

CHAPTER III



METHODOLOGY

Refer to *Hammer and Champy (1993)*, this thesis applied the reengineering process in 4 steps; Team Selection, Current situation, Redesign. and Implementation.

3.1 Team Selection

Changing an organization needs team work, both at the top and within the project teams working on the objective. After management level commits the necessary of reengineering, they set the conference that was clearly made to organize that company was suffering, and would not survive if it did not change. Therefore, several people were selected to work on the team.

The reengineering team was setup which includes:

1. Service manager (Team Leader)	1	person
2. Service centre expert	2	persons
3. Service engineer	1	person
4. Computer staff	1	person

- **Team Leader** (Service Manager)

As the team leader, his job is to facilitate the entire project. He plans the detail and control the resources and the team members to ensure the project deliver to plan. He is a connection cross functional department and responsible for reengineering plan.

- **Team Members**

Process team members were selected from employees who normally work somewhere along the process to be analyzed. It picks process team members from any involved departments. Process team members are employees with good knowledge of the entire process and the ability to critically review and analyze the process.

- **Rules for the Teams**

1. Management support must be absolute. If the management does not support reengineering team, the team will fail.
2. Every one on the team is equal; there are no superiors, bosses, etc.
3. Every Team member agrees to eliminate all waste that they uncover.

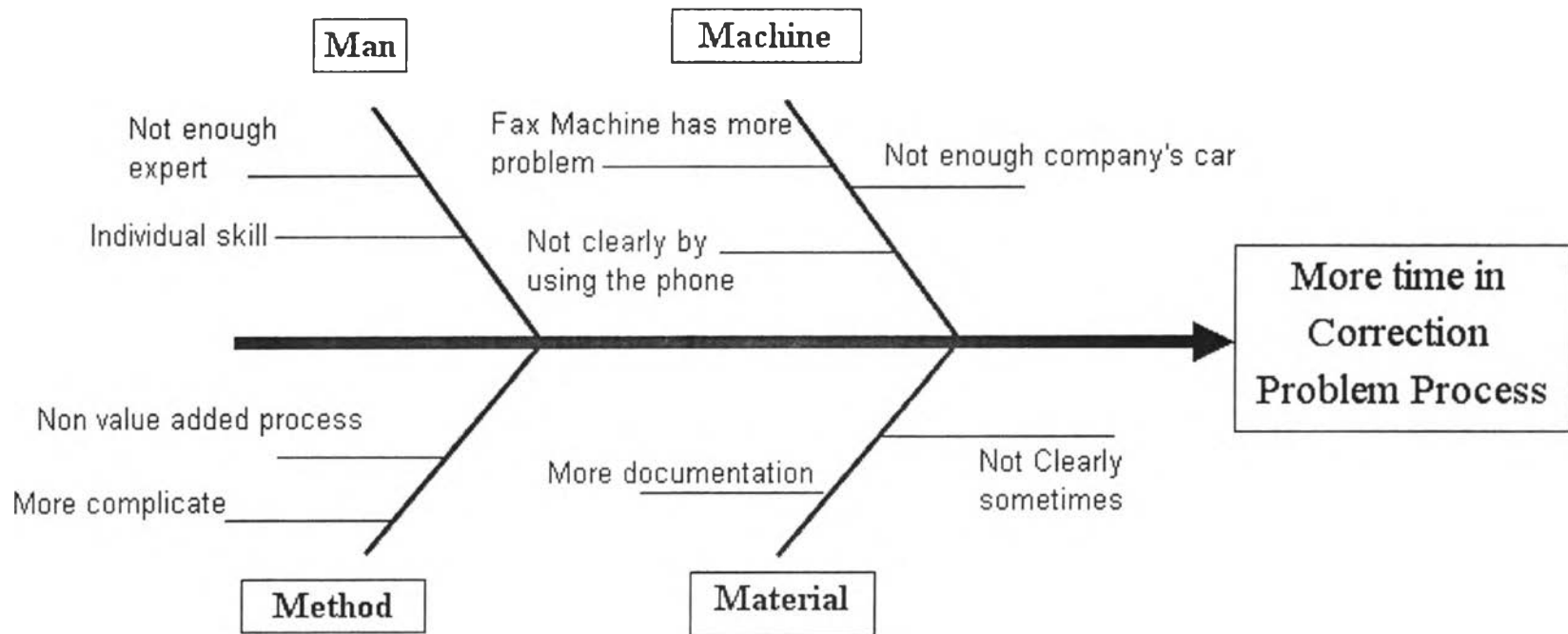


Figure 3.1: Causes and Effects Diagram

Table 4.2: Solution of the Cause & Effect

Categories	Problem Observed	Consequences	Possible Solution
Man	<ol style="list-style-type: none"> 1. Individual Skill 2. Inadequate Expert 	<ol style="list-style-type: none"> 1. Experts have specific skill. Even though they have strong basic skill but they all have individual experience. Some has more electrical system skill, some has more engine skili, etc. 2. Due to there are just 8 experts to take care all of dealer around the country, the problem seem too much for them. If some was sent to upcountry, the left has more duty to handle with. Sometime there was no expert in the centre. 	<ol style="list-style-type: none"> 1. Training all experts in all suspects of problems forward to new system. They must have profound knowledge that can be assist and train to the technician of dealer. 2. Provided the new system which can reduce the load of their job.

Table 4.2. Solution of the Cause & Effect (cont'd)

Categories	Problem Observed	Consequences	Possible Solution
Machine	<p>1. Fax</p> <p>2. Telephone</p> <p>3. Company's car</p>	<p>1.1 It takes too much time to get the data.</p> <p>1.2 Unclear data due to contaminate ink or mechanic problem</p> <p>1.3 Missing of some document because sometimes so many data transfer from several dealers to the fax machine simultaneously.</p> <p>2.1 Due to there are limits of telephones so it is hard to connect to the centre in prompt when all the phones were used.</p> <p>2.2 There are no depict in the phone consequently sometimes unclear or mistake data maybe happen.</p> <p>3. Due to there are limits of company cars and they can be borrowed by others department sometime service centre has to wait for the car.</p>	<p>1. Avoid transfer the data of Technical Report via fax machine.</p> <p>2. Choose the other way to communicate which can be easy to connect and picture available.</p> <p>3. Provided the car belong to service centre only.</p>

Table 4.2: Solution of the Cause & Effect (cont'd)

Categories	Problem Observed	Consequences	Possible Solution
Method	1. Non value add process	1.1 Wait for manager permission 1.2 Lost time in travel 1.3 More expenses such as fuel cost, over time fee, etc.	1.1 Give expert the power to have decision by themselves 1.2 Try to fix the problem right in the first time receive problem from dealer.

Table 4.2: Solution of the Cause & Effect (con'd)

Categories	Problem Observed	Consequences	Possible Solution
Material	<ol style="list-style-type: none">1. Documentation2. Insufficient data	<ol style="list-style-type: none">1.1 Not clearly sometimes. The data receive from dealers is text and sometimes they draw the picture by them so it is not clearly identify the real situation there.1.2 Some technicians of dealers don't really know how to report the problem which can be easy to analyze by others.2. Supporting data such as picture of part or place where the incident occur	<ol style="list-style-type: none">1.1 The true picture with color can help the reader clearly what the problem was.1.2 Train technician from dealer about Technical Report writing and what data should be address in the report.

3.3 Redesign

Referring to the last part, the team concluded that there are five areas to improve in problem correction process.

- **Incoming Data** – try to find the new way to receive data from dealer
- **Problem Correction** – try to find the way to correct the problem in the first time communicate with dealer's technician with short and clearly.
- **Organization setting** – set the organization to match the goals of new process appropriately.
- **Equipment** – provide the equipment which suit the center's goals
- **People** – provide training course to people who involve in the new process

3.3.1 Incoming Data

After the team concluded the areas to improve, they start with the improvement from Incoming Data. By using a fax, it is a time-consuming, expensive and frequently a poor-quality process.

The team use brainstorming techniques to find the way to improve in these factor bellows:

1. Fast
2. Correct
3. Easy to storage
4. Easy to find
5. Easy to summarize

They appoint a member, computer staff, to set the system which supports these needs. This topic was start from September to November 2004. The member use several weeks to set the new system. He came up, in 3rd week, with new system which set from SQL language and storage data in the new mainframe of company.

New Electronic Technical Report system

The new electronic technical report system has three main features as following:

- Recording
- Storage
- Report

The system can be divided in to two sections; Technical centre and Dealer.

3.3.1.1 Dealer Section

The procedure of TR similarly to the old one except some of the processes following:

- *Front Page*

In order to fill the data in TR, there is the security page to protect the company's privacy. Dealer technicians have to fill up the user name, password, and dealer's name or location to enter the site. This user name and password will be given to dealer before they start the new system. The password was recommended to change every two months in order to keep security. In this case there are only two of dealers, Vipavadee and Ladplaow, which are the pilot dealer.

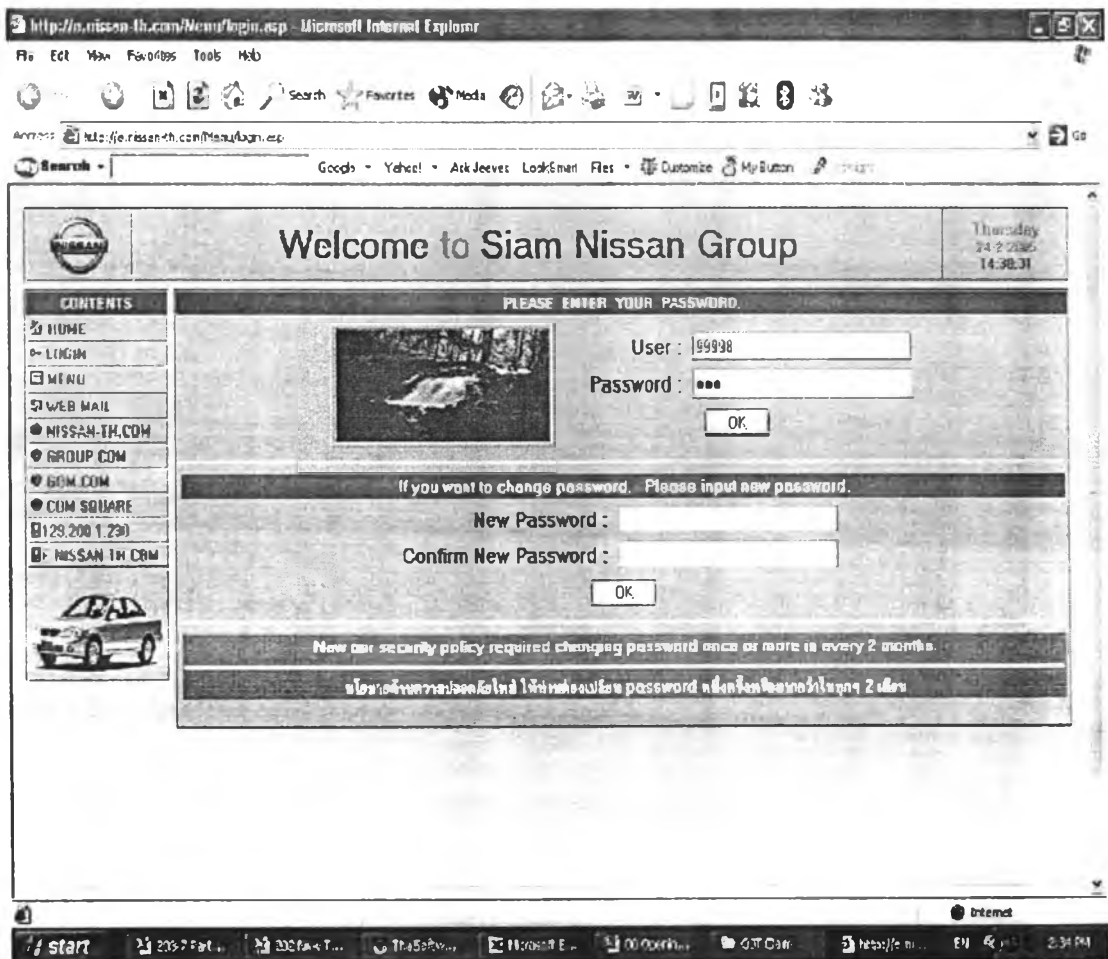


Figure 3.2: Front Page

- **Menu Page**

There are five elements in this Page:

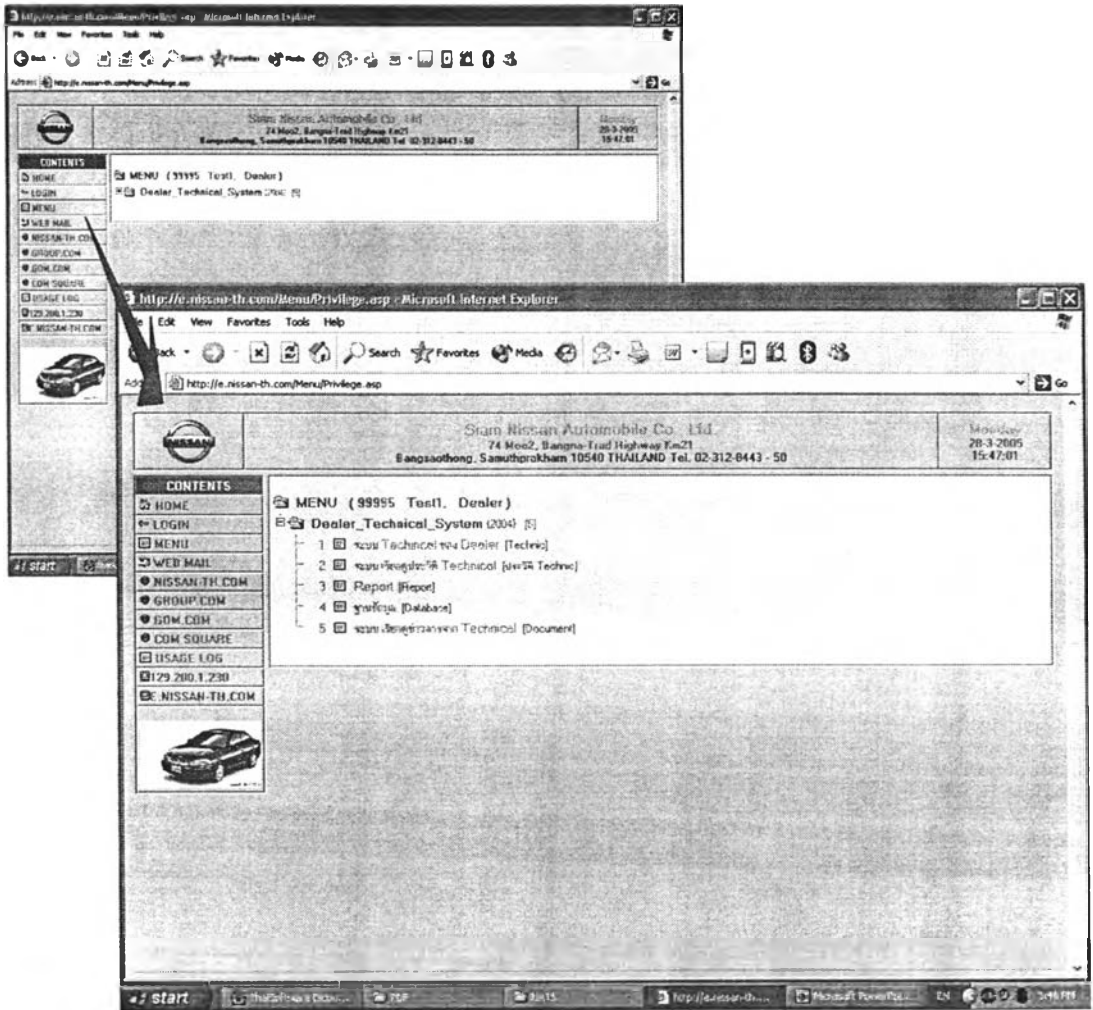


Figure 3.3: Menu Page

1. Dealer's Technical System (TR form)

Firstly technicians have to fill up job no., problem category, model and chassis no. of customer's car so the system will be auto run to the most appropriate specification to easy to fill up next.

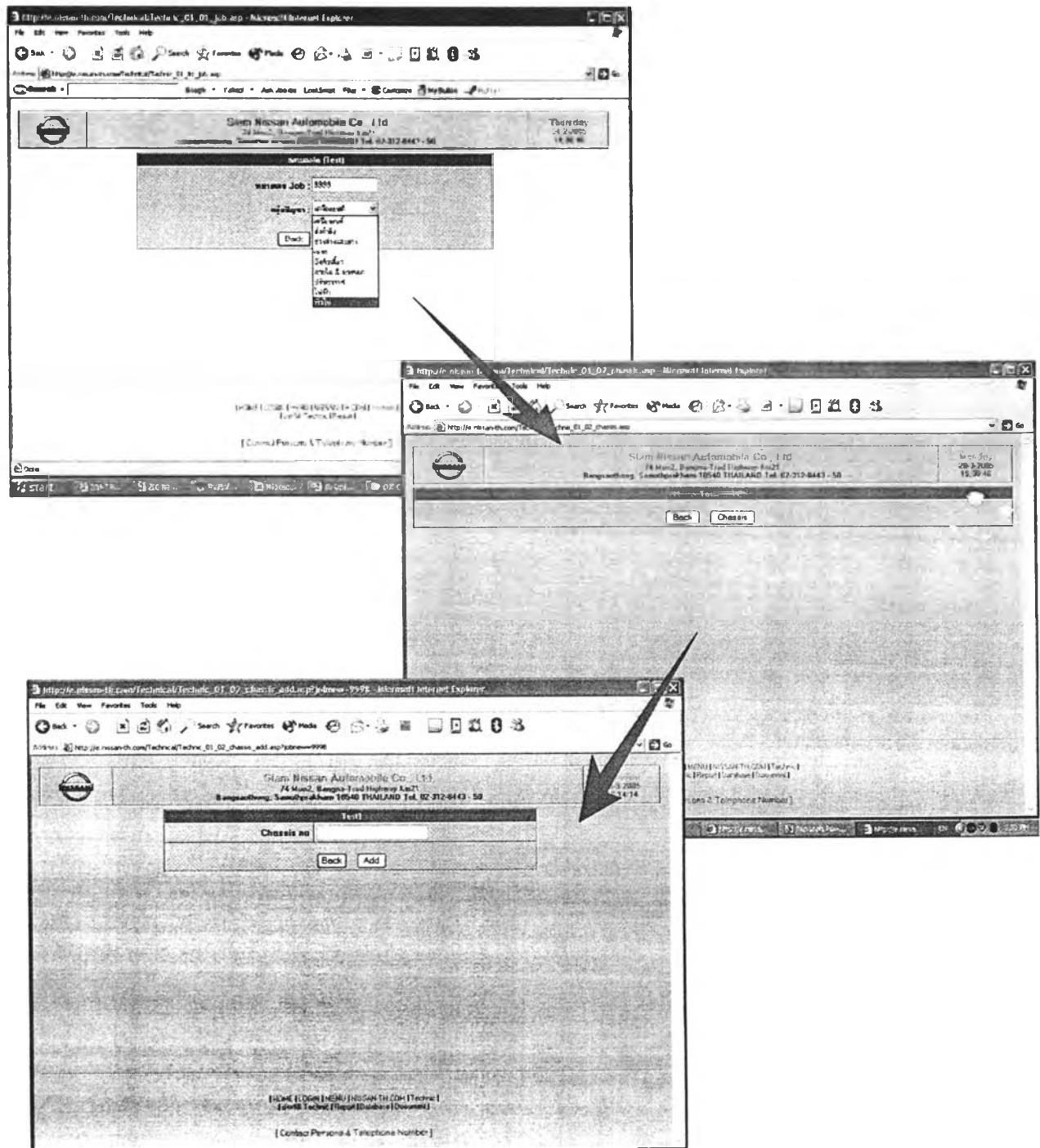


Figure 3.4: TR Form

Second, they have to fill all the details about the car such as mileage, driving and road condition, etc. all about the condition when problem occurs.

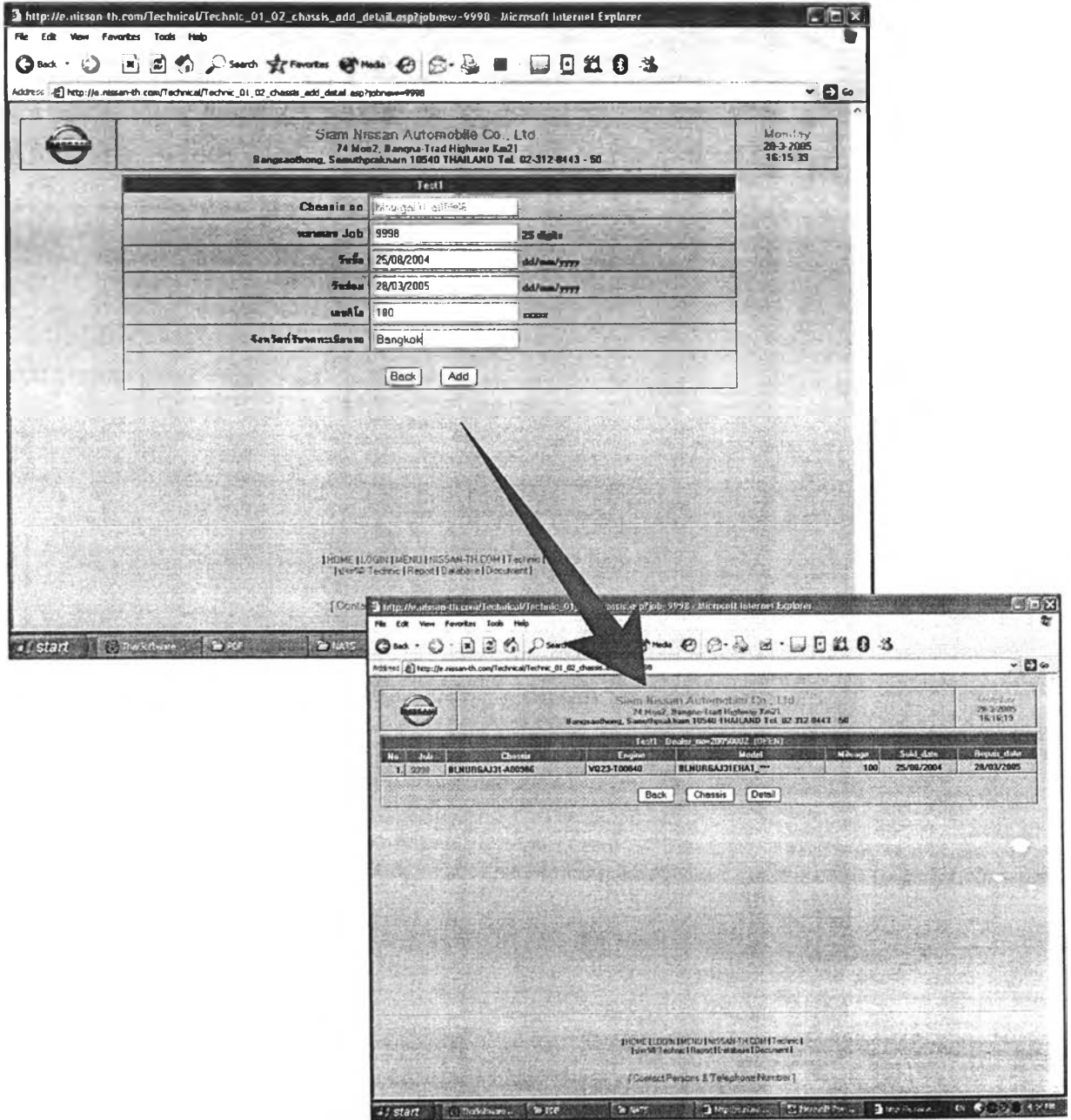


Figure 3.4: TR Form (Con'd)

Finally, the most important part of the page, it is the problem of the car and detail of problem that technician has to concentrate. He can type the problems with his opinions. The important thing is how to describe the problem to let expert understand the situation of that problem. Technician can choose the purpose of TR in three choices.

- to inform
- to request for claim
- to request for assist

The screenshot shows a web browser window displaying a technical request form. The form includes fields for date (28/03/2005), name (dd/mm/yyyy), phone number, and vehicle details. At the bottom, there are three radio button options: 'แจ้งขอรับข้อมูล' (selected), 'แจ้งขอขอยืมรถ' (highlighted with a red oval), and 'กรณาคือขอเงิน' (highlighted with a red oval). A callout box points to these options with the text 'To inform, to request for claim and to request for assist'. The browser address bar shows 'http://e.nissan-th.com/Technical/Technic_01_03_detail.asp'.

Figure 3.4: TR Form (Con'd)

Besides, there are some extra features in this report which are different from the old ones. If technician wants that TR to understand easier, they can attach pictures with report which can be contained four of pictures.

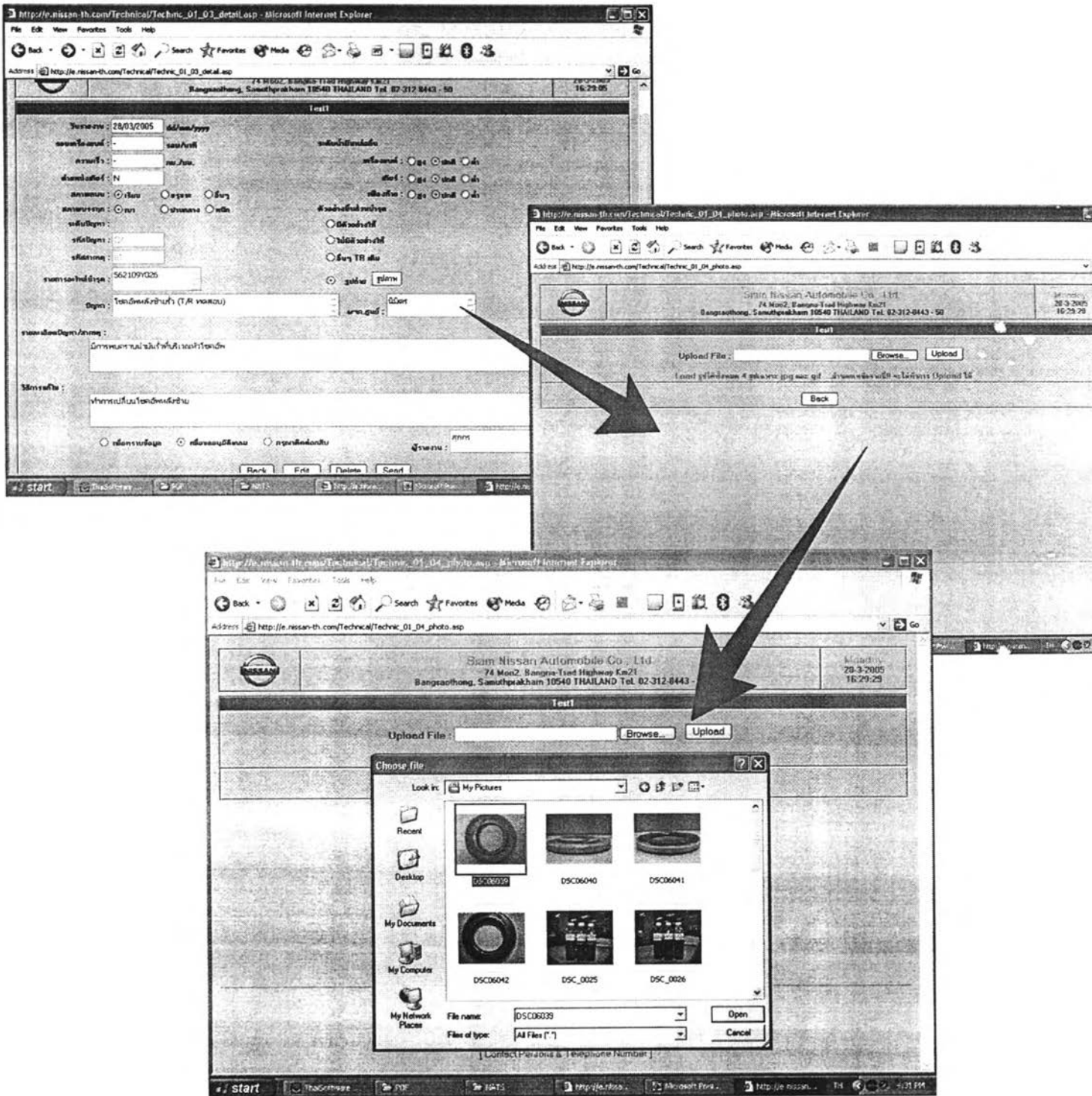


Figure 3.4: TR Form (Con'd)

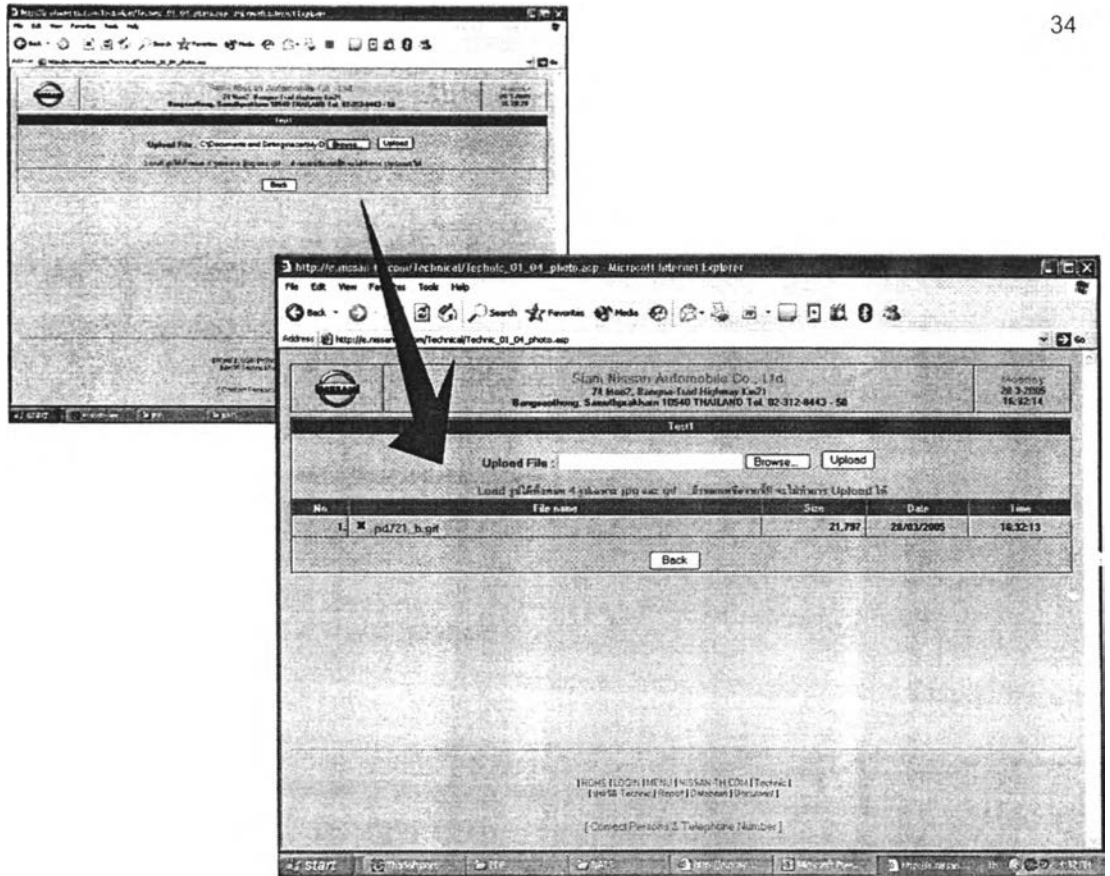


Figure 3.4: TR Form (Con'd)

After they fill up this page completely, the data will be transferred through the local area network line or internet line. Somehow it will reach the centre shortly.

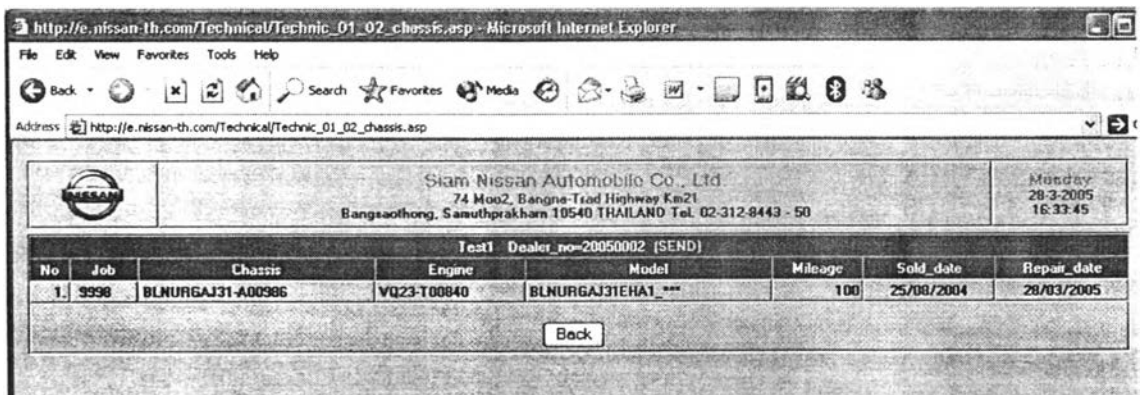


Figure 3.4: TR Form (Con'd)

2. Dealer's Technical Report Status & History

The report that was sending to service centre will be gathered. Dealer can see how progress of that report is. Three types of status are

- Sending; which waiting for response
- Approval; TR was approved by centre
- Return; the mistake of report such as unsuitable data so expert wants technician to recheck

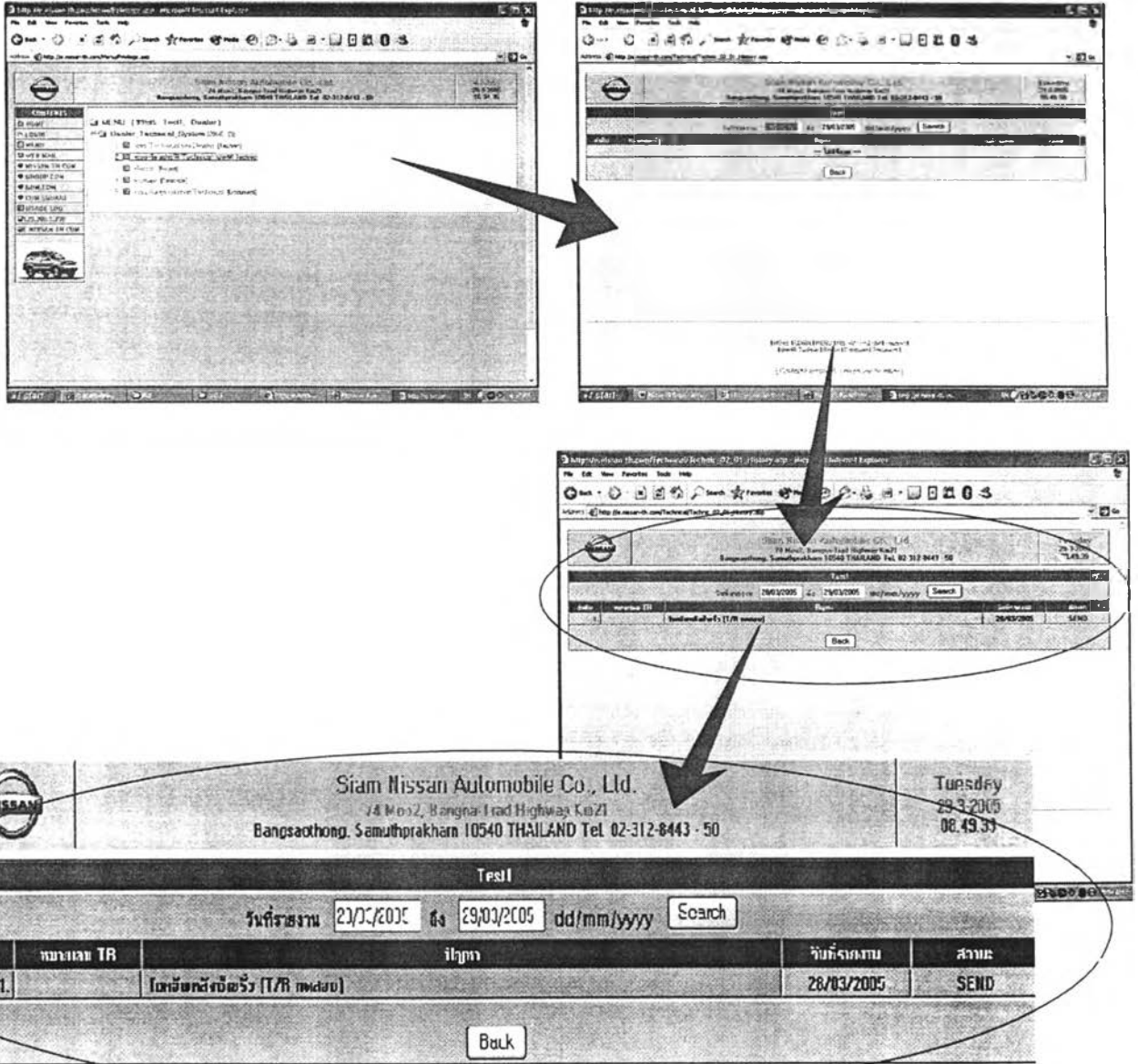


Figure 3.5: Dealer TR System

Technician can see all the report and all the details about TR that was sent to centre by specify range of sending date. The system will show up all report that was sent within that time. Also, they can see opinion and recommendation from centre for that TR.

The screenshot shows a web browser window displaying the Dealer TR System interface. The browser address bar shows the URL: http://e.nissan-th.com/Technical/Technic_02_02_History_detail.asp?dealtr=20050002. The page header includes the Nissan logo and contact information for Siam Nissan Automobile Co., Ltd. The main content area features a table titled "Test1" with the following data:

No	Job	Chassis	Engine	Model	Mileage	Sold_date	Repair_date
1	9998	BLNURGAJ31-A00986	VQ23-T00040	BLNURGAJ31EHA1 ***	100	25/08/2004	28/03/2005

Below the table, there is a detailed report for the selected job. The report includes the following information:

- วันที่รายงาน : 28/03/2005
- รถยนต์รุ่น : - รถบ/เกา
- ความเร็ว : - กม./ชม.
- สีตัวถังสีซีรี่ส์ : N
- สภาพถนน : เรียบ
- สภาพรถเก่า : เก่า
- ระดับน้ำมัน :
- ประเภทรายงาน : เปลี่ยนอะไหล่
- ตัวอย่างชิ้นส่วนชำรุด : รูปถ่าย pd721_b.gif
- รายละเอียดปัญหา/สาเหตุ : มีการพบรอยน้ำมันรั่วที่บริเวณหัวในคylinder
- วิธีการแก้ไข : ทำการเปลี่ยนปั๊มหัวฉีดด้วย
- รายงานโดยช่างเทคนิค :

On the right side of the report, there is a section titled "ระดับน้ำมันหล่อลื่น" (Oil Level) with the following details:

- พริ้วงบนซ์ : ปกติ
- ซีล : ปกติ
- เฟืองลิ้น : ปกติ
- รายการอะไหล่ที่นำรถ : 562105Y026
- รหัสปัญหา - สาเหตุ : CA-01
- ผู้รายงาน : ช่าง
- ผู้ตรวจสอบ : ODS

A "Back" button is located at the bottom of the report area.

Figure 3.5: Dealer TR System (Con'd)

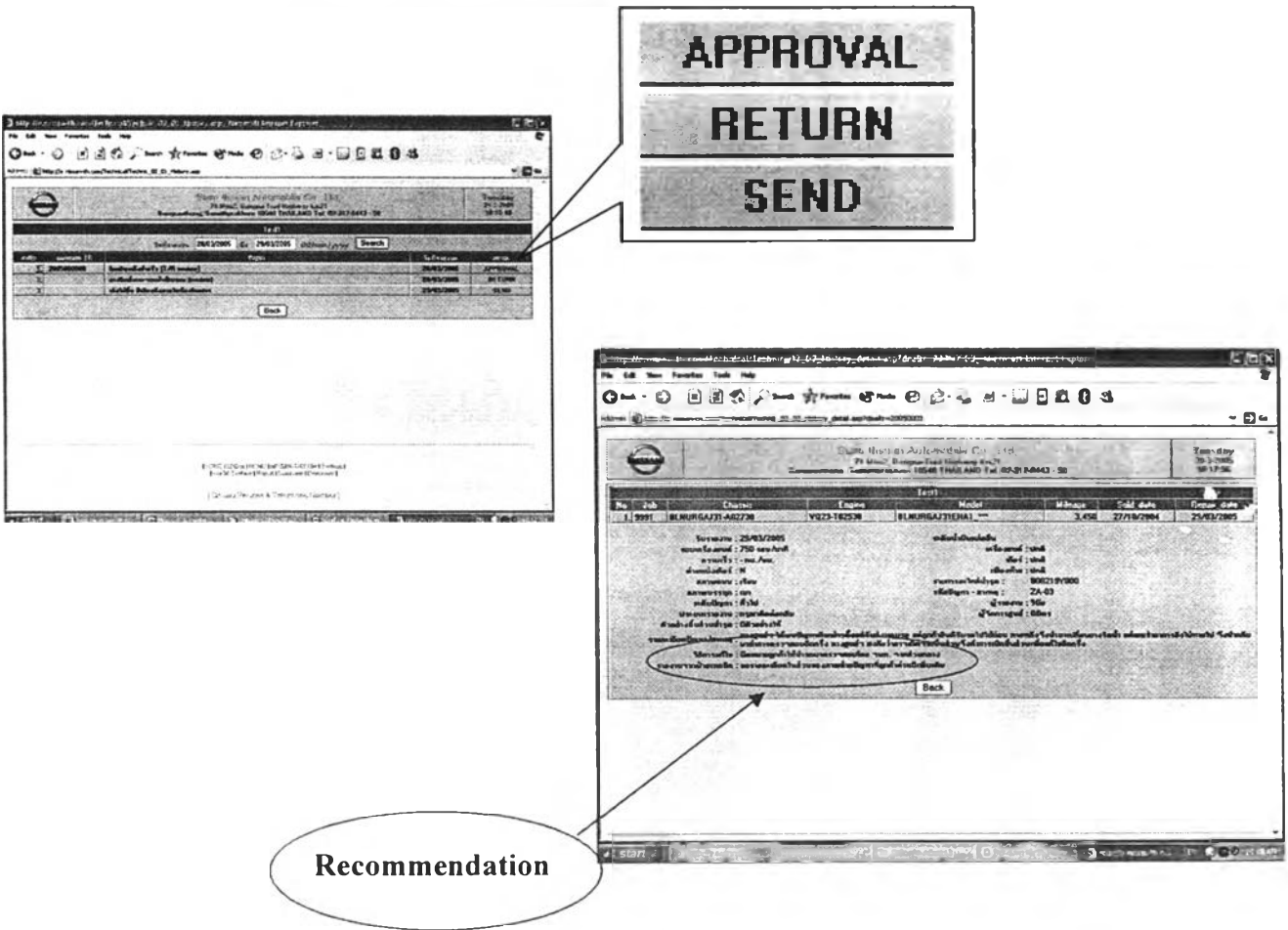


Figure 3.5: Dealer TR System (Con'd)

3. Report

In order to see the report in old fashion, technician can use this menu easily by insert job number.

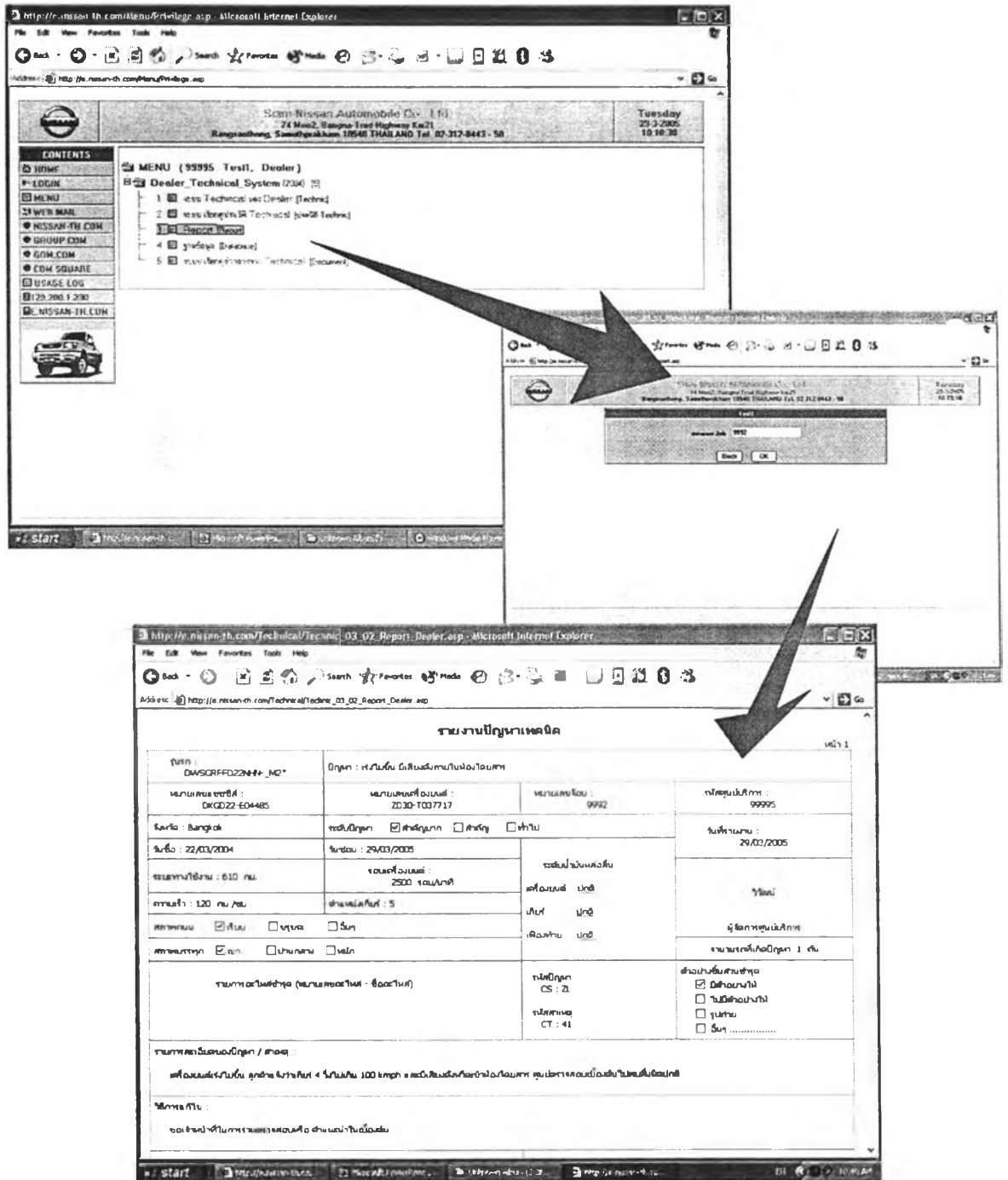


Figure 3.6: Report (Old Format)

4. Database

This menu contains all code of symptom and cause of problem of the car. Technician has to understand each of the code in order to fill up TR correctly.

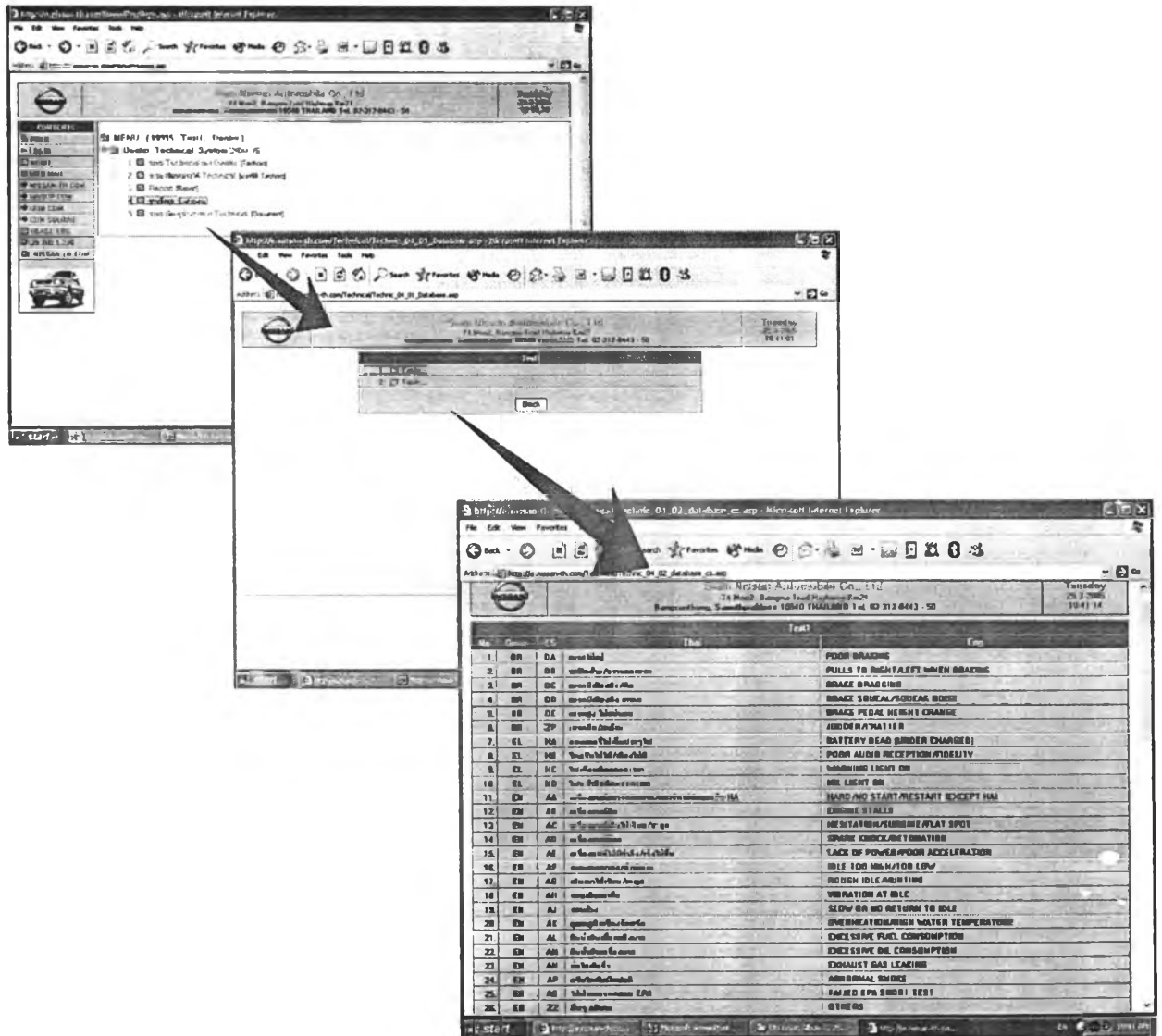


Figure 3.7: Database

5. Technical Information

Technical centre will send information about new product, problem, conference summary, etc. to dealer. Technician was recommended to open it every day in order to get information from technical centre up to date.

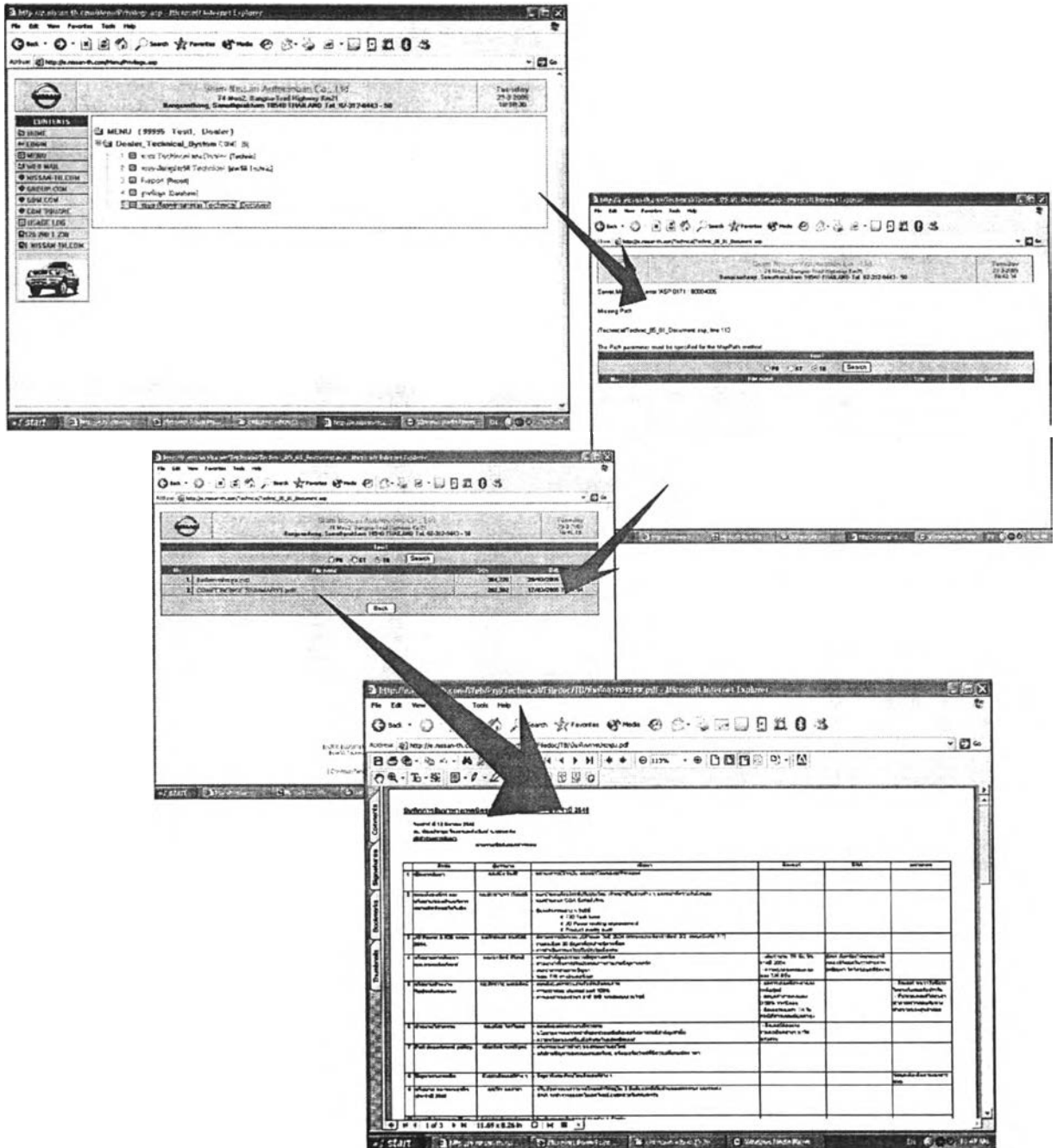


Figure 3.8: Technical Information

3.3.1.2 Technical Centre Section

- *Front Page*

Before the expert accesses to the web, he has to fill up user name and password. These name and password are available for everyone in technical team centre.

- *Menu Page*

There are three main topics in this page.

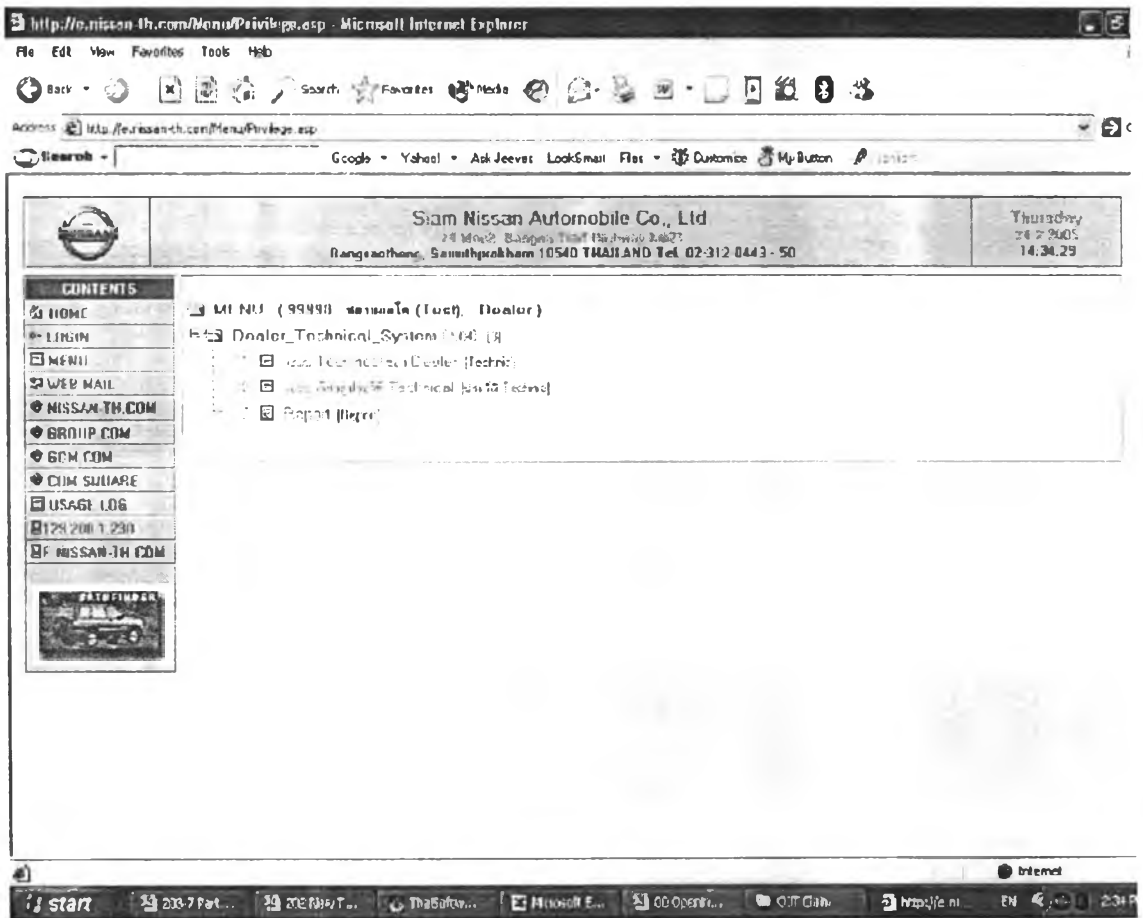


Figure 3.9: Technical Centre's Menu Page

1. Technical Report Status and History

Expert, who is on duty in responsible for incoming data, will open the page when incoming TR alert. He has to concern how important of that TR and he will response it accordingly of it objective.

For Claim: expert will forward TR, which attached with his analysis, to the warranty department to wait for claim acceptance.

For Inform: expert will analyze TR and add it to the statistic database which can be easily to access for using in the problem assessment and product improvement.

For Assist: after he got TR he will analyze the cause of problem and contact to dealer which is waiting for any help.

The screenshot shows a web browser window displaying the 'Siam Nissan Automobile Co., Ltd.' website. The page title is 'รายงาน Technical ทรัพย์สินทางปัญญา - 1356'. The search bar is set to 'Report date' from '27/03/2005' to '27/04/2005'. Below the search bar are radio buttons for 'SEND', 'RETURN', 'APPROVAL', and 'CALL'. A table lists technical reports with columns for 'ลำดับ', 'เลข', 'หมายเลข TR', 'วันที่รับแจ้ง', 'วันที่รับแจ้ง', and 'สถานะ'. The table contains 6 rows of data. At the bottom of the page, there are links for 'HOME', 'LOGIN', 'MENU', 'IN SIAN TH.COM', 'Dealer', 'Report', 'Feedback', and 'Contact Person & Telephone Number'.

ลำดับ	เลข	หมายเลข TR	วันที่รับแจ้ง	วันที่รับแจ้ง	สถานะ
1.	20050003	รถวิ่งไม่ตรงตามคู่มือ (เกาหลู)	29/03/2005	SMS โทรฟรี	SEND
2.	20050004	รถสั่นเมื่อขึ้นเนินลาดชัน	29/03/2005	SMS โทรฟรี	SEND
3.	20050003	รถสั่นขณะวิ่งบนถนนลาดชัน	31/03/2005	SMS โทรฟรี	SEND
4.	20050004	ล้อหลัง alignment	31/03/2005	SMS โทรฟรี no.4	SEND
5.	20050006	รถสั่นขณะวิ่งบนถนนลาดชัน	08/04/2005	SMS โทรฟรี no.4	SEND
6.	20050001	น้ำมันเครื่อง	27/04/2005	TC โทรฟรี	SEND

Figure 3.10: Report Status & History

This menu will show all TR by specifying date of receiving. Expert can browse TR by four elements;

- Send
- Return
- Approval
- All

In case of TR for assist, the detail will be shown in the Problem Correction process.

2. Technical Report Summary

This topic will facilitate management level, or everyone in department, understand the trend of product problem and this data will be useful to another department to improve product quality.

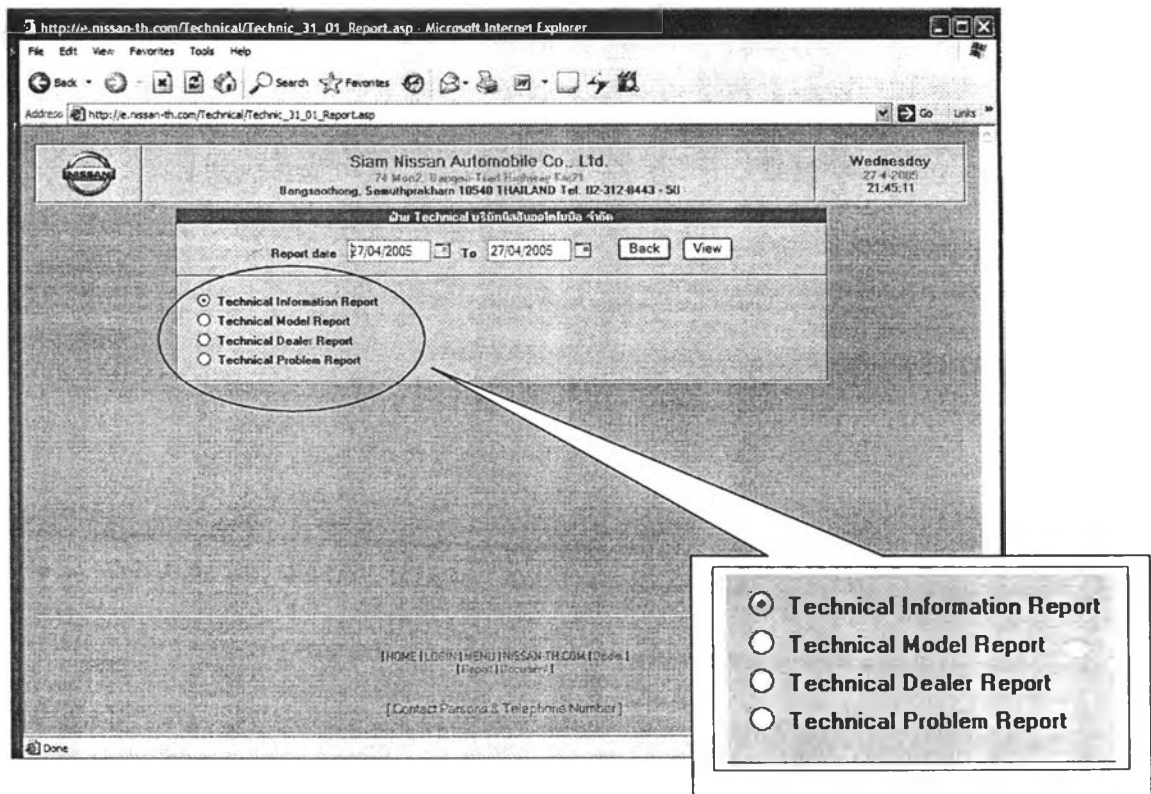


Figure 3.11: Report Summary

In order to see the summary of TR that centre receive, it can be review in four types.

- Technical Information Report

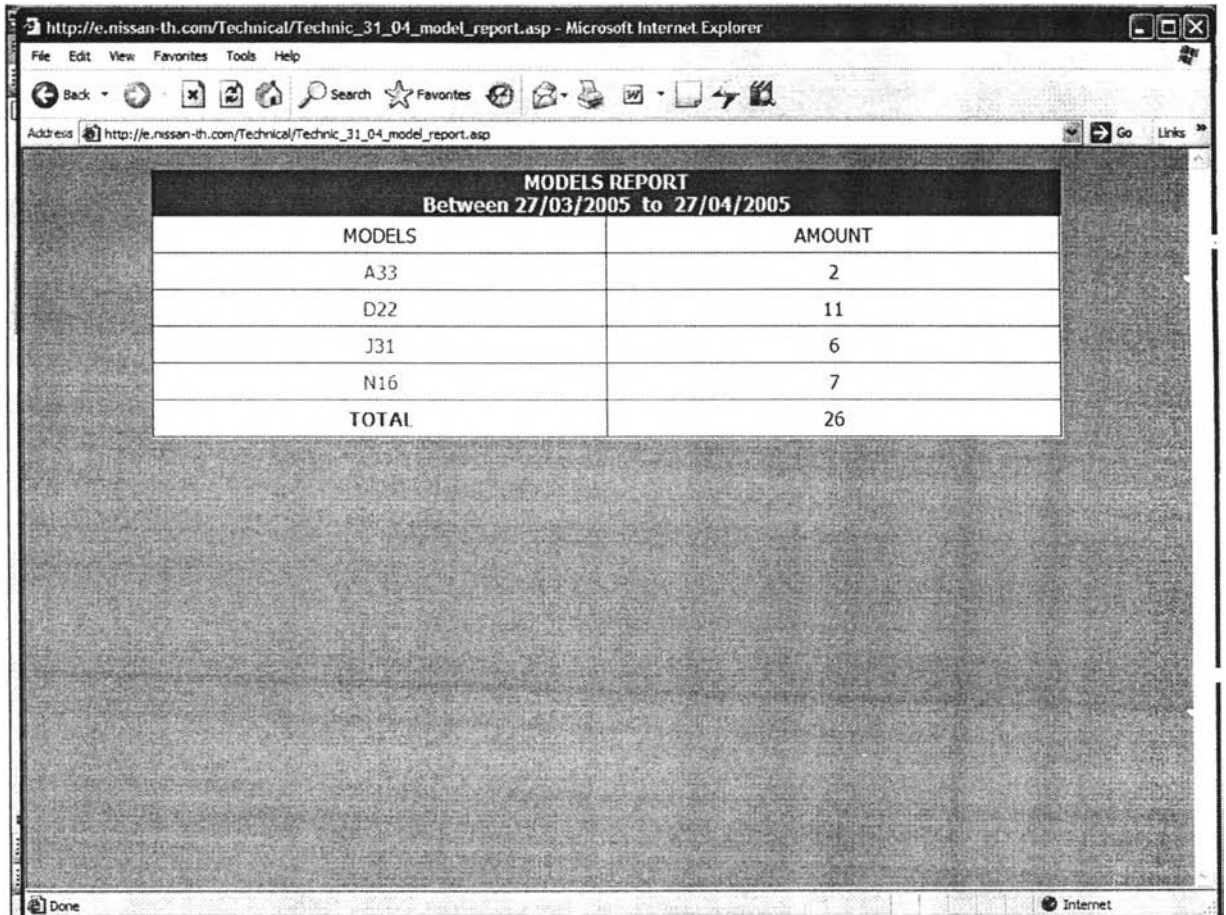
This function will show TR in three original objectives and the part type; Local, CKD, and all will sort it

TECHNICAL INFORMATION REPORT Between 27/03/2005 to 27/04/2005			
T/R TYPIFICATION	LOCAL	CKD.	TOTAL
A : T/R for information	0	0	2
B : T/R for claim approval	0	0	15
C : T/R that needs the suggestion or needs engineer to DLR. and follow up	0	0	9
TOTAL	0	0	26

Figure 3.11: Report Summary (Con'd)

- Technical Model Report

This function will show the amount of report that sorted by model of product. It can be easily to concentrate what model has more problems.



The screenshot shows a web browser window with the address bar displaying http://e.nissan-th.com/Technical/Technic_31_04_model_report.asp. The main content area contains a table with the following data:

MODELS REPORT Between 27/03/2005 to 27/04/2005	
MODELS	AMOUNT
A33	2
D22	11
J31	6
N16	7
TOTAL	26

Figure 3.11: Report Summary (Con'd)

- Technical Dealer Report

This function will show amount of report that sort by area and each dealer.

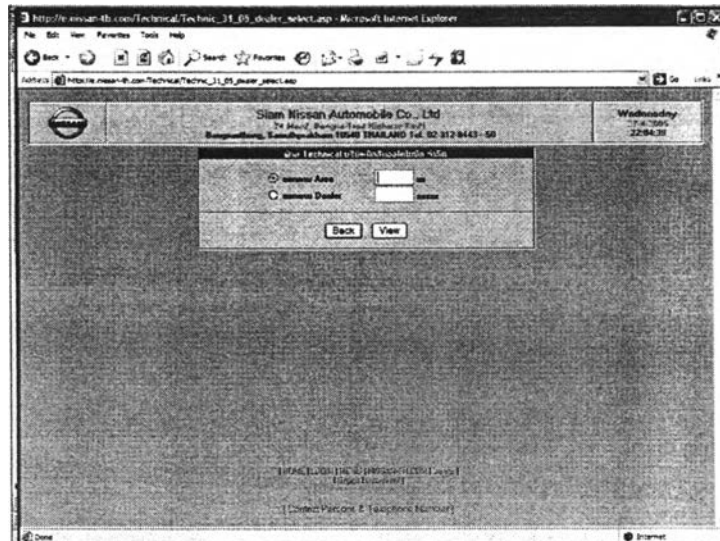


Figure 3.11: Report Summary (Con'd)

- Technical Problem Report

This function will show amount of report that sort by part, symptom, and cause of the problem in order to see what the most problem part or situation occur. It is a very useful tool to let management level understands how the problem occurs.

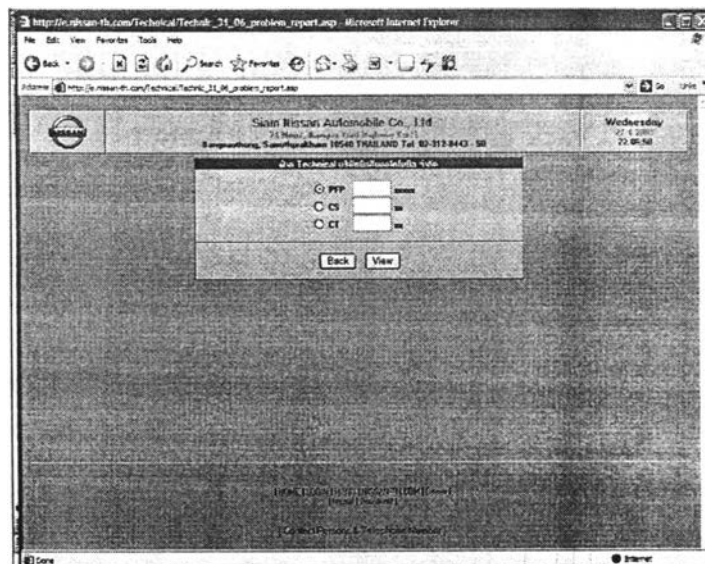


Figure 3.11: Report Summary (Con'd)

3. Technical Document (upload for dealer)

To support dealer, the centre can upload technical document. There are three types of document as following

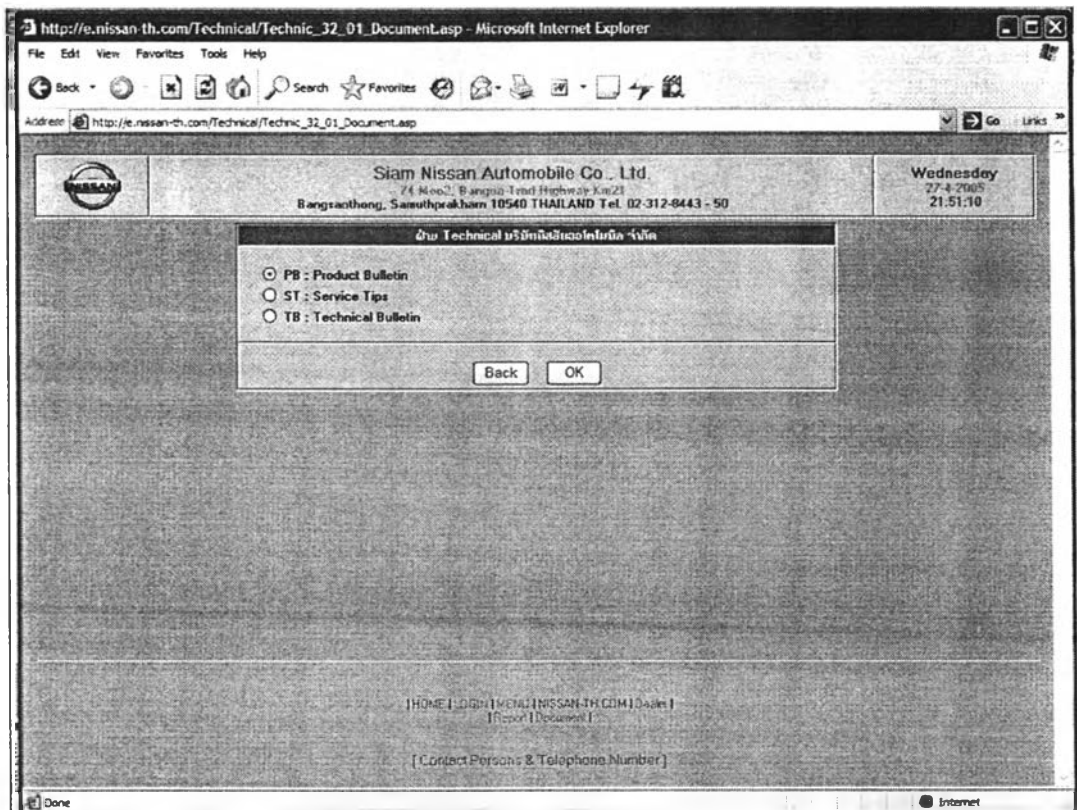


Figure 3.12: Technical Document

• **PB (Product Bulletin)**

To inform about changing of product specification, part, assembly, etc. both factory and Japan.

Advantage

- To help dealers notice detail of specification changing of product in order to prepare for servicing the customer
- To let dealers has their ways in classify different detail of model in each year.
- To be reference document in part request opening
- To be reference document in customer explanation

PB 00 26

PB PRODUCT BULLETIN
ព័ត៌មានផលិតផល

BT 11

ទំព័រ 13 ពីរយ 2542

ឈ្មោះ: ម៉ូដែល 6 គម. ១២ ក្រុង NY QUEEN CAB
 លេខកូដផលិតផល: MI 558 N9 QUEEN CAB (T18)
 កូដផលិត: 06 BULLETIN លេខ P91-D12/43

សំណើស្នើសុំ: ដំឡើង ១២ គម. ១២ ក្រុង NY QUEEN CAB ម៉ូដែល 6 គម. ១២ ក្រុង NY (T18) QUEEN CAB ទិន្នន័យលក់ ១២ គម. ១២ ក្រុង NY 2542 ដើម្បីដំឡើង ១២ គម. ១២ ក្រុង NY បាន។

1. តារាងលក់ផលិតផល


ល.រ	កូដផលិតផល	ឈ្មោះផលិតផល	លេខកូដផលិតផល
1	BATARPT18ENH14P2	WING ROAD	0D4T10-661871
2	BATARF218ENH14P2		0D4T10-664799

2. លក់ផលិតផលផ្សេងៗគ្នា

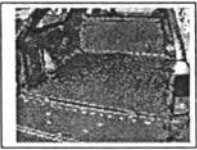
ល.រ	ព័ត៌មានផលិតផល
1	- ដំឡើង ១២ គម. ១២ ក្រុង NY CARRI BOT
2	- ដំឡើង ១២ គម. ១២ ក្រុង NY
3	- ដំឡើង ១២ គម. ១២ ក្រុង NY
4	- ដំឡើង ១២ គម. ១២ ក្រុង NY
5	- ដំឡើង ១២ គម. ១២ ក្រុង NY
6	- ដំឡើង ១២ គម. ១២ ក្រុង NY
7	- ដំឡើង ១២ គម. ១២ ក្រុង NY

ទំព័រ 1 / 2

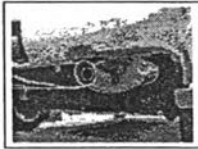
2. រូបភាព ១២ គម. ១២ ក្រុង NY / ផលិតផល ១២




រូបភាព ១២ គម. ១២ ក្រុង NY CARRI BOT



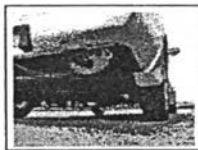
រូបភាព ១២ គម. ១២ ក្រុង NY




រូបភាព ១២ គម. ១២ ក្រុង NY



រូបភាព ១២ គម. ១២ ក្រុង NY



រូបភាព ១២ គម. ១២ ក្រុង NY



រូបភាព ១២ គម. ១២ ក្រុង NY

ទំព័រ 2 / 2

Figure 3.13: Product Bulletin

- **ST (Service Tips)**

ST is knowledge document that involve of theory and principle function of part or vehicle systems including to information from all dealer, technical centre and Japan. This knowledge will be the direction in operation. The language that use in ST is simple as well as experience exchanging. The source of information will be stated in document to give honor to the dealer which sends this knowledge.

Advantage

- To let dealers know what happen with the product that they never know
- To let dealer prepare for facing and solving problem

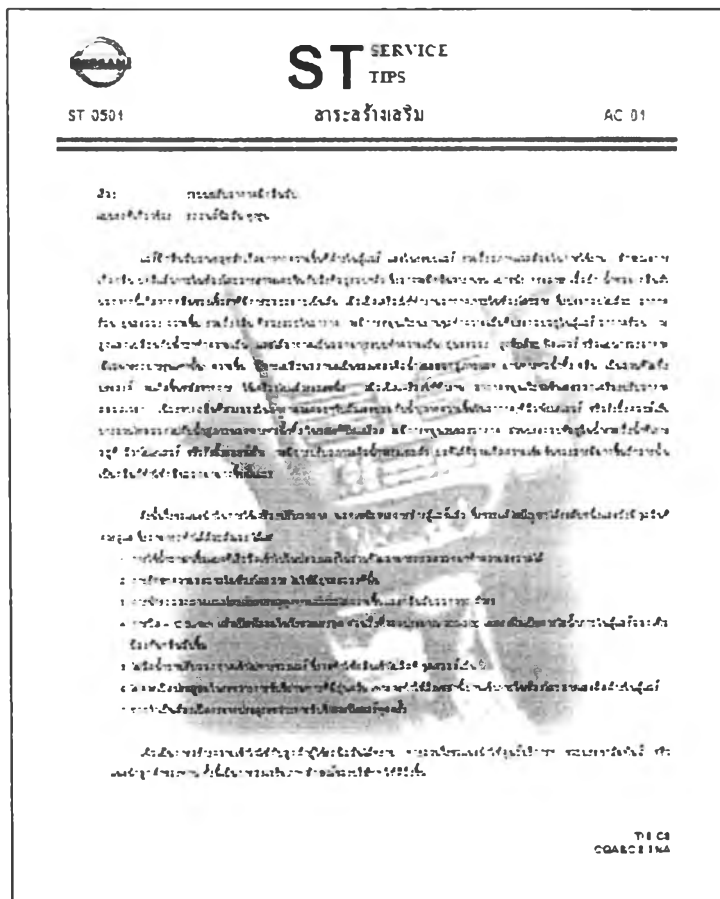


Figure 3.14: Service Tips

- **TB (Technical Bulletin)**

This document informs about technical term, which is necessary to repair the problem in several cases. Some of this information comes from conclusion of problem correction of service centre, report of factory, technical meeting, and information from Japan.

Advantage

- To help dealer correctly understand step and method of problem correction
- To reduce problem analysis time
- To be reference document in case of warranty

All documents from technical centre are confidential and can be used only to authorize dealer. Dealer’s manager has to understand the content and explain involved staff or technician. These documents will be filed where technician or involved people can access.

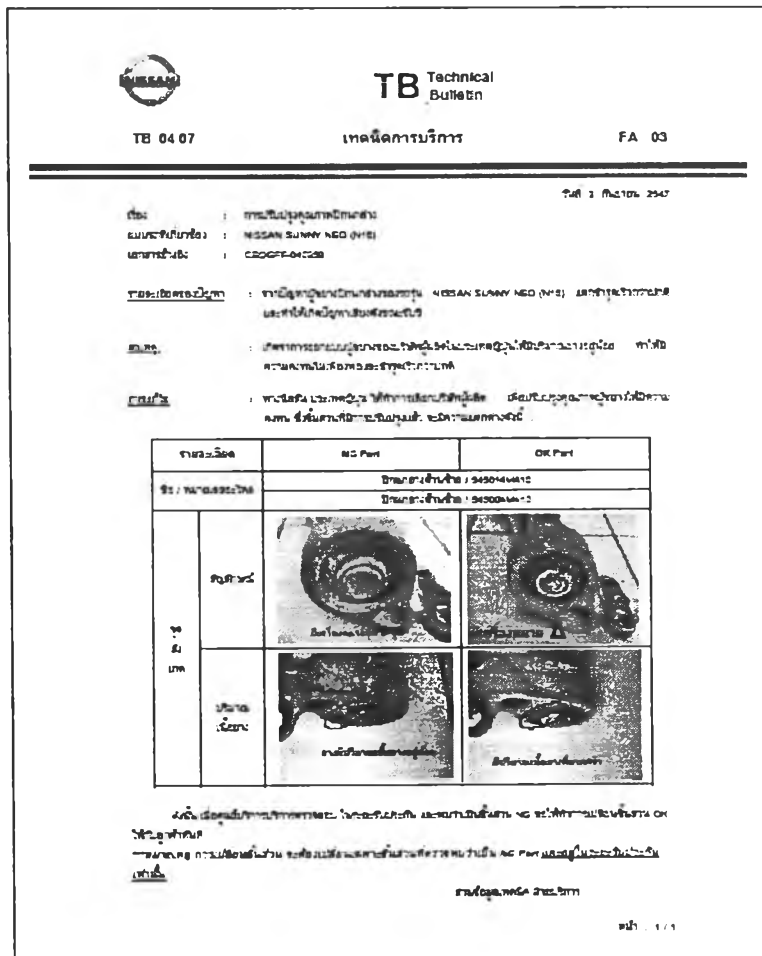


Figure 3.15: Technical Bulletin

3.3.2 Problem Correction

The team concerns that most problems can be solved if dealer's technician can see the real picture than only hear a voice. The biggest disadvantage of online correction is that it does not allow participant for face-to-face and real picture communication. So they concluded to use the video conferencing system to solve this problem. Videoconferencing can be used throughout the problem solving process for exchanging information among the problem solvers who are located in different area. Participants in one location can see graphs, charts, and pictures available in other locations. It's not just only help in correction but it also reduces unnecessary processes. In this case, pilot dealer, they assume to use web camera instead.

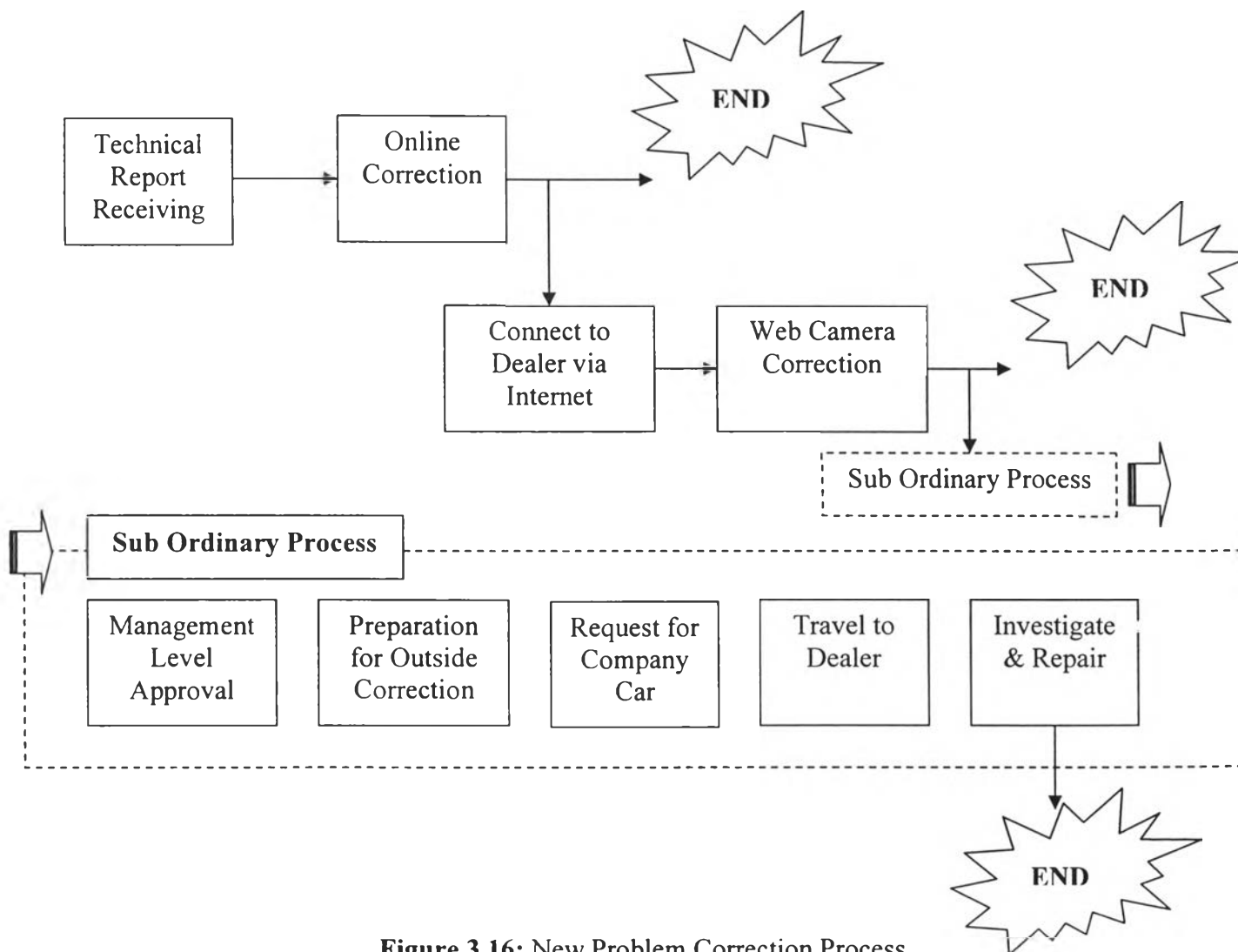


Figure 3.16: New Problem Correction Process

- **Technical Report Receiving**

After the trouble-car comes to dealer, technician will fill detail in the new TR, which connect to the internet all working time, and send it to Technical center for 3 purposes; to inform, to request claim approval and to request for help.

- **Online Correction**

In case of requesting for help, Technical centre will call back to the dealer after the centre got TR. for basically help. They may teach how to correct the component or how to repair specifically case on phone. The picture, which was attached to TR, is very useful in this step.

- **Connect to Dealer via Internet**

After expert has done online correction, in case it was unsuccessful, he will consider whether problem can be solved in house or not. If there can be correct in house, he will set the camera up and connect to dealer via the internet. The camera will place on where it can capture the problem picture in correction room, which the trouble car parks in.

- **Investigation and repair**

In a videoconference, participants in one location can see participants at another location. Pictures of the participants will appear on a desktop computer. So, whatever expert wants to see the problem or want to shows technician how to solve, they can understand situation of problem easily and can exchange experience.

- **Sub Ordinary Process**

In case that above process is unable to correct the problem, the team set the sub ordinary process to support this situation. Sub ordinary process is similar to the old one but it has more performance than previous. The new organization effect to management level approval process consumes less time than before. And the car request process is more easy due to the cars was prepared for this sub ordinary process already.

3.3.3 Equipment

Setting up a video conferencing package can run the range from relatively inexpensive to extremely costly depending on the user's needs. Therefore, it is important for the team to understand the requirements needed for particular use and to research the available technology that fit needs.

They review the components of video conferencing to understand the necessities needed for the technology and broke down individual components into five categories:

1. Camera
2. Microphone
3. Speakers
4. Network Connection
5. Computer System

these categories are important components in supplying the user with a workable video conferencing system. These components are the basic requirements for the small desktop individual to a large company utilizing video conferencing at a high level.

1. Individual Components

A. Camera:

The camera is very important to the correction process and can determine how well the video will be viewed by the receiving end. The team determined what need is and they look at many products available and utilize a camera that meets the user expectations. In the pilot phase, they use relatively inexpensive Desktop PC Cameras that are now available in the market.

B. Microphone and Speakers:

A user must be discriminating when looking at microphones and speakers. If the video fails during a conference it is important the audio continue to be available to keep the functionality of the meeting in tact. Important features include location of microphone, echo control, and background noise suppression.

C. Network Connection:

The network connection is very important to the overall quality of a video conference. The team uses the same internet line, which 56 kbps data flow rate, that available on company.

D. Computer System:

The higher quality monitor coupled with a faster efficient machine will help the overall success of a conference. The team defines at least computer specification as following. The minimum requirements for such kits are Windows 95, 98 or NT 4.0, Pentium 233 or higher with 32MB or more RAM, connection to the Internet, parallel port, computer and keyboard with PS/2 style connectors or computer and keyboard AT style connectors.

2. Software Packages

In the market today there are countless products and software packages available for video conferencing. The low end of products includes the use of a desktop camera, microphone, and speakers along with basic software to get the user started. The team use Microsoft's MSN, which is easy to use and minimal equipment, is needed to run a conference. These software packages basic kits can be download for free. Most kits feature full motion video camera (usually 10-20 frames per second), a microphone, conferencing software, all necessary adapters and converters.

3. Web Camera Correction Process Area

The area system is integrated equipment that includes a PC, web camera, display monitors, the line microphones, etc and also the technical equipment such as Lift, Tool Box and etc. It is clear that there is space of area available to park the vehicle and the camera can capture important part of problem.

4. Department's Car

In order to reduce the time to dealer, the team set two company's cars to use in problem correction process, one is the pickup car and another is four wheels drive. It will be used when investigation and repair via web camera is fail.

Investment

Everything that was stated above are available on the company except the web cameras that the cost of them, 3 web camera, for 3 stations is 3000 baht.

3.3.4 Organization Setting

The team realizes that after they reengineer system, organization structure should go along with new system. Obviously the original one, company gives more power to only management level.

In original organization, both service and part department were under control of one general manager and one vice president. General Manager supervises three of assistance manager; Service, Bangkok Area, and Up-country and one of service planning manager. Service department was divided into two divisions; Warranty and Engineering (Technical Centre).

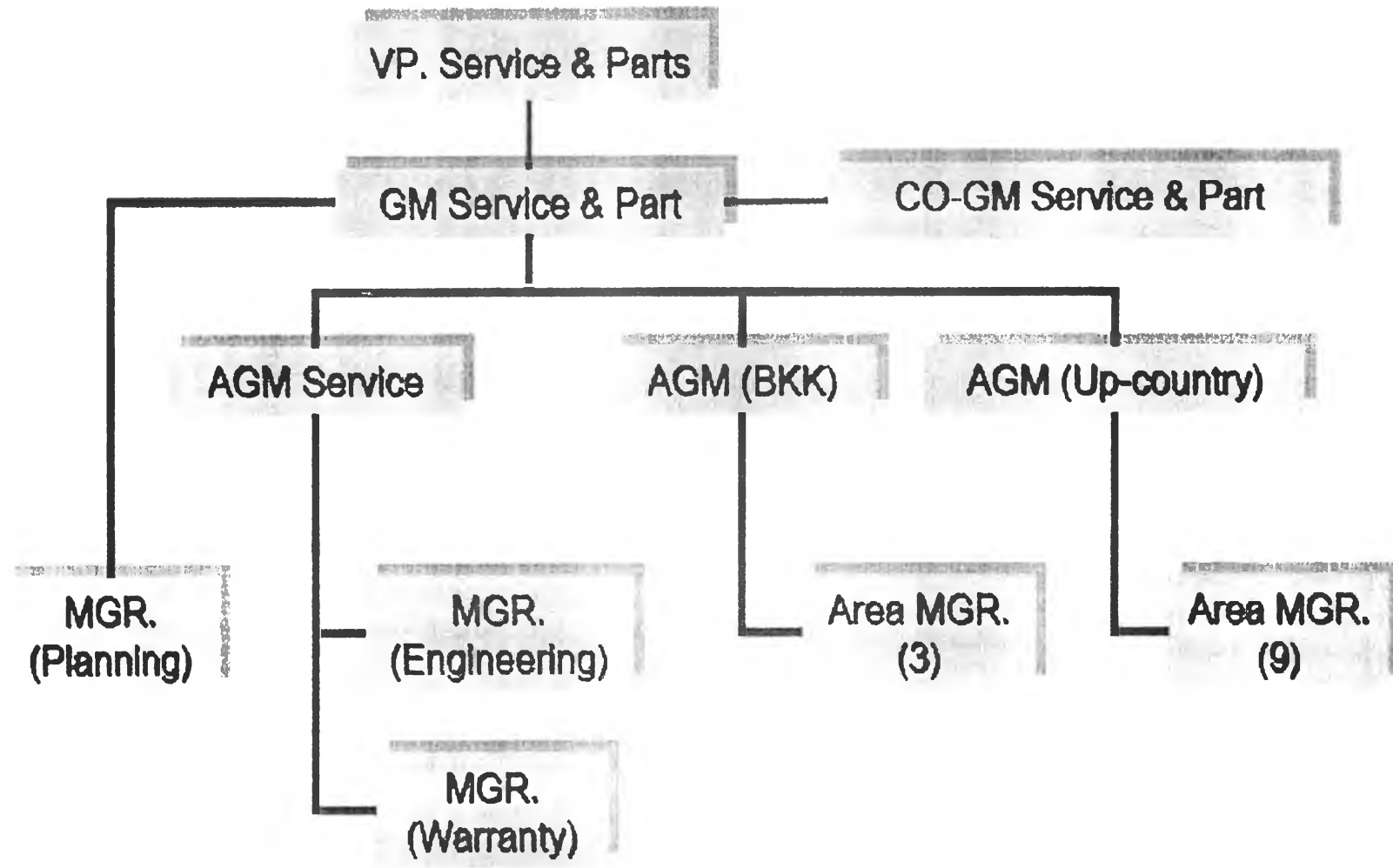


Figure 3.17: Original Organization Chart

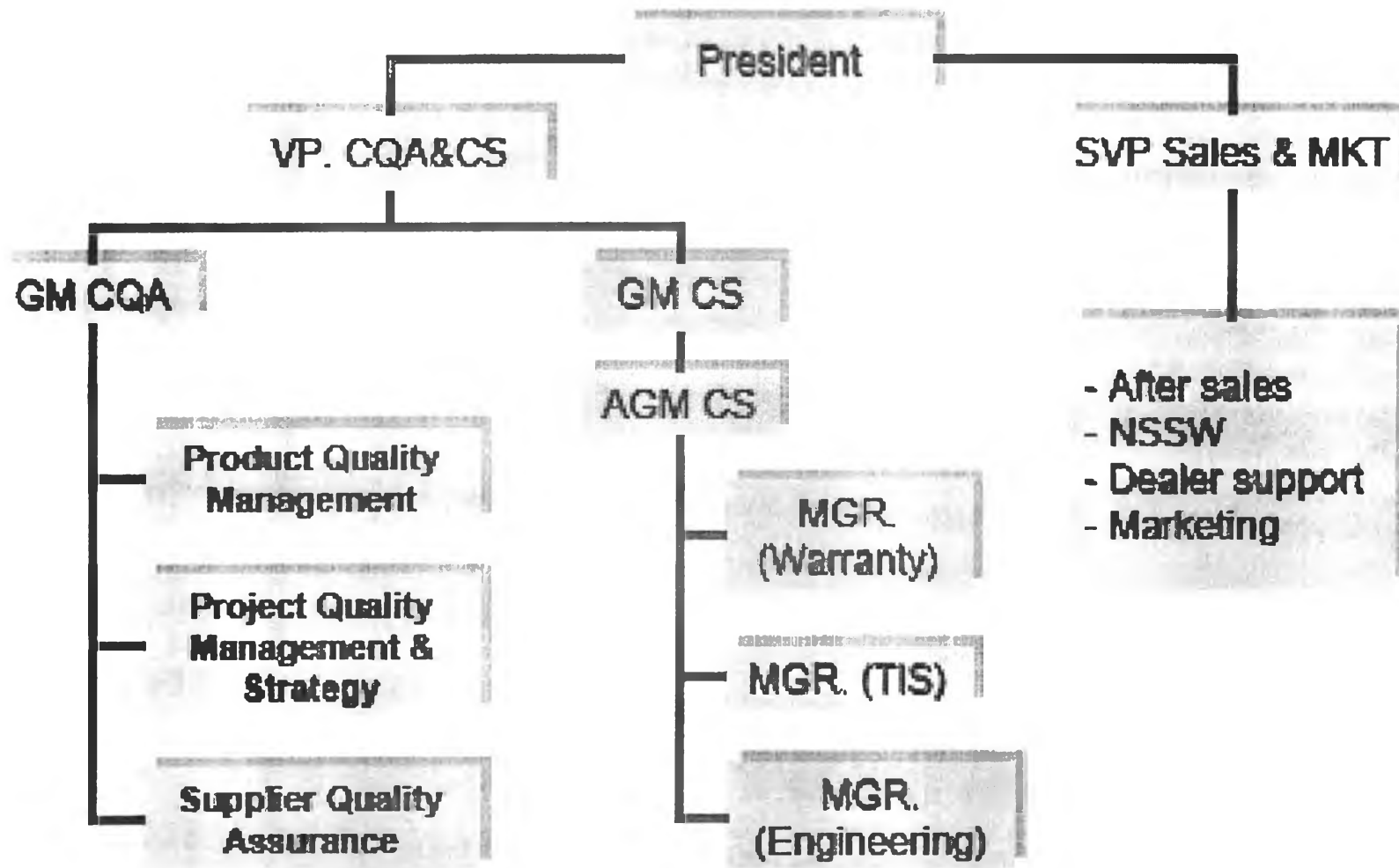


Figure 3.18: New Organization Chart

In order to enhance efficiency of work, company had change organization in the new way. Previously service division depend on service & part vice president one man. In the new structure service and part were separated and work independently with the purpose of increase strength of each department. Service department was changed to Customer Service department (CS) which divided into three divisions which supports the organization's new system.

1. Warranty
2. Technical Information
3. Engineering

Also Corporate Quality Assurance division (CQA) was set up to improve all aspect about product quality.

3.3.5 People

Initially, task of reengineering Teams involved in coaching everyone in the organization. Every person needed to understand that they were responsible for reengineering every day. Given the aptitude of the personnel of the division, this actually proved to be a simple task. Since the members of the team covered all areas of the division, it was easy for them to coach everyone. This step proved to be the critical step.