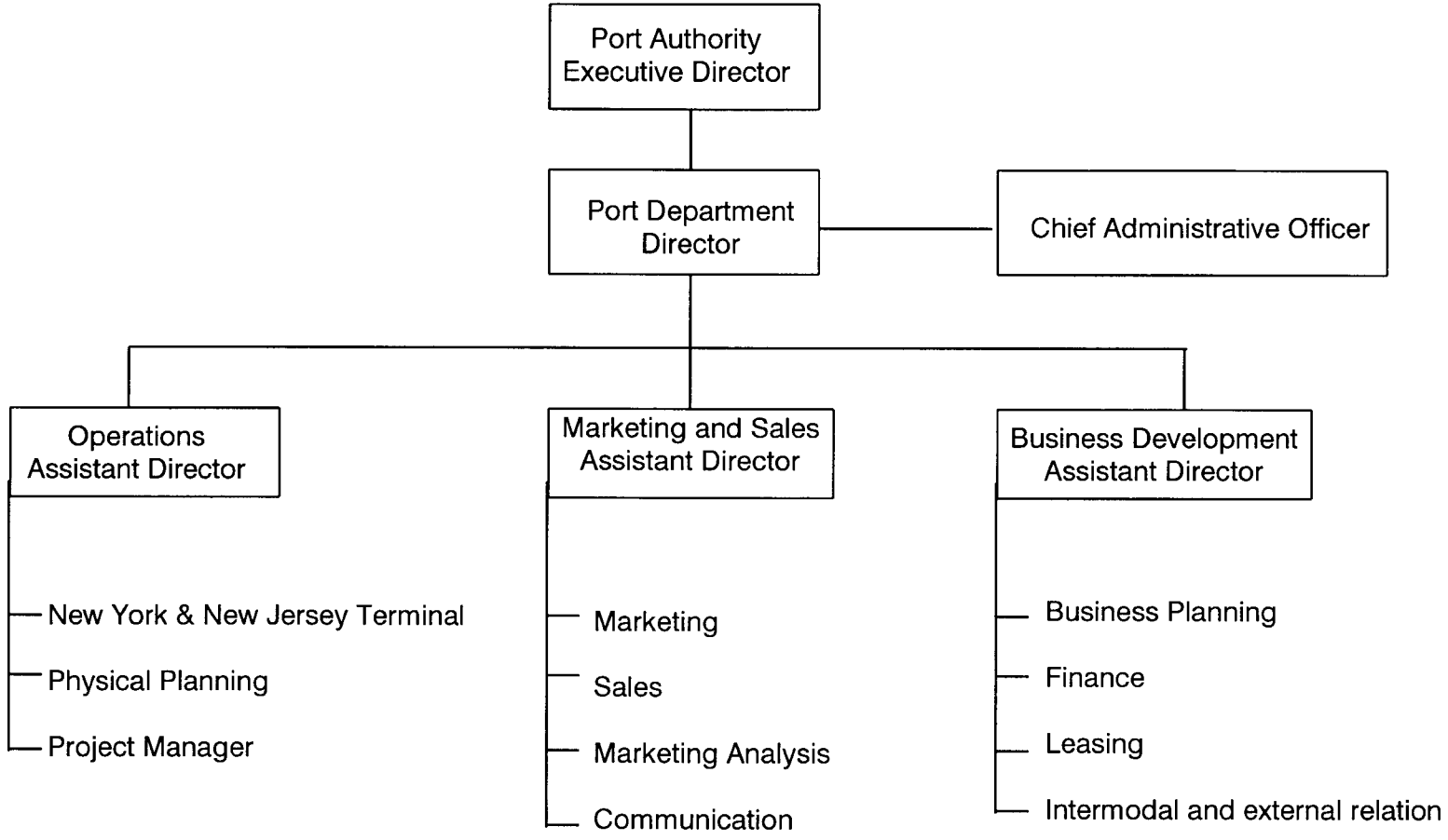
- COST LEADERSHIP
    - Lower Port Operating Costs
    - Lower Cost Labour
    - Higher Productivity of Labour
    - Greater Utilization of Existing Assets
    - Less Expensive Facilities and Equipment - Lower Port Charges
    - Differentiation by Ability to Pay
    - Volume Rebates
    - Flexible Rates with Upper Limits

- DIFFERENTIATION OF SERVICES
    - Location
        - Proximity to major Origins and Destinations
        - Proximity to Major Trade Routes
        - Connection with Road, Rail and Inland Water Transport
        - Size of Vessels Which can be Accommodated
    - Facilities
        - Dedicated Berths or Terminals
        - Specialized Cargo-Handling Equipment and Storage
    - Services
        - Cargo Consolidation and Processing Services
        - Services for Vessel Repair, Crewing, Provisioning and Fuelling
        - Information Services for Vessel Planning
        - Information Services for Cargo Clearing and Tracking
    - Performance
        - Faster Vessel Turnaround
        - Reduced Cargo Dwell Time
        - Improved Customs Service
        - Simplified Cargo Documentation

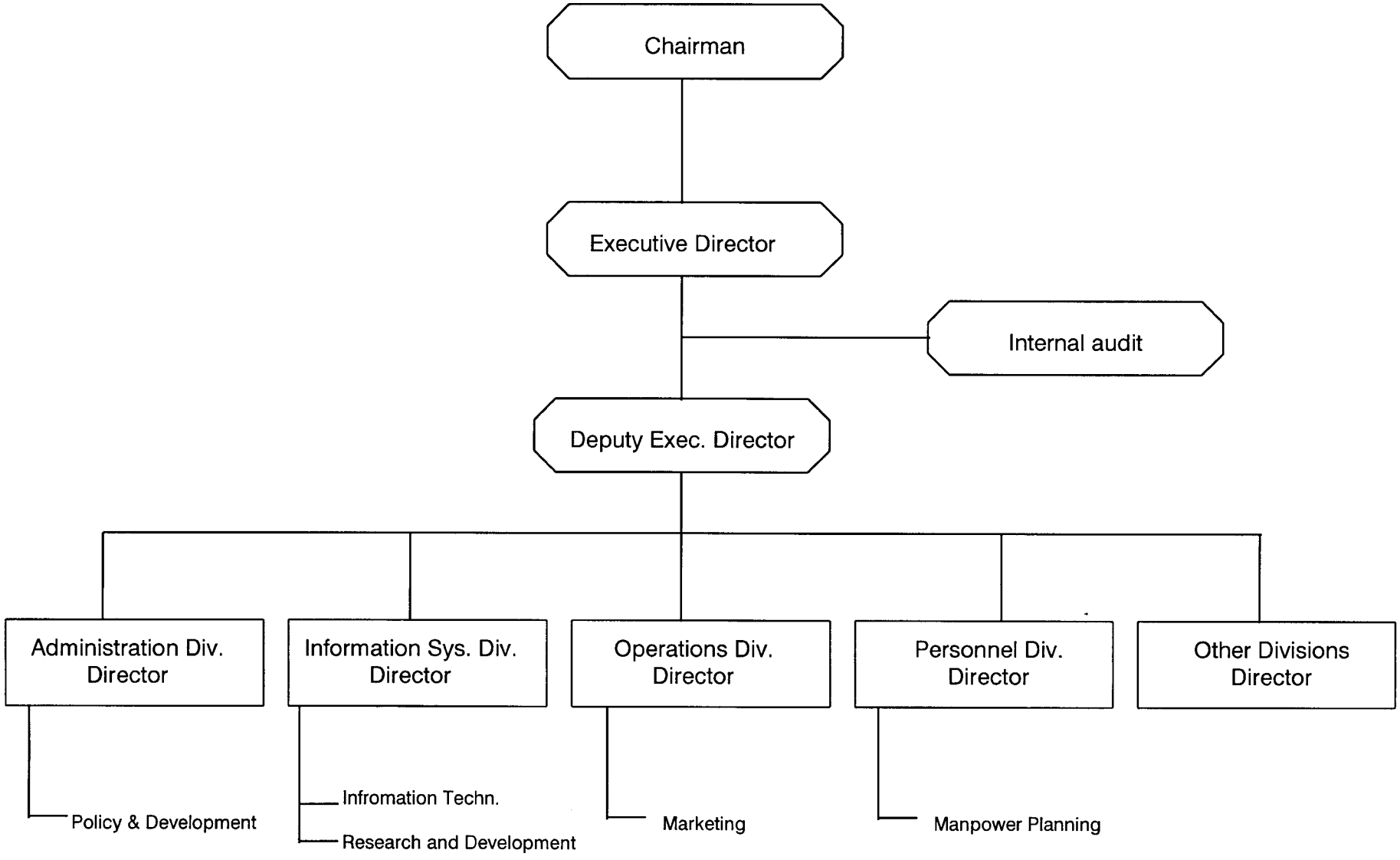
Rotterdam Municipal Port
Strategic Planning Elements



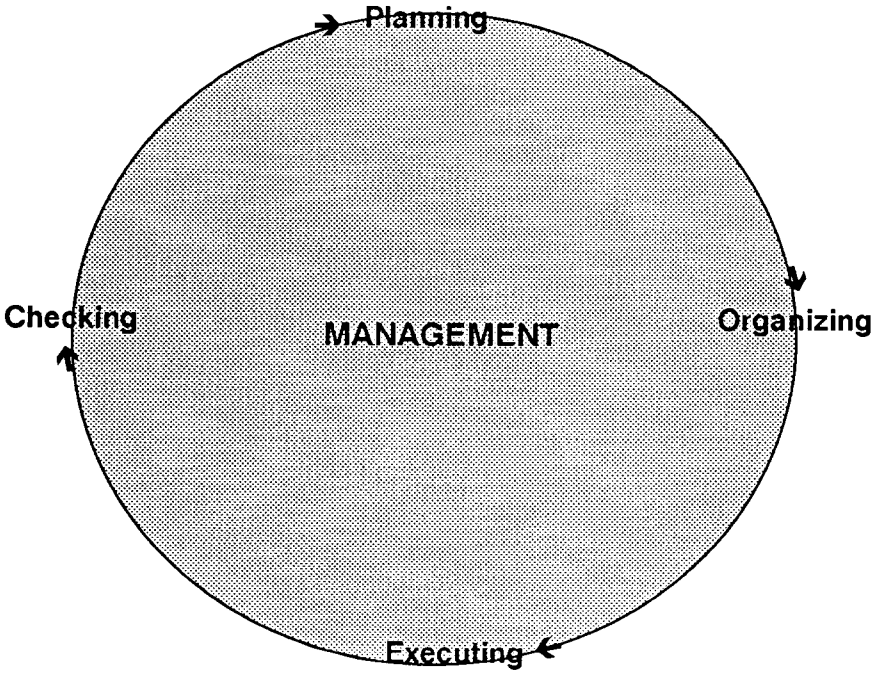
PORT AUTHORITY, NEW YORK AND NEW JERSEY ORGANIZATION CHART OF PORT DEPARTMENT



USA ORGANIZATION FOR STRATEGIC PLANNING



Management Circle



INTERNATIONAL SALE AND CARRIAGE TRANSACTIONS

Rijswijk, March 1996

CONTENTS

1 THE PROBLEMS OF INTERNATIONAL SALES

In essence the international sale of goods presents all those commercial and legal problems inherent in any sale of goods. The special features arise from the fact that seller and buyer are based in different countries.

Any seller is naturally reluctant to part with the control of his goods without receiving payment for them, unless he can retain an interest in the goods as some sort of security for payment. The buyer is equally reluctant to pay for goods before he has received them, unless he can be given some kind of legal right over them. Neither party, moreover, wishes to have capital tied up in goods in transit.

Any seller is likely to be concerned to ensure that he is paid. This concern is increased when the buyer is in another country and another jurisdiction.

- The seller is less likely to be familiar with the buyer, his solvency, creditworthiness and integrity.
- Any attempt, should the buyer default, to obtain payment through legal process is likely to be a much more serious matter and, moreover, be a matter for the application of a foreign system of law.

A revolutionary junta might seize power and ban all sales or payments. No such assurance, and to be concerned about export and import licences and possibly exchange control regulations.

For these reasons a seller will often seek to ensure that the salses contract sets up a system of payment that will give him recourse against a bank in his own country. Another possibility is to seek the protection of often Government sponsored Export Credit Guarantee shemes which provide insurance coverage against some of the losses likely to result from political causes.

The goods themselves have to be transported from the seller to the buyer. This can perhaps be considered the most important single factor in an international sales transaction. The type of sales contract which the parties make will be dictated, to a very great extent, by the type of carriage they envisage for the goods.

The mode of carriage that the parties employ will be determined by various factors:

- Nature of the goods, for example, perishable, fragile, valuable or heavy or otherwise awkward to handle.
- Urgency with which the buyer requires the availability of the goods.
- Cost of the various methods of carriage.

Closely related to the question of the carriage of the goods is that of their insurance. Since the goods have to be carried over long distances, possibly transhipped from one mode of transport to another, they are at greater risk of loss or damage. Buyer and seller will require some form of insurance to protect themselves as much as possible from the financial consequences of such loss or damage.

Because of the problems an international sales contract involves the making of other contracts, with bankers, carriers and insurers. Also in most cases parties will be acting through intermediaries, such as insurance brokers, selling agents, forwarding agents and loading brokers, and the functions of these agents and their relationships to the principals will often affect the contract they make.
Thus, what the businessman may see as a single transaction tends to appear to the lawyer as a complex of contracts, each with its own parties and incidents all related to the central contract of the sale of goods.

Most of these contracts will take the form of, or involve the issuing of, some significant document such as a bill of lading, an insurance policy, or a bill of exchange. Legal rights relating to the goods, to their insurance, to their carriage, to payment for them can be transferred simply from one party to another by the delivery, or indorsement and delivery, of these documents. Documentary transfer of legal rights play a large role in overcoming the problems inherent in the international sales transaction.

Not all the problems, however, are in the sphere of contracts. If a dispute arises it may be necessary to decide whether an own court has jurisdiction to hear the case and, if it has, whether it should apply its own law or the law of another country. This is Conflict of Laws, is also called Private International Law, and is obviously very relevant in the area of international trade.

2 THE SALES TRANSACTION

2.1 The Parties Involved

Principal parties to the sales contract, the seller and the buyer, will in many, if not in most cases act through agents. The high complexity of the operation, requires specialised knowledge of markets, finance, transport, insurance and many other matters.

Firms with specialised knowledge and the administrative machinery, are called "Export Houses" or "Confirming Houses"

The confirming house may act as an agent for the overseas buyer. The sales contract is made between seller and buyer and the legal status of the confirming house will be governed by the ordinary law of agency. The confirming house may also buy from the seller and resell to the overseas buyer, in which case the confirming house is a principal in both contracts. There is no direct contractual relationship between seller and buyer.

More involved is the arrangement in which the buyer instructs the confirming house to buy the goods, in its own name, from the seller and undertakes to pay to the confirming house the price of the goods and a commission. The confirming house has a dual function. In relation to the seller it is a principal and responsible for the performance of the buyer's part of the contract, namely, accepting the goods and paying for them. In relation to the buyer, it is an agent and responsible to the buyer for the performance of an agent's duties.

In another arrangement, the buyer instructs the confirming house to buy in the buyer's name and "confirm" to the seller, that is, give the seller its own undertaking that the contract will be performed. Again the confirming house will be an agent in relation to the overseas buyer and a principal in relation to the seller. The essential difference between this arrangement and the last is that the buyer and the seller also have a direct contractual relationship. The seller could proceed directly against the overseas buyer if, for example, the confirming house refused to pay for goods accepted.

The parties to the sales contract will become involved in other, related, contracts of carriage, insurance and so on, but the parties to these contracts, other than the buyer and the seller, do not become parties to the sales contract. The carrier of the goods may be liable to the buyer if the goods arrive in bad condition because of negligent carriage, because carrier and buyer are parties to the contract of carriage, but the carrier would not be liable for the bad condition of the goods under the sales contract or any term implied therein — such as a term relating to merchantable quality — because the carrier is not party to the contract of sale.

2.2 Forms of International Sales Contracts

The sales contract not only specifies the goods to be delivered by the seller and the price to be paid by the buyer. The contract will have to cover other matters, such as the carriage of the goods overseas to the buyer, the insurance of the goods while they are in transit and the machinery that is to be set up for payment. Endless permutations of the allocation of costs and responsibility for different elements between seller and buyer could be included. In practice buyer and seller will almost certainly adopt a recognised and established form of contract, the incidents of which are well known. By doing so, duties and expenses will, to a great extent, be automatically allocated. If parties adopt such a contract they will be presumed, in the absence of any express term to the contrary, to have adopted all the normal incidents of that type of contract.

The defendants contracted to sell a quantity of bicycles to Central American buyers. Bicycles had been crated and the shipping marks put on the crates for despatch to the buyers when the selling company went into liquidation. The buyers claimed the bicycles on the grounds that they had been appropriated to the contract and that the property in them had thereupon passed to the buyers. The sales contract had, however been made on FOB — Free on Board — terms and the normal rule in such contract is that the property in the goods passes to the buyer as the goods cross over the ship's rail. By using an FOB contract the parties had effectively implied an intention that the property was to pass at that time and therefore the argument that it had passed earlier was rejected.

Carlos Federspiel & Co SA v Charles Twigg & Co Ltd

The existence of these established contracts does not remove all doubt about the parties' responsibilities. Doubtful points as to the actual legal position with regard to some elements of these contracts may still be there. Also parties are perfectly free to depart from an established form in various respects and the legal effect of their so doing may be unclear. Finally, although these contracts have a worldwide recognition in respect of their general nature, different legal systems may take different views as to their legal effects in particular respects.

Attempts have been made to smooth the operations of international trade by establishing agreed rules to apply to overseas sales to the exclusion of National laws. Such rules were agreed by a Hague Conference in 1964. The Vienna Convention 1980, under the auspices of the United Nations Committee for International Trade Law (UNCITRAL), produced a code which may be accepted in a wider circle. Much useful work in the standardisation of sales terms has been done by extra-legal agencies, such as trader associations, who produce standard form contracts for their own trades which are widely used internationally, and by the International Chamber of Commerce.

The established contracts are distinguished from each other largely by the different stages at which the responsibility for the goods and the expenses associated with it are transferred from the seller to the buyer. This may be, but will not necessarily be, the point at which the property in the goods passes to the buyer. The stage at which this transfer occurs must obviously be a significant point in the transit. As a consequence the type of contract the parties employ will be dictated by the method of transport that they envisage.

Under a FAS — Fee Alongside Ship — contract the seller's responsibilities in connection with the goods will usually cease when the goods are alongside the ship at the port of loading. This contract will obviously only be used when the primary mode of transport is to be carriage by sea. It would not be used if, for example, it were intended that the goods should be loaded into a container which was to be carried on a single road vehicle from seller to buyer. The fact that at some stage the lorry might be alongside a ship that was to carry it with its load for an incidental sea transit would be irrelevant as a point at which to transfer responsibilities.

As well as establishing the allocation of Responsibilities between the parties, the choice of a particular form of contract also establishes what the buyer gets for the price that he pays. One extremity is; under the "ex-works" or "ex-factory" contract, the seller has merely to deliver the goods at his own place of business and all expenses and duties thereafter fall on the buyer, who must make all the arrangements for transport. The other extremity; when goods are sold "Free Delivered" or in similar terms, the seller must make and pay for all arrangements necessary to get the goods to the buyer's place of business. Between these two extremities are various forms, not all of which are necessarily export contracts. Of these, the most important are the FOB — Free on Board — contract and the CIF — Cost, Insurance, Freight — contract. Under the former, the seller, for the price he is paid, must deliver the goods onboard a vessel at the agreed port of loading. Under the latter, the seller must not only ship the goods as above but also arrange for their carriage to the agreed port of discharge and pay the freight and arrange and pay for suitable insurance of the goods and must tender to the buyer all the documents relating to the transaction, namely, the invoice representing the cost of the goods, the insurance policy and the bill of lading which represents the freight. The documentary aspect of the CIF contract is extremely important when considering its legal nature. One variant of this contract is the C and F — Cost and Freight — contract, under which the seller does not have to arrange and pay fot the insurance of the goods. There are various forms of contract used when carriage is to be by road, rail or air.

3 THE CONTRACT OF CARRIAGE

3.1 Carriage by Sea

In spite of recent developments in other forms of transport carriage by sea remains the most usual way of transporting goods overseas. In terms of weight, well over 90 percent of goods are so carried.

Especially in sea transport neither buyer nor seller has any physical control over the goods given in transit. It is importatnt to know, therefore, what liabilities the carrier of the goods is under to seller or buyer, or, as they are likely to be termed under this contract, shipper and consignee, and what contractual rights they may have against him

The seller or shipper will not usually make the contract of carriage with the carrier directly. He will almost certainly employ a forwarding agent or freight forwarder to make all the arrangements for the carriage. Similarly the carrier will normally employ a loading broker to obtain cargoes for him.

The loading broker or other agent of the carrier will sign and hand to the shipper or his agent a document known as a bill of lading. If the goods have been handed to the carrier for shipment but not yet loaded this will be a "received for shipment" bill of lading. If the goods have actually been loaded onto the ship it will be a "shipped" bill of lading. This document, which is of the highest importance in international sales transactions, has three functions:

- It is evidence of the contract of carriage which has been made
- It is a receipt for the goods
- It is a document of title to the goods

The last function means that the ownership or possession of the goods can be transferred from one party to another by delivering or indorsing and delivering, the bill of lading. It can thus be used to deliver or sell the goods while they are at sea, or used as a security for a loan. The party to whom a bill of lading is transferred will normally have transferred to him not only the legal rights to the goods but also the rights and duties under the contract of carriage, so that he will have all the rights of action against the carrier that the original shipper would have had.

Bills of lading are normally issued by sets, each bill of lading in the set being numbered and each usually being valid, so that a carrier who hands over the cargo to a party presenting any bill of lading from the set will be discharged from further liability.

For very large cargoes, a shipper may charter an entire vessel, either for a voyage or for a period of time. In this case he is a charterer and his relationship with the ship owner will be governed by the charter party.

3.2 Carriage by Air and Land

Carriage of goods by air may be arranged for a seller by a forwarding agent. It is also common for a seller to deal directly with an air carrier. The document issued as a receipt for goods consigned by air is the air waybill or air consignment note. Unlike the bill of lading it is not a document of title. In most states the Warsaw Conventions of 1929 and 1955 are applied.

Carriage by road or rail may be an incidental stage of a transit or it may be the primary mode.

In a FOB contract the seller might make a contract for the carriage of goods by road or rail to the docks where he has to deliver the goods onboard the ship. In this situation there is no international element in road and rail carriage. Alternatively the seller may make a contract to have the goods carried for the entire journey by road or rail.

The international carriage of goods by road and rail is governed by the CMR Convention 1956 and the CIM Convention 1970. The documents issued as receipts for goods carried by road or rail are consignment notes. Like the air waybill, and unlike the bill of lading, they are not documents of title.

3.3 Combined Transport

Combined transport is being increasingly used, paricularly when cargoes are carried in containers.

Combined transport is also known as Through Carriage, Intermodal or Multimodal Transport. All carriage, by whatever mode or modes, involved in the transport of goods from the seller to the buyer is undertaken by a "combined transport operator" who arranges all the stages with the relevant carriers. The combined transport operator may be a carrier himself or may be a forwarding agent. The seller will make only one contract with the combined transport operator for the entire carriage. The document issued as a receipt will be a combined transport document which may or may not be a document of title.

4 THE INSURANCE OF GOODS IN TRANSIT

Goods in transit are at risk. Under the contract of carriage the carrier may be liable to the owner of the goods in respect of loss or damage occuring to the goods while they are in his charge. Not all loss or damage will be attributable to fault on the part of the carrier or his servants and even if it is, the carrier may, under the terms of the contract of carriage, be exempt from liability or be liable to a limited extent.

Thus all goods sent overseas will almost certainly be insured. Whether this insurance is effected by the seller or by the buyer will depend on the contract of sale.

Under an Ex-works contract, since the seller has only to deliver at his own place of business, there is no reason why he should insure the goods as they will be at the buyer's risk throughout the entire transit. Conversely, in a Free Delivered contract it will usually be the seller who insures. In FAS and FOB contracts the goods will be at the risk of the buyer from the time that the goods are alongside and on board the ship respectively. It will therefore, normally be the buyer who requires the goods to be insured for the sea transit. The parties may agree, however, that the seller shall actually arrange for this insurance as a service to the buyer for which he will carge the buyer. In a CIF contract, on the other hand. it is the duty of the seller, as a normal part of the contract, to procure and pay for the insurance. The insurance policy is one of the documents which he must send to the buyer in order to fulfil his contractual obligations.

The form of insurance used when goods are to be carried by sea will be a policy of marine insurance. Such a policy usually covers not only the sea transit but any incidental surface transit from the seller's place of business to the port of loading and from the port of discharge to the buyer's place of business.

Policies of insurance on goods to be carried by air are based largely on marine policies, though legally they are not such.

The policy of insurance of the goods will be assignable so that the seller may take out the policy in his own name and later assign it to the buyer, who will then be able to claim under the policy if the goods are lost or damaged after the property in the goods

has passed to him. This assignment does not prevent the insurer from employing against the buyer any defence he would have had against the seller.

The right to avoid the contract because of misrepresentation.
The insurance document usually employed in an overseas sale transaction will be the policy, but certificates of insurance, issued by the insurer, a broker or the seller himself, may also be employed. As a general rule, under a CIF contract the policy itself must be tendered to the buyer.

5 PAYMENT ARRANGEMENT

The arrangements made in the sales contract for payment will reflect the reluctance of the seller to part with goods without receiving payment, or security of payment, and the reluctance of the buyer to pay without receiving the goods or an adequate interest in them. Where the parties have knowledge of and Confidence in each other payment may well be made simply and directly by banker's draft or by mail or telegraphic transfer, whereby the buyer instructs his bank to arrange for the seller to receive payment from a bank in the seller's country.

Usually, however, arrangements will be more elaborate and will be based on the contractual documents. These documents can be transferred so as to pass to the transferee all the rights involved in the contracts. Thus possession of a bill of lading may give the holder not only the ownership of the goods to which it relates but also rights of action against the carrier. Possession of the insurance policy will give him the right to claim against the insurer for any loss of or damage to the goods which is covered by the policy. The documents, in fact, stand for the goods and can be sold or pledged as the goods and so can be used as security for payment. Thus various arrangements can be made for payment to be made against presentation of the documents. The party making the payment, whether the buyer or some agent of the buyer, such as a bank, will, in exchange for payment, receive the security of the rights represented by the documents.

One of the most common and useful arrangements of this nature is the documentary credit, also sometimes called a banker's commercial credit. Under this arrangement the buyer instructs a bank in his own country — the issuing bank — to open a credit in favour of the seller with a bank in the seller's country — correspondent bank. The seller may draw on this credit only upon presentation of the documents specified by the buyer when the credit was opened. Thus the seller can be assured of payment by a bank in his own country and the buyer is assured that the seller will not be paid until he has handed to the bank the documents representing the goods. The correspondent bank has the security of the documents for payment by the issuing bank which will in turn have this security for payment by the buyer. As the bank is interested in the documents as a security and not in the goods they represent, it will refuse to accept documents which do not meet the specifications laid down by the buyer even in very minor respects.