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Chapter 1: Operations Management in Transportation

1. Introduction- An Overview

Objectives:

1. Introduce the concept of transport operations management.
2. Understand the historical background of operations management.
3. Examine the principles of operations management in transport.
4. Define the role of transport operations management in logistics.

The management of transport operations encompasses aspects of the logistics chain and is at the heart of the entire service enterprise. The practice may be viewed as a science in itself focused on the process inputs resulting to desired outputs thereby satisfying customer requirements.

(*Translogix Transport Paper .2013*)

1.1 Transport operations defined
1.2 The transport field
1.3 Transport management defined

2. Background and History of Operations Management

Operations Management is the forebearer of transport operations management. The principles used in the manufacturing industry are still relevant and useful in the successful management of transport operations.

2.1 What is operations management in transportation?
2.2 History of operations management practices
2.3 Evolving technologies and concepts from USA and Japan

The management of transport operations encompasses aspects of the logistics chain and is at the heart of the entire service enterprise. The practice may be viewed as a science in itself focused on the process inputs resulting to outputs thereby satisfying customer requirements.

3. Key Drivers of Change in Transport Management

Factors such as increasing or decreasing loads, competition, changing customer behavior, more and newer technologies and better ways of doing business are the key drivers of change in Transport Operations Management.

The key drivers in transport operations include:

- Changes in work practices
- Changes in customer behavior
- Changes in technology
- Increasing or decreasing workloads

4. Today's Challenges to Transport Operations Management

The uncontrollable and controllable variables and challenges in transportation are the very magnet of transport practitioners like you and me. Never has transport operations become so complex and volatile than today. The transport practitioner or manager faces multi-faceted challenges and a lapse or neglect of any one could mean failure. Focusing on a combination of short, medium, and long range goals should put day-to-day routines in order.

Some of these challenges are stiff competition; changing customer behavior; government regulations; natural calamities; option to outsource; human factor; fuel and related costs; process automation and other technologies; Clean Air Act- GO GREEN initiatives; port congestion and other port issues; and safety & security issues.

Peculiar factors like the geography or local terrain would dictate on how transport strategies are to be formulated.

Figure 1-1
(Courtesy of Asian Marine Transport Corporation, Philippines)

Deployment of more roll on-roll off ships across the Philippines archipelago poses a growing challenge to the Philippine Ports Authority to expand and upgrade existing port infrastructure and related facilities. *(Philippine Ports Authority General Manager, Juan Sta. Ana)*

Conclusion:

The uncontrollable and controllable variables and challenges in transportation are the very magnet of transport practitioners like you and me. Never has transport operations become so complex and volatile than today.

References:

1. Christopher Ahoy (2008), Customer-driven Operations Management
2. Cristina Callaway (2004) Operations Management
3. Prof. Anna Nagurney, University of Gothenburg (2012): Theoretical Perspectives in Contemporary Business Administration Research

Chapter 2: Management Principles Applicable in Transport Operations

Objectives:

1. Learn the principles for effective transport operations management.
2. Examine specific principles in operations management.

The principles in the successful management of the enterprise applies to Transport Operations just the same. In context, transport operations would use micro processes focused on the execution of pick-up, delivery, monitoring, and servicing in general.

2.1 Six Sigma

- Reduce process cycle time
- Reduce pollution
- Reduce costs
- Increase customer satisfaction
- Increase profits

2.2 ISO 9000 QMS

- Customer focus
- Leadership
- Involvement of people
- Process approach
- Systems approach to management
- Factual approach to decision-making
- Continual improvement
- Mutually beneficial supplier relationships

2.3 Kaizen 5+2- the 5'S

- Sort or organize
- Straighten or streamline
- Shine or clean-up
- Standardize
- Sustain
- Safety
- Security

2.4 Ergonomics

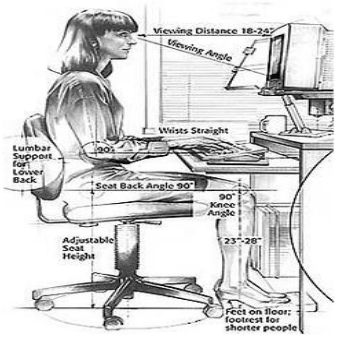

Figure 2-2
(Courtesy of International Ergonomics Association)

Conclusion:

The principles applicable in the successful management of the enterprise applies to Transport Operations just the same. In context, transport operations would use micro processes focused on the execution of pick-up, delivery, monitoring, and servicing in general.

References:

1. Wikipedia on Operations Management
2. Total Quality Management by Peter Drucker and Tom Peters
3. Business Re-engineering by Michael Hammer (1993)

Chapter 3: Role of Transport Operations Management in Logistics

Objectives:

1. Examine the role and functions of transport management in logistics.
2. Understand the impact of transport operations in multimodal transport.

Transport Operations is at the heart of customer fulfilment that without it there is no logistics at all.

3.1 Functions of Transport Operations Management

3.1.1 General transport operations functions

- Booking order
- Documentation
- Execution of the service: pick-up and delivery

3.1.2 Planning for movement

Elements of an Operating Plan

1. Name of Customer:
2. Service or handling procedure:
3. Scope of work:
4. Operational work flow by departments:

(includes elements of the service contract)

5. Other specific handling instructions:
6. Commencement / Validity dates:
7. Conforme or agreement signed by the customer

3.1.3 Risk management

Fleet Services as part of the Risk Management review identified a number of risk sources for the company and these risk sources are:

1. Business practices
2. Economic conditions
3. Environmental management
4. Financial operations
5. Natural hazards and disasters
6. OHS related risks
7. Corporate indemnity
8. Property loss
9. Public liability
10. Statutory compliance

The risk assessment process identifies credible risks, the likelihood of the risks occurring and the consequences should the risk eventuate.

2. Multimodal Transport in Perspective

The choice in the mode of transportation would depend on customer specifications but which is actually based on the value of the goods, its perishability, manner of handling, and the speed to market.

The transport mode mode selection criteria would include:

a. speed
b. reliability
c. flexibility that the mode exhibits
d. comparative unit costs, which the modes incur

MODE / CRITERIA	ROAD	RAIL	SEA	AIR
Relative speed	Moderate	Moderate	Slow	Very high
Reliability	Good	Good	Limited	Very good
Cost per tonne/km	Medium	Low/medium	Low/very low	High
Flexibility	High	Low	Low	Medium
Other considerations	Extensive network	Limited and fixed infrastructure	Restricted network	Limited network
	Short and medium distances e.g. Europe/Middle East. From a neighbouring country to operation site Internal transport; Short/medium distance	Large consignments. From port of discharge to inland operation site (warehouse). Ecological.	Large quantities; Less urgent; Pre positioning phase; Second phase; Long distance with no time constraint.	Emergency phase; Expensive goods; Fragile or perishable goods; Cold chain; No alternative option; Small shipments; e.g. diplomatic pouch; Long distance with time constraint.
Advantages	Relatively fast; No transhipment; Direct delivery; Flexible; Cost.	Economical; Large loading capacity; Range and speed (in most countries).	Economical; Large loading capacity; No restriction on loading capacity; Cheap.	Fast; Reliable; Limited losses; Direct; Easy tracking and tracing.
Disadvantages	Roads may be dangerous (land mines) or blocked (rainy season); Sometimes, driver's nationality or vehicle registration not acceptable	Difficulty finding freight cars; Delays; Transhipment; Inflexible; Tracking.	Slow; Transhipments at ports; Use as a second means of transport for large volumes; Higher theft risk in the port; Not flexible.	Expensive; Restricted to journeys between airports; Restricted loading capacity (dangerous goods, size of shipment, weight, fuel, size of packages, etc.).

Figure 3-3

Conclusion:

The essential role of transport operations management can not be overemphasized in the multimodal carriage of goods across boundaries. Careful planning and proper execution are key elements in every facet of any transport operations.

References:

1. UNESCAP on Introduction to Multimodal Transport

Chapter 4: Some Practical Methodologies, Tools, and Techniques

Objectives:

1. Understand the methods, tools, and techniques applicable in transport operations management.
2. Provide management tools for the transport operations manager

Concomitant to various challenges we face, there are many available methods, techniques, and tools available to the transport manager. Careful and skillful use of these tools would aid in decision-making thus resulting to better service to the customers.
Some of these are:

- QMS Tools and techniques (ISO and Six Sigma)
- Ergonomic methods
- Ishikawa Diagram
- Time and motion analysis
- Systems analysis

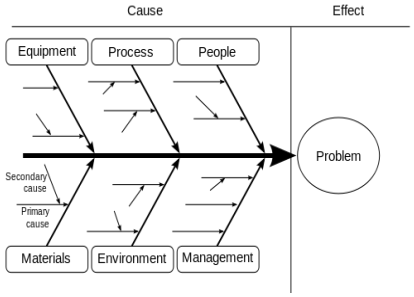

Figure 4-4 Ishikawa "fish-bone" Diagram
(Courtesy of Wikipedia)

References:
Kevin Johnston for Ameriprise Financial
Prof. Anna Nagurney, University of Gothenburg Fall 2012: Theoretical Perspectives in Contemporary Business Administration Research

4.1 Measuring Efficiency and Effectiveness

Unless an organization learns to measure the desired outputs one cannot expect to improve the inputs. Measuring effectivity and efficiency is our gauge if we are working in the right direction.

- Efficiency Formula

$$\eta = \frac{\text{Work Output}}{\text{Work input}} \times 100\%$$

- Effectiveness :

  In determining the most suitable mode of transport, you may consider using mode of transport or freight cost as your X axis versus speed of delivery and quality of delivery as your Y. This approach will help you realize if your "means" leads to an expected and better "end" or achievement of the company's goals or objectives.

  Does hiring more staff result in more satisfied customers? Will this change in process result in better customer satisfaction and speed up decision-making? Questions like these should help in determining whether a particular course of action is effective or not.

  Unless an organization measures the desired outputs one cannot expect to improve the inputs. Measuring effectivity and efficiency is the gauge of our actions and decisions.

4.2 Focus on Process and People

People are the best asset any company has. However, they have to be qualified and skilled for the job required even in view of overwhelming developments in automation. On the other hand, focusing on work processes help us make better transport decisions and provide avenues for improving if not overhauling the existing system. This section will discuss the following:

- A process flow chart example:

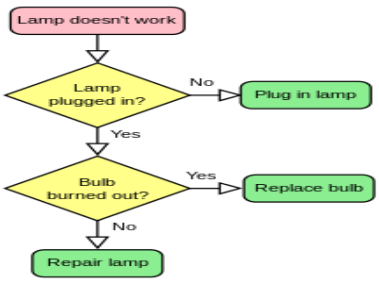

Figure 4-5

Competencies of the Transport Manager

- JOB KNOWLEDGE
- PERFORMANCE: SKILLS
- PERSONAL: ATTITUDE, LEADERSHIP

The ideal transport team should have the following attributes:

- Speed
- Complexity (Technical Skills)
- Creativity
- Organizational Learning
- Single Point of Contact To Promote Order and Follow Through

Conclusion:

FEDEX once embraced the slogan: People, Service, Profit. We cannot overemphasize the critical role of people in any business or activity even in view of overwhelming developments in automation and industry. On the other hand, work processes have to be improved internally and aligned to customer expectations.

With the right tools and techniques, the transport operations team should be able to deliver efficiently and effectively.

References:

1. American Society of Mechanical Engineers (1947) ASME standard; operation and flow process charts, New York, USA

Chapter 5 : Introducing Transport Management Systems

Objectives:

1. Learn the function and technology of transport management systems.
2. Understand the role of TMS in transport operations management.

A transport management system is at the core of any transport enterprise whether you operate your own fleet or not. TMS technologies and practice provide traceability of cargo and data visibility by any mode of transport.

- Fleet management system defined
- Features of a TMS
- Emerging technologies for TMS

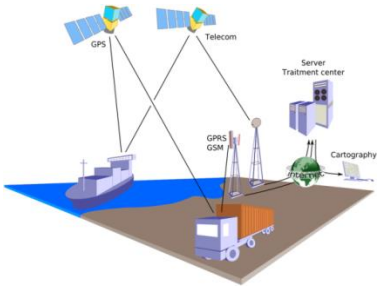

Figure 5-6
(Courtesy of Energy Saving Trust, City of London, United Kingdom)

Fleet Management is a function which allows companies which rely on transportation in business to remove or minimize the risks associated with vehicle investment, improving efficiency, productivity and reducing their overall transportation and staff costs, providing 100% compliance with government legislation and many more. These functions can be dealt with by either an in-house fleet-management department or an outsourced provider.

Functionalities of a TMS:

1. Planning and decision-making
2. Transport execution
3. Follow-up
4. Measurement and follow-through
5. Coordination and communication: external and internal

Route Planning in TMS:

- The number of calls to a particular delivery point in any single day is limited.
- The total vehicle travel in any day is limited and the driver's time is limited.
- Vehicles have a fixed carrying capacity.
- Volume of goods for each delivery point is known and each drop has a location for which there is an established driving time to and from the warehouse or to the next delivery point.
- The quantity of goods delivered to any drop is smaller than the vehicle's carrying capacity and there is an established time to deliver/collect at the drop point.

Green Fleet Issues

The issues covered by green fleet management change over time, but will always include:

- Managing fuel consumption.
- Reducing mileage.
- Driver education.
- Promotion of energy efficient vehicles.
- Use of cleaner fuels.

Conclusion:

TMS is at the core of any transport enterprise regardless whether you operate your own fleet or not. TMS technologies and practice provides traceability and visibility of cargo being shipped by any mode.

References:

1. Aurora Energy Fleet Service (2011) A Paper on Fleet Service Management
2. Energy Saving Trust E&OE TE89 Green Fleet. UK.2003

Chapter 6: Sustainable Transportation

Objectives:

1. Emphasize the significance of sustainable transport in the management transport operations.
2. Develop awareness in implementing "green" transport initiatives.

Sustainable transport refers to the broad subject of transport that is or approaches being sustainable. It includes vehicles, energy, infrastructure, roads, railways, airways, waterways, canals, pipelines, and terminals. Transport operations and logistics as well as transit-oriented development are involved.

Transportation sustainability is largely being measured by transportation system effectiveness and efficiency as well as the environmental impacts of the system.

Let us look at them more closely:

- Reducing mileage
- Managing fuel consumption
- Driver education
- Equipment fit for the purpose
- Promotion of energy efficient vehicles
- Green fleet management
- Stakeholders in transport operations

Dimension of Sustainability	**Definition of a Sustainable Transport System**			
	Accessible	**Safe**	**Environment-Friendly**	**Affordable**
Economic and financial	•			•
Asset condition	•	•	•	•
Social equity	•	•	•	•
Health		•	•	
Ecology			•	
Physical environment		•	•	
Air quality and noise		•	•	
Climate		•	•	

Figure 6- 6
(Courtesy of Asian Development Bank)

Green Fleet Management

Green fleet management goes far beyond just glancing at the fuel bills: it has to be a part of the corporate culture to run cars and vans efficiently and cost-effectively.

A green fleet is one that does its best to minimize fuel consumption and exhaust emissions. It will also seek to minimize the amount of traffic it generates, by utilizing vehicles efficiently, by using alternatives to the car wherever possible and by conducting its business so as to minimize the need for travel.

Green fleet will also be a safe fleet; its drivers will be trained, encouraged to drive safely and efficiently and not put under pressure to do excessive hours behind the wheel. It will choose vehicles with safety in mind – not just that of the occupant but also of other road users.

To better appreciate initiatives in transport sustainability, we need to be aware of the stakeholders who can be affected in the process:

- Company and its shareholders
- Shippers and consignees
- Third party service providers
- Government agencies
- Environment
- Community or society in general
- Port authorities and handlers

Conclusion:

There was no need worry about the environment before the introduction of machines running on different types of fuel. And yet population explosion and the detrimental effect of human behavior not to mention harmful emissions from mobile and stationary industry sources have constrained us to do something decisive and fast for the next generations.

References:

1. Asian Development Bank(July 2010): Sustainable Transport Initiative Operational Plan
2. www.transportenergy.org.uk
3. Prof. Anna Nagurney, University of Gothenburg(2012): Theoretical Perspectives in Contemporary Business Administration Research

Chapter 7: Guidelines on Outsourcing

Objectives:

1. Learn the criteria in deciding on whether to outsource or not.
2. Provide guidelines in outsourcing and choosing the right service provider.

Third Party Service providers or 3PL providers have never been more relevant than ever before in our present way of doing business. Enterprises realize that in order to survive in today's market and stay competitive, they need to focus more on their core competencies thus the need to outsource non-profit and non-core functions to 3PL's who can do a better job in logistics and transportation.

Factors to consider in the selection of third party service providers:

- carrier characteristics and capacity;
- proven efficiency;
- timely delivery;
- known integrity, reputation and reliability;
- responsiveness to urgent needs of the organisation (if previously contracted);
- financial viability and adequate insurance to cover costs of providing the service;
- adequate communication systems to facilitate tracking of the vehicle;
- assets to safeguard cargo;
- presentation of timely reports and correct invoices
- necessary technology for tracking , visibility, and reporting

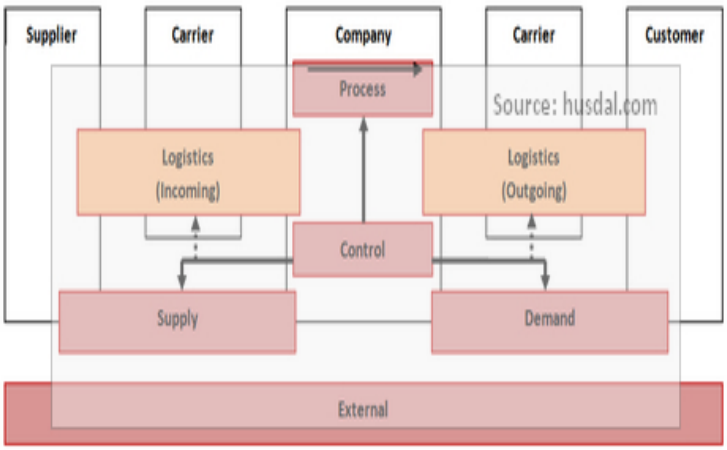

Figure 7- 7
(Courtesy of A Study on Challenges of Outsourcing, Germany)

References:

1. Ansari, Al, & Modarress, Batoul (2010) on Outsourcing Logistics

Chapter 8: Some Pointers

Transport operations management revolves around best practices solutions on efficiency and effectiveness which should result in both the acquisition of new customers while retaining existing customers. Furthermore, the right working attitudes and values would go a long way in the successful management of transport operations.

Let us look at some of them:

- Solutions, not excuses
- Collaboration not division
- Teamwork is key!
- Proactive not reactive
- Better safe than sorry
- If you think safety is expensive, try accident!

"Be better today than you were yesterday and better tomorrow than you are today – this is a requirement, not a nicety." -

The 5 pillars of organizational excellence:

- Process management

"If you don't have your process controlled, its output is a matter of luck."

- Change management

"Handling change is the biggest problem that most organizations face."

- Project management

"Processes define how we operate. Projects are the way we improve our processes."

- Knowledge management

"When a person dies, a library is lost. Knowledge takes us from chance to choice."

- Resource management

"Even the best ideas need resources to transform them into profit."

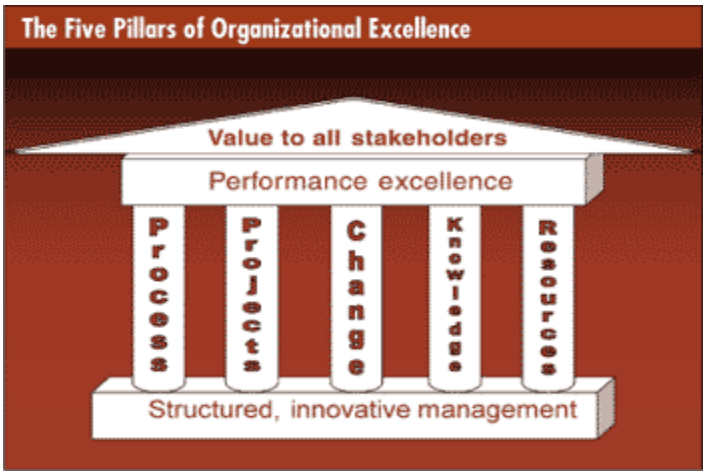

Figure 8-8
(Courtesy of J. Harrington, Harrington Institute)

Conclusion:

Business paradigms like Six Sigma, 5S, and other quality management concepts provide frameworks on which transport operations management or management in general can learn from. What is important is that organizations benchmark with best practice solutions and emulating or even creating what is best suited to their organization.

References:

1. H. James Harrington (2003) on "The Five Pillars of Organizational Excellence"

Chapter 9: Summary

1. Transport operations management is a complex combination of work skills and job knowledge plus the right attitude to ensure consistency in the routine delivery of services.

2. TMS and various technologies are now available to improve and support transport operations.

3. Good people management is essential in successful transport operations management.

4. Sustainable transport is the corporate responsibility of the operator to the environment and generations to come.

5. Transport solutions should be designed to maximize operational efficiencies and minimize costs; streamline processes; and provide a competitive advantage to your business.

6. Good is no longer good enough. To survive in today's competitive environment, you need to excel.

Developed and prepared by: Abraham "Abe" Asuncion

Manila, Philippines

Chapter 10: Case Studies

1. A freight forwarder arranges for pick up of a shipment of fresh cut flowers from an exporter for transfer to the airline within the same day. Upon arrival at destination, consignee claims cargo was damaged. How would you have handled it better?

2. Transport manager instructs truck driver to use Route 1 from Point A to Point B. But bad weather caused floods and roadblocks along the way. While truck was stalled in traffic, driver calls the office for further instructions. How will the transport manager handle the situation? How could he have prevented this incident?

3. A customer complained about the late delivery of his cargo. The goods were also received wet and cartons were dented. What caused the problem? How will the transport manager resolve the situation?