INTRODUCTION TO LOGISTICS SYSTEMS

(Ghiani - Laporte - Musmanno, Chap. 1)

Logistics: DEALS WITH PLANNING AND CONTROL OF MATERIAL FLOWS AND RELATED INFORMATION, IN PUBLIC AND PRIVATE ORGANIZATIONS

The aim: TO TAKE DECISIONS (e.g. HOW AND WHEN RAW MATERIALS SHOULD BE ACQUIRED), BY SATISFYING A GIVEN SET OF CONSTRAINTS (e.g. A BUDGET CONSTRAINT) WHILE OPTIMIZING A CERTAIN PERFORMANCE MEASURE (e.g. MINIMIZING THE TOTAL COST)

Context:

- MILITARY CONTEXT: SUPPLY OF TROOPS WITH FOOD, ARMAMENTS ... AND TROOP TRANSPORTATION

- CIVIL ORGANIZATIONS : PRODUCTION AND DISTRIBUTION IN FIRMS

- PUBLIC ORGANIZATIONS : SERVICE MANAGEMENT (e.g. GARBAGE COLLECTION, MAIL DELIVERY ...)

RELEVANCE OF LOGISTICS : VERY IMPORTANT IN MODERN SOCIETIES (e.g. THE TOTAL LOGISTICS COST INCURRED BY USA ORGANIZATIONS IN 1997 WAS HIGHER THAN THE OVERALL USA EXPENDITURE IN SOCIAL SECURITY, HEALTH SERVICES AND DEFENSE !)

HOW CAN WE DEFINE A LOGISTICS SYSTEM ?

IS MADE UP OF A SET OF "FACILITIES" LINKED BY "TRANSPORTATION SERVICES", WHERE :

- FACILITIES : SITES WHERE MATERIALS ARE PROCESSED (PRODUCED,

STORED, SOLD, CONSUMED ...); THEY INCLUDE MANUFACTURING CENTRES, WAREHOUSES, DISTRIBUTION CENTRES (DC), TRANSPORTATION TERMINALS ...

- TRANSPORTATION SERVICES: DENOTE THE MOVEMENT OF MATERIALS BETWEEN FACILITIES (USING VEHICLES AND EQUIPMENT), AND ARE DEPICTED AS DIRECTED ARCS

FACILITY FACILITY

< SEE SOME EXAMPLES AT PAGES 2 / 3 >

SUPPLY CHAIN: THE SET OF FACILITIES AND TRANSPORTATION SERVICES IS CALLED SUPPLY CHAIN; IT MODELS THE COMPLEX LOGISTICS SYSTEM WHERE RAW MATERIALS ARE CONVERTED INTO FINAL PRODUCTS AND THEN DISTRIBUTED TO THE FINAL USERS