STRATEGIC DEVELOPMENT OF
INTEGRATED PORT INFORMATION SYSTEM
IN INDONESIA

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ABSTRACT

Indonesian Archipelago consists of a thousand islands and a hundred ports, big and small ports. Each port takes an important role in providing cargo flows and movements in Indonesia, including import and export.

Some of these ports were managed by an authority called Pelabuhan Indonesia or PELINDO, owned by the government and covers all strategic ports in Indonesia. In General, Indonesian Archipelago was devided in 4 (four) regions and all ports in that region are responsible to the PELINDO, so we have PELINDO I, II, III and IV.

This paper will focus on the development of an Integrated Port Information System, build in each Port Authority (PELINDO I to IV) and connected each other. This system cover also the Information System Development in the Ministry of Communications (MoC) and Directorate General of Sea Communications (DGSC).

1. BACKGROUND

The Development of Database in the Ministry of Communications (MoC Database) is in progress. Some reports has been prepared (MoC,1994) (MoC,1995) (MoC,1996) (MoC,1997) and also some softwares and hardwares, supporting the system.

In General, MoC Database could be devided into 3 (three) groups, according to the mode of transport i.e. Land Transport Database, Sea Transport Database and Air Transport Database (see figure 1).
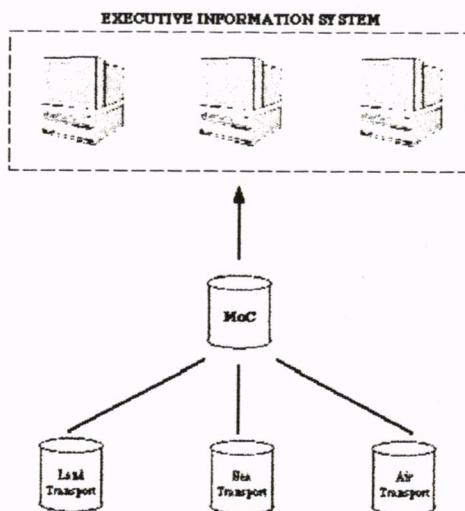

Figure 1. Ministry of Communications Database according to the mode of transport

All the datas are processed in MoC Database and the product or output, will be produce in the form of "Executive Information System" (EIS).
This system (EIS) could be presented in the statistical reports and also in the computer network (INTRANET).

According to the "Management Information System" (MIS) theory (Kroeber, DW., *et al*, 1990), there are 3 (three) levels of MIS i.e. (see figure 2).

- MIS level 1 : Strategic Planning
- MIS level 2 : Management Control
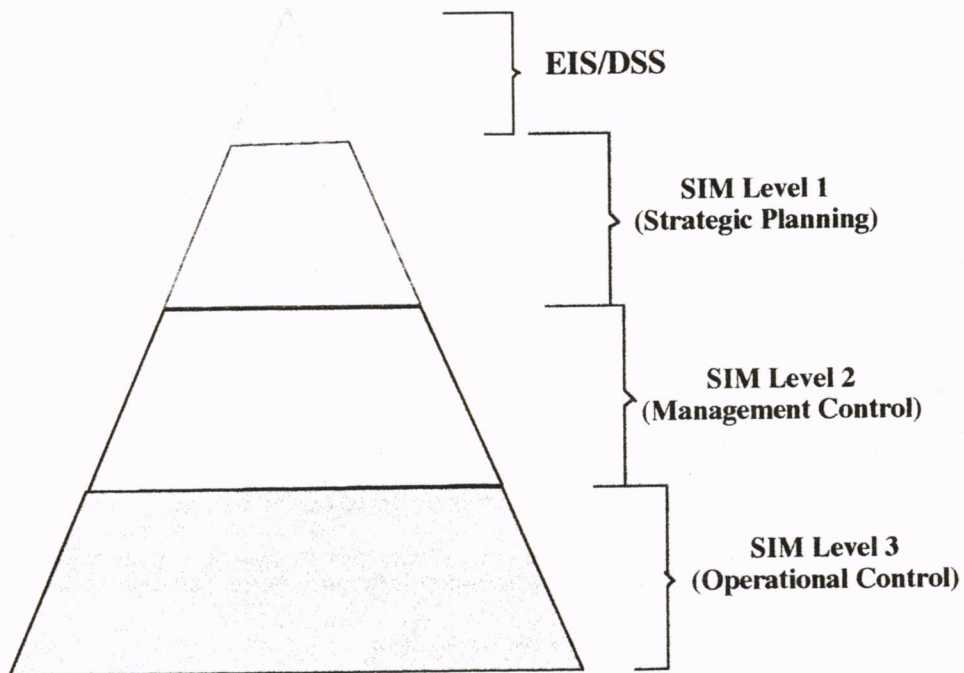- MIS level 3 : Operational Control

Figure 2.   Management Information System Triangle

On the top of MIS triangle, we found : EIS and DSS (Decision Suport System).

At the moment, the Data and Information Center (PUSDATIN) of MoC, focus on the development of MIS level 2 (Management Control) and EIS (Executive Information System).

The actual MoC Database could be devided in 5 (five) Databases, based on data types and clasifications (see figure 3).

a. Operational and Traffic Database

Operational and Traffic Database is a combined structured data from transport sector including Land, Sea and Air transport.

INTRANET

ISP

Report

Database Server   Web Server

Printer

Modem

Operational
And Traffic
Database
- Monthly
- Annually

Six Related
Sector Database
Finance
- Tourism,Postal and
- Telecommunications
- Trade & Industry
- Minning
- Agriculture
- Logistic Agency

Project Monitoring
Database

Infrastructure
Database
- Airport
- Port

SIMOPPEL
Database
- Indonesian Port I
- Indonesian Port II
- Indonesian Port III
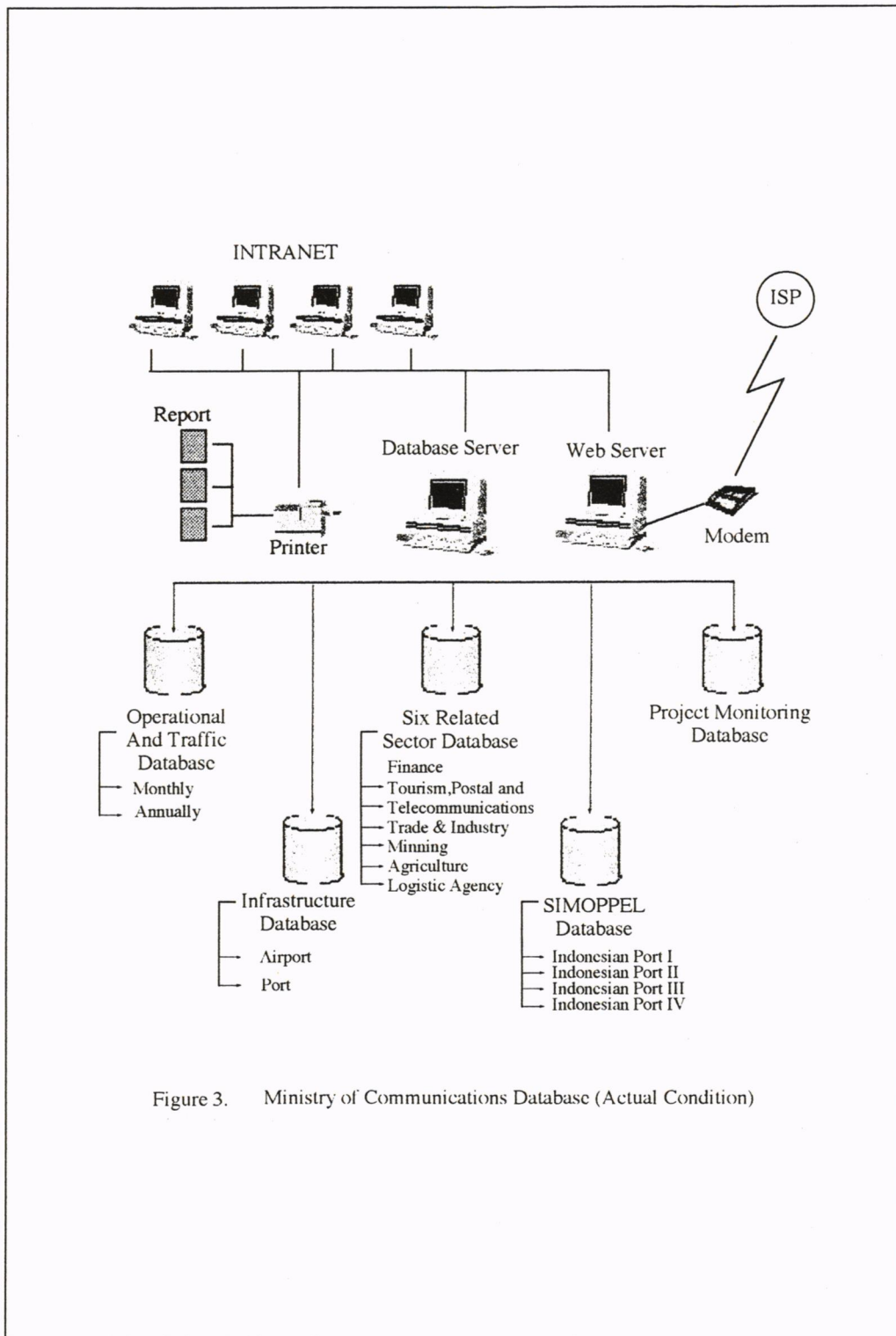- Indonesian Port IV

Figure 3.   Ministry of Communications Database (Actual Condition)

These data is collected monthly from operational observation in site by each State Owned Company, ie. Land, Sea and Air Transport Subsector State Owned Company.

b. Infrastructure Database

Infrastructure Database consist of collected data, graphical and numerical data, from infrastructure built by Ministry of Communications. It included Sea Transport Infrastructure and Air Transport Infrastructure.

This Database contain Port and Airport drawings with supported data for existing condition and also future plan.

c. Six Related Sector Database

The Six Related Sector Database is a combined structured data from 6 (six) sectors that quite related in Transport Sector.

The data is coming from : Ministry of Finance, Ministry of Trade and Industry, Ministry of Tourism, Postal and Telecommunications, Ministry of Agriculture, Ministry of Energy and Minning and "BULOG".

d. Port Operational Information System Database

The Data for Port Operational Information System (SIMOPPEL) Database come from SIMOPPEL first level reports, sent by each PELINDO every month. Further descriptions about SIMOPPEL will be discussed in the next chapter

e. Project Monitoring Database

Project Monitoring Database consist of collected data every month from MoC's project progres report, funded by "APBN" (Government Budget).
The data were collected from 27 province Project Leader Report and received, processed and then combined into the database form.

2. PORT OPERATIONAL INFORMATION SYSTEM

Port Operational Information System, called SIMOPPEL, was set in the late of 1992 and is a part of Sea Transport Database.

This system is devided in (3) three levels, ie. level 1, 2 and 3, where each level has certain characteristic and data coverage.

The aim of SIMOPPEL are to unite the meaning of data and information and to create a uniformity in collecting technique, data processing, report setting and evaluation and port operational analysis .

This system can be classified into 5 (five) subsystems i.e.:

   a. Information on Ship Arrival, called Traffic Data, in Unit and GRT, reported monthly and yearly.

   b. Information of Bulk Cargo Flows, Import and Export, either Regional and International Movement in Tons and cubic-meters.

c. Information on Container Flows, either Regional and International Movements, in Box, TEUS and Tons.

d. Information on Port Performance, including : Services performance for ships (i.e. Waiting Time, Turn Round Time), performance for container terminal, performance cargo loading/ unloading (Regional and International).

e. Information on Port Facilities Efficiency, i.e. Bert Occupancy, Yard Occupancy, Storage Occupancy and Equipment Utilization.

The SIMOPPEL are processed semi-manually, that is : inputted manually, processed by computer in each Port Branch Office, and printed as a monthly report to the Port Main Office. Using the same procedure, the Port Main Office publish the SIMOPPEL report every month and send it to the MoC cq. PUSDATIN and DGSC cq. Posko SIMOPPEL. Actually the Sea Transport Database doesn't exist yet.

The existing procedure of data processing for SIMOPPEL was shown on Figure 4. So, all Port Branch Offices process the data using PC Computer, produce the report and send it to the Main Office. After that, the Main Office compiles all report, produce the "consolidated" report and send it to the MoC and DGSC.

Regarding the actual data processing for SIMOPPEL, we can say that the data are processed manually and there is no Computerized Database in the DGSC Office and also in the Port Main Office.

Although some Database study has been published but their implementations is still facing many problems.

3. PROPOSED AN INTEGRATED PORT INFORMATION SYSTEM

Regarding the actual data processing for SIMOPPEL, it's clear that the Computerized Database takes the first priority to be implemented, either in the DGSC office, Jakarta and in the Head Office of PELINDO I to IV.

Once these Databases have been built, the communication system could be set up directly, and the computer networks for SIMOPPELwill be exist.

The proposed computer networks is shown in Figure 5, and the brief description is :

a. The actual procedure for SIMOPPEL should be re-evaluated; the formats, data processing, and reporting procedure.

b. Establish the Port Operational Database in the Head Office of each PELINDO and provide also with "Internal Local Area Network" using INTRANET and INTERNET.

c. Establish the Sea Transport Database in Directorate General of Sea Transport, Jakarta, particularly for Port Operational & Performance Monitoring.

d. Establish an Integrated (Computer) Network between MoC Database, Sea Transport Database (DGSC) and SIMOPPEL Database in the Head Office of PELINDO (I to IV), using INTRANET and INTERNET provider.
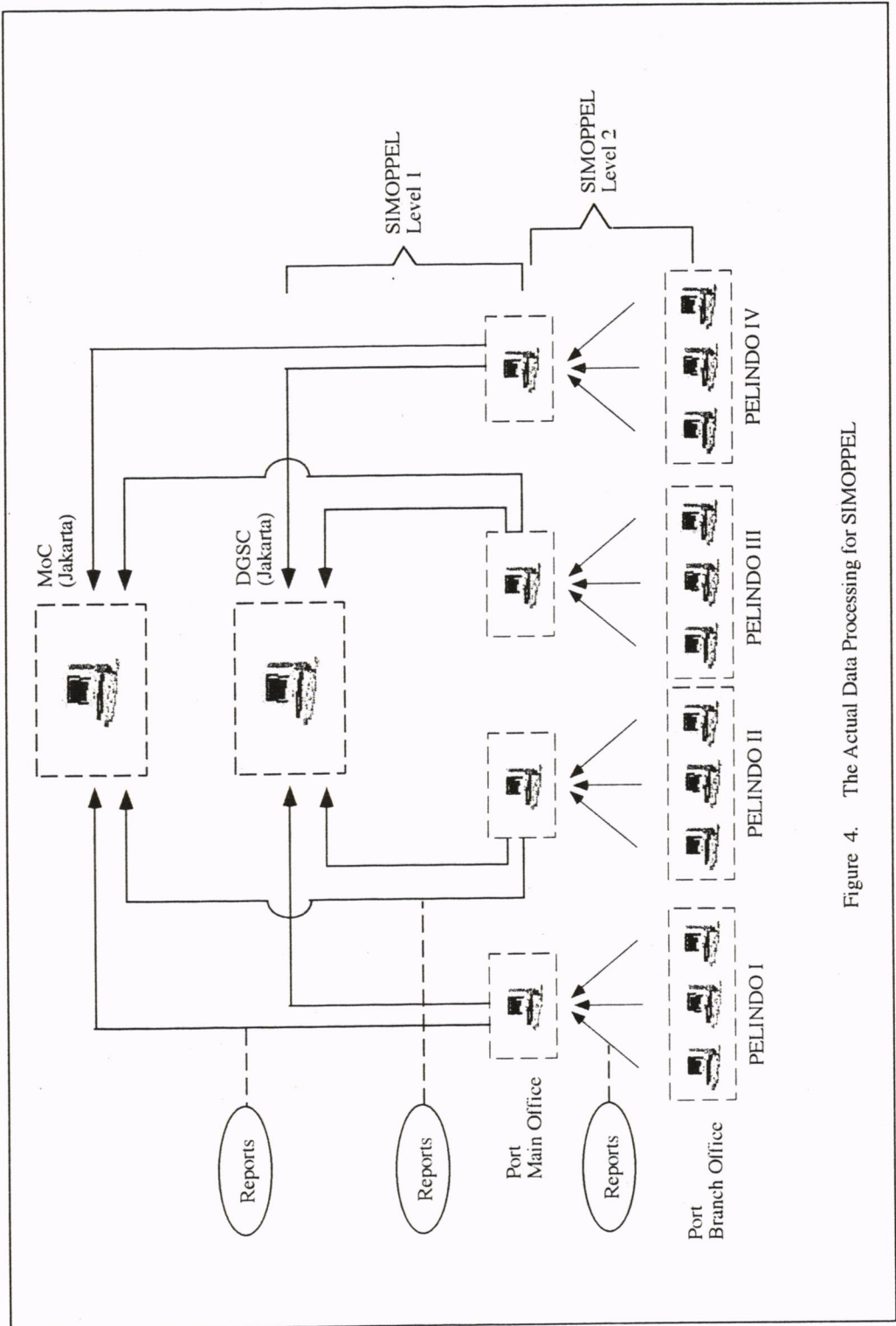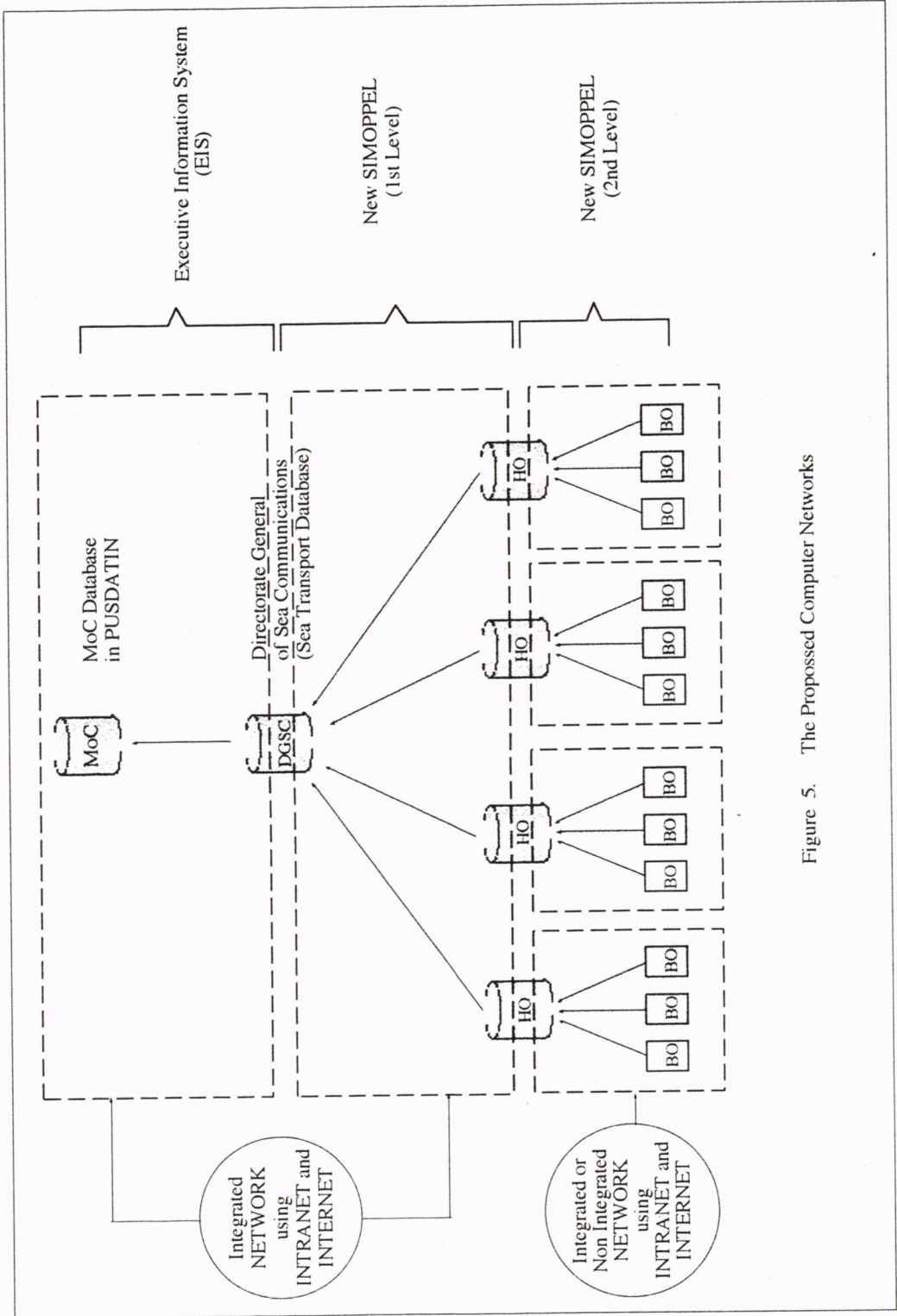
Figure 4.   The Actual Data Processing for SIMOPPEL

Figure 5. The Propossed Computer Networks

4. CONCLUSIONS

Considering all the brief analysis of actual condition of data processing for SIMOPPEL and the proposed integrated network system, we can conclude that :

a. The SIMOPPEL plays an important role for monitoring the port operations and performances in Indonesia.

b. The data processing for SIMOPPEL should be improved, using Computer Database and Computer Networks (INTRANET), either in each PELINDO and between PELINDO's.

c. An integrated Computer Network between MoC Database, Sea Transport Database and PELINDO Database should be established in near future, in order to implement to concept of "Ministry of Communication System and Database", with the aid of INTERNET provider.

d. Before that, a comprehensive study, considering all the actual condition, must be launched and to prepare a "Master Plan" of the development of Port Operational Information System in Indonesia.

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