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Logistics â The Factory Without Walls

By Brian Ashton

This is the full length version of Brian Ashton's research into logistics and class composition (see 'The Factory Without Walls' in the Articles section of this site for a brief introduction to the issues).

A team of researchers from the Cardiff Business School studied the chain of actions required to make a can of cola. The whole process, starting at the Bauxite mine in Australia, and passing through the various smelting and rolling processes to the manufacture of the can itself, printing its label, filling it with the cola and finally getting it into somebody's refrigerator, took no less than 319 days. Only three hours were spent on manufacturing, the rest of the time was spent in storage and transport, as many as 14 storage lots and warehouses were involved. In an advertisement for the shipping company P&O Nedlloyd it says that the journey of one single container can involve literally a hundred people. These range from the guy who stuffed the container to the bookings crew and the IT people, from the logistics planners to the insurance brokers, from the dockers, through the haulage drivers to the warehouse workers, from the customs officer to the captain of one of the worlds' largest merchant ships. Time and labour are what the above highlight, and it is the control of these two factors that are major concerns for those charged with the management of supply chains. And as the Cardiff Business School study highlights logistics is a major factor in the supply chain

What is a supply chain? It includes all of the organisations involved in the extraction, manufacture and distribution of raw materials, components and commodities. The organisation and coordination of the various functions is the business of supply chain management (SCM). SCM is a strategic and operational process that directs the materials flow through the supply chain to the end user. Be that a company or a single consumer. The range of functions that fall under the remit of SCM are as follows:

- Logistics.
- Purchasing & Supply.
- Materials Management.
- Supplier Network Development.
- Communications.
- Manufacturing.
- Production Planning.
- Marketing.
- Design.
- Facilities & Resource Management.

Some people in industry see terms like supply chain management, logistics and materials management as jargon describing the same process. Logistics is, according to the Council of Logistics Management, 'the process of planning implementing, and controlling the efficient, effective flow and storage of raw materials, process inventory, finished goods, services and related information from the point of extraction/production to the point of consumption.' I will use both logistics and SCM in this piece.

The last ten years or so has seen a tremendous growth in the size of the logistics industry and the emergence of giant logistical companies. Some of the largest companies have been highly acquisitive in this period and there have been some huge global players emerging from the buying frenzy. EXEL a British based concern took over one of its biggest rivals Tibbett & Britten, another British company, and there have been strong rumours circulating on the London stock exchange that the American giant UPS is gearing up to launch a takeover bid for EXEL. Perhaps a brief look at these three companies might be useful for understanding the industry. The summaries relating to Exel and Tibbett & Britten

relate to the time before they merged.

EXEL

Exel, the global leader in supply chain management, provides complete and customized logistics solutions from design and consulting through freight forwarding, warehousing and distribution services to integrated information management and e-commerce support. It has a presence in 1600 operating locations in more than 120 countries and employs 67 000 personnel. The company achieved a turnover of £4.7bn in 2002.

Exel run WalMart's worldwide 288,000sqm import centre in Mira Loma, California. The centre, which employs 292 Exel associates (not workers, you note), handles a huge range of high priced merchandise and other non-perishables for forward delivery to more than 30 of WalMart's regional distribution centres in the western half of the USA. Exel also operate a 40,000sqm tyre handling facility in Atlanta, Georgia for WalMart's speciality tyres and lubrication business, delivering to WalMart and Sam's Club stores in seven southeastern states. Sam's Club stores are a WalMart subsidiary.

TIBBETT & BRITTEN

T&B provides domestic warehousing, transport, and vendor and inventory management services. It serves manufacturers, distributors and retailers of food, drink, clothing and other consumer products through 23 member companies employing more than 36 000 personnel. The company has more than 370 offices, operates nearly 5 million sq. m. of warehousing space and runs 15 500 commercial vehicles. Its main clients include Associated Wholesale Grocers, ConAgra Foods, Gap Inc., JC Penney, Kroger, Neilson Dairies, Procter & Gamble and WalMart. In 2002 it recorded revenues of US\$2.4 billion.

UPS

UPS is a US\$33.5 billion corporation. It provides synchronized movement of goods, funds and information. It operates in more than 200 countries; providing transportation and freight logistics/distribution, international trade, financial services, financial mail services and consulting services through its group companies- UPS Air Cargo, UPS Mail Innovations, UPS Aviation Technologies, Mail Boxes Inc, UPS Capital Corporation, UPS Professional Services, UPS Consulting, UPS Supply Chain Solutions and UPS Logistics Group. UPS has moved far beyond being only a small package distribution company. It now also deals with large items and heavy freight across international borders. It has developed this capacity by merging with several large freight forwarding companies. UPS paid US\$450 million for the American owned Fritz Companies trucking empire. One of the biggest companies in the world with more than 340,000 employees, UPS describes its strategy thus:

‘...Moving forward, UPS will be able to offer customers a single point of accountability. For example, a customer will be able to manufacture products anywhere in the world and through UPS move those goods by any mode of transport across any border. When combined with our technology solutions and the financial solutions offered by UPS Capital and supply chain management provided by the UPS Logistics Group, UPS has created an unparalleled offering in the marketplace.’

The contract between UPS and National Semiconductor (NS) to manage NS's global supply chain highlights the importance of the logistics industry to global manufacturers. The two companies opened a global distribution centre in Singapore in August, 2000. The combined operation will enable UPS Logistics Group to manage the movement of silicone chips from manufacturing plants in Malaysia and Singapore to the new distribution centre and then on to customers around the world. The facility utilizes radio frequency, bar code scanning and Web based technologies to manage the fulfilment of more than 450,000 semiconductor orders a year. The centre enables rapid order fulfilment, with an

average delivery time of 48 hours on a global basis. It also has the capacity to receive an average of 12 million inbound chips per day, with the ability to accommodate further growth rates. UPS can monitor the receipt, storage, shipment and delivery of chips regardless of location, carrier or customer destination using the information technologies at its disposal.

The biggest prize for these global giants is the Chinese logistics market, and while they have a foothold there they would like to significantly increase their presence in what is potentially the biggest logistics market in the world. And the chance to do so is just around the corner with the Chinese logistics industry due to be fully opened to foreign investors next year, 2006. The market is being liberalised in line with China's commitments at the time of its accession to the World Trade Organisation. There has been a realisation for some time that if the Chinese economy is to maintain its momentum its high level of logistics costs must be reduced. Logistics costs are estimated to be around 20% of GDP, 2-3 times the level of developed countries. For this reason the Chinese government has been keen to encourage western logistics companies to enter the market, and bringing with them know-how, capital and IT.

Just-in-time production (the method of supplying what is needed, when it is needed and in the quantity required) has increased the need for tight control of the logistical process. It can be argued that JIT production is responsible for the change in capitalist production from a push economy to a pull economy. That is that commodities are pulled through the supply chain by actual demand rather than being pushed through by forecasted demand. If it ain't been sold don't make the replacement is the motto of the pull economy. This increases the power of the giant supermarkets, as they own the information needed to put production in motion. When you buy something at WalMart or Tesco and the bar code is scanned the information is transmitted to all those along the supply chain and the process is put in motion. Of course, millions of pieces of such info are flowing through the supply chain computer system at any one time. The bar code is currently being supplemented by a system using radio frequency identification tags (RFID). Some people believe that the tag will replace the bar code system while others hold that eventually both will find their niche in the global tracking systems of capital. The tag consists of a transmitter/receiver and a microchip. These are labour saving devices that do away with the need to physically scan products; they can be attached to a product, a pallet load of components or a container load of goods. Put simply, the system works by transmitting information from the microchip attached to the minute radio transmitter/ receiver. At the moment the cost of an individual RFID is about 40 cents, so in terms of low cost items, like a tin of beans, the tag would be attached to the pallet load rather than the individual tin, but with the cost forecasted to fall to three cents per tag just about any commodity could be tagged. Those who see a continuing job for bar codes believe that the tags will not be used on low cost individual items. The demand for this system is driven by WalMart, with other major retailers joining the push. Computer company Dell is also committed to RFID. The system was developed by the Massachusetts Institute of Technology in conjunction with Cambridge University and Adelaide University at the Auto-ID Centre in Massachusetts. The Centre works closely with some one hundred companies. Allied to satellite communication systems RFID will enable companies to track their products in real time wherever they are. The implications for workers along the supply chain have not yet been identified but will certainly involve tighter control of their work

A look at the logistical needs of a company might prove useful at this point. This is an extract from a document entitled 'Transport Policies for the Euro-Mediterranean Region – An Agenda for Multimodal Transport Reform in the Southern Mediterranean. It was published in 2002.

' As the subsidiary of a large German car part supplier, Leoni Tunisie S.A. produces cable and electronic components for Daimler Chrysler and other European car manufacturers. It was established 25 years ago, employs 2400 employees (including 170 in research and development), and invests about 3.5 million euros a year in facilities and training each year. The just-in-time supply chains put

extremely high demands on logistics systems. Leoni has outsourced all logistics needs to an international forwarder, which has a local subsidiary in Tunisia. As an example of the long-term relationship with its logistics provider, Leoni has developed a tailor-made stacking system that is specifically fitted to the trucks of the forwarder and permits for a capacity utilization of between 95 and 98 percent.

A full production and logistics cycle lasts about nine days and looks as follows...Raw materials and intermediate products are sourced from across Europe, Asia and the United States. They are consolidated at Leoni's headquarters in Germany and shipped to about a dozen different factory locations in various countries. Seven trucks leave Germany for Tunisia each week. The trailers are cleared and sealed by German customs on the firm's premises, where they are picked up by the logistics provider who then drives the trailers to Genoa or Marseilles (2-2.5 days for this land leg), places them without driver on a roll on roll off ferry (20-24 hours for the sea leg), picks them up at Rades port, and delivers them to the factory in Sousse (2-3 hours for this leg). The next day the finished components have been assembled and are cleared by Tunisian customs on the premises before they are sent on their return journey. Eight trucks with 320-350 tons of finished products leave Tunisia each week. The company considers the chain both efficient and reliable. As a major exporter, Leoni has offshore status in terms of tariffs and customs, and receives favourable treatment in Tunisia's ports.

Nonetheless, the JIT demands of the industry are so high that they are now posing a threat to Tunisia as a production base. Instead of the current cycle of nine days, clients increasingly demand cycles of six days. Internal production processes have been streamlined so far (incoming orders are produced within 24 hours) that any additional time savings must come from logistics. Leoni Tunisie recently lost a company-internal competition for a completely new factory with 1,700 jobs and 12 million euros worth of investment to Leoni's Romanian subsidiary. The reasons were not wages or the investment environment – where companies regard Tunisia as very competitive – but primarily Eastern Europe's logistics advantage. The land journey between Romania and Germany takes one day less in each direction, saving 1000 euros per trailer load. According to the CEO of Leoni Tunisie, who sits on the board of the Tunisian-German Chamber of Commerce (TGCC), Tunisia will need cheaper and better air cargo connections or high-speed ferries to Europe if it wants to remain competitive in time-sensitive industries...'

The emergence of the giant logistical companies has gone hand in hand with the withdrawal of the state from the transport infrastructure industries. Attacks on 'rigidities' in the transport labour market take place daily as privatisation continues across the globe. The scale of the deregulation can be seen in the privatisation of railways in South America; in 1990 there were no private railway systems on the continent, by 1999 all the major systems had been handed over to the private sector. Dockers in Argentina and Brazil also felt the cold blast of deregulation in this period. In the Argentine dock industry, during the period 1990 to 1993, the government abolished most of the regulations governing working practices at ports and on vessels. Argentine shipowners were allowed to temporarily register their ships under foreign flags and thus benefit from lower requirements on crew size. Contracting arrangements with stevedore companies were freed up, and pilotage and stowage services were deregulated and operators allowed to establish their own tariffs. Foreign ships were allowed to practice cabotage. (Allowing them to carry out coastal trade) Other labour agreements and norms that were deemed to be hampering productivity in port operations were abolished. In the period 1991 to 1995 productivity in the port of Buenos Aires was driven up from 800 tons per worker per year to 3000 tons per worker per year. Total employment fell from about 8000 just before the reforms to 2500 in 1994. Such changes mean drastic alterations to the working conditions of the workers, for the redundant workers it can amount to a disaster. In many countries access to housing, health and education are dependent on the state employers; the old Soviet block countries spring to mind. The new private

employers are averse to picking up the tab for the social wage.

RFID is a technological development, but it is by no means the only one in the world of logistics. If we look at developments in the rail and shipping industries and take a broader view of technology than just IT then we begin to realise just how important logistics and supply chain management are to capitalism. We are in a sense looking at the management of the cycle of accumulation. We might also realise just how vulnerable capitalism is in its new global JIT low stock inventory composition. God, that was a mouthful. But it is those three things, Globalisation, JIT and low stock inventory, which are driving developments in logistics. Everything has to be on the move, capitalists talk of managing flows, they see the supply chain as a virtual factory and want the workers along the chain to identify with the chain. They could be in the process of creating a new social subject, a truly globalized worker.

I got a bit carried away there, so I'll get back to developments in rail and shipping. The Trans-Siberian Railway (TSR), which provides an overland freight corridor between Asia and Europe, has seen major investments in track and IT technologies. Today, the TSR is a high capacity freight corridor, double tracked and electrified throughout. It has benefited from the latest advances in automation and IT technologies, including the most up-to-date optic fibre communications network. The process of crossing borders has been speeded up; the waiting time at customs stations has been cut from 3 or 4 days to just a few hours. The speed up of freight movements is reliant on the optic fibre technology, this covers 45 000 kilometres of track. Wagons are monitored automatically using programmes known as DISPARK and DISKON that pinpoint the location of every container in real time. To speed up the flow of traffic express trains running to special timetables have been introduced. These have reduced the quoted delivery times for Europe-bound single containers to just 15 days, which is significantly faster than the trans-oceanic shipping route. In fact, average journey time for goods from Asia to Europe by sea is 45 days. The major objective in the next few years is to create a direct link between the TSR and the ports of South Korea. This would offer a much shorter sea crossing to southern Japan. A major benefit will be that freight will be able to travel more than 12000 km covered by a single set of transport regulations. The cost of this expansion east will run to \$ 5 or 6 billion. A proposal to set up an international consortium to rebuild and run the Trans-Korean Railway is also being considered. This would involve North Korea, and it is, perhaps, that countries ability to block the flow of trade rather than its nuclear developments that is upsetting capitalism. Allied to the changes and developments outlined here there are major developments taking place across Russia to speed up the transit of raw materials and commodities, these include a project to link up northern Europe with India through Russia and Iran. This would link the Baltic coast with the Indian Ocean. All of the developments mentioned involve state organisations, private companies and employers coordinating bodies such as the International Co-ordinating Council for the Trans-Siberian Railway. (ICCTSR) This particular body includes representatives from railways in other countries, shipping companies, port operators and forwarding companies. In 2003 the ICCTSR agreed through tariffs for foreign trade moving in containers between the Asia-Pacific region and Western Europe via European border stations and Russian ports on the Baltic. The rail developments taking place in Russia will put pressure on the European Union to speed up the liberalization of its railways. And the sheer cost of modernising the railways of the new member states of the EU will be a major financial burden for years to come; while being kept in reasonably good condition during the Soviet era they have been allowed to deteriorate since. The journey from Berlin to Tallinn takes about sixty hours due to the condition of the rolling stock and the tracks. But change will come, although not without conflict with the workers.

Before looking at technological and organisational changes in the ports industry I will outline the political pressures for port reform. Such reforms are often a requirement of the Structural Adjustment Programmes demanded by the International Monetary Fund (IMF) and the World Bank when they lend money to developing countries. By 1997 the World Bank had imposed reform on 230 ports in 24

developing and Eastern European countries. And the World Trade Organisation (WTO) is under pressure from global companies such as Hutchison Whampoa and APM Terminals, who between them have a 22.8 percent market share in the world's ports industry, to eliminate restrictions on foreign ownership and management in ports. And the US Federal Maritime Commission has been applying pressure on the Japanese and Brazilian governments to change working practices on their waterfronts. And in the European Union (EU) in recent years there have been moves to open up ports to market access, this has been strongly resisted by dockers across the EU. The matter will not go away though and port workers must be ready for further attacks by the state, be that as the EU or the WTO. I will look at this particular struggle later in the document.

As I said above one of the drivers for changes in the ports industry is Hutchison Whampoa, which is a Chinese company. A brief description of their business will give some idea of the spread of the global terminal operators. They have a 13.3 percent share of the market and move some 36.7 million containers a year. They have 175 berths in 31 ports in 15 countries: Argentine, Bahamas, Britain, Burma, China (Hong Kong), Indonesia, Korea, Malaysia, Mexico, The Netherlands, Pakistan, Panama, Saudi Arabia, Tanzania and Thailand. It is estimated that by 2008 the top four companies, of which Hutchison Whampoa is the biggest, will control over one third of the world's container port capacity. The big four are already active in over 90 ports in 37 countries. The gap between them and the rest is widening.

The key used by the state to allow private companies access to the ports industry is privatisation. On the docks the four main port models are:

Σ Public Service: The government continues to own the infrastructure (berths, wharfs, waterways, channels and roads) and the superstructure (cranes, warehouses, cargo handling equipment, office buildings and communications network) and to employ the port labour.

Σ Tool Port: All the port administration, infrastructure, buildings and equipment remain in public hands. Some services, especially cargo handling, are concessioned to the private sector to run and employ the necessary labour.

Σ Landlord Port: The government, through the Port Authority, owns the land and other infrastructure and runs the port administration. The superstructure with the employment of labour is taken over by the private sector. At least 88 of the world's top container terminals follow this model.

Σ Fully Privatised Port: The government sells all assets including land, berths and basins to the private sector and retains no controlling interest. This form of privatisation is rare, only occurring at some ports in Britain, Greece and New Zealand. Liverpool is an example.

In the shipping world developments have been taking place in regards to the carrying capacity of container ships and the equipment required to load and unload ships. Pressure from producers and retailers drives such developments, but as the giant supply chain management companies like EXEL take over more and more functions for those producers and retailers it will be they who push for bigger and faster ships and the automation of port operations. Logic would seem to suggest the eventual amalgamation of the giant logistics companies with the giant port owning companies, Exel with Hutchison Whampoa perhaps. In fact, these two already work closely together, running the largest warehouse and container handling facility in Southern China. It is located in the city of Guanlan, which is located between the ports of Yantian and Shekou, both of which service the trade with the USA.

Container ships are measured in TEUs (twenty foot equivalent unit). This means that a 6000 TEU ship can carry the equivalent of 6000 twenty-foot containers, although its actual load may be made up of containers of various sizes. The size of container ships can have an impact on the business of ports. In 1998, Maersk-SeaLand, one of the largest container shipping consortia in the world, revealed its intention to consolidate its East Coast of North America trade in one hub. It invited a number of ports

to bid for this business, a traffic in excess of 700,000 TEUs per year, more than the total container shipments of all but a few of the largest ports in the world. This prize was dangled before the port administrations of Baltimore, Boston, Hampton Roads, Halifax, New York-New Jersey, Philadelphia, and Quonset Point (RI). Maersk-SeaLand expected the bidders to meet certain conditions that if met would require unprecedented concessions from the port authorities just to remain in contention. Of the three ports short-listed by Maersk-SeaLand in December 1998, two made significant efforts to win the business, Baltimore and Halifax. Halifax lined up several hundred million dollars in capital to help defray the costs of providing Maersk with dedicated berth and rail access. Baltimore got the state of Maryland to dredge the access channel to the port as well as offering the company 335 acres of the 550 acre Dundalk container terminal. The Maersk bidding approach resulted in most of the competing ports making significant concessions. Other shipping consortia have applied similar pressures on port authorities. The port of Seattle has recently invested some \$72 million on a dedicated terminal for a Chinese shipping company, this investment will guarantee that the company continues to use the port for the next ten years. Seattle, by the way, is the main port for Chinese imports. And it sometimes works the other way around; the Chinese shipping company Cosco is considering investing \$664.3 million in developing a container terminal in Hamburg, which handles more cargo from China than any other European port. This would follow on from a major investment in the port of Antwerp, Belgium by the shipping company.

Container ships are getting bigger, 8000 TEU vessels are in production, and there is talk of 10,000 and 12,000 TEU constructions. These giant ships are effecting changes in the ports industry, producing hub and spoke systems. Due to the size of these ships (a recent design for an 8000 TEU ship measured 338 metres in length and had a breath of more than 46 metres) only certain ports can accommodate them. For example, Rotterdam would be a hub port and other European ports would be spoke ports, which means that when a 8000 TEU ship arrives at Rotterdam smaller ships will come from other ports bringing containers to be loaded on it and, if necessary, take containers from it back to the smaller ports. The hub and spoke system demands a high level of synchronization between the ports and the various vessels. In Europe Bremerhaven and Hamburg have installed giant cranes with the reach to unload ships with a breath of 46 metres so they can become hub ports. This sort of investment does not guarantee that ports will win such business, though. The giant logistics companies and shipping consortiums will not be tied to old loyalties, just because a shipping line has always traded between Liverpool and New York it doesn't mean it will continue to do so. If a logistics company controlling a supply chain can save money and/or time by shipping from Bristol instead of Liverpool it will do so. Its only loyalty is to its shareholders.

In terms of road freight there are plans a foot to modernize the old Silk Road. A meeting in Shanghai in April of 2004 approved plans for an 87,500-mile network of motorways, bridges and ferry routes connecting Asia and Europe. There are some 32 countries involved in developing the project. Which is, in fact, an update of a plan drawn up in 1959 that fell foul of cold war machinations. Many of the roads are already built, but many will require extensive improvements to meet international standards in time for the scheduled completion in 2010. China, alone, is planning to build 10,000 miles of new highways in addition to modernising some 7000 miles of existing roads. The system will connect South Korea with Turkey, Bhutan with Bulgaria and Finland with Sri Lanka. Japan has covered most of the preliminary costs; its construction industry will hope to gain contracts from the project. It is proposed to raise the necessary finance through public-private partnerships, with the World Bank and the Asian Development Bank being major players in the process.

The impact of Information Technology (IT) upon logistics and supply chains is immense and I will now try to outline how it works. The most successful companies use IT systems that allow all the participants in a supply chain to access the information needed to keep flows moving along the supply chain. An example is the information hub model, this instantly processes and forwards all relevant

information to all appropriate parties. The hub is a node in the data network where multiple organizations interact in pursuit of supply chain integration. It has the capabilities of data storage, information processing and push/pull publishing. The overall network forms a hub and spoke system with the participants internal information systems being the spokes. An analogue to the information hub in the physical logistics world is 'cross docking', a process in which products from multiple supply sources arriving at a logistics hub are sorted in accordance to the needs of destination points. They are then delivered to the destination points without being stored at the hub. In a similar fashion, the information hub allows critical supply and demand data to be 'cross-docked' and seamlessly forwarded to the right partners at the right time. These global companies to control their costs and revenues have developed in-house banking systems and payment factories. According to a report by Killen and Associates, a company with \$1 billion in revenues can waste as much as \$32 million annually through inefficient working capital and processing functions. It is not surprising therefore, that businesses are increasingly focusing on reducing idle cash and rationalising processes. These financial set-ups operate like a hub and spoke system as I understand it, but I don't understand them well enough to go into detail. I'm still trying to get my head around it.

Cross docking is a warehouse management technique that can significantly reduce storage and handling costs; a study of the food service supply industry in 2000 estimated that cross docking could save the industry \$830 million. In cross docking, incoming goods are identified at receiving and immediately routed for outbound shipping, without being placed into warehouse storage. Cross docking does not work if materials can't be identified quickly and accurately, making bar code and RFID use essential for the operation. Mobile bar code label printers are especially valuable for the process. Shipping and receiving workers equipped with mobile computers, bar code scanners and label printers can receive inbound shipments, log them into the host warehouse or inventory control system with the mobile computer, then immediately generate a bar code shipping label with the required cross dock information using the mobile printer, which may be mounted to a forklift truck or worn on a belt or shoulder strap. Some mobile printers can also connect directly to wireless LANs to manage communication between the host system and the warehouse worker.

RFID can also facilitate efficient cross docking, incoming pallets or cartons with smart labels can be automatically routed for cross docking or delivery directly to the manufacturing line because the fast reading capabilities enable instant identification of the shipping container plus all the of the individual items inside. For shipping on, RFID readers can help packers quickly locate and aggregate all the items needed to complete the load. Cross docking combines receiving, putaway and shipping operations to minimize product handling. Each of these traditional steps can also benefit by identifying materials with bar code or RFID. For traditional receiving applications, a bar code label on incoming shipments can be scanned to record the item's arrival. Manifest data or information from an Advance Ship Notice (ASN) electronic data interchange message can be included on the label in a 2-D barcode or smart label to provide more detailed shipping information. Shipment identification information can be forwarded to the warehouse management system, typically over a wireless LAN, which records the arrival, updates inventory records and provides putaway instructions to the receiving worker. In this way all materials are tracked automatically and accurately. And so are the workers. UPS has just announced the introduction of a new generation of driver hand held computers to 'aid efficiency and fuel consumption.'

Globalisation requires the movement of goods and people at ever greater volume and speed and at lower cost. These demands of global capital impose severe strains upon workers in the various sections of the logistics industry. Truck drivers are forced to work beyond the legal hours limit; seafarers work in horrendous conditions under the flags of convenience system and dockers see the return of casual labour and are subjected to work speeds that are set by automated guided vehicles (AGV's), automated stackers and semi automated cranes. The deteriorations experienced by these workers are mirrored in

the air, rail and warehousing sections of the industry.

The road transport sector is growing rapidly, yet liberalisation to increase competition in the market has caused road transport workers everywhere to suffer deteriorations in terms and conditions of employment. After trucking was deregulated in the USA there was an enormous increase in low-cost carriers, all non-union firms. The competition led to low wages, long hours and unsafe conditions for truckers. The term 'Sweatshops on Wheels' was coined to describe the situation. In Western Europe trucking companies have been able to cut costs by using truckers from Eastern Europe, where salaries and other social costs can be ten times lower than in countries like Germany. The German company Willi Betz now mostly employs drivers of Turkish, Belarussian and Bulgarian origin, and its 8000 trucks are mostly registered in Eastern Europe. A recent ruling in the USA has opened the door for Mexican truckers to bring cargo across the border. Apart from speeding up the movement of containers it reduces labour costs and raises questions about the health and safety of the Mexican truckers. The leadership of the Teamsters Union has been campaigning against letting in the Mexican truckers, seeing it as a threat to their members. The Mexican workers are paid about twenty percent of the going rate in the USA. Some teamsters have been arguing for joint work with the Mexican workers and unions. The ruling by the Supreme Court is for the NAFTA regulations on cross border trucking to be adhered to. NAFTA rules allow trucks to deliver goods from Mexico or an international port to a specific US location, then return to Mexico, they cannot shuttle goods between American cities. Under the Supreme Court ruling the only factor that can be considered in blocking the cross border movements of Mexican truckers is safety. In recent years, perhaps in anticipation of the ruling, American trucking companies have been buying in to their Mexican counterparts

World trade is expanding at such a rate that there are labour shortages in many areas of the logistics industry. A recent conference of industry bosses lamented significant congestion resulting from labour shortages in the ports of Los Angeles and Long Beach. They saw the need for increases in the number of longshore workers, both registered and casual, with the increase in casual almost out numbering the registered by two to one. Their calls for these increases came six months after the International Longshore and Warehouse Union (ILWU) had called for the same thing. Shortages of truckers and train drivers in this present year are expected to impact on port operations.

Air cargo is another section of the logistics industry that is seeing radical change being brought about by the JIT demands of capitalism. Airfreight is used to move high value and time sensitive commodities. The amount and value of goods being moved by air is growing, Boeing predicts that cargo volumes will grow at an average of 6.4 per cent per year for the next twenty years. That would make air freight the fastest growing sector in the logistical field. In terms of the value of goods JFK airport moves more than the Port of Los Angeles.

The driving forces behind changes in the air cargo industry are the major passenger airlines and the logistical giants like UPS, DHL, TNT and Federal Express (FedEx). The big airlines are forming alliances amongst themselves to expand their cargo business at the same time as developing cooperation agreements with logistics integrators like UPS and DHL. In a relatively short time the integrators have become very large airlines. FedEx owns 640 planes and UPS runs 622. By 2019 it is estimated the integrators will control 44% of the airfreight business. In anticipation of this trend Airbus has started to develop a new super air freighter, the A380F, to enter service in 2008.

Airports in many countries are being privatised and some of them are looking to become regional cargo hubs. This means that they are investing in warehousing and logistics facilities in order to become intermodal centres. That is a place where a container can be swapped from one transport mode to another quickly. Amsterdam's Schiphol airport aims to become a 'mainport' juncture of European air, road and rail freight traffic. Montreal aims to become 'the logistics centre for both maritime and

air cargo logistics.’ Huge investments in cargo and logistics facilities are being made at almost every international airport in the world.

The growth in air cargo combined with increasing reliance on air transport by global manufacturers has led to the development of special logistics airports: Liege and Ostend in Belgium, Lyon and Chateauroux in France and Nashville in Tennessee. Ex military air bases are also being converted into specialist freight airports. These airports have encouraged logistics companies to set up their hubs at their sites. When TNT Express Worldwide chose Liege as its European hub cargo traffic at the airport shot up from 35,000 tonnes to 280,000 in three years. In the USA the Southern California Logistics Airport (SCLA) is one of the new airports exclusively geared to logistics. It is a 5,000 acre multi-modal complex which integrates manufacturing and office uses with a dedicated international air cargo airport, a rail service and a trucking hub. This model is being followed elsewhere. The Beijing Airport Logistics Zone was opened in 2002.

SCLA has become a major hub for SwissGlobal Cargo, which is a joint venture between Panalpina, a container shipping line, and SairLogistics, the cargo subsidiary of Sair Group. This company flies in tonnes of electronic goods and garments from China for redistribution to global manufacturing corporations in North America and Europe.

The growing importance of airfreight is not only affecting the make up of airlines and the development of airports, it is also being used to bring pressure on legislators for change. The integrators are fighting to extend liberalisation of international transport on several fronts simultaneously, and they have the backing of their customers, the global manufacturers. They have developed sophisticated and well-funded lobbying machines and, according to the Polaris Institute, FedEx and UPS are among the top contributors to political party funds in the USA. Express delivery and logistics companies have also been at the forefront of lobbying for port liberalisation and rail liberalisation in Europe. In terms of airfreight they are increasingly frustrated at being tied into an aviation regulatory regime shaped by the needs of the passenger carriers. They have operated a concerted campaign through the Organization for European Co-operation & Development (OECD) to pressure ICAO to create a separate set of regulatory standards for airfreight. They are also fighting for increased influence in the WTO.

The massive changes that have and are taking place within the logistics industry have produced a plethora of bourgeois experts and theorists; they inhabit university business schools and state organizations such as the EU, the World Bank and the WTO. They can also be found on the Internet; just key in logistics management or supply chain theory on Google and a whole lot of them will come tumbling down. The reason for this is that capital is pouring huge amounts of financial and intellectual capital into the management of the supply chain and its integral parts, particularly logistics. The concerns of such people are with the smooth running of the supply chains, there is little or no concern with the situation of the workers who keep the bloody thing turning.

Which leads me on to the unions and their take on the world of logistics. The main global trade union organization involved with the logistics industry is the International Transport Union Federation (ITF), it contains the majority of unions organising in the industry. I will draw on ITF documents for this section. The ITF believes that the constant demand for lower costs and greater speed within the industry as the volume of world trade increases ‘has led to indecent work standards’. It feels that there is a danger of employers using something similar to the flags of convenience system in other sectors of the industry. In fact it used the slogan ‘Ports of Convenience’ as a rallying cry in the fight against the European Commissions directive on market access to port services, which was published in February 2001. The draft directive provided for ‘self handling’, which would have allowed shipping lines to employ seafarers on cargo handling activities while the ship was in port. Alternately the ship owners

and the terminal operators could choose to hire non recognised dockers from employment agencies or other sources of labour supply. According to the ITF the result of such a directive would be a deterioration of health and safety standards and an increase in the use of casual labour. The dangerous standards of the flags of convenience system would then spread to the landside operations of European ports.

The Ports of Convenience dispute gives us an opportunity to look at how an organisation like the ITF organizes. Initially the ITF, through its European arm the ETF, argued about the wording of the directive. It then took issue with a request to complete a questionnaire, demanding more time to consult with affiliated unions before a formal response was made. At the first official meeting with the Commission the ETF asked for the references to self-handling to be removed, this request was ignored, although the ETF believed it had received assurances on the matter during the meeting. The unions condemned the consultation as totally inadequate.

The ETF then started to focus on taking action to defeat the directive. It highlighted the issue of self-handling and the possible creation of 'ports of convenience'. This was intended to establish common ground between the various ports. The ITF dockers section secretary stated 'We need to mobilise big actions against specific issues.' As the campaign to win backing for action started the individual unions affiliated to the ETF lobbied their national governments. The unions still seem to have a belief in the old Western European tripartite approach to industrial problems. Now while this system may still be in place in some countries of the EU it is under increasing pressure from global capital. The distance between China and Europe cannot be shortened, but the time to cover it can. Tripartite discussions slow processes down, and the role of the state in terms of logistics is to facilitate the movement of commodities and raw materials inside and across its borders. The rigidity that is organised dock labour will be attacked because it represents an impediment to the cycle of accumulation.

The actions taken by the dockers under the control of the ETF consisted of strikes, one in January 2003 involved more than 20,000 dockers across the EU, and stop work meetings at ports around the EU. These were supplemented by demonstrations in Brussels while the European Parliament's transport committee made its final deliberations on the directive. Another demo took place outside of the main entrance of the Parliament in Strasbourg about a month later; this was attacked by the police using water cannons, tear gas and smoke bombs. Large demonstrations took place on the 29th of September 2003 in Rotterdam and Barcelona, the latter organised by the International Dockworkers Council (IDC). The IDC is, as I understand it, a new organisation outside of the ITF, although members may be in unions that are affiliated to the ITF.

The directive was defeated in the European Parliament on the 20th of November 2003. The vote was 229 against the directive, 209 in favour and 16 abstentions. The respite for the dockers was a short one, in June 2003 the EU transport commissioner, Loyola de Palacio, announced her intention to reintroduce a directive on ports; the directive was presented last October. The new document attempts to extend cargo handling to the regular seafaring crew, as well as to unregistered, land-based staff hired by the shipowners.

As the above shows, the pressures on logistics workers in the EU and other parts of the globe, for that matter, are not going to go away. The role of the WTO is to facilitate the continuous movement of the cycle of accumulation, and its General Agreement on Trade in Services (GATS) allows the private sector to invade the public sector. In other words, the needs of capitalists to shorten the time needed to produce and consume a commodity and the desire of logistics companies to get their hands on public sector utilities such as ports, railways and the various sections of the air transport industry means that logistics workers are faced with a number of problems, how to fight against state attacks like the one

described above and how to organise within the global giants of the logistics industry. The security situation post September 11th 2001 has also posed problems for workers in the logistics industry, and the Madrid bombing confirmed that transport is exceptionally vulnerable to terrorist attack. Extra responsibilities are being placed on workers to be vigilant, to be more security conscious, to be, in effect, front line security guards. At the same time the state is implementing measures that invade the privacy of workers in the industry and, in some cases, restrict their movements. The right to shore leave for visiting seafarers has been affected by the actions of some states, including the US. The American state has said it will not recognise this right, which is enshrined in the International Labour Organisation Convention No.185. The Canadian governments application of the International Ship and Port Facility Security Code shows how extensive the states checks on workers are. The police and security services will check for known or past associations and criminal records and, in addition, financial checks will be carried out in order to ascertain if a worker is prone to being induced. Fingerprints and photographs will be taken, in some countries biometric technology is used. The information gathered will be shared with other foreign intelligence agencies. If a worker refuses to undergo security clearance he or she will be sacked. The ITF has found that the implementation of the code has limited their inspectors ability to spot-check flag of convenience vessels due to the requirement to seek an invitation in advance of the inspection.

During the Liverpool docks dispute in the late 1990s the workers went to other countries to try to win support for their struggle, and though ultimately they were defeated they brought together port workers from around the globe, organising two international conferences that convened in Liverpool. I believe that the communications taking place between rank and file dockworkers in the European ports at the moment are a result of those conferences in Liverpool. The ITF has acknowledged that during the 'ports of convenience' dispute this was taking place. In a document released a couple of years ago the ITF recognised the inevitability of such organising by rank and file workers. With the technological means at their disposal why should workers leave cross border organising to union bureaucrats? Have they started to organise along the supply chain is, perhaps, the question we should be asking. Because of JIT and low inventories global capital leaves itself vulnerable to attack. The lockout of the American West Coast longshore workers a couple of years ago threw suppliers and retailers in to a panic, as cargoes lay idle on the quayside. The truckers' disputes in the American ports produced a similar reaction more recently. In recent weeks seafarers from Britain Belgium and France blockaded French ports in protest at the use of low waged Chinese and East European workers on the cross channel ferries. They called for parity of wages for all seafarers; this dispute will probably continue to run. Threats to the supply chains are a matter for serious consideration by global companies, General Motors has a war room in the States, the purpose of which is to monitor the movement of goods along their supply chains and to react quickly to any problems that arise, be it a dispute in a suppliers factory or a hold up at a Chinese port due to bad weather.

The logistics industry's largest service providers continue to expand the range of services they offer to their customers and they continue to enlarge their businesses through acquisitions, geographic expansion and organic growth, and not forgetting good old-fashioned price increases. 2004 was a tremendous year for the third party logistical companies (3PLs) like Exel and Kuehne + Nagel; the top 25 3PLs earned \$97 billion compared to \$79 billion in 2003. These 25 now account for nearly 30% of all logistics outsourcing expenditure worldwide. Just about every major manufacturing and retail company relies on the logistical giants to expedite the movement of raw materials and commodities. As companies focus on their core competencies the importance of 3PLs continues to grow. And as supply chains become more complex the levels of investment needed to keep the IT infrastructures up to date keep increasing. Some small and medium sized logistical companies are finding it difficult to cope in this area and so the Exels' of the logistics world grow bigger and stronger. The complexity of supply chains is perhaps understood by the fact that Wal-Mart has over sixty thousand suppliers on their books; imagine trying to coordinate commodity movements on their behalf.

To conclude; the complexity and geographical spread of supply chains combined with JIT and low inventories makes capital vulnerable to attack. The continuing growth in world trade and the developing labour shortages in the logistics industry should put the working class in a strong position to mount such an attack, but it is still on the back foot. In my opinion the particular composition of the class that is starting to become visible within the world of logistics is a harbinger of troubles to come. In the past the distinction between blue collar and white collar workers in the industry was clear, but today that is changing as the discipline of the production line is imposed throughout the supply chain and IT allows workers to carry out functions that were previously the business of the office staff. And it is IT that can be the vehicle for organising throughout the industry. The open ended communication systems being developed to coordinate supply chain integration offer opportunities to workers for cross company and cross border dialogue. And studies indicate that workers are not slow to take the opportunity. A study by UCLA found that 60.7% of employees visit the web for personal use and one by International Data Corporation estimated that 30% to 40% of employee internet use is not work related. And it is estimated that 60% of hacking attacks against a company originate within the organisation. Furthermore, a survey of 15,000 workplace computers found that 20% had file-sharing software installed illicitly. Just as the mass worker of the Fordist production system learned to use the factory's technology against the imposition of work the logistics worker will, I believe, do the same. But what will be the response to the struggles that spring forth? When I worked at Fords in the seventies groups like Big Flame leafleted regularly, in fact, when there was a struggle going on they would be there daily. Their leaflets were a source of information to counteract the company's propaganda. In a factory of 14,000 workers operating three different shift systems they helped us to find out what was going on. Now I know it is a little bit difficult to leaflet trucks as they hurtle down highways and the same goes for air and rail freight too, but, in my opinion, we do need to engage with the world of supply chains. That is why I feel there is a need for a workers inquiry, a need for those of us within the movement to engage with workers in the largest industry in the world.

You might not agree with my political viewpoint, but I hope this piece has given you a better understanding of the world of logistics.

APPENDIX... Wal-Mart has become involved in the logistics industry as a provider of dedicated logistics parks in Europe. These parks, of which there are about thirty, provide retailers and manufacturers with crossdocking and intermodal transfer facilities coupled with state of the art global communications systems. The parks operate under the name Gazeley and are managed by ASDA, Wal-Mart's British subsidiary. Given the companies anti union stance logistics workers in Europe should be on their guard. And how long before the company starts opening up such sites in the US of A?

As the giant logistics companies spread out across the globe they need to find the real estate on which to establish their facilities. Estate companies exist to facilitate such expansion, the biggest being ProLogis. In their own words they are...

As a worldwide owner, manager and developer of distribution and light manufacturing facilities, ProLogis operates on a global level, while providing unmatched service and expertise within local markets throughout North America, Europe and Asia. Whether a customer wants to establish a presence in Portland or Paris, the ProLogis portfolio of distribution facilities can meet any real estate or logistics need.

At the very foundation of every customer solution is the ProLogis Operating System ®. This unique structure is based on the seamless integration of four groups of professional and highly experienced individuals - all working toward the same goal of providing the highest level of customer service.

- The Global Services Group is responsible for providing the world's largest users of distribution and light manufacturing space with a single point of contact to access the broad range of solutions offered

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