Chapter 5

Information System Implementation

This chapter described the network topology, software and
hardware which are installed in the network on intranet
platform. Since it is dealing with huge data collection and
real time problem solving. It also concerns with day-to-day
issues which affects to the requirement in data analysis by
engineering group, management base activities and management
decision-making. The workflow diagram added, will explain
users how to solve problems by linking such information shown
in the model.

5.1 Network Topology

In production area of HGA products, all electric testers
locate in the clean room. HGA performance data of every HGA
flows from these electric testers to the application server,
whose these 2 models installed via untwisted pair cable.

However, these electric testers can be relocated frequently
This depends on the volume requirement of the products.
Consequently, the users' stations, (the front line
technicians) are also affected. Even for the office employee,
the layout is changed frequently as well, based on
organizational changes. Therefore, the HGA operations use the
star network topology is used according to the dynamic
environmental changes.

The star network topology has several advantages. First, the
file servers act as the center in collecting data from
electric testers whereas users can monitor the information
anytime. Second, if workstations are added or removed, it is
not necessary to restructure the existing system. Also, if a

workstation fails, it will not affect to the system or any other workstation.

Figure 5.1 shows the physical network diagram of these 2 models including the electric testers connected.
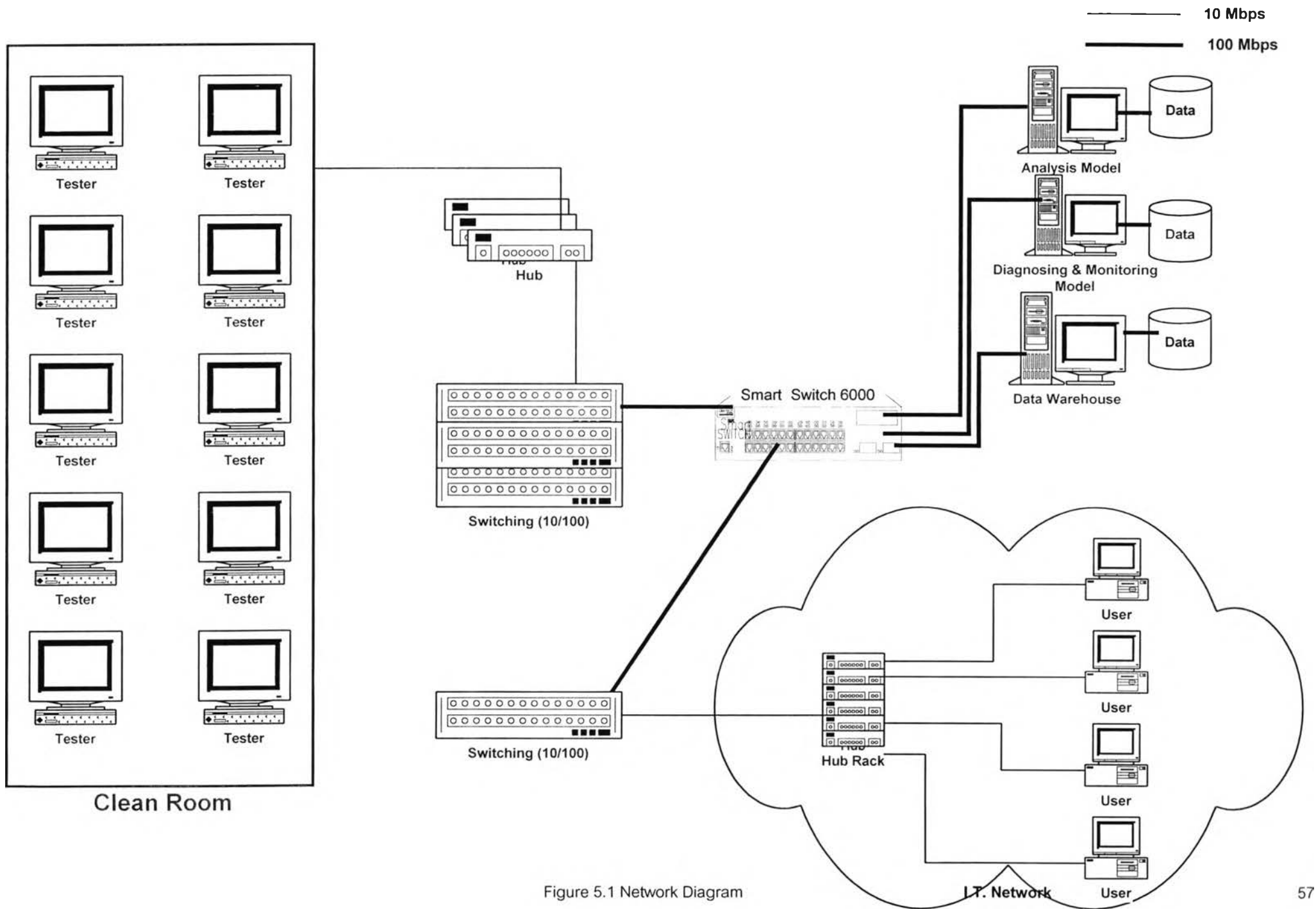
Figure 5.1 Network Diagram

5.2   Hardware and Software

The hardware and software of these 2 models; analysis and
diagnosing & monitoring models can be summarized in the table
of figure 5.2 below. The models are installed on EISWEB,
which is easy for users to access anytime. It has a data
transfer rate 100 mbps via untwisted pair cable.

	Analysis Model	Diagnosing and Monitoring Model	Users
Hardware			
• Mocroprocessor	Pentium-II	Pentium-II	Pentium-II
• RAM	128M	128M	>=32M
• LAN CARD	3Com	Intel	3Com
• Monitor	VGA	VGA	VGA
Software	Visual Basic	JAVA	
Operating System	Window NT	Window NT	Window 95

Figure 5.2 Software and Hardware

5.2.1   Microprocessor:

1) Analysis Model: use 1 Pentium-II 300 MHz CPU with
   128M RAM to service all tasks and this server is PC
   based.

2) Diagnosing & Monitoring Model: use 2 Pentium-II
   300MHz CPU with 128M RAM because this real-time
   system need more powerful server to support real-
   time transactions which flow to it more than 800,000
   transaction per day.

3) Client/Users: normally use standard configuration PC
   of IT department that is update beyond current
   technology and almost are Pentium-II 266 or 300 with
   32M RAM.

5.2.2 RAM:

1) Analysis model: use 128M RAM because the current version requires this amount of RAM. However, in next version which calculate engineering data analysis may need 256M RAM minimum to support heavy load of calculation per users requirement.

2) Diagnosing & Monitoring model: use 128M RAM with first release and was upgraded to 256M RAM after we put more calculation about Wafer analysis in decision making model.

3) Clients/Users: use 32M RAM as minimum specification according to standard configuration of IT department. Some PCs require more RAM and upgraded to 64M depend on how much heavy routine and calculation on that workstation.

5.2.3 LAN CARD:

1) Analysis model: use 3Com as the ready setup in Dell computer that we use for generates analysis server. This NIC is the Fast-Ethernet 10/100.

2) Diagnosing & Monitoring model: use Intel because we use hardware of Intel and this network card ready setup in this server. This network interface card is the Net-Intelligent 10/100.

3) Users: use 3Com because it is already setup in Dell computer, standard configuration PC from IT department.

5.2.4 Monitor:

VGA monitors.

5.2.5 Hard Disk:

1) Analysis model: use 8 GB hard disk. This database is roll up from big database and keeps 2 months of data.

2) Diagnosing & Monitoring model: use 27.3 GB hard disk to retain all raw data for 2 days to support real

time information. It also retains 2 months of
manipulated data.

3) Users normally use 2.1 GB hard disk as the standard
configuration of PC from IT department.

5.2.6   Software:

1) Analysis model: visual basic software is used
because the local programmers are familiar with it.
Also, it provides fast response in graphic mode.

2) Diagnosing & Monitoring model: JAVA is used due to
the local developers are familiar with JAVA.

5.2.7   Operating System:

Both analysis model and diagnosing & monitoring model use
Window NT for Operating System platform because it is most
popular technology for server level. Window NT is easier to
setup, manage and it works well with SQL server, which are
both products of Microsoft. The selection of operating system
will scope the direction of programming tools and other
component in system development. Almost real-time system uses
Window NT and SQL server to create database to support high
throughput transaction environment especially in production
environment of HGA products.

5.3   Operating Mode

On the diagnosing & monitoring model, its operating mode is
reported hourly to support the real time problem solving
approach. It supports diagnosing approach by analyzing
whether it is the internal or external problem. If it is the
external problem, the front line takes no action but engineers
require further analysis, which can be supported by the
analysis model.

The analysis model is more suitable for reporting shiftly,
because more data is required in analysis and decision making.

The weak point of this model is that it cannot react to real time according to the high technical knowledge required and complex correlation between dimensions in wafer and slider to HGA test performance. Besides, there is no system at wafer and slider sites to support the real time action approach. However, there is a plan to develop to that level which is being discussed in the high management level team in the corporate group.

5.4   Workflow Diagram

The workflow diagrams developed specify the relationships among objects in two ways. First, a hierarchical relationship to solve problems is organized. Second, they specify how to communicate each other within organization through messages. As shown in figure 5.3 and 5.4, the two workflow of both diagnosing & monitoring model and analysis are drawn. They specify the relationship of activities, reports and organization. He or she then solves problems by linking such information to problems occur.
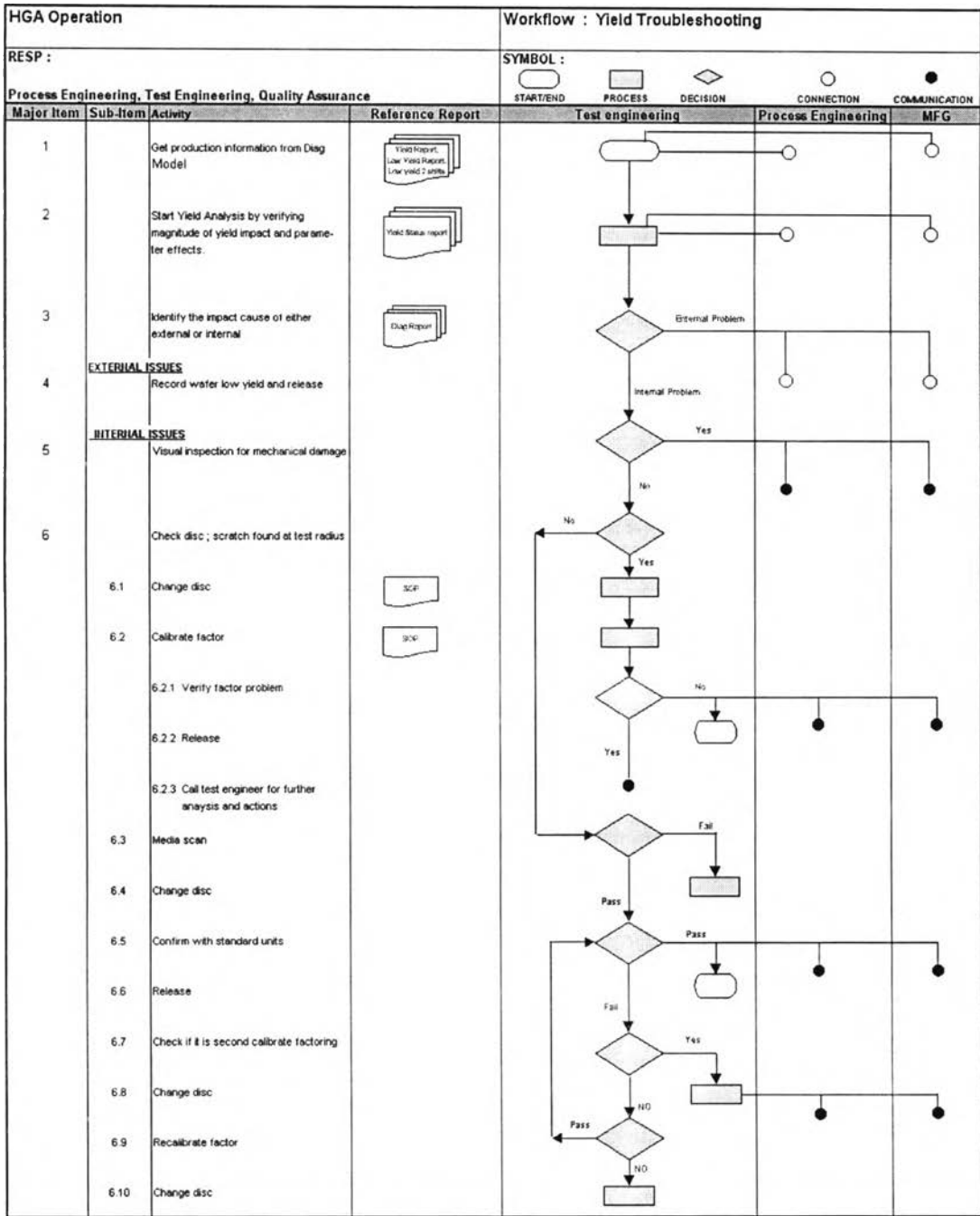
Figure 5.3 Workflow Diagram for Yield trouble shooting
Of Diagnosing & Monitoring Model

HGA Operation

				Workflow : Yield Analysis

RESP :

Process Engineering, Test Engineering, Quality Assurance

SYMBOL : START/END PROCESS DECISION CONNECTION COMMUNICATION

Major Item	Sub-Item	Activity	Reference Report	Process Engineering	Test Engineering	Quality Assurance
1		Get production information from database	Quick Sheet or Daily Analysis			
2		Start Yield Analysis by verifying magnitude of yield impact and parameter effects.	Quick Sheet or Daily Analysis			
3		Identify the impact cause of either external or internal	Summarized analysis Report			
	INTERNAL ISSUES					
	3.1	Study assembly cell number effected	TMWI Report			
	3.2	Study tab type concerned	Yield Analysis Report			
	3.3	Verify tester number	Tester Analysis Report			
	3.4	Verify factor lot changed				
	3.5	Replace with new factor lot				
	3.6	Verify media lot changed				
	3.7	Replace with new media lot				
	3.8	Confirm with standard units				
	3.9	Verify APTI/AMP/PTR changed and most correlate to yieldand impacted parameters				
	3.10	Feedback to slider or wafer plant				
	3.11	Change disc				
	3.12	Confirm with standard units				
	3.13	Check hardware, software, optimization of testers per SOP of the applicable product	SOP			
4	**EXTERNAL ISSUES**					
	4.1	Verify material type	TMWI Report			
	4.2	Inform design group				
	4.2	Study wafer code identification	Yield Analysis Report			
	4.3	Verify wafer and slider process which most correlate to impacted parameters				
	4.4	Feedback to wafer or slider plant to take corrective action				
	4.5	Perform SAT PLOT and Optimization for possibility of yield improvement				

Flowchart labels: External Problem, Internal Problem, yield drop on some testers, yield drop across the board, Yes, No, Yes, No, Pass, Fail, Fail, Pass, Evaluation, Reclaim, Prime

Figure 5.4   Workflow Diagram for Analysis Model