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REMOTE SCHEDULING SYSTEM AND APPARATUS

This invention relates to a remote scheduling system and apparatus. It is particularly applicable to control of service industry functions from a central location but is not limited to such use. In a preferred embodiment, the invention relates to a wireless system for maintenance audit, fault tracking and building health monitoring.

It is necessary in the service industry for many service providers to be operating individually or in small teams at a plurality of different locations depending on the requirement of the users. For example in the cleaning industry it is necessary for an individual cleaner or small group of cleaners to be accessing office buildings or schools or other locations after the usual hours of operation of that facility to undertake a cleaning job and undertake any small maintenance as required. It is therefore not possible to have managers at each location assisting in decision making or checking the completion of an entire location. It has therefore been necessary to rely on the service provider to undertake the required cleaning operation unsupervised.

One particular problem with this is that the cleaner might not be allocated to the same location or there might be a turnover of cleaners employed by a particular company or cleaning service. It is therefore not possible for the new cleaner to be aware of the required procedures or the particular difficulties at the location to be cleaned. This loss of knowledge over time does not allow the best result for the owner of the facility being cleaned and does not allow the service provider to provide the best service through no fault of the service provider.

It is shown in published documents to have a scheduling system for a delivery person or the like who needs to travel from one place to the next. In US Patent No 6,263,209 to Motorola Inc there is disclosed a method and apparatus in a wireless communication system for creating a learning function. The wireless communication system conducts communications between a fixed portion of the wireless communication system and a portable subscriber unit carried by a user; and records a relevant aspect of the communications, thereby producing recorded

information. The system determines a current time of day and a current position of the user and makes a comparison of the recorded information with the current time of day and the current position of the user to determine whether an alert is necessary, and generates the alert when the comparison determines the alert is necessary.

This document also states that Personal Digital Assistants (PDAs) are well known. One function that PDAs usually have supported is a scheduler or calendar for allowing a user to record appointments, meetings, and other predefined events. The scheduler typically can be programmed with a reminder which will be generated at a user-selected time prior to each event. Some PDAs have been integrated with a communication device such as a pager or a cell phone, as well. Many events beyond the control of the user can make it difficult or impossible for the user to stay on schedule. For example, traffic congestion, road construction, or an accident along the user's route can delay the user. An extended prior appointment could overlap with a next appointment. Prior-art PDAs have not been able to deal automatically with situations such as these examples and inform the user about the need to leave earlier, or inform other users about the lapse in schedule adherence. Prior-art PDAs have required users to place a voice phone call or manually send a page to report a lapse in schedule adherence. Thus, what was needed was a method and apparatus in a wireless communication system for creating a learning function and generating an alert in response to information learned. Preferably, the method and apparatus would act automatically to alert the user when unforeseen circumstances make it desirable for the user to leave sooner for a next scheduled event, and would further act to notify other users when the user is going to be late for an event.

This Motorola patent therefore provides a learning function to assist in the scheduling of the user on the road.

In a more recent Motorola Inc US Patent, No. 6,484,033, is disclosed a wireless communication system, and method, for location based schedule management, which includes a plurality of wireless communication devices, including a wireless communication device

and a backup wireless communication device; a system controller for generating a message; a RF transmitter for transmitting the message to the plurality of wireless communication devices; and an application server. The application server includes a server memory for storing an event location and one or more event criteria parameters, a server processor for processing a current location of the wireless communication device; and a server event management application for comparing the current location with the event location. The server processor sends a server command to the system controller in response to the comparison of the current location and the event location exceeding the event criteria parameters. The system controller sends an update message to the backup wireless communication device in response to the server command.

Therefore this Motorola patent provides the added advantage of inputting location for the schedule of the user that needs to travel from place to place with deliveries or the like. However, neither of the Motorola patents provides any assistance to the user at each location. They are merely time schedulers for travelling from place to place.

In another system there is tracking of physical objects regardless of whoever uses or transports them. For example, in US Patent No. 6,477,452 there is disclosed a vehicle service status tracking system and method. The system allows multiple stations in geographically dispersed locations to monitor and track vehicle repair record and service status information. In a service area comprised of a number of geographically-bounded service regions, at least one regional communications terminal is provided in communication with a plurality of local communications terminals. Each local communications terminal is typically located at a separate repair or service location having responsibility for servicing the vehicles temporally located within the region. The disclosure provides a system and methods for maintaining and disseminating vehicle service information within and among regions. Vehicle service events are entered into a vehicle tracking system and maintained using a vehicle status database. Database files are exchanged among regional communications terminals and with a central equipment manager in order to provide timely and accurate dissemination of service status.

A further aspect of the disclosure is the sharing of vehicle service status with marketing offices and retail locations. This enables personnel at such locations to understand the repair history of a particular vehicle. A still further aspect of the disclosure is the ability to predict vehicle availability or time of return from service. The system and methods provide an availability prediction for operations personnel to allocate fleet vehicles while taking account of anticipated vehicle demand.

In US Patent No. 6,430, 496, there is disclosed a fully automated vehicle dispatching, monitoring and billing. The system for controlling vehicles to provide transportation services is without need for human intervention. A database stores records each documenting needed transportation services. Processing circuitry (which can be one or several networked computers) reviews these records, locates records indicating a need for immediate transportation service, and instructs vehicles to provide the service. The processing circuitry also monitors vehicle activities by reviewing the records, and automatically obtained vehicle activity information, to identify transportation services which are not being adequately provided, and refer these to human dispatchers for special attention. A variety of methods for obtaining and updating vehicle activity information are disclosed, as are various applications for the system.

These systems, therefore, are limited to control and recording of geographical movement of the article rather than assisting the user at the location.

There is also disclosed a method of scheduling a resource according to requirements. For example, in US Patent No. 6,415,259 to American Management Systems, Inc., there is disclosed an automatic work progress tracking and optimising engine for a telecommunications customer care and billing system. The system includes work progress tracking and management in which customer orders can be received and entered into the system. Upon the entry of customer orders the system automatically schedules the orders for completion and optimises the schedule based on several factors. These factors include work force utilisation, customer priority, due date and task dependencies. Further, the system takes

into consideration geographical constraints and automatically reschedules and re-optimises the schedule when changes occur due to unforeseen events. The disclosure is directed to a system for work progress tracking and management and, more particularly, to a system for assigning tasks to a workforce, optimizing the scheduling of the tasks, with automatic rescheduling of the tasks while ensuring the completion of the tasks before the desired completion date and utilizing the workforce with minimal ideal periods on a geographic basis.

It is stated in this document that in many firms, if not most, personnel costs are by far one of the largest, if not the largest, cost a firm has to address. In large telecommunications ("telecom") companies staff costs are also a major cost item and can also have greatest impact on profitability for several reasons. First, schedule optimization of such resources can save significant costs. Second, effective scheduling with customer constraints in mind (access to premises when the customer is available, reliable end-date forecasting) is a major differentiating factor in today's competitive telecom market. Finally, a swift reaction to changing circumstances (preferably transparent to the customer) can increase a firm's competitive advantage in the market by filling orders when other firms cannot. Telecom companies need to handle orders of customers having significant complexity from diverse domains. These domains include wireline, wireless, residential customers, and business customers. Further, business customer orders are often many times more complex than those found in the residential marketplace. To schedule staff for these customers, telecom companies need to reflect the customer's value. Often a customer's value can be assigned designations such as gold, silver, or bronze. The same order from these three different types of customers can result in three different solutions or methods of filling the order. Further, these solutions need to reflect the hundreds or thousands of changes, which can happen during a day. Such changes include:

1. Tasks and orders being added, deleted, or modified;
2. The actual duration of tasks can vary from the anticipated duration;
3. The workforce situation also can change due to sickness, or addition of new workforce members; and
4. The ability to load balance between workforce units in different locations and to recognize

dependencies between tasks, both at the workforce level and external system level also adds to the complexity.

The foregoing dependencies are complex in this document, particularly when volume is high. All optimisation changes that can occur in a high volume environment need to be effectively handled. Furthermore, the same workforce handles new orders (installations) and maintenance. Maintenance loads can change so significantly that the system must include a percentage of the workforce that is reserved just for maintenance tasks. This percentage of the workforce dedicated to maintenance must be "invisible" to the scheduling process and be able to fluctuate from one day to another. Scheduling optimisation also must be based on more than one parameter. One such parameter is order priority, which can reflect the value of the customer as discussed above. Another is flexibility, which is needed to reflect the desired workforce utilization. For example, one telecom company can desire to schedule their workforce to 75% of maximum capacity, while another prefers to operate at 90% utilization, leaving the remaining capacity for trouble tickets or handling emergency calls. A telecom company needs to be able to change this percentage quickly based on the rescheduling of orders already in the system. By doing so, it can smooth the "peaks and valleys" in the load in both the new orders and maintenance areas.

This document explains that given the number of possible permutations based on daily changes, each with a potential impact to the schedule, solutions with manual intervention are sub-optimal and cannot meet the needs of large telecom companies. Furthermore, the system must both automatically integrate workflow with scheduling, and then re-optimize the orders based on the latest situation during the day while taking into account work order priority, risk (how close are we to slipping the date committed to the customer) and keeping costs to a minimum. No integrated solution for the above identified problems is known to exist which can manage workflow, scheduling, and optimization of workflow and the workforce based on multiple parameters.

The American Management Systems, Inc patent therefore tries to automatically solve this scheduling system. It is typical of management systems of a resource such as manpower or time. However there is no input regarding a user not on the same location or input to the way a task is undertaken at various locations. The system generally requires control of the communication system with the caller at the end being placed on hold or passed around. It is not suitable for the true service industry providing the best service to the customer rather than limiting the service.

It is therefore an object of the present invention to provide a remote scheduling system and apparatus which overcomes or at least ameliorates the problems of the prior art. In particular it is an object of the invention to provide a system and apparatus that allows the best service to be undertaken at remote locations and to be monitored at a central station.

Other advantages and objectives of the defined invention are apparent upon inspection of this specification and the drawings appended hereto.

In accordance with the invention, there is provided remote scheduling system having one or more portable wireless communication systems for one or more users with each having download means, upload means and storage means, input means, and display means such that the user can request and view one or more audits to be undertaken at a location or on an asset, the user able to use the download means to receive from a central station the latest audit for a particular location and to report by the upload means the completion of the audit such that the central station is able to maintain a remote supervision of the users.

The portable wireless communication system download means is able to receive an updated checklist from the central station and allow input by the user of the completion or other information including condition status, further required action steps and the like, with such input able to be transmitted by the update means to central station to maintain an updated checklist for later downloads.

The display means displays a first checklist and only providing a second checklist when the user inputs indication of completion of tasks of first checklist. The display means is also able to display plurality of actions to be undertaken and requiring plurality of inputs by user through input means to check off each action as completed. In one form the display means is able to display predetermined plurality of actions and order that actions to be completed provided by downloaded checklist and requiring plurality of inputs of completion according to predetermined checklist which is uploaded to central station such that the central station maintains remote supervision of user.

It can be seen that the system allows for an accumulation of schedules and knowledge to be maintained at a central location and to be available to individual users or small group of users at a remote location such that a required service can be undertaken with knowledge an a result provided back to the central station.

Also in accordance with the invention there is provided a remote scheduling system including the steps of:

a) providing to a user a portable wireless communication system
b) providing on the portable wireless communication system one or more checklist of actions to be undertaken by the user
c) providing on the portable wireless communication system a list of assets or areas of location on which the actions are to be undertaken
d) displaying on the portable wireless communication system one subset of the list of assets and its related checklist of actions to be undertaken
e) providing on the portable wireless communication system an input for a user to record completion of checklist of actions for the displayed subset of the list of assets
f) displaying on the portable wireless communication system the next subset of the list of assets and its related checklist upon the previous subset having been input as completed
g) communicating details of the checklist of actions from the portable wireless communication system to a central station.

wherein the central station is able to determine remotely the locations the user has been and the actions undertaken.

The communicating of details of the checklist of actions from the portable wireless communication system to a central station can occur at real time when the action has been input as having been completed wherein the central station is able to determine remotely the real time present position of the user and the actions undertaken.

The remote scheduling system can also include one or more of the steps of

h) providing a list of resources available for undertaking the actions;

i) providing a communication receiving device at a remote location which is able to be used for downloading information or updates from a central location on any one or more of the above.

j) providing a communication transmitting device at the remote location which is able to transmit the results of each scheduled action from the remote location to the central location;

k) the central station having storage means able to record the results and the differences from previous result;

l) providing a navigation function on the communication receiving device at a remote location to provide a digital map to the asset or areas of location and associated checklists.

Further the invention provides a remote scheduling apparatus including:

1) a central station having:

i. a database of checklist of actions to be undertaken

ii. a database of a plurality of remote locations at which actions are to be undertaken

iii. a list of assets or areas of location on which the actions are to be undertaken

iv. a list of resources available for undertaking the actions

v. a communication transmitting device which is able to be used for transmitting information or updates from the database to a selected remote PDA

2) a plurality of remote PDAs having

vi. a communication receiving device at a remote location which is able to be used for downloading information or updates from a central location

vii. a database for holding transmitted information or updates from a central location

viii. an output for outputting checklist of actions to be undertaken, a plurality of remote locations at which actions are to be undertaken, a list of assets or areas of location on which the actions are to be undertaken, and a list of resources available for undertaking the actions

ix. an input for inputting results of actions undertaken

x. a communication transmitting device at the remote location which is able to transmit the results of each scheduled action from the remote location to the central location

wherein the central station is able to determine remotely the locations the user has been and the actions undertaken. Each of the plurality of remote PDAs having a navigation function on the communication receiving device at a remote location to provide a digital map to the asset or areas of location.

The invention still further provides a communication receiving device for use in a remote scheduling system having a storage database and display able to provide a checklist of actions to be undertaken, provide a list of assets or areas of location on which the actions are to be undertaken, provide a list of resources available for undertaking the actions, and able to download information or updates from a central location on any one or more of the above with a communication transmitting device able to transmit the results of each scheduled action from the remote location to a central location. The input means can be able to record

the results and the differences from previous result of actions undertaken and transmit the results of each scheduled action from the remote location to a central location. Also the communication receiving device can have a navigation function on the communication receiving device to provide a digital map to the asset or areas of location.

The invention also provides a remote scheduling system including the steps of:

a) providing to a user a portable wireless communication system

b) providing on the portable wireless communication system one or more actions to be undertaken by the user

c) providing on the portable wireless communication system a list of assets or areas of location on which the actions are to be undertaken

d) providing on the asset or location an identity code able to be entered into the portable wireless communication system when at the asset or location

e) communicating details from the portable wireless communication system to a central station of the entered identity code and other details including the time

f) providing on the portable wireless communication system an input for a user to record details of actions or results on the asset or the location

g) communicating details of the actions, completion of actions or results from the portable wireless communication system to a central station

h) displaying on the portable wireless communication system the next assets or location and its related action to be completed

wherein the central station is able to determine remotely the locations the user has been and the actions undertaken.

The remote scheduling system can include the steps of:

a) providing on an asset or at a location a portable wireless communication system

b) providing on the portable wireless communication system one or more actions to be automatically and routinely undertaken by connected apparatuses

c) communicating details from the portable wireless communication system to a central station an input of actions or results of the actions on the asset or the location

d) communicating details of the actions, completion of actions or results from the portable wireless communication system to a central station

e) central station determining remotely the status of the asset or location and automatically instigate emergency action as required by external communication means.

The remote scheduling system can include the steps of:

a) providing to a user a portable wireless communication system

b) providing on the portable wireless communication system one or more actions to be undertaken by the user

c) providing on the portable wireless communication system a list of assets or areas of location on which the actions are to be undertaken and having secure entry

d) providing on the asset or location an identity code able to be entered into the portable wireless communication system when at the asset or location

e) communicating details from the portable wireless communication system to a central station of the entered identity code and other details

f) providing on the portable wireless communication system an input of user and action to be undertaken on the asset or the location

g) communicating details of the user and action from the portable wireless communication system to a central station

h) selectively providing from the central station opening instruction after assessment of received information for opening the secure entry such as on a Simons-Voss lock

wherein the central station is able to determine remotely the location of the user and the user's authority and action to be undertaken so as to remotely supervise the actions undertaken at secure locations.

The invention in a particular preferred enablement provides a remote scheduling apparatus including:

1) a central station having:

i. a database about one or more remote locations at which actions are to be undertaken

ii. a database about one or more users who can undertake the actions on the assets or at areas of location

iii. a communication transmitting device which is able to be used for transmitting information or updates from the database to a selected user's PDA possibly at a remote position

2) one or more PDAs having

iv. a communication receiving device possibly at a remote location which is able to be used for downloading to the user information or updates from the central station

v. a database for holding transmitted information or updates from the central station

vi. an output for outputting information or data to the central station

vii. an input for inputting data, information or results about remote asset or location or user

viii. a communication transmitting device at the remote location which is able to transmit the input data from the remote location to the central location

ix. one or more modules performing combination of the above described invents.

A first module can enable

a) providing to a user a portable wireless communication system

b) providing on the portable wireless communication system one or more checklist of actions to be undertaken by the user

c) providing on the portable wireless communication system a list of assets or areas of location on which the actions are to be undertaken

d) displaying on the portable wireless communication system one subset of the list of assets and its related checklist of actions to be undertaken

e) providing on the portable wireless communication system an input for a user to record completion of checklist of actions for the displayed subset of the list of assets

f) displaying on the portable wireless communication system the next subset of the list of assets and its related checklist upon the previous subset having been input as completed

g) communicating details of the checklist of actions from the portable wireless communication system to a central station.

A second module can enable:

h) providing to a user a portable wireless communication system

i) providing on the portable wireless communication system one or more actions to be undertaken by the user

j) providing on the portable wireless communication system a list of assets or areas of location on which the actions are to be undertaken

k) providing on the asset or location an identity code able to be entered into the portable wireless communication system when at the asset or location

l) communicating details from the portable wireless communication system to a central station of the entered identity code and other details including the time

m) providing on the portable wireless communication system an input for a user to record details of actions or results on the asset or the location

n) communicating details of the actions, completion of actions or results from the portable wireless communication system to a central station

o) displaying on the portable wireless communication system the next assets or location and its related action to be completed

A third module can enable:

p) providing on an asset or at a location a portable wireless communication system

q) providing on the portable wireless communication system one or more actions to be automatically and routinely undertaken by connected apparatuses

r) communicating details from the portable wireless communication system to a central station an input of actions or results of the actions on the asset or the location

s) communicating details of the actions, completion of actions or results from the portable wireless communication system to a central station

t) central station determining remotely the status of the asset or location and automatically instigate emergency action as required by external communication through one or more of the modules.

And a fourth module can enable:

u) providing to a user a portable wireless communication system

v) providing on the portable wireless communication system one or more actions to be undertaken by the user

w) providing on the portable wireless communication system a list of assets or areas of location on which the actions are to be undertaken and having secure entry

x) providing on the asset or location an identity code able to be entered into the portable wireless communication system when at the asset or location

y) communicating details from the portable wireless communication system to a central station of the entered identity code and other details

z) providing on the portable wireless communication system an input of user and action to be undertaken on the asset or the location

aa) communicating details of the user and action from the portable wireless communication system to a central station

bb) selectively providing from the central station opening instruction after assessment of received information for opening the secure entry such as on a Simons-Voss lock wherein the central station is able to determine remotely the location of the user and the user's authority and action to be undertaken so as to remotely supervise the actions undertaken at secure locations.

In order that the invention may be more readily understood, embodiments will be described by way of illustration only with reference to the figures wherein:

FIGURE 1 illustrates an example of the components of the invention showing how they interrelate with each other.

FIGURE 2 is a schematic representation of a mobile/wireless maintenance inspection checklist according to Module 1 of the invention;

FIGURE 3 is a schematic representation of wireless scheduling and monitoring of a contractor's work according to Module 2 of the invention;

FIGURE 4 is a schematic representation of a wireless performance monitoring system according to Module 3 of the invention;

FIGURE 5 is a schematic representation of wireless access control according to Module 4 of the invention;

FIGURE 6 is a swim lane diagram of Module 1;

FIGURE 7 is a swim lane diagram of Module 2;

FIGURE 8 is a swim lane diagram of Module 3, Part 1, the data reading function; and

FIGURE 9 is a swim lane diagram of Module 3, Part 2, the fault alarm.

Module 1: Maintenance Inspection Module

The mobile maintenance inspection checklist module contains all the necessary maintenance inspection forms for each facility based on scheduled audit.

At each location the user is able to go through a maintenance/inspection checklist to record defects, compute relevant figures and note down required follow up actions.

The library of specialised equipment to be checked is stored on the central server. The central server has the web-based functionalities to create/ maintain checklists (which includes both the audit maintenance checklists and the cleanliness checklist) to create/maintain the location's information including resources eg vacuum cleaners and create/maintain maintenance audit schedules.

When the system administrator schedules a maintenance audit, the scheduled audit uses the current version of information including assets and resources of the location and the current version of the relevant checklists.

At the location where the audit is to be performed the user logs on, selects the maintenance inspection audit module and selects the scheduled audit for the location. All the related information pertaining to the selected audit is downloaded wirelessly via GPRS into the PDA

In the event that a defect is detected the user can optionally take pictures using a digital camera for transmission to the central station.

On completion of the scheduled action the resulting report is transmitted to central station. The central station records the latest results and maintains records of changes and defects from earlier reports.

First Use Case: Complete Maintenance Audit

As the user inspects the asset, the user completes the checklist on the PDA.

Pre-Condition

- The user is given the authority to access the module.
- Only one audit is downloaded to the PDA at each time.

Primary Flow of Event

1. The User logins the PDA by keying the following information:
   +Login
   +Password
2. The Select Module page showing the different modules allows the user to select Inspection Audit Module.
3. User selects the Audit Checklist Module. The "Maintenance Inspection Checklist" screen displays the list of premise for inspection with 4 columns, the date, the time, the premise and the contact person of the premise. There is a flag next to each line item to indicate whether the maintenance audit is new or not. There 4 buttons namely, the Back button, the Audit Maintenance button, the Resource Audit button ad the Cleanliness Audit button.

Maintenance Audit Checklist

4. User selects the Audit Maintenance Button. Screen displays the list of Blocks/External elements of the Premise selected. There are 3 buttons on this screen, namely, the back button, the Scan Asset button and Navigate to Asset button. When the user selects Block, and click on the Navigate to Asset button, the user is able to navigate down to floor, rooms, list of asset and then the asset maintenance checklist.

Navigation to Checklist of External Elements

5. When user selects external elements, such as car park or swimming pool, screen displays the list of assets associated with it. When user selects the asset, screen displays the maintenance checklist.

Navigation to the Checklist by Block>Level>Assets>Checklist

6. User selects the Block to be inspected. Screen indicates the location details, such as the premise and the block user is in, and displays the list of floors in this Block.

7. User selects the Level to be inspected. Screen displays the list of rooms, corridor and stairways, etc associated with each floor.

8. User selects the room, corridor or stairways, etc. Screen shows the exact location (premise, block and level) where the user is and displays the list of assets/equipments that are in the room. There are 2 other buttons, namely the "Back" button and the "Check this Asset" button. When user select the asset/equipment, the details of highlighted row are reflected at the lower portion of the PDA.

9. User clicks on the "Check this Asset" button. Screen displays the list of checklist items associated with the assets and the status of the checklist item. There is a button for "General Remarks", which will display the most recent 5 general remarks associated with this asset. At the lower portion of the screen, there are 2 radio buttons, OK and not OK with the selected checklist item of the asset. There is also a line that describes the previous status, if any. *(By default, the radio buttons are not set unless the asset has been deemed as not OK on the previous audit. In this case, Not OK will be selected).* The user can click on "View Remarks" to view the most recent 5 historical remarks associated with this item.

Satisfactory Item

10. User clicks on the selected item on the list. The selected list is reflected at the lower portion of the PDA. User updates the status as OK by clicking on the "OK" radio button. And the status next to the line item is updated as OK.

11. User clicks on the next item on the list and update the status accordingly. The process is repeated till all the lists are checked.

12. When all the checklist items have been checked, the user clocks on Done button. The icon is changed to completed on the Asset Page.

Unsatisfactory Item - Specific Items

13. If there is defect detected, the user selects the "not OK" radio button and the status next to this line item is updated as "not OK". "Fill Remark" screen shows a list of 5 last remarks with the date, time and the author, associated with the assets. A remark test box permits the user to document the latest defect. Only the author of the remarks is able to delete the remark that is written. The user an optionally take a digital picture of the defect using a separate digital camera. There is a checkbox that allows the user to indicate that a digital photo has been taken. User is also able to add in an auto-incrementing photo number corresponding to the sequence of the number of photo that is taken.

14. User documents comment on the text box and clicks on the Done Button. The new remark is added and the system goes back to the Select Checklist Item screen.

Unsatisfactory Item – Non Specific items

15. From the "Select Checklist Item" screen, when the user clicks on the General Remarks button, the user is able to document general remarks of the defect of the assets. Screen displays the list of the last 5 remarks. Only the author of the remarks (or the one who is given the privilege/access right) is able to delete a remark.

Resources Audit

16. User is able to navigate to the Resources Audit screen by either from Step 3 where the user clicks on the "Resources Audit" at the menu bar at bottom of the PDA screen.

17. The Resources Audit screen has 2 sections. The top section displays the list of the Resources with 3 columns, namely Plant & Machinery, Required Quantity and

Quantity Available. The highlighted item is displayed at the bottom section where the user is allowed to key in the quantity of the item counted. There is a field that shows the Total Liquidated Damages (LD). There are 2 buttons, namely the "Back" button and the "Done" button.

18. User keys in the quantity of the item counted and click on the "Done" button. The quantity is updated on the screen. The total amount of LD (Liquidated Damages is computed automatically and reflected on the screen as the user goes down the list. The icon next to the line item changes as user updates the audit lists.

19. User repeats the process till the list is completed.

Cleanliness Audit

20. User is able to navigate to the Cleanliness Audit Screen by either from Step 3 where the user clicks on the "Cleanliness Audit" Button or by selecting "Goto > Cleanliness Audit" at the menu bar at right button of the PDA screen.

21. Screen displays the list of categories where the cleanliness audit is to be carried conducted. User selects the category. The selected category is displayed at the lower section of the PDA.

22. The Cleanliness Audit screen has 2 sections. The top section shows the list with 2 headings, Elements and Fault. The icon next to the selected elements indicates whether the element is checked. The selected Element is highlighted at the lower section of the PDA screen, with the Tolerance level, the text box that allows the user to key in the score. The overall score and the Total LD amounts are computed automatically. There are 2 other buttons, "Back" and "Done".

23. User fills in the score of the system accordingly

24. User is able to synchronise the audit by navigating, on the menu bar. File> Synchronise, and the information is transferred to the Central Server.

25. The use case ends.

<u>Alternative Flow of Event</u> (Assess the Checklist via Bar Code Scanning of the Asset).

1. From step 4 when user clicks on the Scan Assets button, the user is able to assess the Checklist directly by scanning the barcode of the asset.

2. User scans the equipment bar code screen displays the checklist for the selected asset.
3. User clicks on the selected item on the list. The selected list is reflected at the lower portion of the PDA. User updates the status as OK by clicking of the "OK" radio button
4. The whole process is as step 10 above.

Alternative Flow of Event (High Rise)

1. For high-rise building, there are daily audit checks and monthly audit checks. And there is no Resource Audit and they tag cleanliness audit to particular location. Therefore, cleanliness audit an be considered as an asset under a location.
2. User from the high rise logs in, the maintenance audit checklist screen will show either Daily or Monthly Audits. There are only Back button and Audit Maintenance Button. The Audit Cleanliness and the Resource Audit buttons are now shown on the screen.
3. User selects an audit and clicks on "Audit Maintenance" button and the user is able to navigate down to the assets checklist through Blocks > Levels> Rooms>Assets.
4. The maintenance audit check is as per above from main flow Step 5 onwards.

Post-condition

- Maintenance Audit Information collected during the audit process is entered.
- Maintenance Audit Information is synchronised to the Central Server.
- The central server keeps the audit records of the current audit for generation of reports until a new audit is downloaded.
- User able to proceed to the View/Sign PDA Report Use Case (on the PDA) or the View/Generate Report use case (on the Central Server).

Second Use Case: View/Sign PDA reports

The user can recall the Maintenance Audit checklist report of the selected audit.

Pre-condition:

- User is given the access and authority to view the report for area that is the user's responsibility.
- The chosen audit has been performed (partial completion is acceptable).

Flow of Event:

1. The User logins the PDA by keying the following information:
   +Login
   +Password
2. The Select Module page showing the different modules allows the user to select Inspection Audit Module.
3. User selects the inspection Audit Checklist Module.
4. The Select Audit screen displays the list of audits for inspection. User selects the date and the premise of which the user wants to retrieve the reports.

List of Unsatisfactory Assets

5. On the bottom menu bar, user selects "Lists>List of Unsatisfactory Items.
6. The screen displays the list of the unsatisfactory items from the audit.

List of Unchecked items

7. On the bottom menu bar, user selects Lists>List of unchecked items.
8. The screen displays the list of the unchecked items from the audit.

Unsatisfactory Assets Report

9. On the bottom menu bar, user selects "Reports>Unsatisfactory Assets Report.
10. The screen displays the summary list of the unsatisfactory items and the count for each asset from the audit. User is able to scroll down to collect/view the signatures of the contractor, the technical executive and building contact person (with the date and time).

Resources Audit Report

11. On the bottom menu bar, user selects "Report>Resources Audit"
12. Screen displays the "Resources Audit screen" showing 3 columns, the list of consumables, the Required Quantity and the Available Quantity (LD is not displayed on this screen). User is able to scroll down to collect/view the signatures of the contractor, the technical executive and building contact person (with the date and time).

Cleanliness Audit Report

13. On the bottom Menu bar, user selects "Report>Cleanliness Audit"

14. Screen displays the "Cleanliness Audit" screen with the overall performance (LD is not displayed), the global status (pass or fail) and the signatures (with the date and time).

15. The Use Case ends.

Central Saver Use Case

Third Use Case: Maintain Premise Information

The Maintain Premise Information Use Case allows the user to create and update premise information.

Pre-condition

- The user is logged into the system.
- The user given the rights to create and update the premise information.

Primary flow of Event

1. The User logins the Central server through a web page by keying the following information:
   +Login
   +Password
2. User chooses the Maintain Premise Module
3. There are 2 panels to the screen. The left panel a tree diagram that shows the hierarchy of premises while the right panel shows details of the selected node (an item in the hierarchy tree). At the top level of the hierarchy, there are 2 groups – "Low-rise" and "High-rise" – each of which is mapped to a checklist group (see below). At the second level, there are the Premise Groups, such as "Hub 3" and "Hub 10". Under each Premise Group, the user can perform the following.
4. Create New Premise
   User clicks on the new Premise Button, the following data fields is to be captured on the New Premise Form (on the details tab):
   Create New Premise Form
   Premise Name:
   Premise Barcode (used by module 2):

Address:

Postal Code:

Telephone:

Fax Number:

Contact Person (OM):

Contact Person Barcode (used by module2):

Email Address:

On this screen, there are the additional:

(a) Add New Block/Ext Elements Button (on the details tab)

(b) Resources tab (for maintaining the list of resources for the premise)

5. Create New Block

User clicks on the Add New Block Button, a textbox allows user to add new block or external element.

6. Create New Level

User selects the block and clicks on the Add New Level Button to enter the level name/number.

7. Create New Location

User selects the level and clicks on the Add New Location Button to enter the location name.

8. Create New Asset

User selects the location and clicks on the Add New Asset Button to enter,

Asset Description:

Checklist Selection list box:

Asset Barcode:

9. User attaches the relevant checklist to the asset by selecting from a dropdown list containing all the checklists for the premise group.

10. User Case ends.

Alternative Flow – Resource Audit Checklist

1. When user selects Resources tab from Step 4b, screen shows the list of Resources, the Quantities and the LD rate associated with each resource. Next to each line item, there are Edit button and Delete button.
2. User creates new Resource by clicking on the Add New Resource Button; a text box allows the user to add new resource item and the quantities.

Post-Condition:

- Premise data is added/updated and saved.

Fourth Use Case: Create Checklist

The Create Checklist Use Case allows the user to create and update checklist.

Pre-condition:

- The user is logged into the system.
- The user given the rights to create and update the checklist.

Primary Flow of Event

3. The User logins the Central Server through a web page by keying the following information:
   +Login
   +Password
4. User selects the Checklist Maintenance Module.
5. Screen allows user to navigate to Maintenance Audit Checklist or Cleanliness Audit List via tabs.

Maintenance Audit Checklist

6. When user selects Maintenance Audit Checklist, screen shows the Checklist hierarchy (tree diagram) on the left panel (similar to maintain premise). On the right panel, the details of the selected node and appropriate buttons (i.e. Add, Delete, Save).
7. User selects the root node and creates new Checklist Group by clicking on the Add New Checklist Group Button on the right panel. Textbox allows user to enter its name.

8. User selects the Checklist Group and clicks on the Add New Checklist button on the right panel. User enters the name and clicks Save.
9. User selects the Checklist and indicates whether the new item is Daily, Monthly, Quarterly or Yearly, and clicks on the Add New Checklist Item button on the right panel. User enters the details (description) and clicks Save.

Cleanliness Audit List

10. When user selects Cleanliness Audit Checklist tab, screen shows the Cleanliness Checklist hierarchy (tree diagram) on the left panel (similar to maintain premise). On the right panel, the details of the selected node and appropriate buttons (i.e. Add, Delete Save).
11. User selects the root node and creates new Category by clicking on the Add New Category Button on the right panel. Textbook allows user to enter its name.
12. User selects the Category and clicks on the Add New Element button on the right panel. User enters the name and clicks Save.
13. User selects the Element and clicks on the Add New Fault button on the right panel. User enters the details (tolerance, LD rate if any, etc) and clicks Save.
14. The User case ends.

Post Condition

- Checklist is created.

Fifth Use Case: Create Maintenance Audit Schedule

The Create Maintenance Audit Schedule Use Case allows the user to schedule maintenance audit.

Pre-condition:

- The user is logged into the system
- The user given the rights to create and update the checklist.

Primary Flow of Event

1. The User logins the Central server through a web page by keying the following information:

+Login

+Password

2. User selects the Audit Schedule Module. The screen shows list of maintenance audit schedule with 2 columns. Date and Premise. User is able to add to the list by clicking onto the New Schedule button. The data elements are:

Date/time:

Premise:

Audit Frequency (Daily, Monthly, Quarterly, Yearly)

Levels (all selected by default):

Resources: Yes or No

Audit Cleanliness: Yes or No

3. Use Case Ends

Post-condition

- The maintenance audit schedule is created.

Sixth Use Case: Generate Report

The Generate Report Use Case allows the user to

1. Create report
2. Attach Photos to List of Unsatisfactory Items
3. Print out reports

Pre-condition

- The user is logged into the system.
- The user given the rights to create and update the checklist.

Primary Flow of Event

1. The User logins the Central server through a web page by keying the following information:

+Login

+Password

2. User selects the Report Module. User is allowed to search based on date and schools. And the screen shows a list of reports.
3. The screen shows the following list of reports for the selected premise:

(a) Unsatisfactory Items Report

(b) Consumables Audit Report

(c) Cleanliness Audit Report

Post-Condition

- User will be allowed to assess the reports based on the premise selected.

3.2 Module 2: Wireless Scheduling & Monitoring of Contractor's Work

Seventh Use Case

Module 2: Wireless Scheduling & Monitoring of Contractor's Work

The Wireless Scheduling and Monitoring of Contractor's Work module tracks maintenance activities on site. A client identifying a need for breakdown maintenance work will call the system Operator help-desk to log the request. The help-desk would log the request into a Customer Relationship Management (CRM) system and a Work Instruction (WI) is generated. The WI is sent to the relevant contractor wirelessly via GPRS. Upon receipt of the WI, the contractor would be required to acknowledge receipt of the WI wirelessly using the PDA. With the detail information on the PDA, the contractor proceeds to the site of to perform the job. On site, the Contractor scans the on site barcode before beginning job to log the start time of the job. The completion time of the job is log once the Contractor wirelessly sent the completed fault report form to the central server. This enables the system to track the duration of the job and track the progress of the Contractor's work, as well as the Contractor's response time to the job request.

On site, the Contractor scans the on site barcode before beginning job to log the start time of the job. The completion time of the job is log once the Contractor wirelessly sent the completed fault report form to the central server. This enables the system to track the duration of the job and track the progress of the Contractor's work, as well as the Contractor's response time to the job request.

When the inclusion of this component into wireless facilities management system, the system Operator managers can easily monitor and track the maintenance work of the Contractors.

Maintenance jobs can be automatically scheduled and assigned to the respective Contractors and the system Operator Managers have a greater control of the progress of work. This wireless function also benefit the contractors as they are no longer required to travel to and from the office to report on the time logs and progress of their work.

For this module, the Central Server has 7 use cases. They are:

- Work Instruction Notification
- Login
- Acknowledge Work Instruction
- View Details
- Process WI
- Query
- Generate report

Eighth Use Case: Work Instruction Notification

A typical Work Instruction (WI) generated by the CRM is sent to the wireless facilities management system. The wireless facilities management system receiving the WI would identify the relevant contractor to assign the job and send the WI wirelessly to the contractor via the PDA.

Pre-condition:

- the system Operator staff (helpdesk personnel) generates a work instruction (WI) through the CRM.
- Relevant information can be extracted from the CRM and sent to wireless facilities management system Central Server.
- The Use Case ends.

Post-condition:

- SMS sent to the appropriate contractor & TE via GPRS (The SMS is sent via the MFMS server).

Ninth Use Case: Login

The authorised contractors are allowed to login to the Central Server via the PDA to access the Modules required to process the user's work.

Pre-condition:

- Information on the contractors is available.
- The contractor is the authorised user of the PDA application.

Primary Flow of Events

1. The Contractor login from the PDA using
   +User ID
   +Password
2. The Central Server verifies the identity of the user and grant access when the authorised user logs in.
3. The Use Case ends.

Post-condition:

- The contractor sees the screen that allows him to select the "Wireless Scheduling & Monitoring of Contractor's Work" module to see the relevant WI.

Tenth Use Case: Acknowledge Work Instruction

To ensure that the contractors meet a certain service standards agreed in the maintenance contract, the system Operator has an escalation process ht reminds the relevant parties of the unattended WI. The procedure defines the allowable acknowledgement time of the contractor to the notification of a WI. It reminds the respective contractor as well as the responsible technical executive (TE) or higher management via SMS when there is no response from the contractor after a certain period of time.

The contractor will be informed via SMS that the user has a job assigned to him. Seeing the SMS, the contractor has to login and click the acknowledgement button. The timestamp of the acknowledgement will be captured by the Central Server and the wireless facilities management system will update the status of the WI in the CRM, thus stopping the escalation.

Pre-condition:

- Contractor receives SMS notification of the WI assigned to him.
- Contractor log-in to PDA and selects module 2 from the PDA Select Module screen.
- Telecommunication service available.

Primary Flow of Events

1. The contractor selects the relevant WI and click the acknowledge button on the PDA to acknowledge receipt of the WI notification.
2. The date and time of the acknowledgement is updated in the Central server.
3. CRM is notified by the Central Server of the acknowledgement from the contractor.
4. The Use Case Ends.

Post-condition:

- The status of the WI is updated in the Central Server.
- Relevant information is sent to the CRM System to update the WI's status and stop the escalation process.

Eleventh Use Case: View Details

In the existing the system Operator practice, an alphanumeric pager message is sent to the contractor to notify the WI that has been assigned. Due to the limitations or message length in a pager, the amount of information provided by a pager message is not sufficient to help the contractor to get a basic understanding of the problem. The contractor has to call the helpdesk to obtain information on the details of the Work Instruction.

The View Details use case allows the contractors to wirelessly access the details of the Work Instruction assigned to him. The relevant information is structured in a standard format to improve the readability of the WI details. The amount of screen area available on the PDA as compared to the PDA also allows more information to be included.

Pre-condition

- The Contractor logs in on the PDA.
- The Contractor selects Module 2, "Wireless Scheduling & Monitoring of Contractor's Work" from the Select Module screen.

Primary Flow of Events

1. The contractor clicks on the relevant WI and then clicks on the "View Details" icon to see the WI details. The contractor is able to see the following detail information:
   +Date:
   +Type of Services:
   +Organisation:
   +Contact Person:
   +Location:
   +System:
   +Fault Description:
   +Severity:
2. The Use Case ends.

Post-condition

- WI details are retrieved and displayed on the PDA.

Twelfth Use Case: Process Work Instruction

Currently, the contractors have to complete a standard fault report form and fax the complete form to the helpdesk. Upon receipt of the completed fault report from the contractors, the helpdesk personnel are required to key in the information as per recorded.

With the deployment of wireless facilities management system, when the Contractor arrives at site, the user logs into the Central Server via the PDA to access the WI assigned to him. After selecting the relevant WI, click the "Arrive" icon to log the arrival time of the contractor and scan the School officer's barcode, the contractor is allowed to access to the respective fault report or problem. Using the PDA, data entered or updated by the Contractor on the report would be updated real-time and wirelessly to the Central Sever. With the real-time updates of reports, the system Operator staff will be able to monitor the progress and status of the fault rectification. This also reduces the time and effort taken to process a work instruction.

Pre-condition:

- The relevant contractor being informed.
- The contractor receives a SMS that notifies him of the WI.

- The contractor has acknowledged receipt of the notification of the WI via PDA.
- The contractor logs in from the PDA using the user's user, ID, password and chooses the relevant WI in the list.
- Premise and School Officer's barcode is available.
- Telecommunications service available.

Primary Flow of Events:

1. When the contractor arrives on site, the user is required to click "Arrive" button and scan the premise barcode to loge the user's arrival time.
2. The contractor is prompt to scan the premise barcode.
3. The contractor is then allowed to access to the fault details form to process the WI.
4. The contractor sees a screen that allows the contractor to choose "Open Door" or 'View Details" buttons. The "Open Door" button allows the contractor to access secured areas (see module 4), while the "View Details" button allows the contractor to view the WI details screen.
5. Clicking the "View Details" button, the contractor is able to see the WI information.
6. The Contractor clicks "Next" to proceed to the next screen that allows him to log the actions taken to rectify fault.
7. The contractor performs the user's job and completes the Fault details form in the PDA. Real-time information entered by the contractor is sent and recorded on the Central Server.
8. After the form has been completed, the contractor is to get endorsement from the officer in charge of the premise to verify that action has been taken by the contractor to rectify the fault. If the school officer is available, the contractor will obtain the user's signature on the PDA. The contractor would also be required to scan the premise barcode.
9. After scanning the barcode information, the contractor would be brought to a screen that allows the officer (OM) to optionally enter remarks and indicate the status of the job, pending or completed. The pending status is to provide for cases whereby the contractor is unable to complete the job due to the reasons such as lack of spare parts.

10. The contractor after completing the form would click "Done". This logs the date and timestamp and updates the status of the WI to the Central Server. The Down Time period is from the time when wireless facilities management system server receives a WI from the CRM to the time the status of the WI (in the wireless facilities management system) is updated to "Complete" or "Pending".
11. The Use Case ends.

Alternative Flow of Events

Accessing Secured Locations (module 4)

1. If contractor is at a secured site, the contractor has to scan the officer's (OM's) bar code and the premise barcode and click the "Open Door" button to open the digital locking system.
2. After the contractor access the location, the user can click the "view details" to view the WI details Screen and access the fault report forms.

Post-condition:

- The contractor's arrival time is logged when the contractor scans the barcode at site.
- The real-time data entered into the fault report is sent wirelessly to the Central Server.
- The endorsed report is updated to the central serve and the time of completion is logged.

Thirteenth Use Case: Case Query

The user is allowed to query and retrieve previous Work Instruction from the Central Server using the PDA.

Pre-condition:

- WI case is logged in the Central Server.
- The WI case in which the user intends to enquire is not a new WI.
- User is authorised to access the information.
- User logs in on the PDA.
- User selects Work Instruction Module (Module 2).
- Telecommunication service is available.

Primary Flow of Events

1. User selects the query button on the PDA.
2. User is brought to a screen that allows him to enter the search criteria to query for the WI that the user is interested to find out.
3. User clicks on the search button.
4. User's request is sent wirelessly to Central Server.
5. Information is retrieved and sent to the user. Screen shows list of Work Instruction that corresponds to the search criteria keyed by the user.
6. Post-Condition:

- The requested cases are listed and one user selects a Work Instruction (WI), and clicks on "View Detail" button, user is able to view the selected WI displayed in the WI details page.

Fourteenth Use Case: Generate Report

All the data collected at site and the timestamp captured are stored in the Central Server. To provide for the system Operator requirement to obtain statistics or reports for management reporting, the wireless facilities management system Central Server has a screen to allow the generation of various reports.

Pre-condition:

- Data are available.
- The user is authorised to generate report from the Central Server.
- Report templates are available.
- Formulas for calculation of Key Performance indicators are present.

Primary Flow of Events

1. The user logs in at the Central Server using the user's user ID and password.
2. The user selects the type of report to be generated.
3. The user sets the required parameters for the report.
4. The relevant information is retrieved from the database.
5. The report is generated.
6. The Use Case ends.

Post-condition

- The required reports are generated and printed (if required).

Fifteenth Use Case

Module 3 Wireless Performance Monitoring System

The Wireless Performance Monitoring System module enables remote collection of the temperature readings, tracking of fault alarms of different systems in the facilities and the auto-generation of job orders to rectify the fault identified. The central Building Management Systems (BMS) at the system Operator will monitor the performance of the different systems in the client's facilities.

When any fault is detected, the BMS will trigger an alarm that will send information to the wireless facilities management system Central Server. The wireless facilities management system Central Server forwards the fault information to the CRM. CRM generates work instruction (WI) and the WI is forwarded to the respective Contractors or Technical Executive in charge. This process triggers the workflow as in Module 2.

This module involves mainly interaction with the Building Management System (BMS). The Central Server of the Mobile Facility Management System (wireless facilities management system) interfaces with the BMS Server.

1a Upon receipt of request for the selected parameter readings from the user, the wireless facilities management system server sends a request to the BMS system for a certain premise.

1b The BMS server sends the requested information to the central server and date is transmitted to the PDA via GPRS.

3. In even when there is a fault detected in the BMS such as an electrical trip or certain parameter monitored is beyond a permissible range, the BMS will trigger a fault alarm. This alarm is detected in the wireless facilities management system server, which in turn, will send a message to the CRM to automatically raise a Work Instruction.

There are 3 use cases that are identified:

1. Data Reading
2. Fault Alarm Detection

Sixteenth Use case: Data Reading

The user is able to remotely monitor parameters (such as Temperature and Humidity) of certain rooms (such as the server room) at any time. The system Operator Technical staff sends request for parameter reading by selecting the premise and the parameter to be monitored by on the PDAs. Upon receipt of the request, the wireless facilities management system server accesses the readings from the BMS system. And the readings are down loaded onto the PDA via GPRS.

Pre-condition:

- The user is given the privilege to access this Module.
- The Parameter/Data to be monitored is available.

Primary Flow of Events:

1. The user logins the PDA by keying the following information:
   +Login
   +Password
2. The Select Module page showing the different modules that allows the user to select BMS Monitoring Module.
3. User selects the BMS Monitoring Module. There are two other sub-modules namely, Parameter Monitoring and Summary list of BMS faults.
4. User selects the BMS Monitoring Module.
5. Parameter Monitoring Module displays list of locations/assets and the Types of parameters to be monitored. Once a particular location and parameter is chosen, the details of the location and the parameter monitored are displayed at the lower portion of the PDA screen. The information of the selected parameter and location is transferred from the wireless facilities management system central Server via GPRS to

the PDA. There are 2 buttons: the Back button and the Show Details button. The Back button allows the user to navigate backwards to the previous page.

6. User clicks on the Show Details button, screen displays the list of parameters at different time intervals. There are 2 buttons: the Back button and the Show Graph button.
7. User clicks on the Show Graph button, screen shows graphical representation of the parameters to be monitored.
8. The use case ends.

Post-condition:

- User is able to view the various parameters of the selected premise at anytime when required.

Seventeenth Use Case: Fault Alarm Detection

In instances where there is an electrical trip, or certain parameters monitored falls below certain permissible level, a fault is detected by the BMS system and will trigger a fault alarm. This fault alarm is forwarded to the wireless facilities management system Central Server. The wireless facilities management system central server will forward a message to the CRM to raise a Work Instruction (Module 2).

At the PDA level, the user is able to view a summary list of faults reported, the location and the status (whether the WI has been raised in the CRM).

Pre-condition:

- The user is given the privilege to access.

Primary Flow of Event:

1. Fault (such as electrical trip or certain parameter is not within the acceptable level) detected by the BMS system triggers a fault alarm.
2. The fault details in transmitted to the wireless facilities management system Central Server. The wireless facilities management system Central server sends a message to the CRM to raise a Work Instruction.
3. User is able to view the summary list of faults reported in the PDA. The User logins the PDA by keying the following information:

+Login

+Password

4. The Select Module page showing the different modules.
5. User selects the BMS Performance Monitoring Module. There are two other sub-modules namely, Parameter Monitoring and Summary list of BMS faults.
6. User selects the Summary List of BMS faults. Screen shows a list of BMS faults with Date, Time, Description and Status.
7. Use case ends when the Work Instruction is raised in the CRM.

Post-condition

- A work instruction is raised in the CRM and the process continues with Module 2.
- User has quick access to the list of BMS faults when required.

3.4 Module 4: Wireless Access Control

Eighteenth Use Case

Module 4 Wireless Access Control

This module allows remote control of access by Granting access to authorised personnel at specified times. Upon identification of a maintenance job, a work instruction is raised and assigned to the respective Contractor. The Maintenance Management System will automatically retrieve and log the relevant information such as the Location ID of the secured maintenance site and the Contractor ID for the assigned job.

It is proposed that the contractor, upon receipt of a work-order on the user's PDA, goes to the site. And instead of the current practice of manually retrieving the key or password to access the secured location, the contractor scans an onsite barcode (for security purposes, this barcode is with the Operation Manger of the premise) using the user's PDA. The PDA will transmit information such as Location ID and Contractor ID to the Wireless Access Control Module in the system Operator Wireless FM System for verification of the Contractor's identity and access rights to the location at the specific time. Upon confirmation of the Contractor's identity on site, the Wireless Access Control Module will grant the Contractor

entry. The contractor can then click on the Open Door button to unlock the Simons-Voss lock.

This feature increases the security of the location and prevents access of any unauthorised personnel or unauthorised access outside pre-defined hours.

Nineteenth Use Case: Unlock the Simons-Voss Lock

Pre-condition

- A work instruction has been raised.
- The contractor has received the work instruction.
- The contractor is at the site and has scanned the premise barcode.
- The lock system is installed on the door at the site.
- The user is given the access rights to log into the system.

Primary Flow of Event

1. The User logins the PDA by keying the following information:
   +Login
   +Password
2. The Select Module page showing the different modules allows the user to select Wireless Scheduling and Monitoring of Contractor's Work Module.
3. User selects the Wireless Scheduling and Monitoring of Contractor's Work Module. The "Wireless Scheduling and Monitoring of Contractor's Work Module" screen displays the list of work instructions with 4 columns, the status, date, the Case ID, the Premise and the Contact Person of the premise. Once a work instruction is selected, the lower portion of the screen shows more details of the work instruction namely: Date, Time, Premise, Severity, Case ID, and Status.
4. User selects work instruction. Screen displays details of the work instruction. User selects arrive and scan the premise barcode to log the arrival time. For premise with sensitive door, the Open Door button is then enabled. (Please refer to Module 2 above for details).

5. User scans the OM Bar code. System verifies the bar code. If the barcode corresponds to the authorised barcode, when user clicks the Open Door button, the door unlocks. If the barcode does not correspond to the location, ID, error message shows that user is not given authorisation to enter premise.
6. Use case ends.

Post Condition:

- The user is given access to the location.

Module 5 Schedule of Rates System

Twentieth Use Case: Create Estimation

1. Brief Description

This use case describes how a Technical Executive creates a new estimation in the Schedule of Rates (SOR) System.

The actor starting this use case is Technical Executive.

2. Flow of Events

The use case begins when the actor selects a WI and clicks on the SOR icon from the PDA WI module.

2.1 Basic Flow – Create Estimation

1. The System displays a new estimation page.
2. The Technical Executive selects one of the four books (3FSR + 1BUR).
3. The System displays the categories of the selected book.
4. The Technical Executive selects one of the categories.
5. The System displays the sub-categories of the selected category.
6. The Technical Executive selects one of the sub-categories.
7. The System displays the items of the selected sub-category.
8. The Technical Executive selects one of the items.
9. The System displays the detailed description, unit, rate and SOR code of the item.

10. The Technical Executive enters a quantity and selects add to basket.
11. Steps 2-10 are repeated for each item added to the basket. When the actor finishes adding items to the basket, the Technical Executive and contractor both sign the estimation. The use case ends.

2.2 Alternative Flows

1. *Item not found in the books*

If the Technical Executive is not able to find the item or template in the four proposed books, the actor can enter a Star Rate by keying in the Star Rate name, Star Rate quantity.

3. Special Requirements

There are no special requirements associated with this use case.

4. Pre-Conditions

4.1 Log In

Before this use case begins the Technical Executive has logged onto the mFMS system.

5. Post-Conditions

There are no post-conditions associated with this use case.

6. Extension Points

There are no extension points associated with this use case.

Twenty-first Use Case: Manage FSR/BUR Books

1. Brief Description

This use case describes how a System Administrator manages the Fixed Schedule of Rates (FSR)/Build up Rates (BUR) books in the SOR System. This includes add, modify and delete items and templates from the online system.

The actor starting this use case is System Administrator.

2. Flow of Events

The use case begins when the actor selects the admin module from the online system.

After a quotation and a committee decision, a star rate could be added to the FSR books. The System Administrator can also combine FSR items to create a BUR template.

2.1 Basic Flow – Add FSR item.

12. The System displays a new FSR item page.
13. The System Administrator selects the book, category and sub category then keys in the name, description, unit, rate and SOR code.
14. The System validates the fields and save the new item.
15. Steps 2-3 are repeated for each item added to the System. When the actor finishes adding items to the System, the use case ends.

2.2 Alternative Flows

2. *Category or Sub Category not found*

If the System Administrator is not able to find the correct category or sub-category, the actor can create new ones.

3. *Modify FSR Item*

The System Administrator selects the item and can modify the name and/or description and/or unit and/or rate.

4. *Delete FSR item*

The System Administrator selects the item and can delete it.

5. *Create BUR Template*

1. The System displays a new BUR template page.
2. The System Administrator keys in the name, description and BUR code.
3. The System Administrator selects from the FSR books the list of items to be added to the BUR template.
4. The System validates the fields, compute the total rate and save the new template.

5. Steps 2-4 are repeated for each template added to the System. When the actor finishes adding templates to the System, the use case ends.

3. Special Requirements

There are no special requirements associated with this use case.

4. Pre-Conditions

4.1 Log In

Before this use case begins the Technical Executive has logged onto the mFMS system.

5. Post-Conditions

There are no post-conditions associated with this use case.

6. Extension Points

There are no extension points associated with this use case.

Appendices

Further specific examples are given in the attached appendices wherein:

APPENDIX 1 is a user guide for the central server for Module 1;

APPENDIX 2 is a PDA user interface for Module 1;

APPENDIX 3 is a training manual for the central server user interface for Module 2;

APPENDIX 4 is a mobile work instruction PDA user interface for Modules 2 and 4; and

APPENDIX 5 is a mobile work instruction PDA user interface for Module 3.

It should be understood that the above embodiment is by way of illustration only. Clearly there are modifications and variations, which would be understood by a person skilled in the art without any inventive effort, and these are included within the scope of this invention as defined by the following claims.

CLAIMS

1. A remote scheduling system having one or more portable wireless communication systems for one or more users with each having download means, upload means and storage means, input means, and display means such that the user can request and view one or more audits to be undertaken at a location or on an asset, the user able to use the download means to receive from a central station the latest audit for a particular location and to report by the upload means the completion of the audit such that the central station is able to maintain a remote supervision of the users.

2. The remote scheduling system according to claim 1 with the portable wireless communication system download means able to receive an updated checklist from the central station and allow input by the user of the completion or other information including condition status, further required action steps and the like, with such input able to be transmitted by the update means to central station to maintain an updated checklist for later downloads.

3. The remote scheduling system according to claim 1 with the portable wireless communication system having the display means displaying a first checklist and only providing a second checklist when the user inputs indication of completion of tasks of first checklist.

4. The remote scheduling system according to claim 1 with wireless communication system having the display means able to display plurality of actions to be undertaken and requiring plurality of inputs by user through input means to check off each action as completed.

5 The remote scheduling system according to claim 4 with the display means able to display predetermined plurality of actions and order that actions to be completed provided by downloaded checklist and requiring plurality of inputs of completion according to

predetermined checklist which is uploaded to central station such that the central station maintains remote supervision of user.

6. A remote scheduling system including the steps of:

a) providing to a user a portable wireless communication system

b) providing on the portable wireless communication system one or more checklist of actions to be undertaken by the user

c) providing on the portable wireless communication system a list of assets or areas of location on which the actions are to be undertaken

d) displaying on the portable wireless communication system one subset of the list of assets and its related checklist of actions to be undertaken

e) providing on the portable wireless communication system an input for a user to record completion of checklist of actions for the displayed subset of the list of assets

f) displaying on the portable wireless communication system the next subset of the list of assets and its related checklist upon the previous subset having been input as completed

g) communicating details of the checklist of actions from the portable wireless communication system to a central station.

wherein the central station is able to determine remotely the locations the user has been and the actions undertaken.

7. A remote scheduling system according to claim 6 with the communicating of details of the checklist of actions from the portable wireless communication system to a central station occurring at real time when the action has been input as having been completed wherein the central station is able to determine remotely the real time present position of the user and the actions undertaken.

8. A remote scheduling system according to claim 6 including the step of

h) providing a list of resources available for undertaking the actions.

9. A remote scheduling system according to claim 8 including the step of

i) providing a communication receiving device at a remote location which is able to be used for downloading information or updates from a central location on any one or more of the above.

10. A remote scheduling system according to claim 9 including the step of :

j) providing a communication transmitting device at the remote location which is able to transmit the results of each scheduled action from the remote location to the central location

11. A remote scheduling system according to claim 10 including the step of

k) the central station having storage means able to record the results and the differences from previous result.

12. A remote scheduling system according to claim 11 including the step of

l) providing a navigation function on the communication receiving device at a remote location to provide a digital map to the asset or areas of location and associated checklists.

13. A remote scheduling apparatus including:

1) a central station having:

i. a database of checklist of actions to be undertaken

ii. a database of a plurality of remote locations at which actions are to be undertaken

iii. a list of assets or areas of location on which the actions are to be undertaken

iv. a list of resources available for undertaking the actions

v. a communication transmitting device which is able to be used for transmitting information or updates from the database to a selected remote PDA

2) a plurality of remote PDAs having

vi. a communication receiving device at a remote location which is able to be used for downloading information or updates from a central location

vii. a database for holding transmitted information or updates from a central location

viii. an output for outputting checklist of actions to be undertaken, a plurality of remote locations at which actions are to be undertaken, a list of assets or areas of location on which the actions are to be undertaken, and a list of resources available for undertaking the actions

ix. an input for inputting results of actions undertaken

x. a communication transmitting device at the remote location which is able to transmit the results of each scheduled action from the remote location to the central location

wherein the central station is able to determine remotely the locations the user has been and the actions undertaken.

14. The remote scheduling apparatus according to claim 13 with each of the plurality of remote PDAs having a navigation function on the communication receiving device at a remote location to provide a digital map to the asset or areas of location

15. A communication receiving device for use in a remote scheduling system having a storage database and display able to provide a checklist of actions to be undertaken, provide a list of assets or areas of location on which the actions are to be undertaken, provide a list of resources available for undertaking the actions, and able to download information or updates from a central location on any one or more of the above with a communication transmitting device able to transmit the results of each scheduled action from the remote location to a central location.

16. The communication receiving device according to claim 15 including imnput means able to record the results and the differences from previous result of actions undertaken and transmit the results of each scheduled action from the remote location to a central location.

17. The communication receiving device according to claim 15 including a navigation function on the communication receiving device to provide a digital map to the asset or areas of location.

18. A remote scheduling system including the steps of:

i) providing to a user a portable wireless communication system

j) providing on the portable wireless communication system one or more actions to be undertaken by the user

k) providing on the portable wireless communication system a list of assets or areas of location on which the actions are to be undertaken

l) providing on the asset or location an identity code able to be entered into the portable wireless communication system when at the asset or location

m) communicating details from the portable wireless communication system to a central station of the entered identity code and other details including the time

n) providing on the portable wireless communication system an input for a user to record details of actions or results on the asset or the location

o) communicating details of the actions, completion of actions or results from the portable wireless communication system to a central station

p) displaying on the portable wireless communication system the next assets or location and its related action to be completed

wherein the central station is able to determine remotely the locations the user has been and the actions undertaken.

19. A remote scheduling system including the steps of:

f) providing on an asset or at a location a portable wireless communication system

g) providing on the portable wireless communication system one or more actions to be automatically and routinely undertaken by connected apparatuses

h) communicating details from the portable wireless communication system to a central station an input of actions or results of the actions on the asset or the location

i) communicating details of the actions, completion of actions or results from the portable wireless communication system to a central station

j) central station determining remotely the status of the asset or location and automatically instigate emergency action as required by external communication means.

20. A remote scheduling system including the steps of:

i) providing to a user a portable wireless communication system

j) providing on the portable wireless communication system one or more actions to be undertaken by the user

k) providing on the portable wireless communication system a list of assets or areas of location on which the actions are to be undertaken and having secure entry

l) providing on the asset or location an identity code able to be entered into the portable wireless communication system when at the asset or location

m) communicating details from the portable wireless communication system to a central station of the entered identity code and other details

n) providing on the portable wireless communication system an input of user and action to be undertaken on the asset or the location

o) communicating details of the user and action from the portable wireless communication system to a central station

p) selectively providing from the central station opening instruction after assessment of received information for opening the secure entry such as on a Simons-Voss lock

wherein the central station is able to determine remotely the location of the user and the user's authority and action to be undertaken so as to remotely supervise the actions undertaken at secure locations.

21. A remote scheduling apparatus including:

3) a central station having:

x. a database about one or more remote locations at which actions are to be undertaken

xi. a database about one or more users who can undertake the actions on the assets or at areas of location

xii. a communication transmitting device which is able to be used for transmitting information or updates from the database to a selected user's PDA possibly at a remote position

4) one or more PDAs having

xiii. a communication receiving device possibly at a remote location which is able to be used for downloading to the user information or updates from the central station

xiv. a database for holding transmitted information or updates from the central station

xv. an output for outputting information or data to the central station

xvi. an input for inputting data, information or results about remote asset or location or user

xvii. a communication transmitting device at the remote location which is able to transmit the input data from the remote location to the central location

xviii. one or more modules

wherein a first module enables

cc) providing to a user a portable wireless communication system

dd) providing on the portable wireless communication system one or more checklist of actions to be undertaken by the user

ee) providing on the portable wireless communication system a list of assets or areas of location on which the actions are to be undertaken

ff) displaying on the portable wireless communication system one subset of the list of assets and its related checklist of actions to be undertaken

gg) providing on the portable wireless communication system an input for a user to record completion of checklist of actions for the displayed subset of the list of assets

hh) displaying on the portable wireless communication system the next subset of the list of assets and its related checklist upon the previous subset having been input as completed

ii) communicating details of the checklist of actions from the portable wireless communication system to a central station.

and wherein a second module enables:

jj) providing to a user a portable wireless communication system

kk) providing on the portable wireless communication system one or more actions to be undertaken by the user

ll) providing on the portable wireless communication system a list of assets or areas of location on which the actions are to be undertaken

mm) providing on the asset or location an identity code able to be entered into the portable wireless communication system when at the asset or location

nn) communicating details from the portable wireless communication system to a central station of the entered identity code and other details including the time

oo) providing on the portable wireless communication system an input for a user to record details of actions or results on the asset or the location

pp) communicating details of the actions, completion of actions or results from the portable wireless communication system to a central station

qq) displaying on the portable wireless communication system the next assets or location and its related action to be completed

and wherein a third module enables:

rr) providing on an asset or at a location a portable wireless communication system

ss) providing on the portable wireless communication system one or more actions to be automatically and routinely undertaken by connected apparatuses

tt) communicating details from the portable wireless communication system to a central station an input of actions or results of the actions on the asset or the location

uu) communicating details of the actions, completion of actions or results from the portable wireless communication system to a central station

vv) central station determining remotely the status of the asset or location and automatically instigate emergency action as required by external communication through one or more of the modules

and wherein a fourth module enables:

ww) providing to a user a portable wireless communication system

xx) providing on the portable wireless communication system one or more actions to be undertaken by the user

yy) providing on the portable wireless communication system a list of assets or areas of location on which the actions are to be undertaken and having secure entry

zz) providing on the asset or location an identity code able to be entered into the portable wireless communication system when at the asset or location

aaa) communicating details from the portable wireless communication system to a central station of the entered identity code and other details

bbb) providing on the portable wireless communication system an input of user and action to be undertaken on the asset or the location

ccc) communicating details of the user and action from the portable wireless communication system to a central station

ddd) selectively providing from the central station opening instruction after assessment of received information for opening the secure entry such as on a Simons-Voss lock

wherein the central station is able to determine remotely the location of the user and the user's authority and action to be undertaken so as to remotely supervise the actions undertaken at secure locations.

22. A remote scheduling system as hereinbefore described with reference to the example uses.

23. A communication receiving device as hereinbefore described with reference to the example uses.

24. A remote scheduling apparatus as hereinbefore described with reference to the example uses.

buildfolio





CPG FM Mobile Facility Management System

-Mobile Maintenance Inspection Checklist-

User Guide
(Central Server)
Module 1

Version	Date	Author	Remarks
0.1	28/06/2002	How Ai Ling	
0.2	3/09/2002	How Ai Ling	Add Admin Page

APPENDIX 1

Table of Content

Table of Content 2
Introduction 3
Login Page 4
Premise Maintenance Page 5
Checklist Maintenance Page 9
Maintenance Audit 11
Resources Audit 13
Cleanliness Audit 14
Audit Schedule 18
Administrators 21
Reports 25
To Print Report 34

Introduction

The Central server pages are the main interface for the administrator and the user to create the core database supporting the application.

The 4 key sections in the Central Server pages are:

1) Premise Maintenance
2) Checklist Maintenance
3) Audit Schedule
4) Reports

Users assigned with different access rights are given different level of authority to access the pages. (see Access Rights)

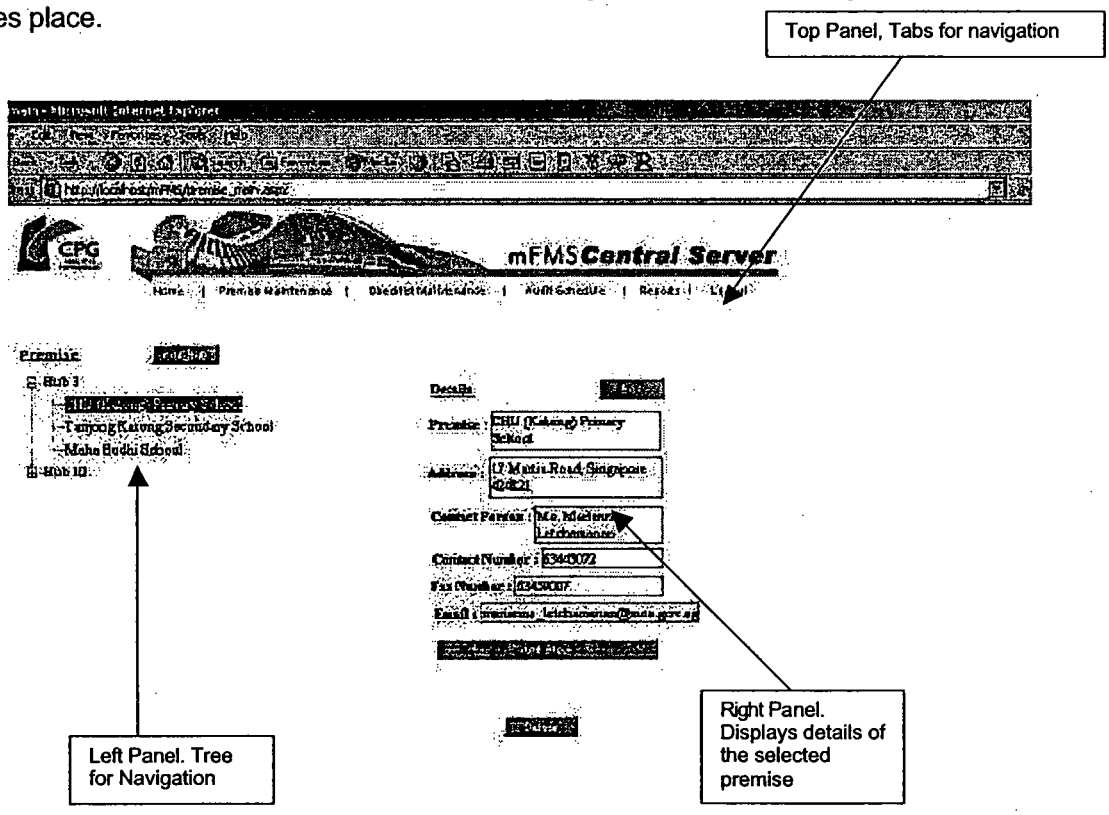
The Server page interface is divided into three sections.

- Top Panel
- Left Panel
- Right Panel

The Top Panel contains the tabs for the various pages that make up the application. Once User logs in, he is able to navigate to the various pages such as Premise Maintenance, Audit Schedule, Checklist Maintenance, Report and Log Out by clicking on the various tabs.

The Left Panel contains an explorer tree, dependent upon the page selected, that allows the user to navigate to display the details on the right panel.

The Right Panel is the primary location where the information is viewed or entered by the user. It contains form with one or more fields or objects where data entry and data retrieval takes place.



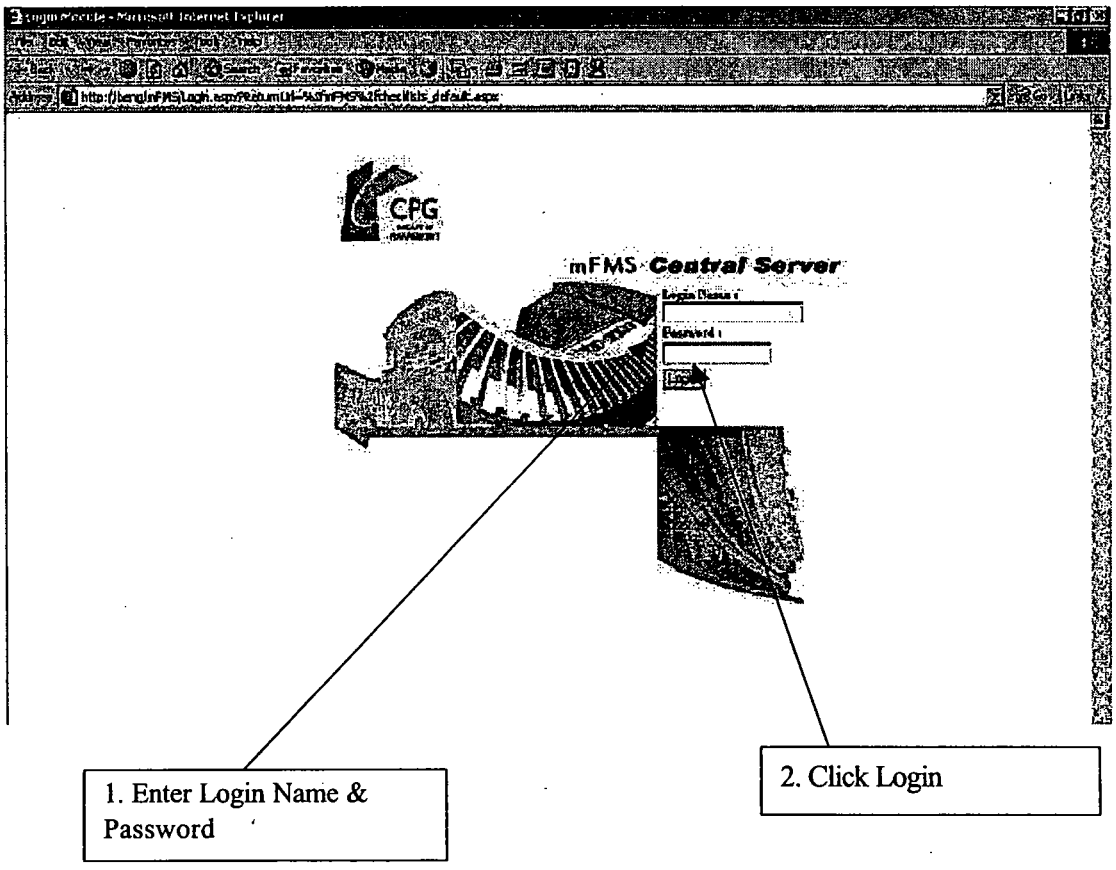
Login Page

User keys in the Login Name and the Password

Access Rights:

Depending on the Access Rights given to the user, the user is only allowed different functionality.

1) Hub Manager or Administrators have full privileges (read, write and delete)
2) Technical Executives have limited privileges (Read only for most pages) and generate reports only.
3) User will only be allowed to see information of their designated Hub(S) and the Premises that are associated with the Hub(s)



Premise Maintenance Page

This page allows the user (with the appropriate rights)

1) To navigate and view premise information
2) To create new Hub/Premise and/or
3) To edit the existing Premise information

Premise information includes the hierarchical structure of the premise(the levels, locations) and the assets associated with the location.

By selecting a premise on the left panel, the user is able to navigate to the different levels, rooms and to the assets associated with each room via a tree. The right panel displays the details of the selected node.

Only user with given authority is able to add or edit the Premise Information

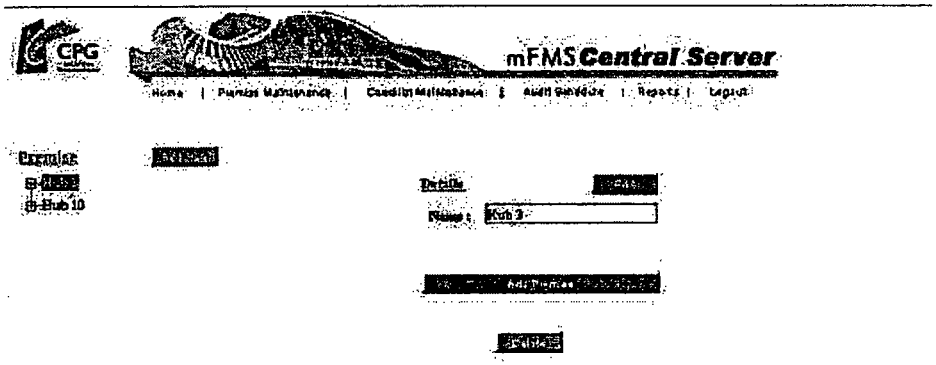
Create New Hub

User clicks onto the Add Hub Button, the page, on the right panel displays the New Hub Screen. This screen allows the user to enter the name of the New Hub.

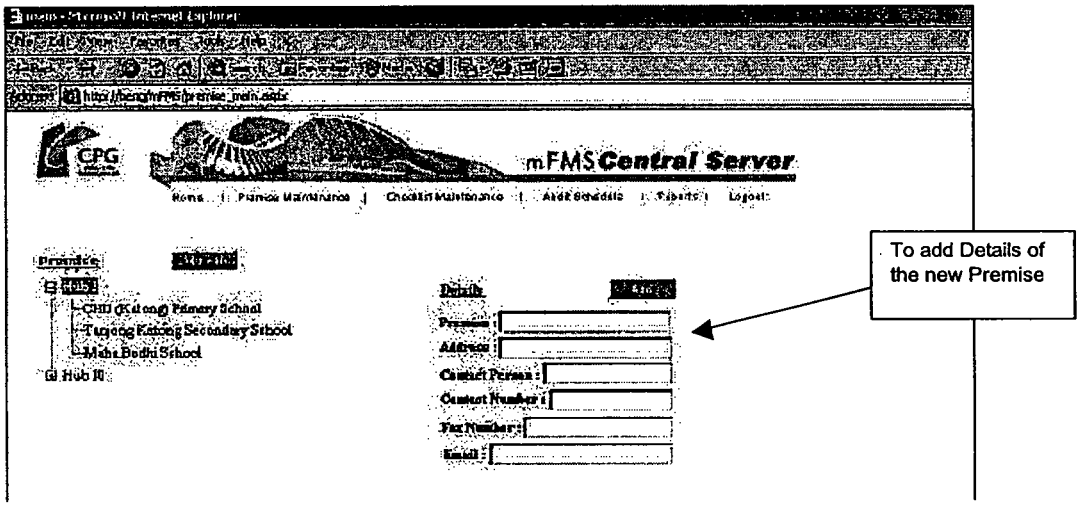


Create New Premise

Once the node of the selected Hub is selected, the right panel displays the Hub Details Screen, with the 3 buttons, namely Edit, Add Premise and Delete Buttons. The Edit button allows the user to edit the Hub name accordingly. To add new Premise, user clicks onto the Add Premise Button.

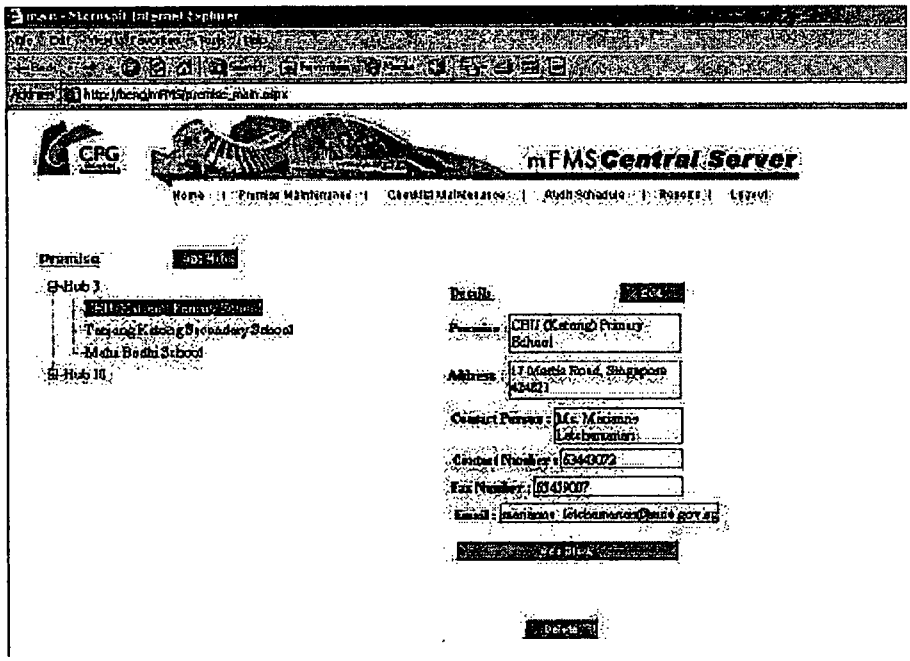


The next screen allows the user to enter New Premise Details. The user clicks onto the ADD button to save the information that was keyed.

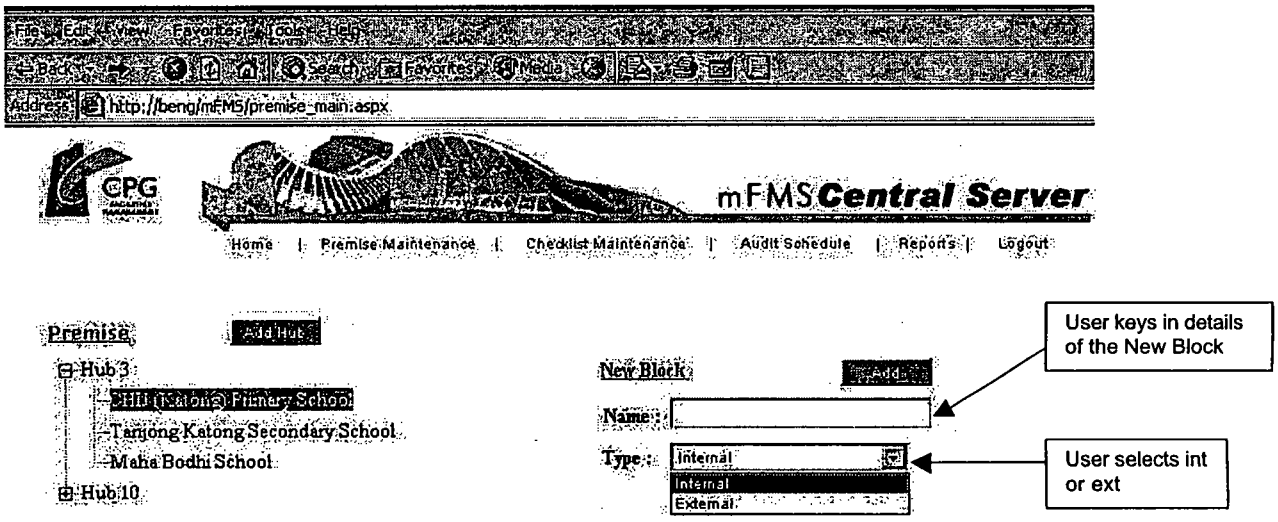


Create New Block(Internal/External Elements)

At the node of the selected Premise, screen on the right panel displays the details of the selected premise. There are Edit, Add Block and Delete Buttons. The Edit and the Delete buttons allow user to edit or delete the information displayed. To add a New Block Screen user clicks on the Add Block Button.



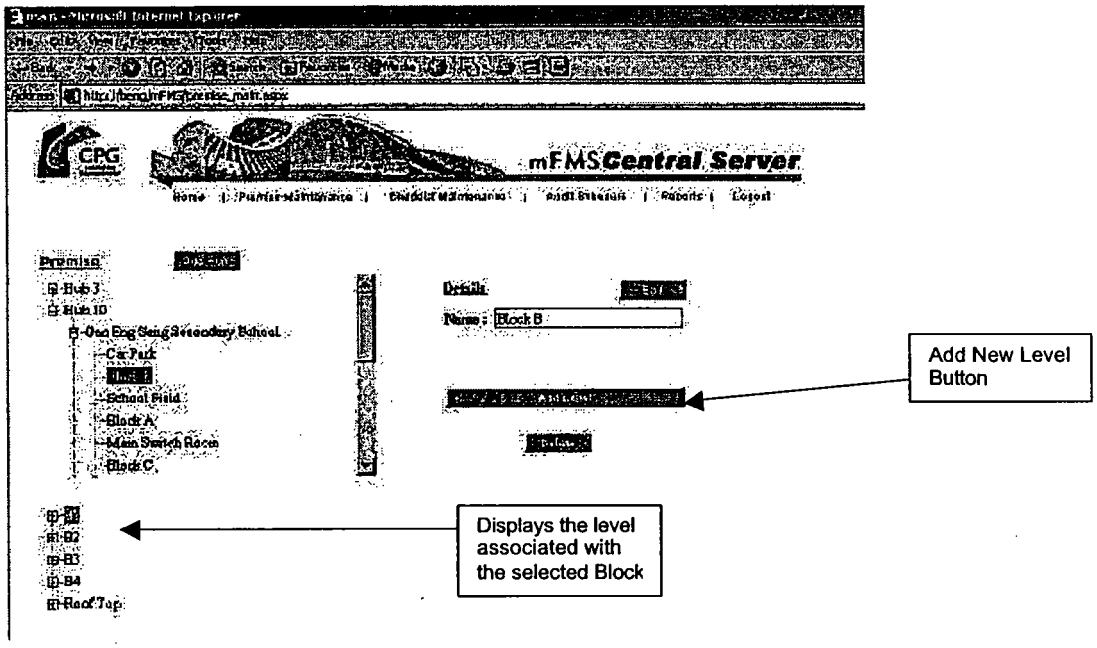
This next screen allows the user to create the name of the New Block. There is a also a drop down list that allows user to selects the block type, namely Internal or External.



Create New Level

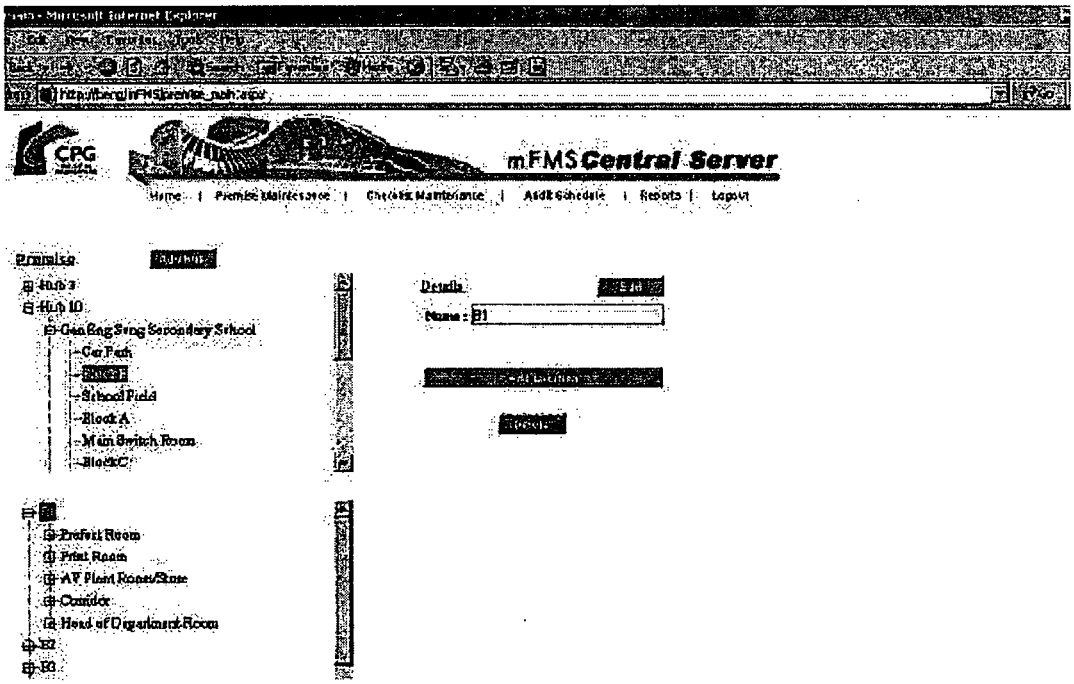
At the node of a certain Block, screen on the right panel displays all other levels of the selected block(if any) on the lower portion of the left panel. The right panel allows the user to edit, delete and add New Level.

To create a new level, user clicks onto Add Level Button, the new level details screen allows the user to create the name of the New Level.



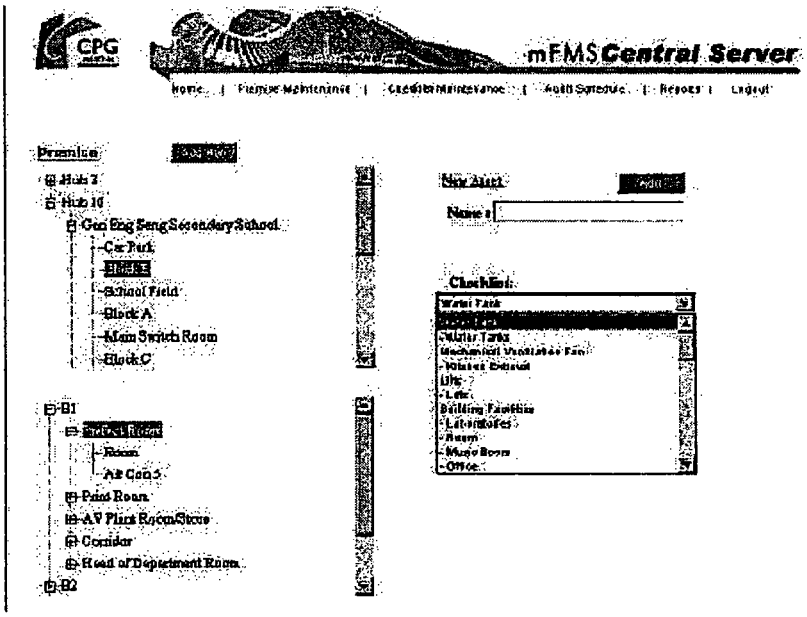
Create New Location

At the node of a certain Level, screen on the right panel displays the details of the selected level. User is able to edit or delete the details and there is Add Location button that allows the user to add new location to the selected level. User clicks onto Add Location Button, the screen displayed allows the user to create the name of the New Location.



Create New Asset

At the node of a certain Location, the screen on the right panel displays New Asset screen. This screen allows the user to add the name of the New Asset and choose the associated Checklist. User clicks onto Add Button and the new assets is saved. .



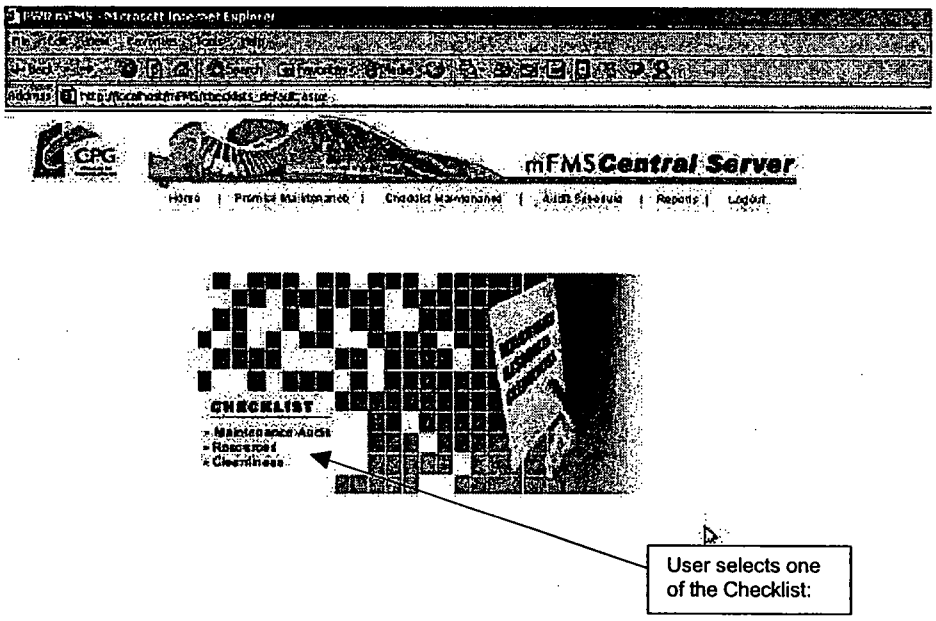
Checklist Maintenance Page

This section allows the authorized user to:

1) View Existing Inspection Checklist
2) Edit the existing inspection checklist
3) Or remove an existing checklist
4) Create New Inspection Checklist

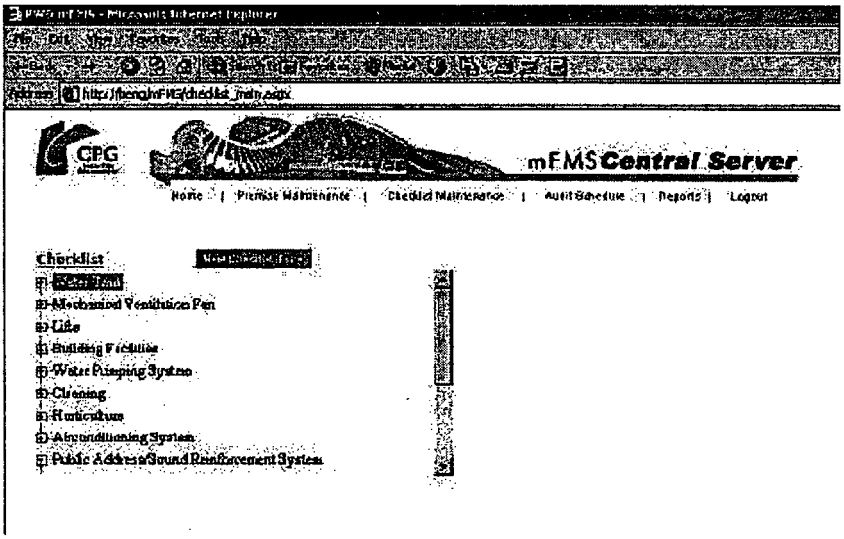
Once user clicks onto the Checklist Maintenance Tab on the top panel, screen diaplays menu that allows the user to select one of the various checklists, namely,

1) Maintenance Audit,
2) Resources and
3) Cleanliness.



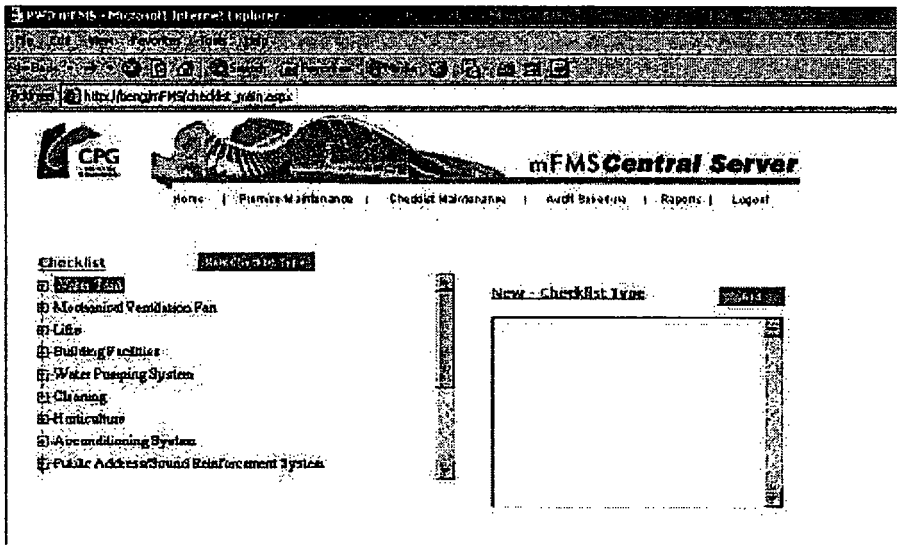
Maintenance Audit

User selects Maintenance Audit, the left panel displays the tree diagram with a list of checklist Type. .



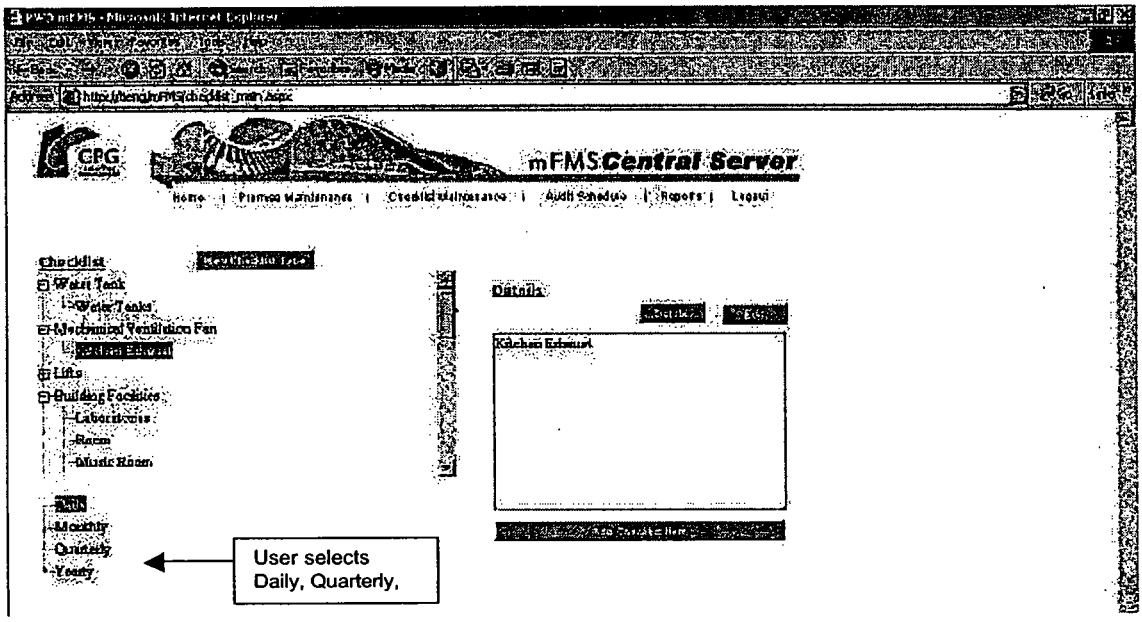
Create New Checklist Type

User Adds new Check list type by Clicking on the New Checklist Type button. Screen on the right panel displays textbox that allows user to add New Checklist Type. The New Checklist Type is saved by clicking on the ADD button.



Create New Checklist Item

When user selects node, the right panel shows the details of the selected node. The user is allowed to delete, edit and add Checklist Item.

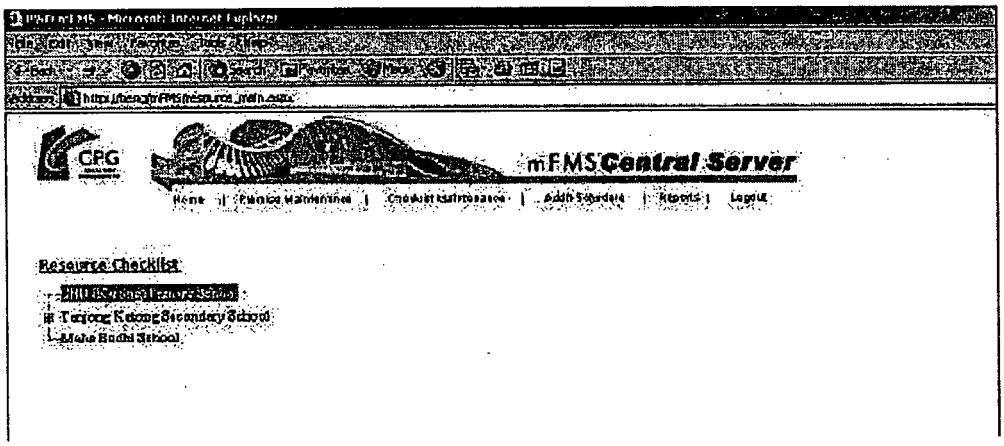


At the selected node, user clicks on the add New Checklist Item, the right panel displays the text box which allows user to add the New Checklist Item. There is also a drop down list that allows the user to choose the frequency of check, whether it is for Daily check, for Monthly Check, for Quarterly Check or Annual Check.

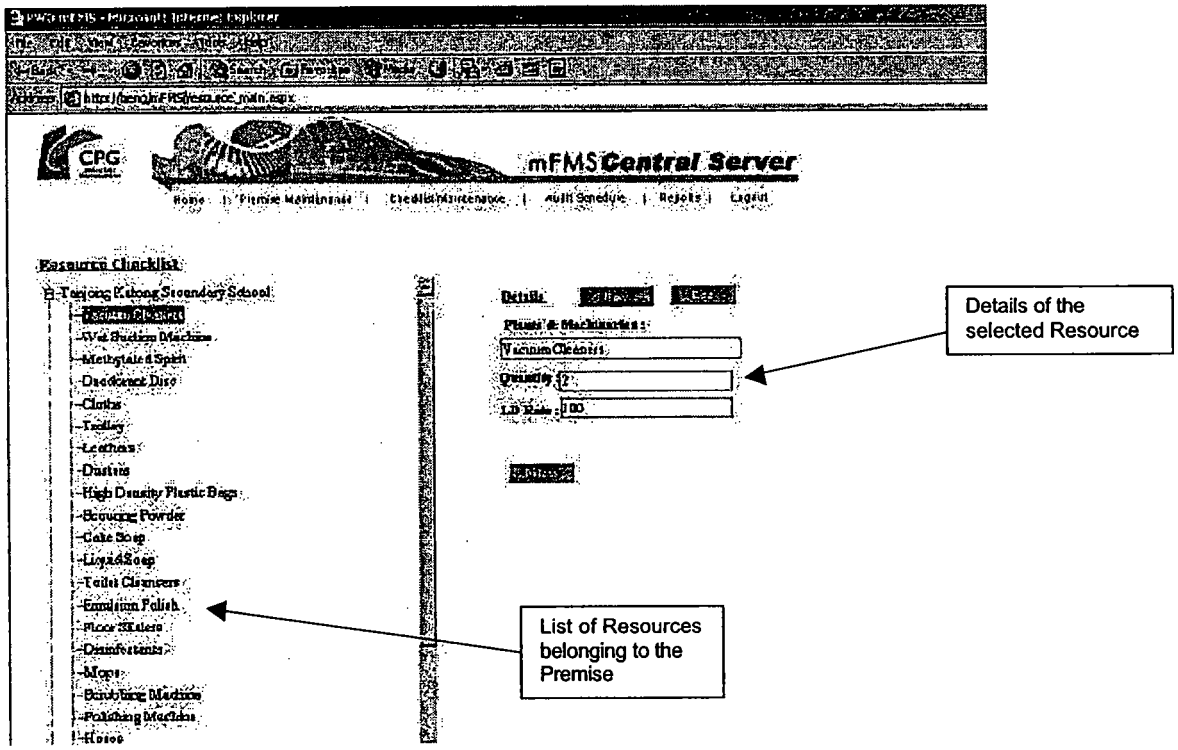
User clicks on the ADD button and the new Checklist Item is added to the List.

Resources Audit

User selects Resources Audit, the left panel displays the tree diagram with a list of Premises. The + sign next to the Premise Name indicates that there are a list of Resources that are associated with the Premise.



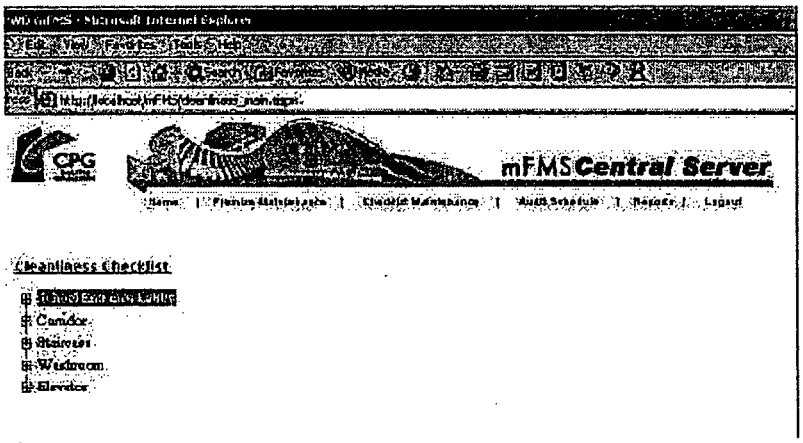
The Resources List is displayed once the list is expanded. With a selected node, the right panel displays the details of the selected Resource item. The user is able to add New Resource Item, Edit or delete the item.



Cleanliness Audit

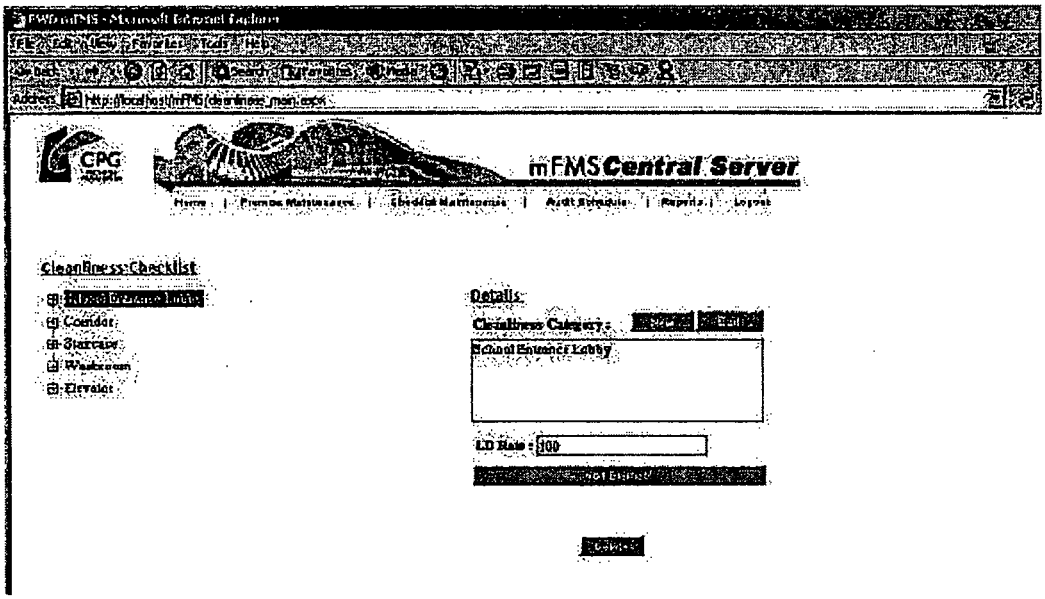
This module maintains the Cleanliness Audit Checklist.

User selects Cleanliness Audit, the left panel displays the tree diagram with a list of Categories that are checked in Cleanliness Audit. The + sign next to the Category Name indicates that there are a list of Elements that are associated with the Category.



Create New Category

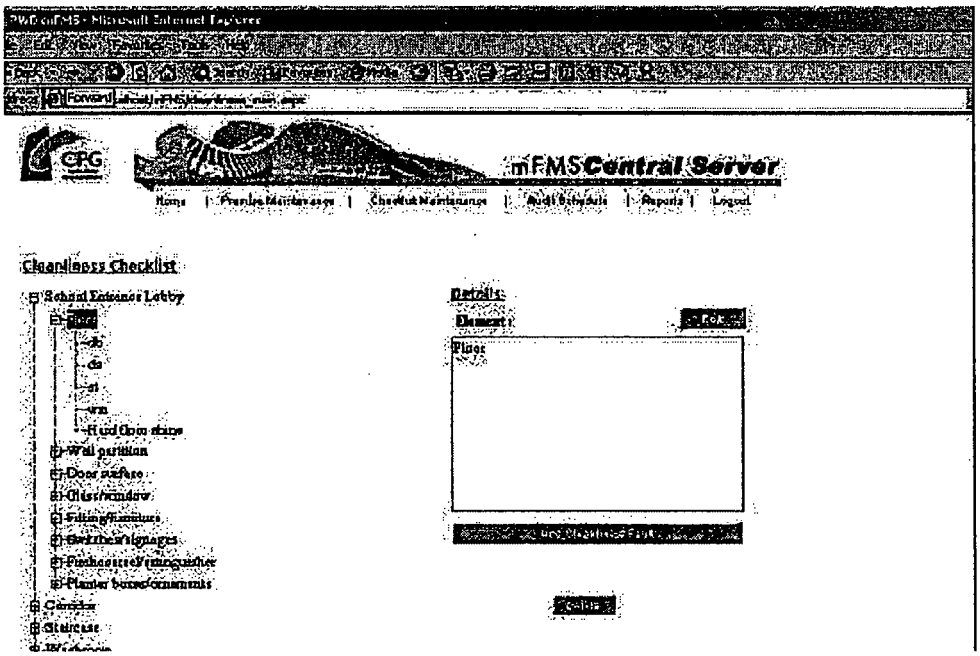
Once the node is selected, the right panel displays the details of the selected Category, whereby the user is allowed to Add New Category, Edit, Delete and Add Elements associated with the selected Category.



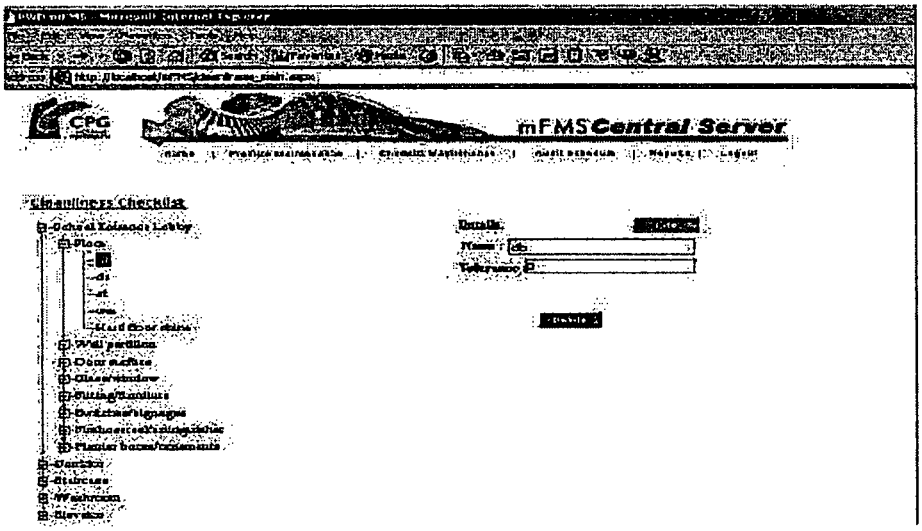
Create New Element

At the node of the selected category, user adds a New Element Clicking on the Add Element button. Text box on the right panel allows user to create New Element

When user expands the node of the associated Element, the tree displays the Cleanliness Fault associated with the Element. The Right Panel displays the details of the associated Element. And user is able to Edit, Delete and Add Cleanliness Fault.

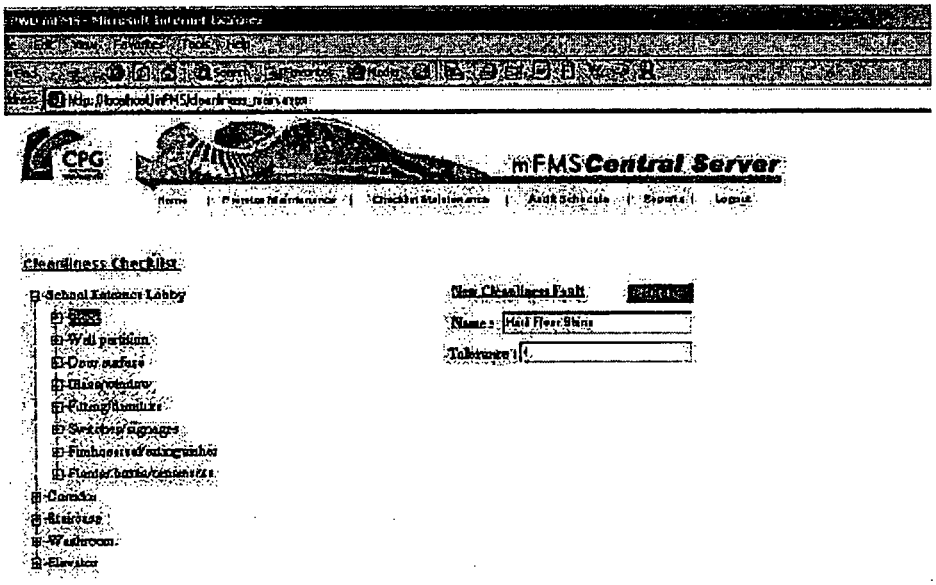


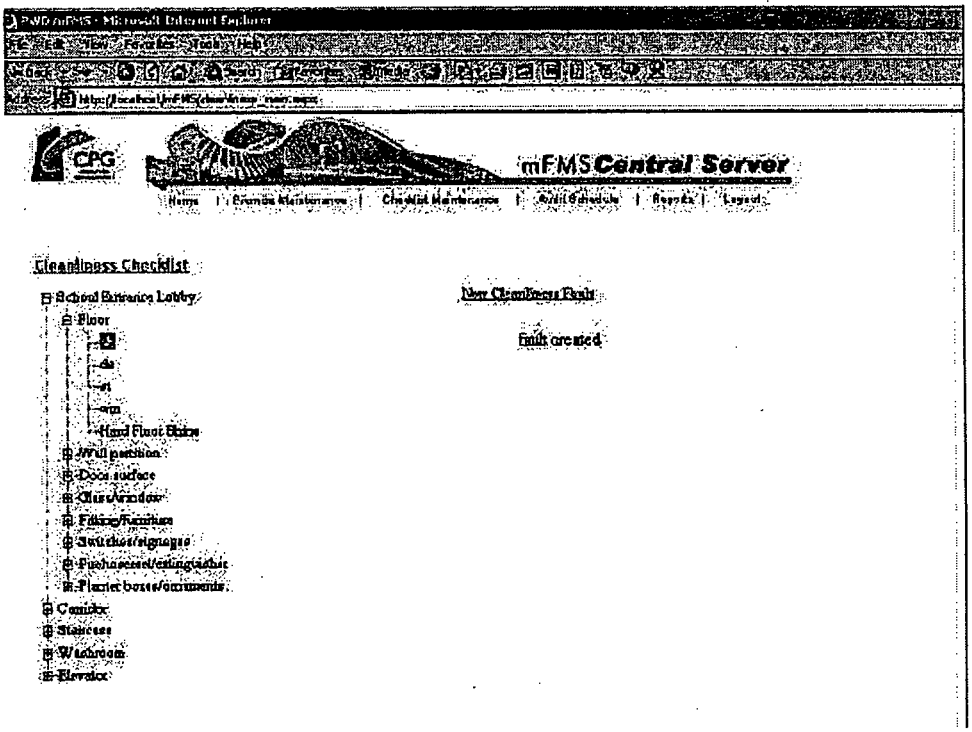
User selects the Cleanliness Fault node, the right panel displays the details of the associated fault node whereby user is able to delete or edit the fault accordingly. The tolerance is to provide a guide on how many count of such fault is tolerated during the audit check.


mFMSCentral Server

Create New Cleanliness Fault

Add the selected node, user is able to add New Cleanliness Fault as shown:





Audit Schedule

When user selects the Audit Schedule Tab, the screen displayed below allows the user to view/search and create schedule.

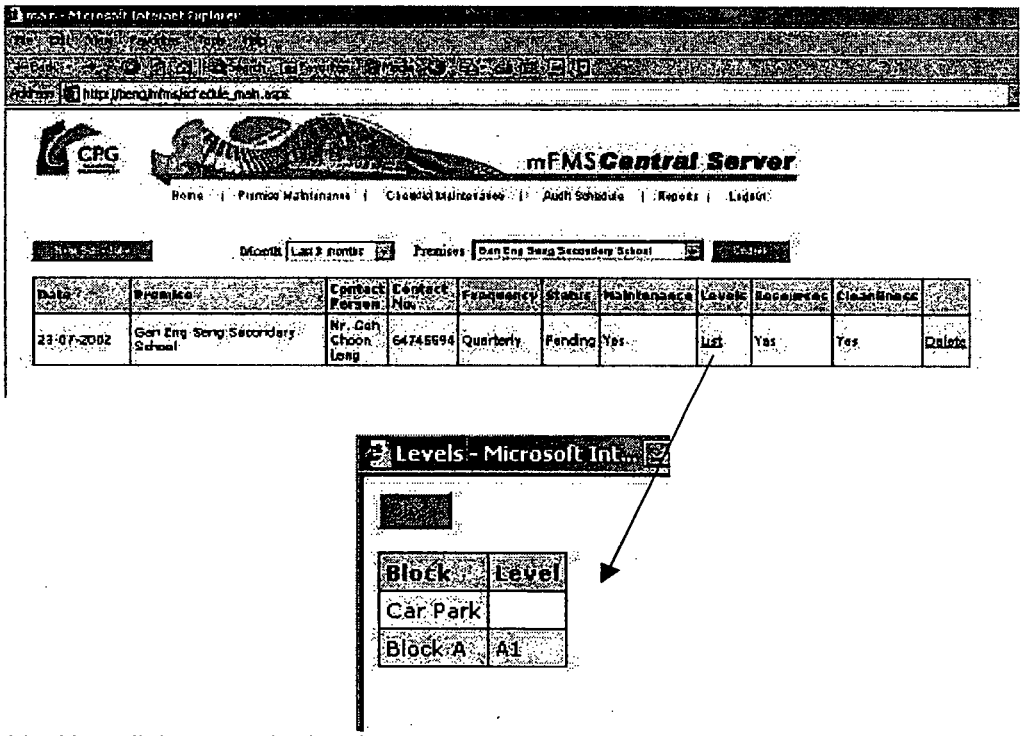
User is only allowed to search and view the schedules for the Hub(s) and Premises that is assigned to him.

Search

The list of all the schedules is displayed on the screen. User is able to search by

1) Month and
2) Premise.

The list displays the Date, Premise, the contact person of the premise, Frequency, Status of the Audit(New/Pending/Completed), Maintenance, Resource, Cleanliness and the levels selected for the audit.

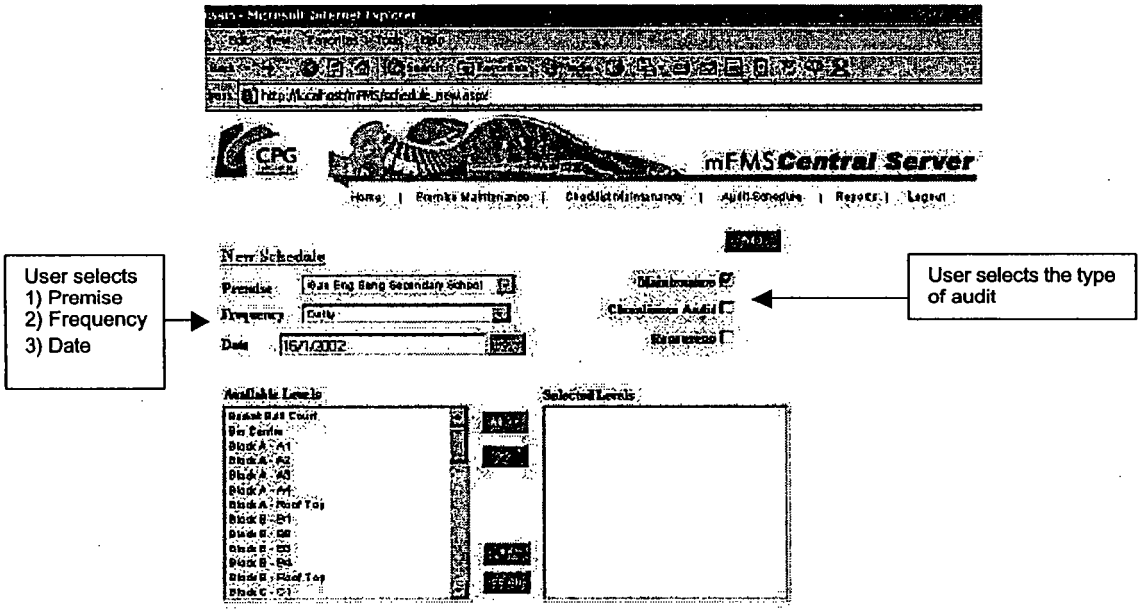


The List Hyperlink opens the levels that were selected when the New Schedule was created.

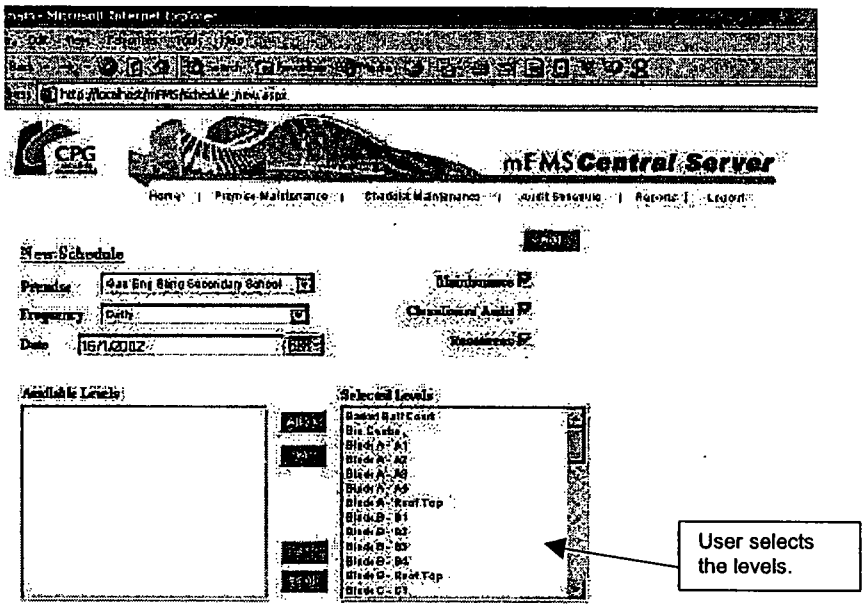
Create New Schedule

To create a new schedule, user clicks on the New Schedule Button above. The New Schedule screen allows the user to create a New Schedule by selecting the following:-

1) Premise (drop down selection)
2) Frequency (drop down selection)
3) Date
4) Select the Levels
5) Choose the type of audit(checkbox)[1]
    a. Maintenance Audit
    b. Cleanliness Audit
    c. Resource Audit



[1] For MOE HQ, only Maintenance Audit is applicable



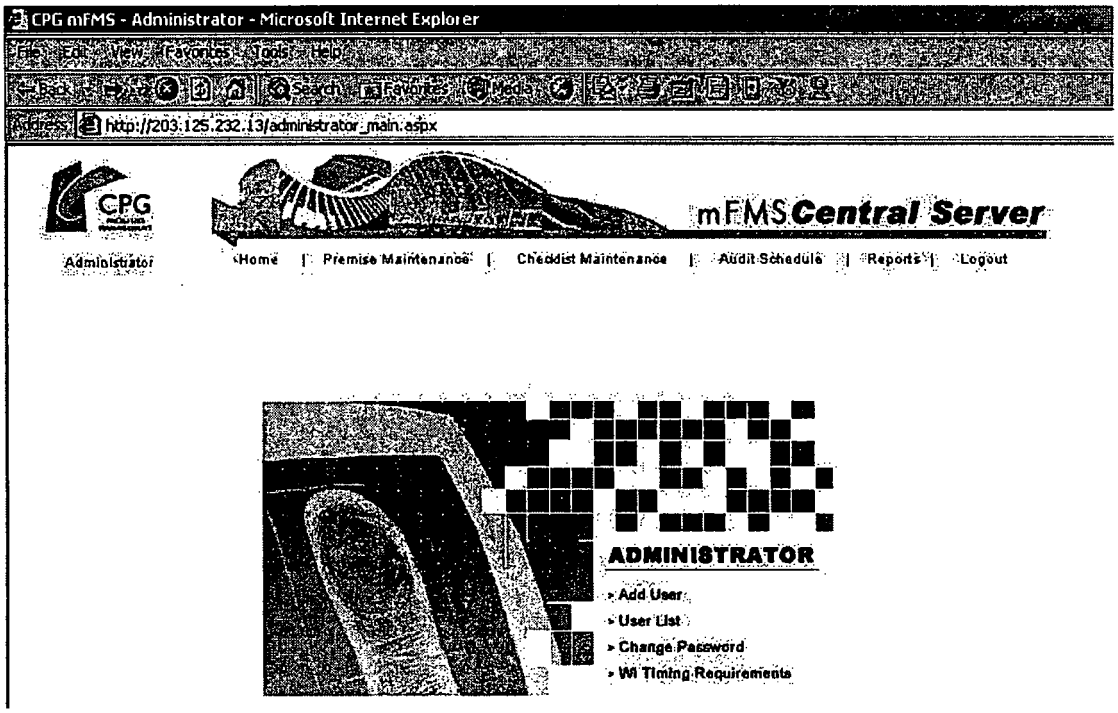
User clicks on the Add Button, the new audit is created and added to the list.

Administrators

User with administrators' right is given access to the Administrator tab on the left of the screen.

The screen displays the following list of items that the Administrators are able

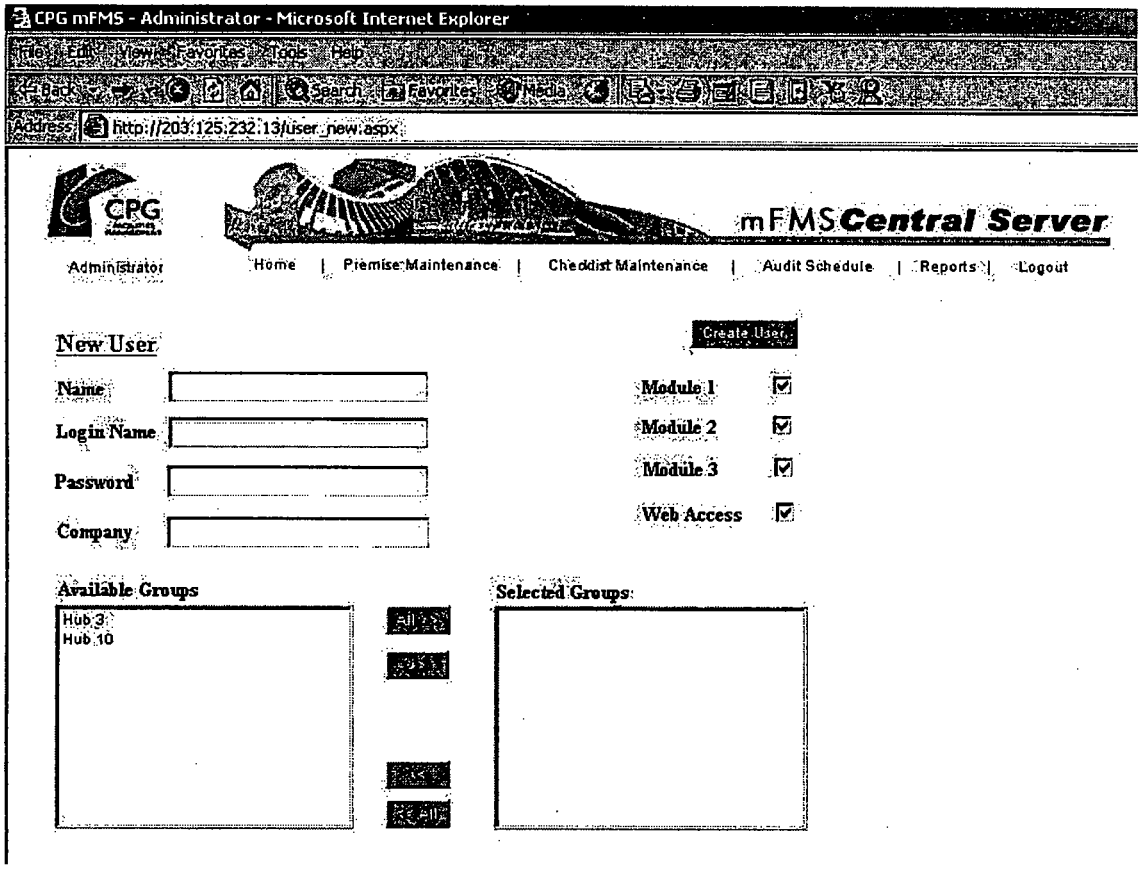
1 Add User
2 User List
3 Change Password
4 WI Timing Requirements (Module 2)



Add User

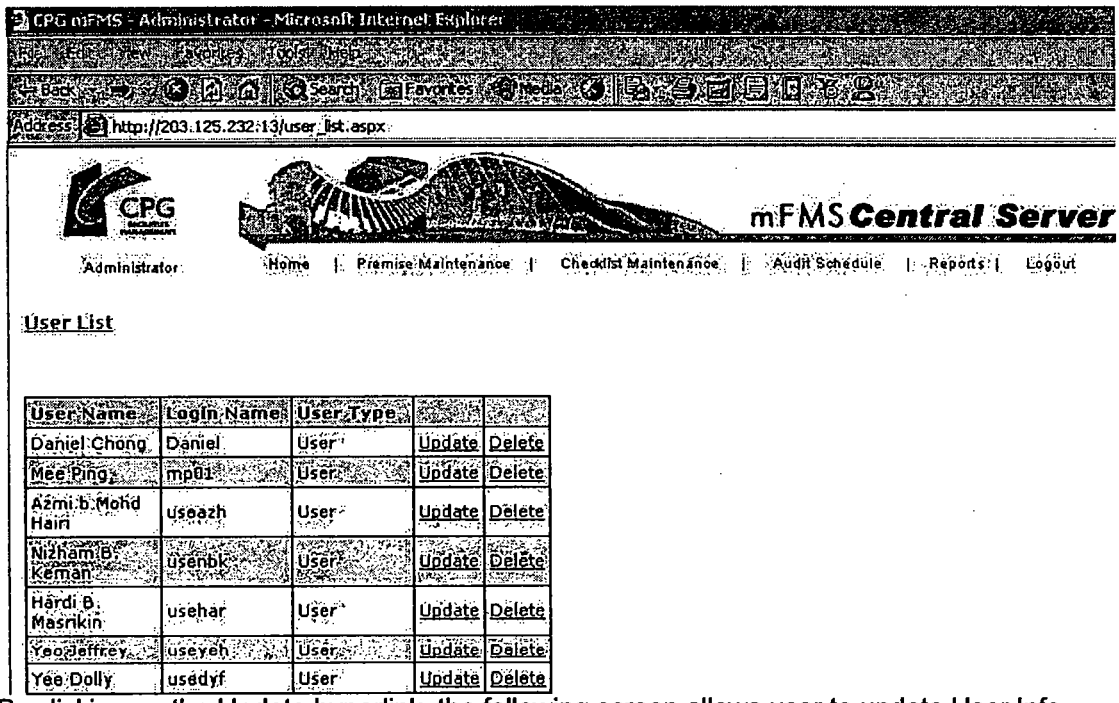
When user clicks on Add user, screen allows user to create New User by keying the following fields:

1) Name
2) Login Name
3) Password
4) Company
5) Select the Groups
6) Select the users' access to:
    - Module 1
    - Module 2
    - Module 3
    - Web Access

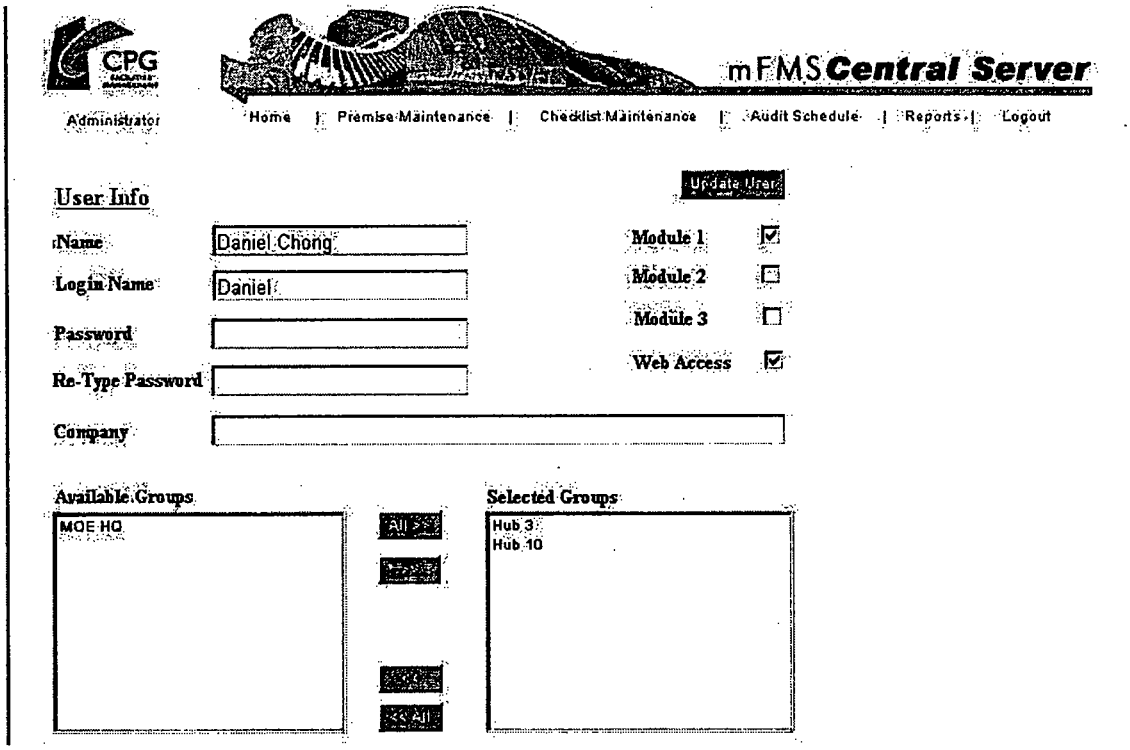


User List

Screen displays the list of users created. User is able to Delete or Update the User Profile.



By clicking on the Update hyperlink, the following screen allows user to update User Info.

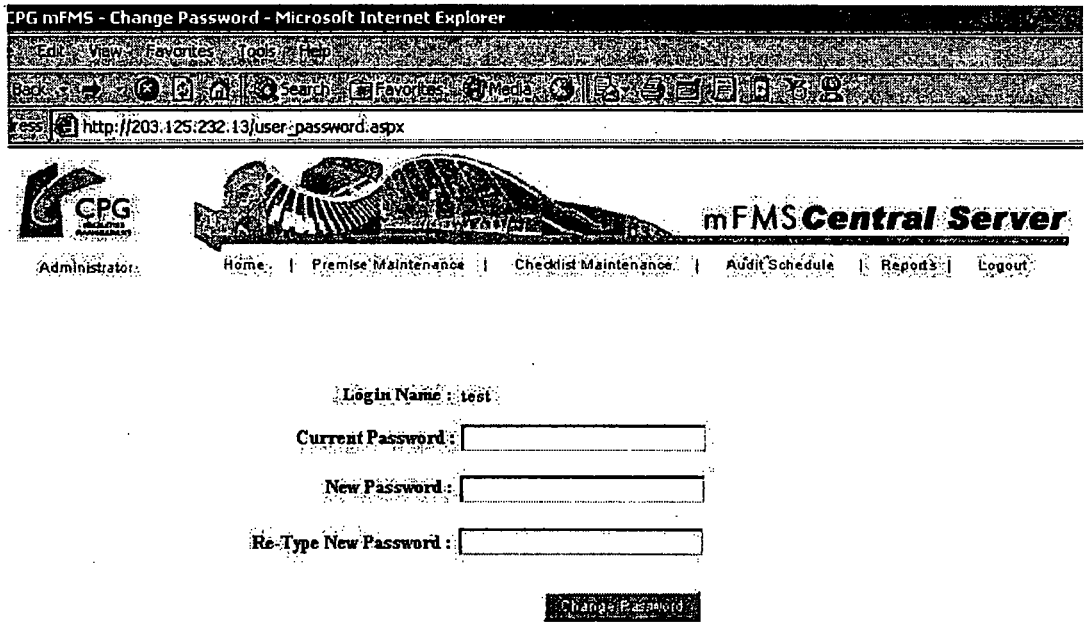


Change Password

When user selects Change Password in the Administrator Menu Page, screen allows the current user to change the password with the following fields:

- Current Password
- New Password
- Re-Type New Password

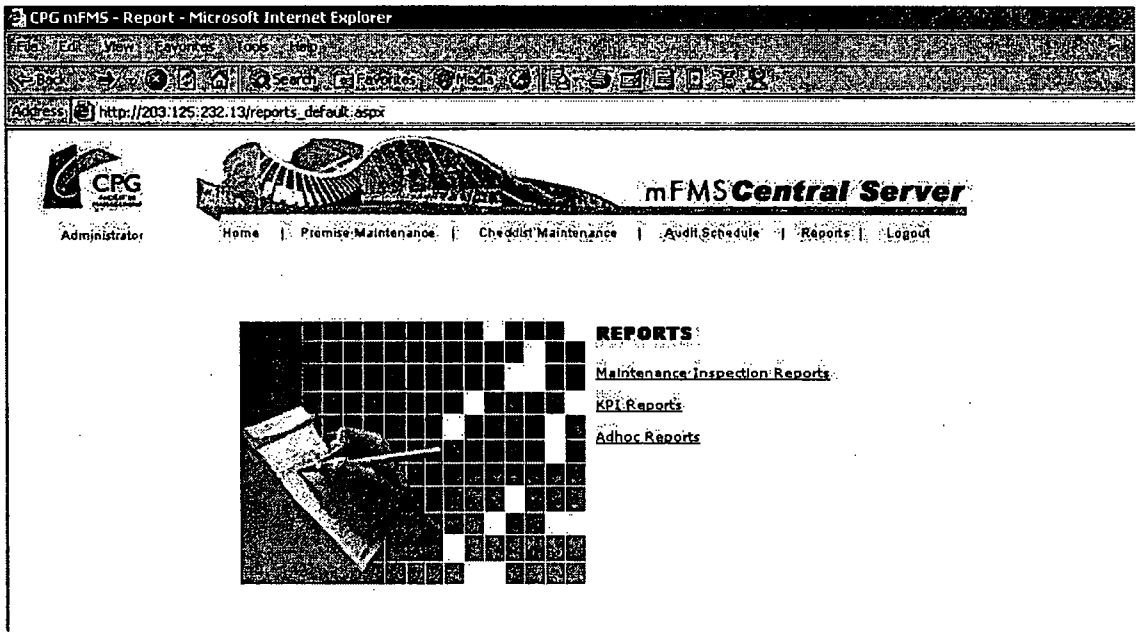
User clicks on Change Password Button to submit the new passwords.



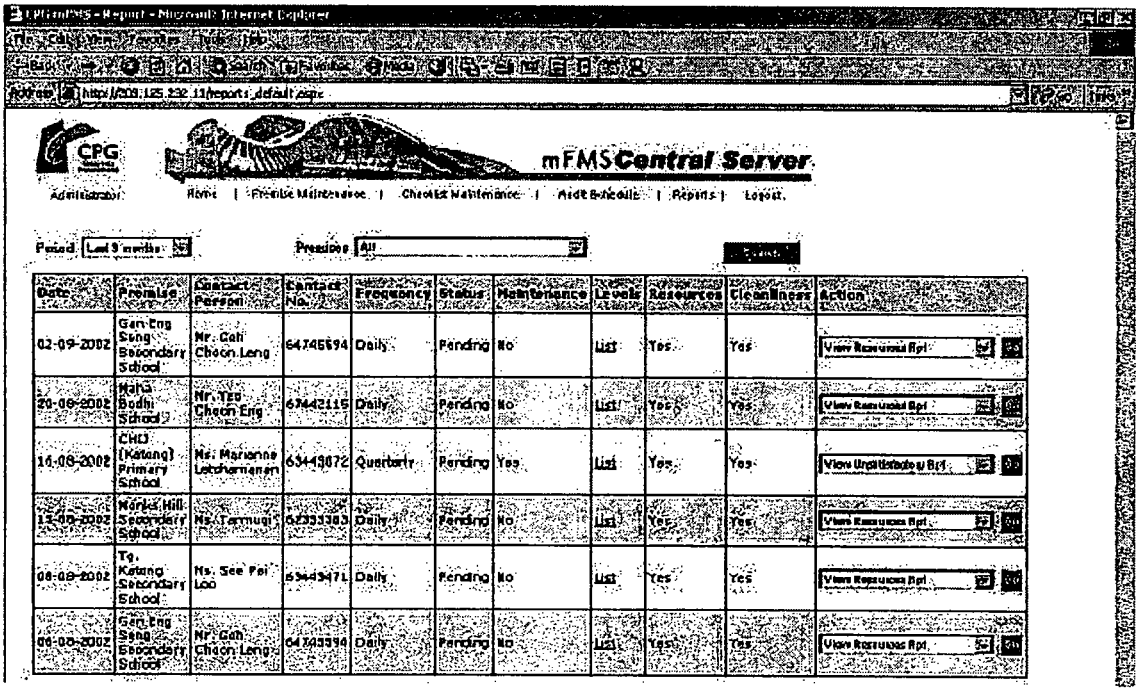
Reports

By clicking on the Report Tab, screen displays the various reports that he is able to navigate to namely:

1) Maintenance Inspection Reports (Module 1)
2) KPI Reports (Module 2)
3) Adhoc Reports (Module 2)



Maintenance Inspection Reports

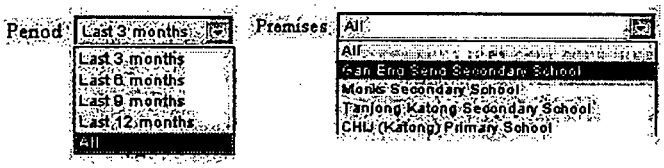


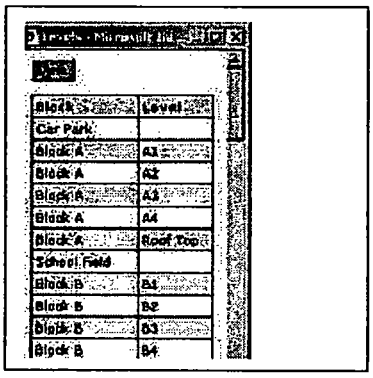
Search Function

User is able to search for the reports that he would like to view by:

1) Period (drop down selection) and
2) Premise (drop down selection)[2].

There is a drop down list for both the Period and the Premises to allow the user to make the appropriate selection.



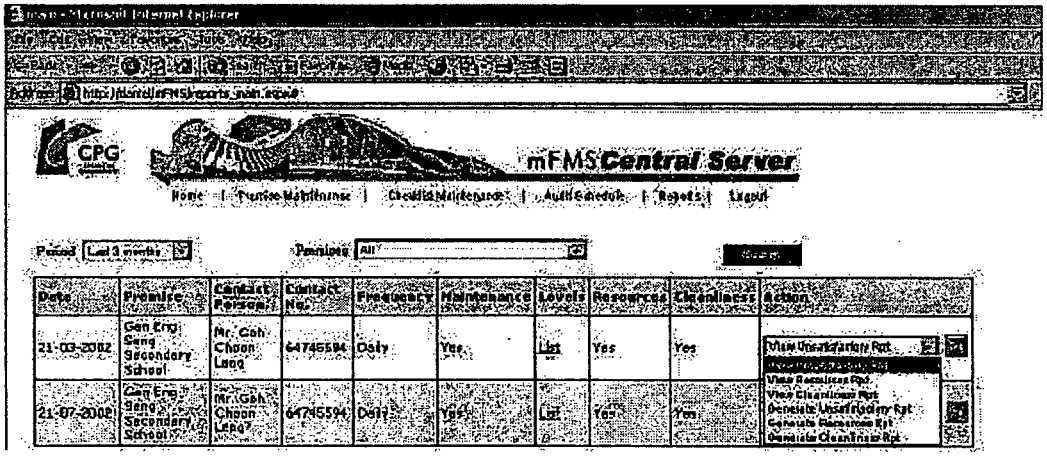


When user clicks on the List hyperlink under Level column, the list of selected blocks or levels that was selected when the schedule was created is displayed. In situation where all levels were selected, only a text "All" will be displayed.

[2] User is only able to see the premises that is assigned to him

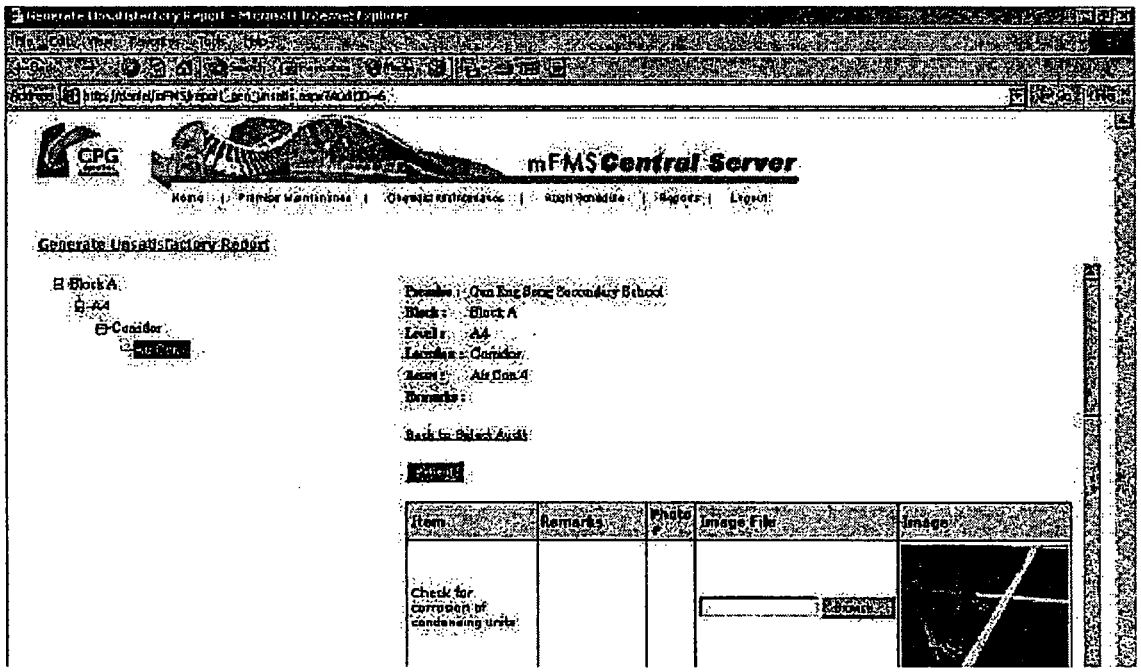
Under the action heading, a drop down list of reports can be viewed. They are:-

1) View Unsatisfactory Report
2) View Resources Report (If any)
3) View Cleanliness Report (If any)
4) Generate Unsatisfactory Report
5) Generate Resources Report (If any)
6) Generate Cleanliness Report (If any)



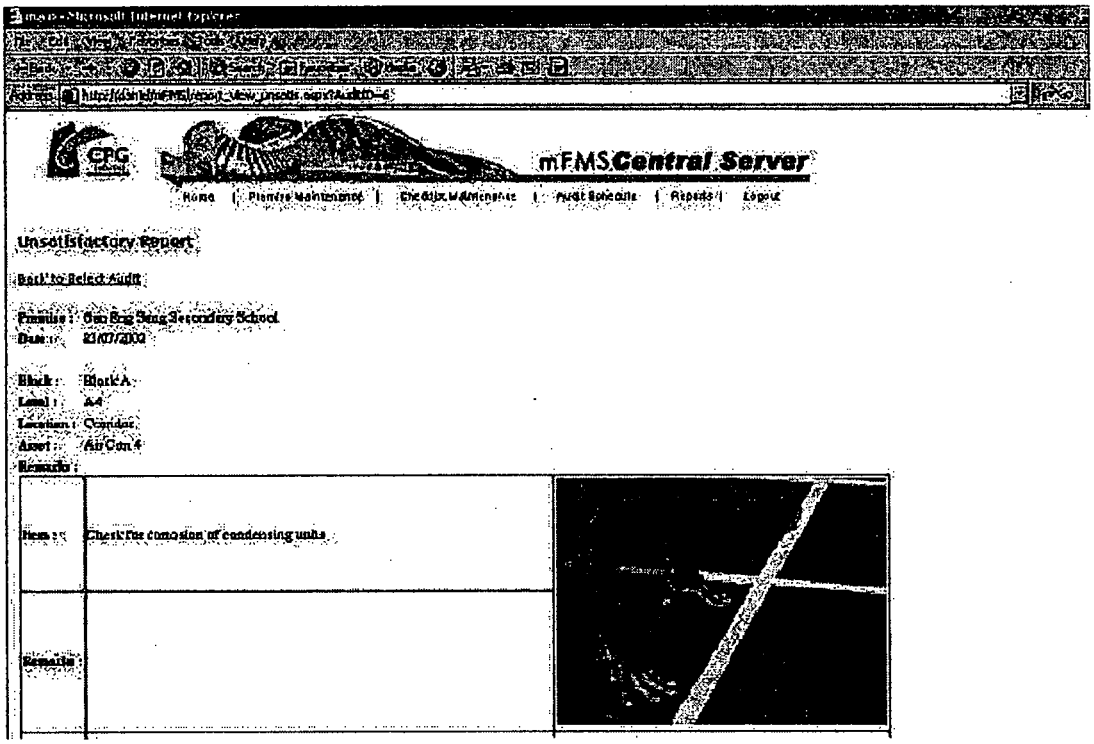
Generate Unsatisfactory Report

User selects Generate Unsatisfactory Rpt and click "go". The screen displays 2 panels, the left panel displays the tree diagram of the premise information. The right panel shows the list of unsatisfactory items that was noted in the audit and the users are allowed to attach the image file that was captured in the digital camera.



View Unsatisfactory Report

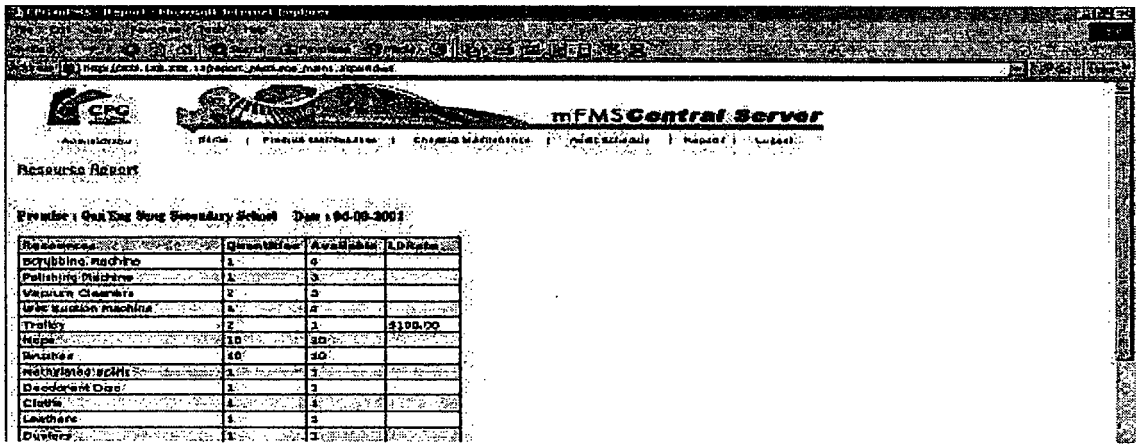
Once the unsatisfactory report has been generated, user is able to "view the Unsatisfactory Report". User selects "View Unsatisfactory Rpt" and selects go. Screen displays the Unsatisfactory report of the selected Premise.



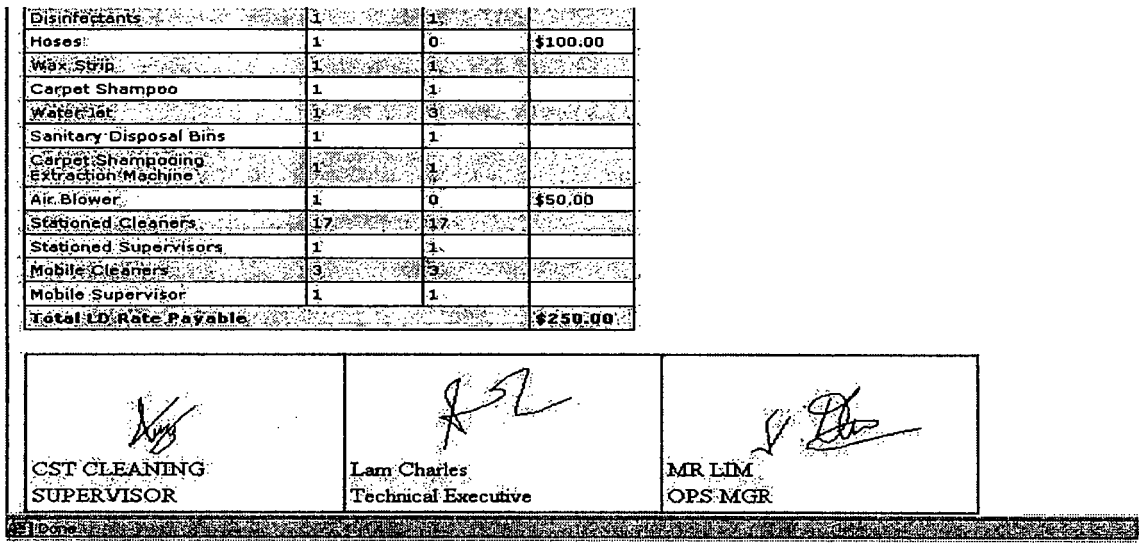
Generate Resources Report

This is only available if the Resource Audit has been selected during the creation of Audit Schedule. And after the Resource Audit has been done.

From the main page, user selects Generate Resources Report and click "go". The screen displays the list of Resources that are checked during the resource audit and do not meet the required quantities. The LD rate is computed.



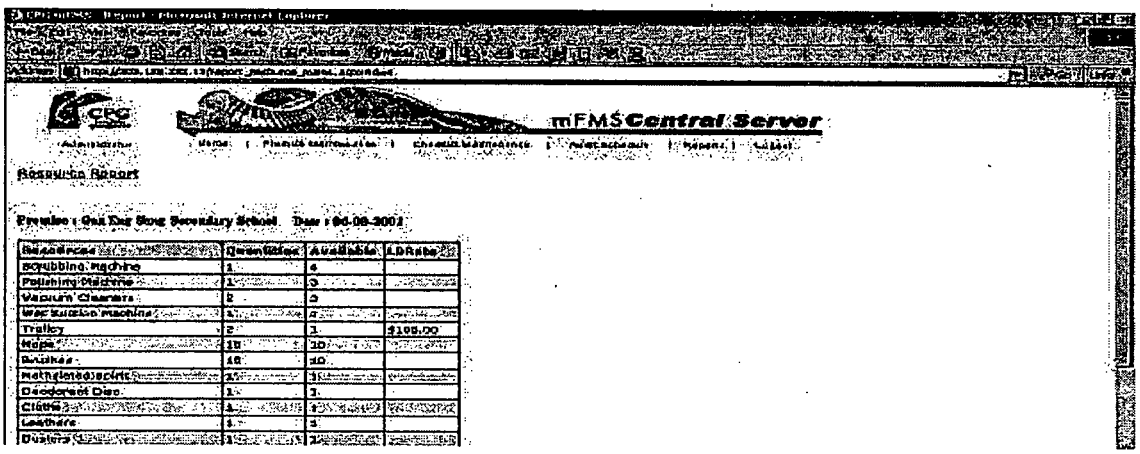
The signatures of the various parties, the Supervisor, the Technical Executive and the Ops Manager captured in the PDA during the audit are reflected in the report.



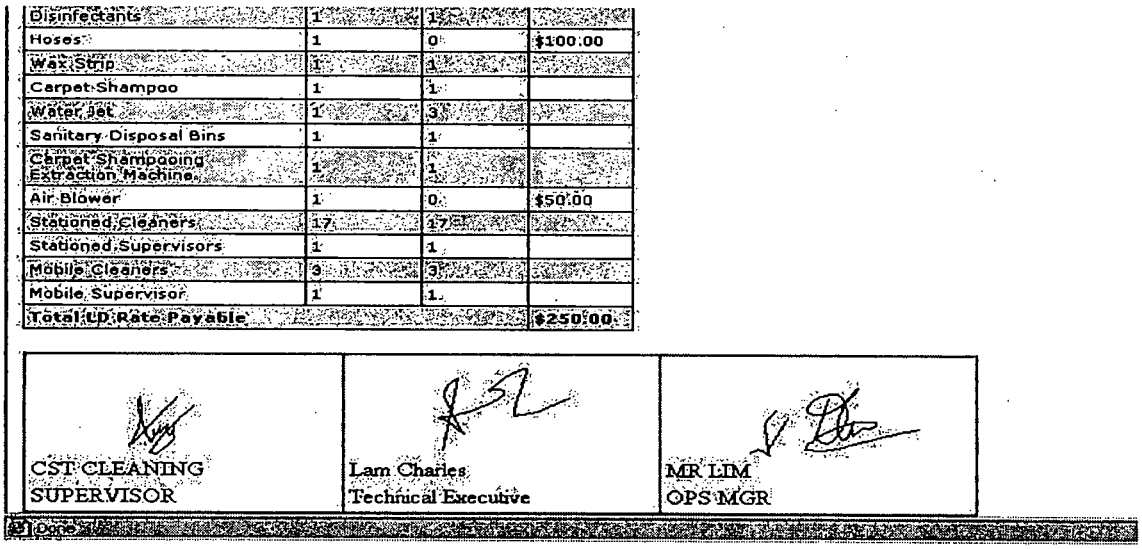
Disinfectants	1	1	
Hoses	1	0	$100.00
Wax Strip	1	1	
Carpet Shampoo	1	1	
Water Jet	1	3	
Sanitary Disposal Bins	1	1	
Carpet Shampooing Extraction Machine	1	1	
Air Blower	1	0	$50.00
Stationed Cleaners	17	17	
Stationed Supervisors	1	1	
Mobile Cleaners	3	3	
Mobile Supervisor	1	1	
Total LD Rate Payable			$250.00

View Resources Report

Once the Resource report has been generated, user is able to "view Resource Report". User selects "View Resource Rpt" and selects go. The screen displays the list of Resources that are checked during the resource audit and do not meet the required quantities. The LD rate is computed. The signatures of the Contractor, the Technical Executive, the person in charge of the school can be seen on this page.



The signatures of the various parties, the Supervisor, the Technical Executive and the Ops Manager captured in the PDA during the audit are reflected in the report.

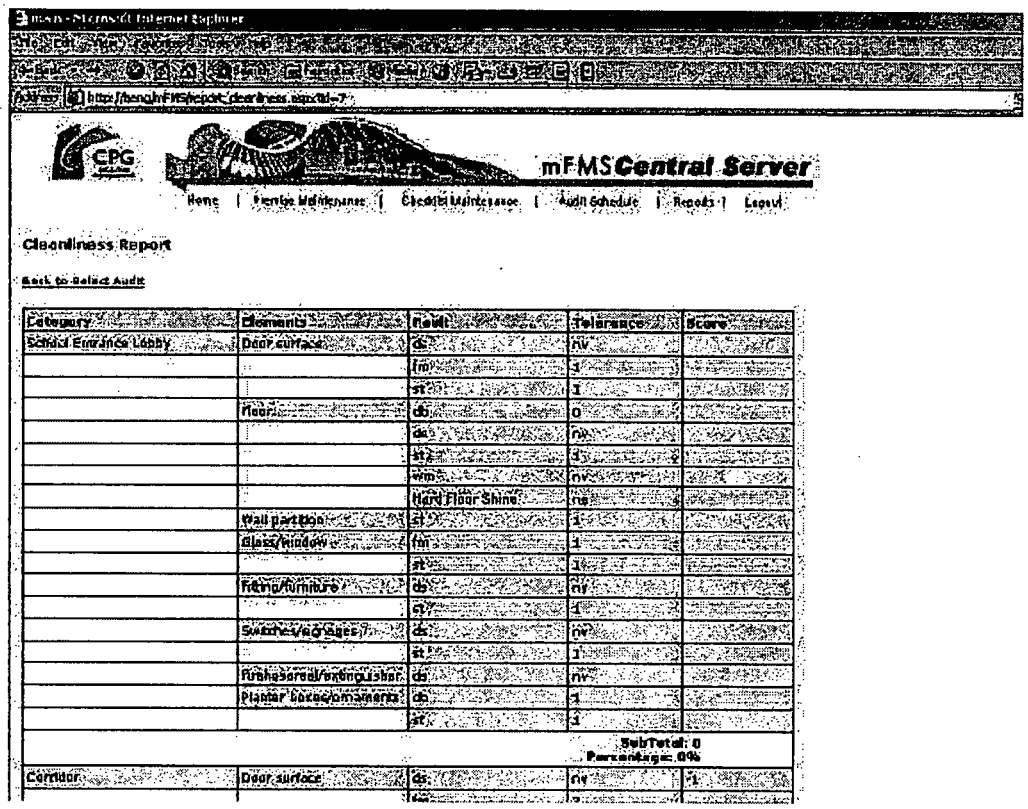


Disinfectants	1	1	
Hoses	1	0	$100.00
Wax Strip	1	1	
Carpet Shampoo	1	1	
Water Jet	1	3	
Sanitary Disposal Bins	1	1	
Carpet Shampooing Extraction Machine	1	1	
Air Blower	1	0	$50.00
Stationed Cleaners	17	17	
Stationed Supervisors	1	1	
Mobile Cleaners	3	3	
Mobile Supervisor	1	1	
Total LD Rate Payable			$250.00

Generate Cleanliness Report

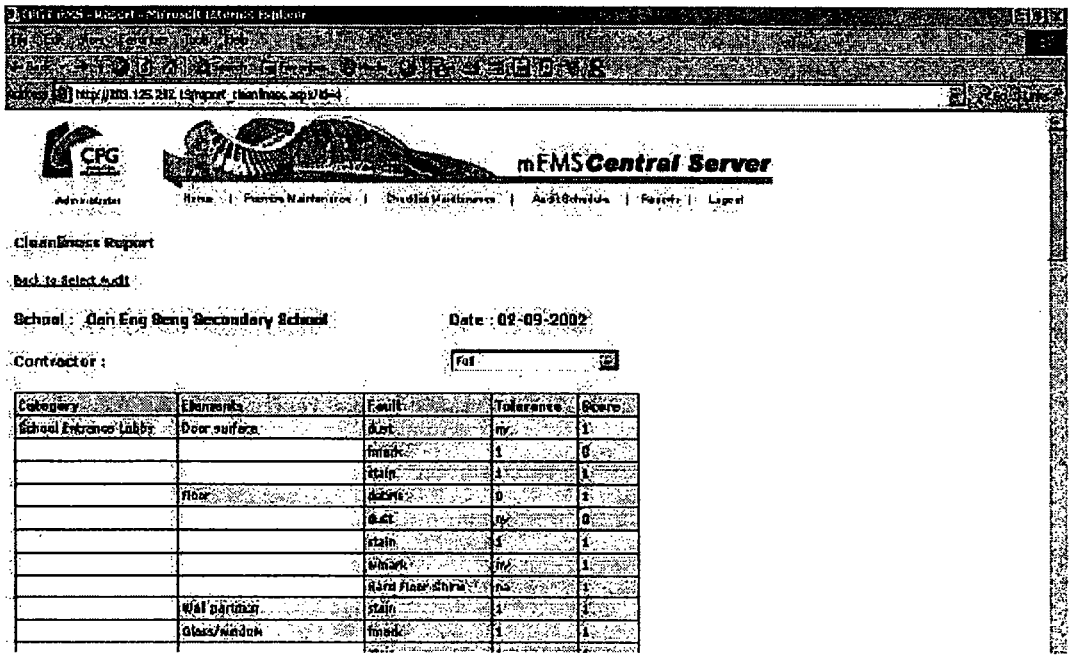
This is only available if the Cleanliness Audit has been selected during the creation of Audit Schedule.

From the main page, user selects Generate Cleanliness Rpt and click "go". The screen displays report of the scoring of the cleanliness audit that are computed from the cleanliness audit. The overall score is computed and LD rate(if any) is computed.

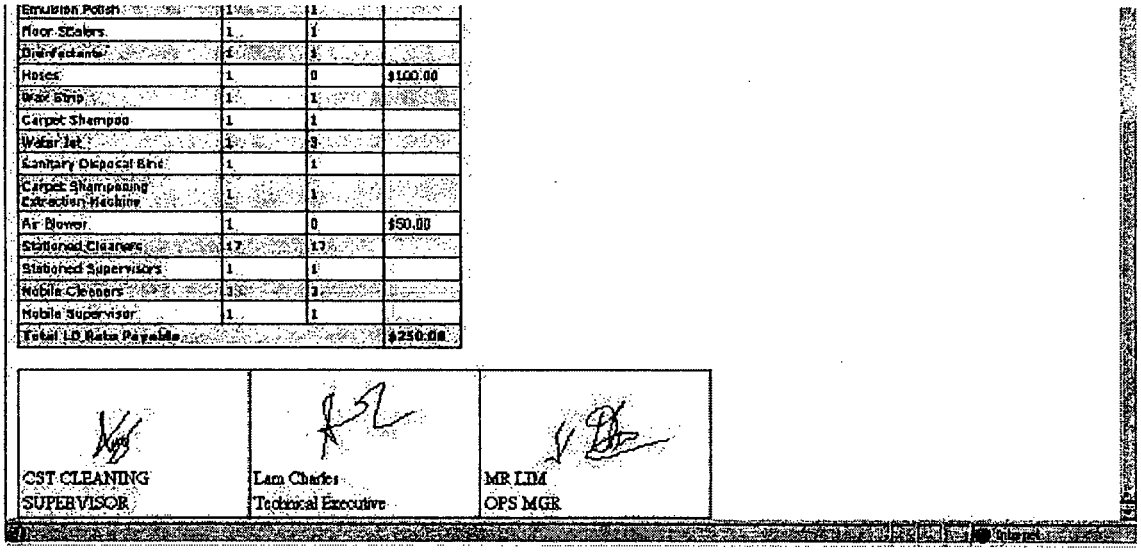


View Cleanliness Report

Similarly, the user is able to view the cleanliness report through the View Cleanliness Report.

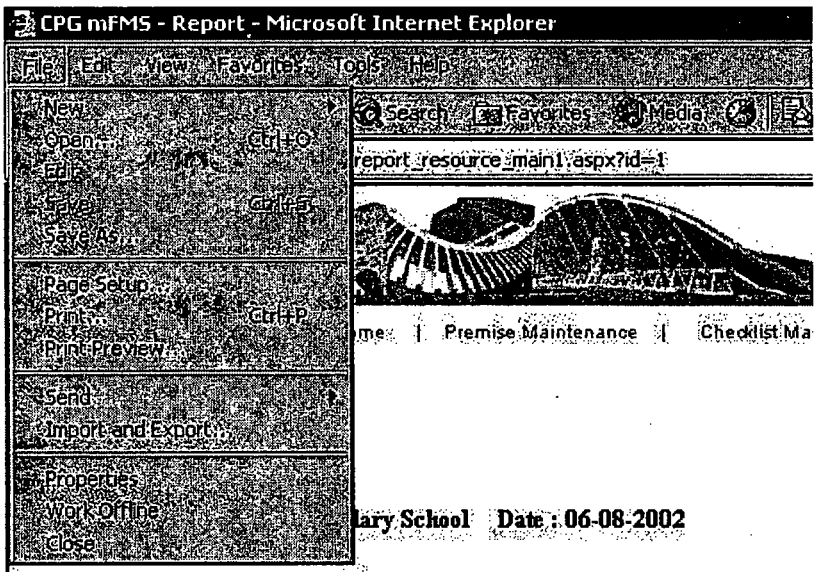


The signatures of the various parties, the Supervisor, the Technical Executive and the Ops Manager captured in the PDA during the audit are reflected in the report.

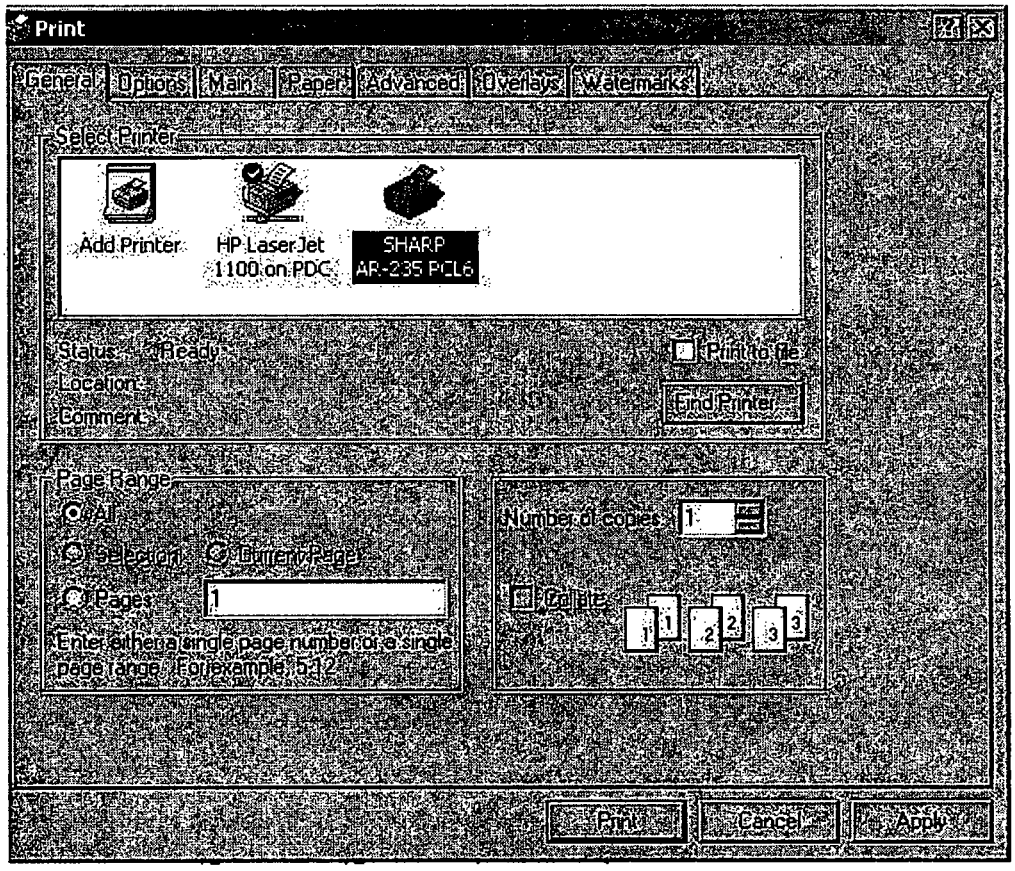


To Print Report

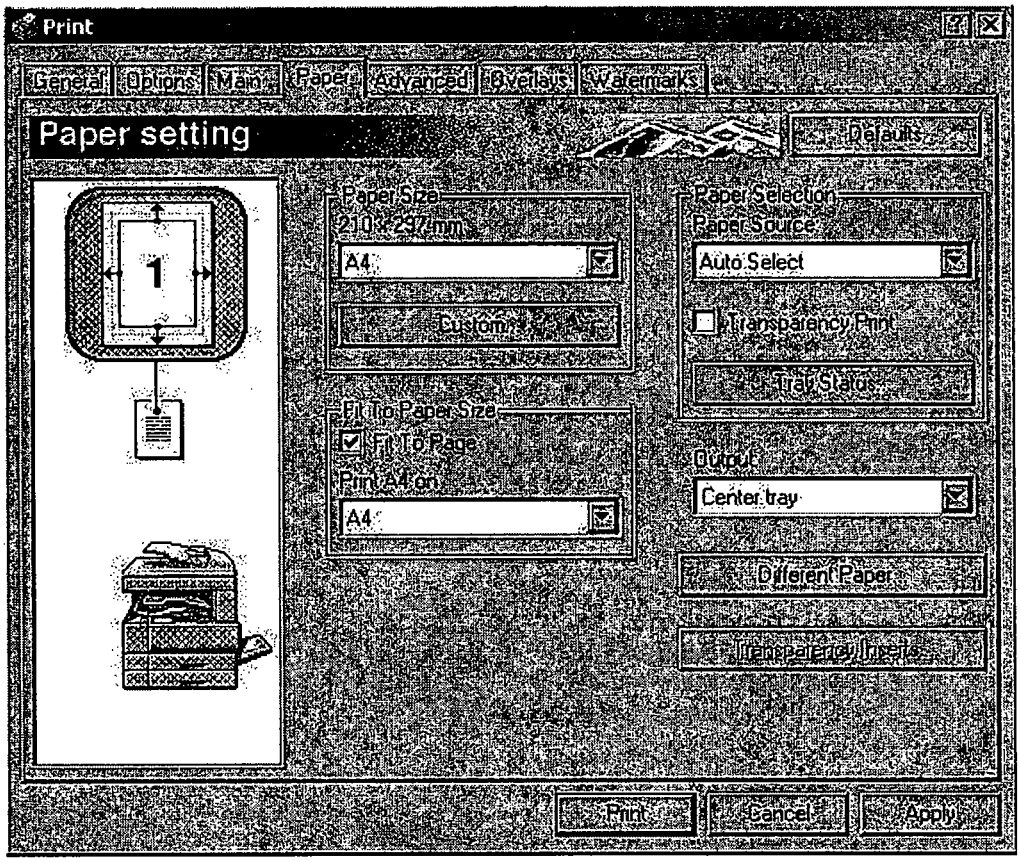
Step 1 Select File > Print



Step 2 Select Printer(if Applicable)



Step 3 Choose Paper Size:



Step 4 Click Print button

Buildfolio

CPG FACILITIES MANAGEMENT

CPG FM Wireless Facility Management Facility

-Mobile Maintenance Inspection Checklist-

(PDA User Interface prototype)
Module 1

Version	Date	Author	Remarks
0.1	03/05/2002	A. Brauner	
0.2	16/05/2002	A. Brauner	
0.3	28/05/2002	A. Brauner	
0.4	28/06/2002	How Ai Ling	
0.5	23/06/2002	How Ai Ling/ Lau Mee Ping	
3	16/12/2002	How Ai Ling	With Cradle Synchronisation + Offline Mode

APPENDIX 2

Cradle Synchronisation

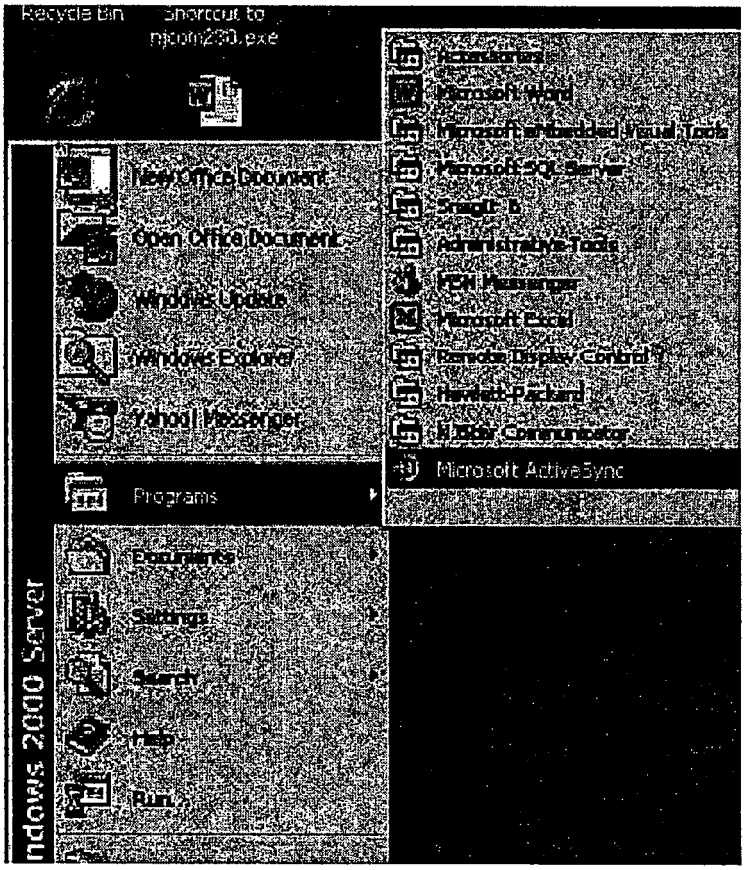
To down load an audit through cradle synchronization:

Step 1: User installs Microsoft ActiveSync and attaches the cradle to the computer. (Note: a) The installation is one time only. b) The Computer must have internet connection)

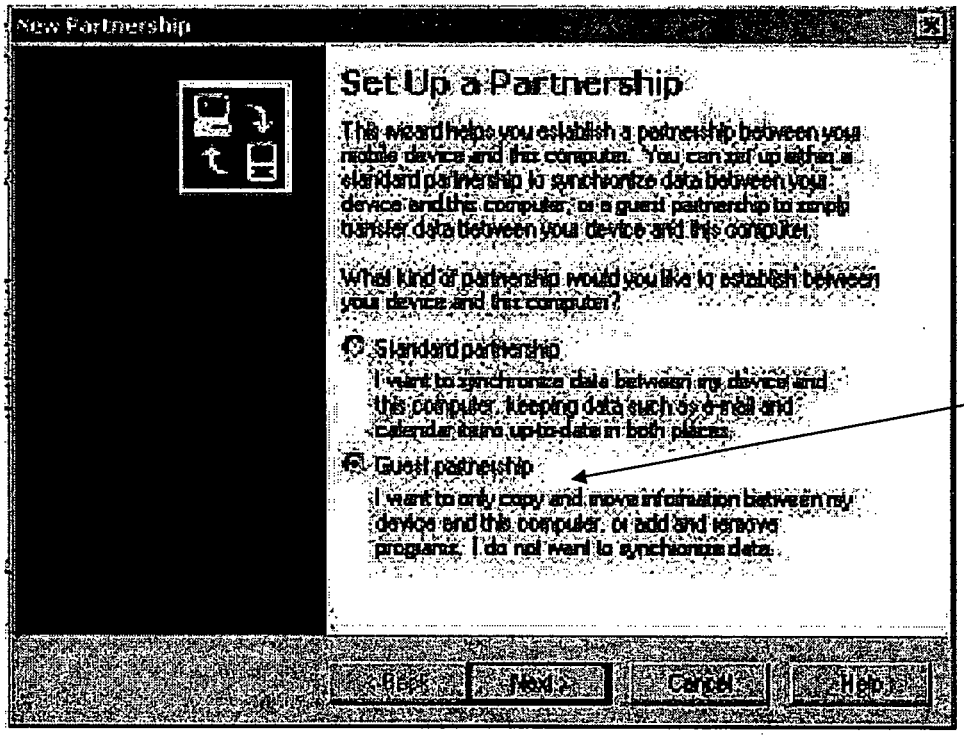
Step 2 : User starts the Microsoft ActiveSync by:-

(a) Programs > Microsoft ActiveSync

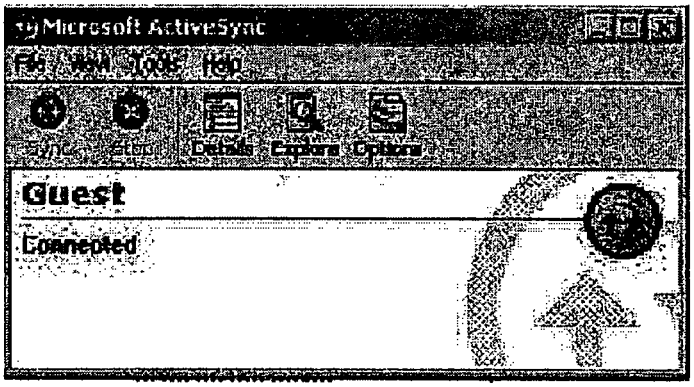
(b) Or the Microsoft ActiveSync shortcut on the desk top



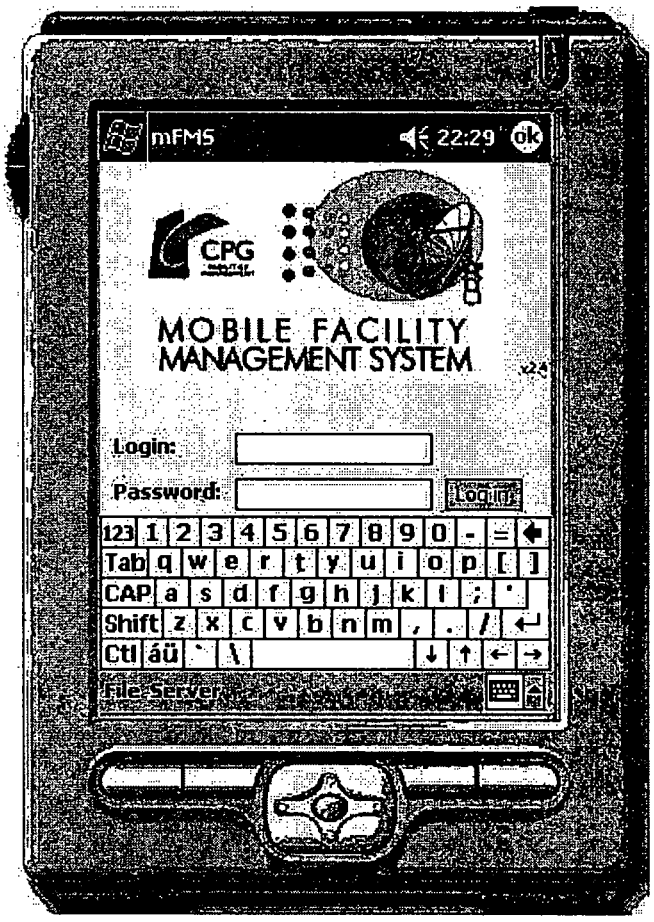
Step 3: User places PDA on Cradle, the New Partnership Dialog box pop up on the screen.



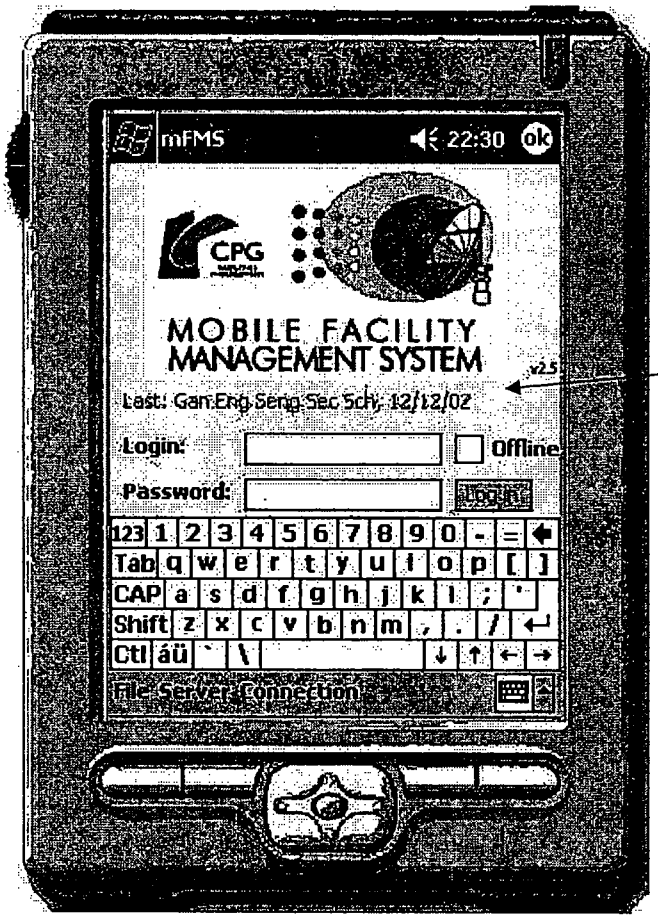
Step 4: User selects Guest Partnership and click Next. The pop up dialog box displays that the connection has been established.



Step 5 User logs into the mFMS system using PDA.



- User logins in by keying in the login ID and Password

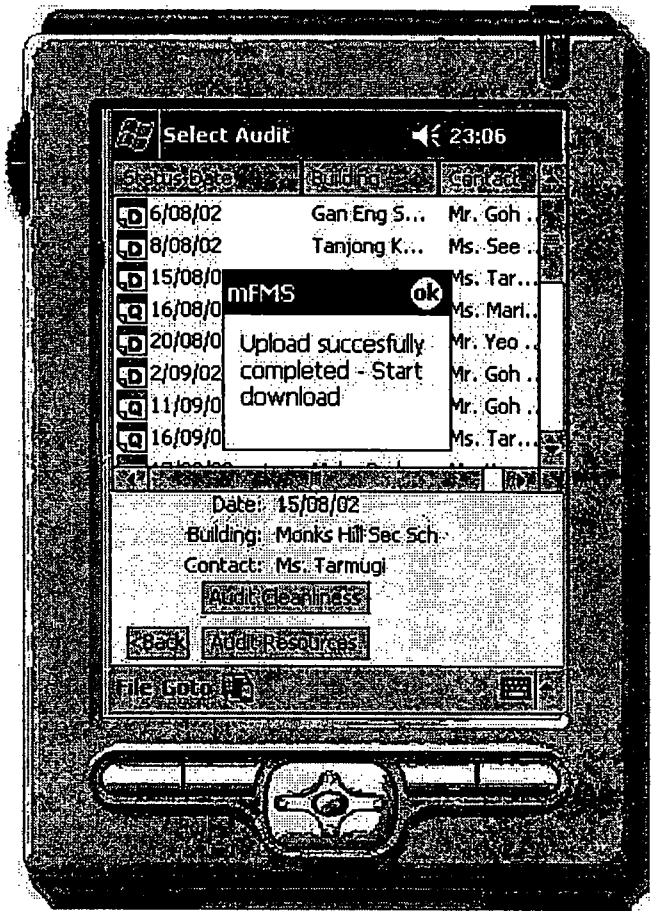


Details of the audit that was downloaded on the PDA.

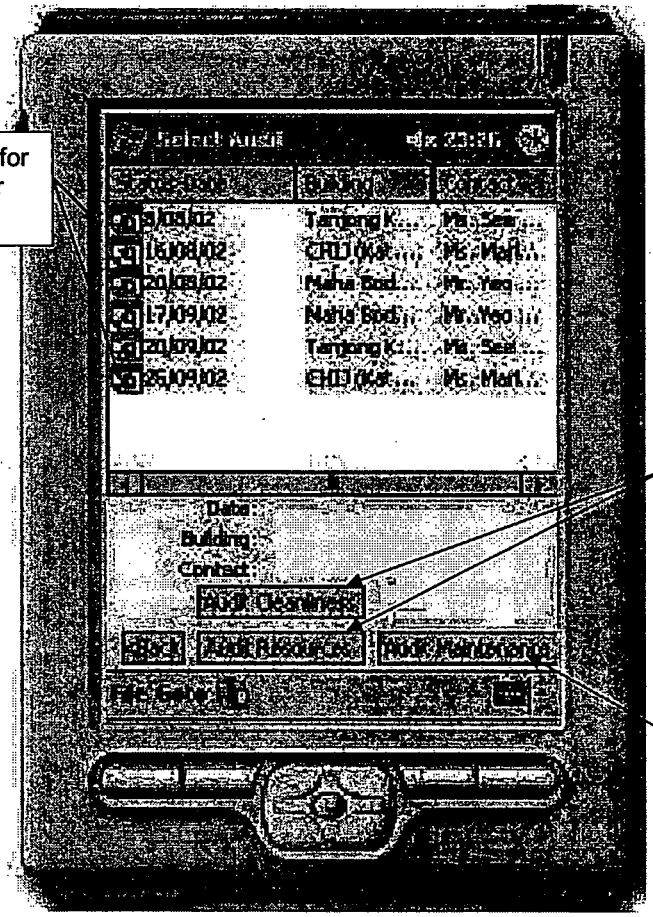
If a previous audit has been downloaded, the details would be reflected on the screen.



Before downloading a new audit, if the PDA has an outstanding audit, a pop up menu will be there to prompt the user to synchronise before downloading the new audit.

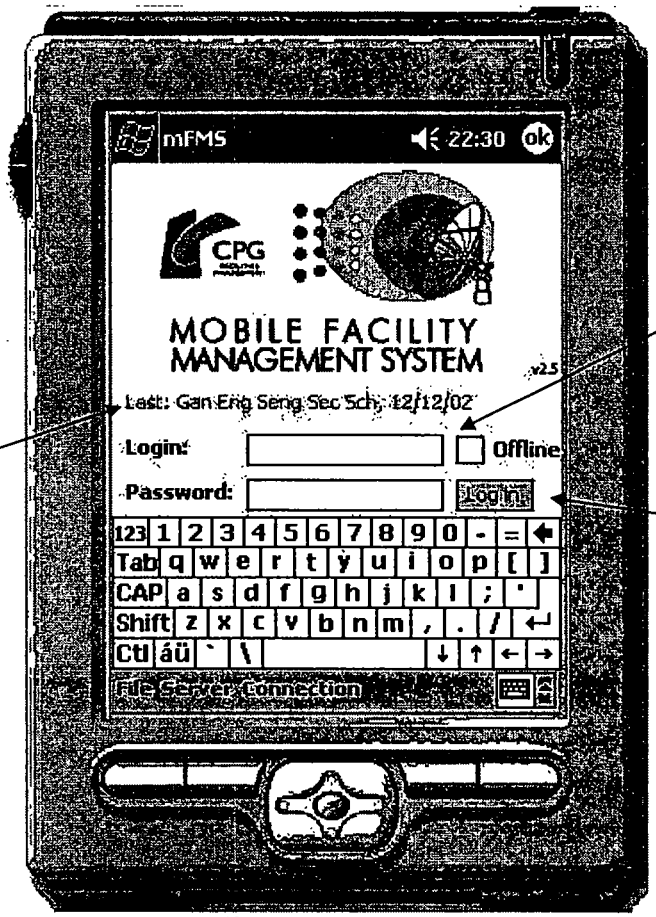


User is able to start download the new audit.



- User selects the premise and the date he wants to inspect.
- And clicks on any of the three button, Audit Cleanliness, Audit Resources or Audit Maintenance button to download the audit onto the PDA.
- Then user clicks File> Exit to exit the application

Login(Offline Mode)



Details of the audit downloaded on the PDA.

1. Enter login name and password.

2. Click Log in

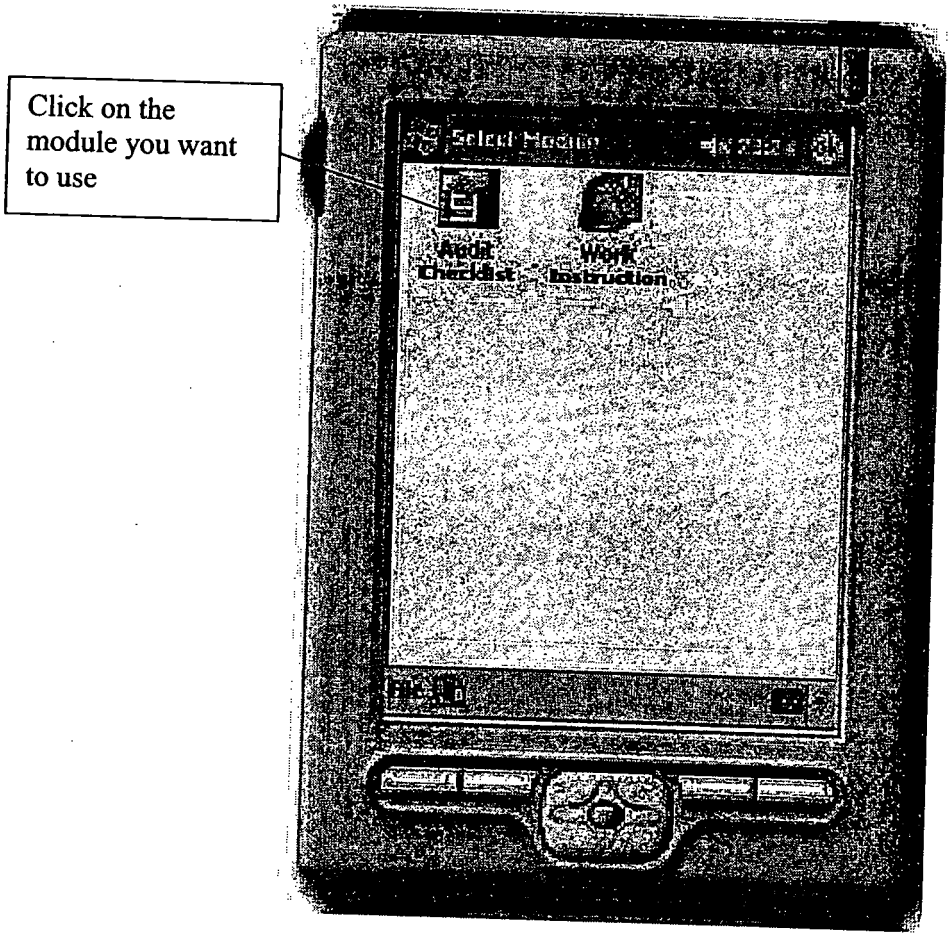
- For Offline mode, user verifies that the date and the premise of the audit is correct, and check the "Off-Line" Check box
- User logins in by keying in the login ID and Password.

Select Module

Access rights: depending on authentication, the application displays only modules that the user is authorized to access. For example, a member of EMS staff could use the Audit Checklist Module, the Work Instruction Module and the BMS Monitoring module, while the contractor is only allowed access to Audit Checklist and Work Instruction only.

In a same manner, we divide EMS staff into 2 categories:

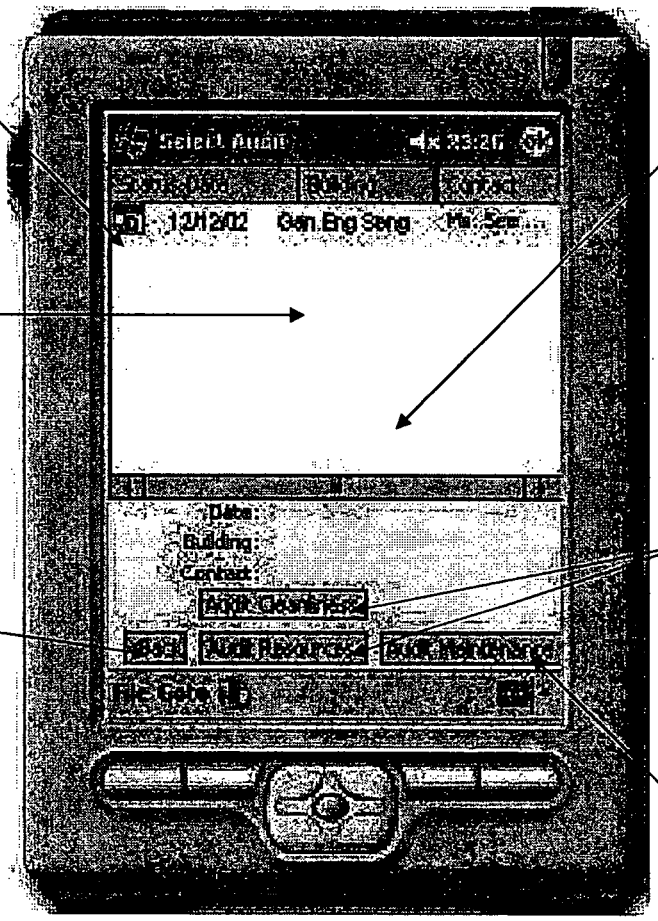
- Hub Manager or higher responsibilities: these users will have full privileges (read, write and delete)
- Technical Executive staff: these users will have limited privileges (read, write)



❖ User selects the module that he wants to use

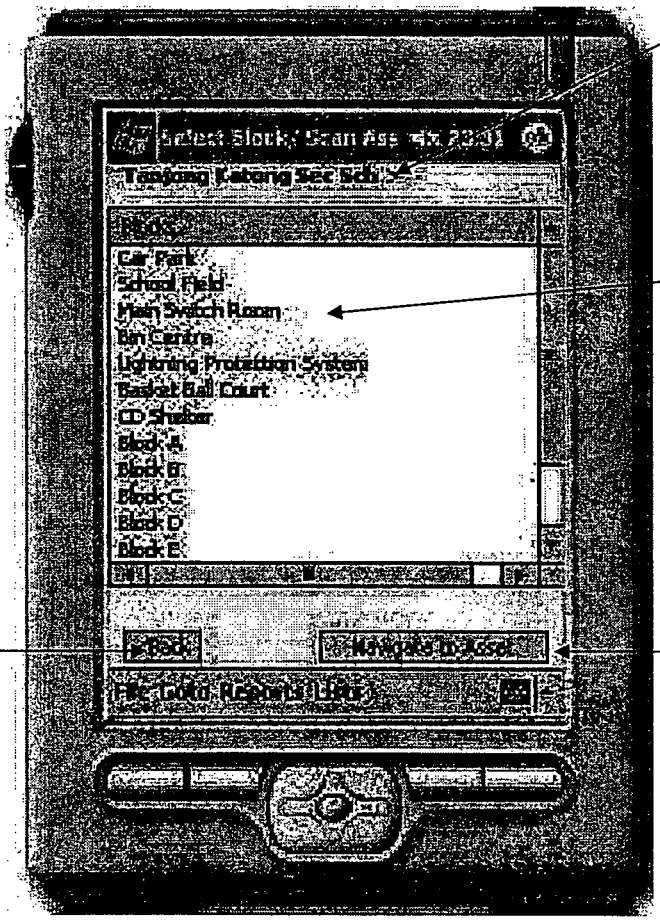
100

Maintenance Inspection Checklist Module



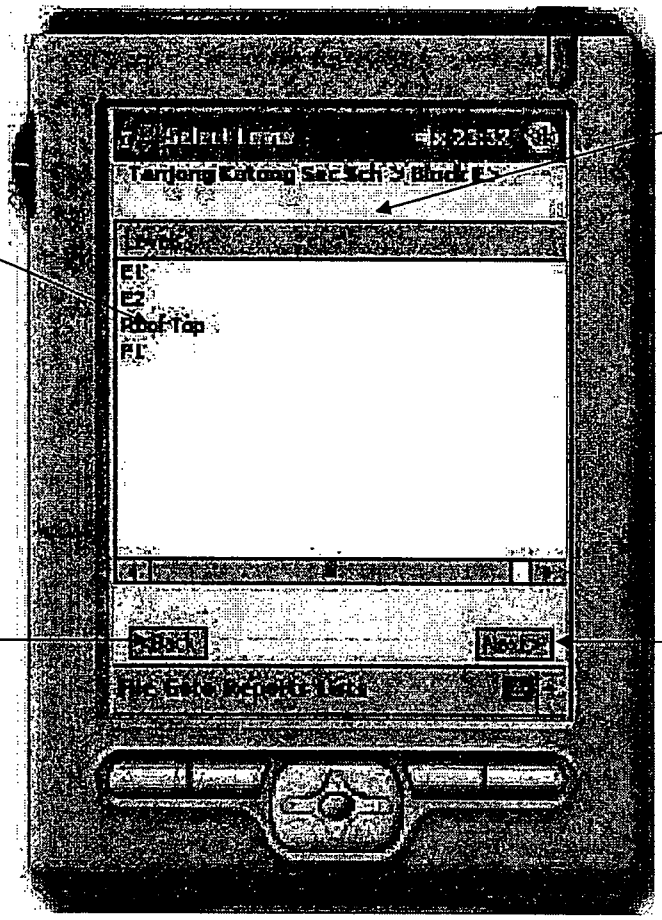
- Only the downloaded audit is shown on the screen.

The user clicks on the AUDIT button

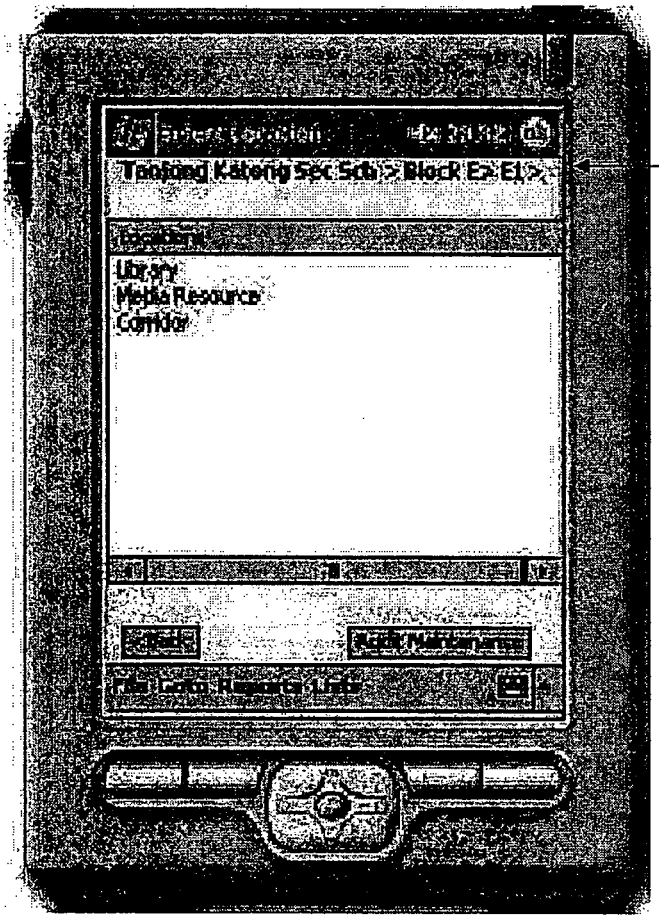


- The user is in a specific building. The exact location is as indicated at the top of the screen
- He/she can either navigate to the asset by selecting the block, the level and the exact location down to the level of the asset, or he may navigate to the actual asset by using a bar code reader to scan the asset.

The user clicks on the Navigate to Asset button and access the Select Level page

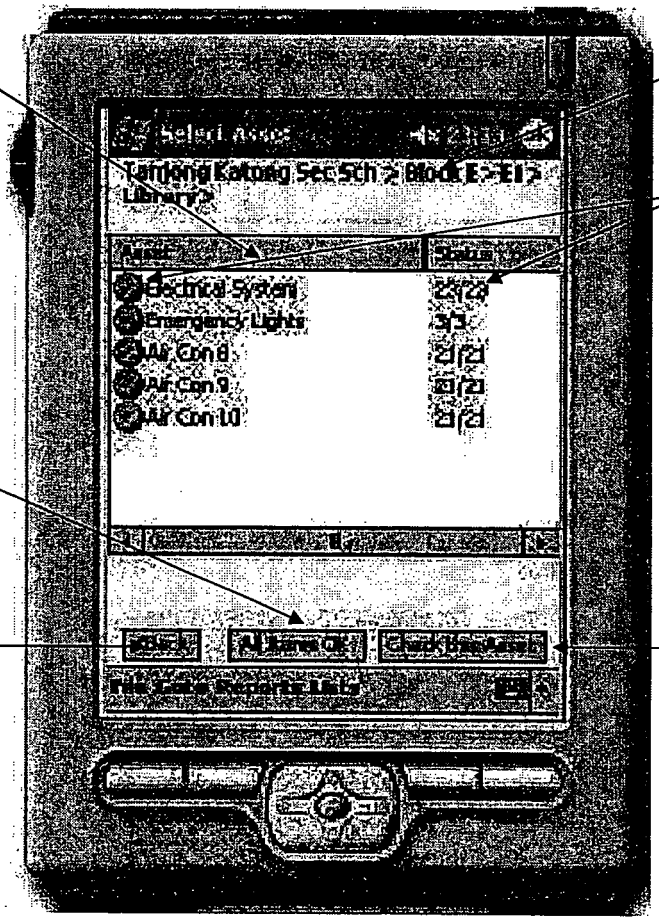


The user clicks NEXT and access the Select Location page



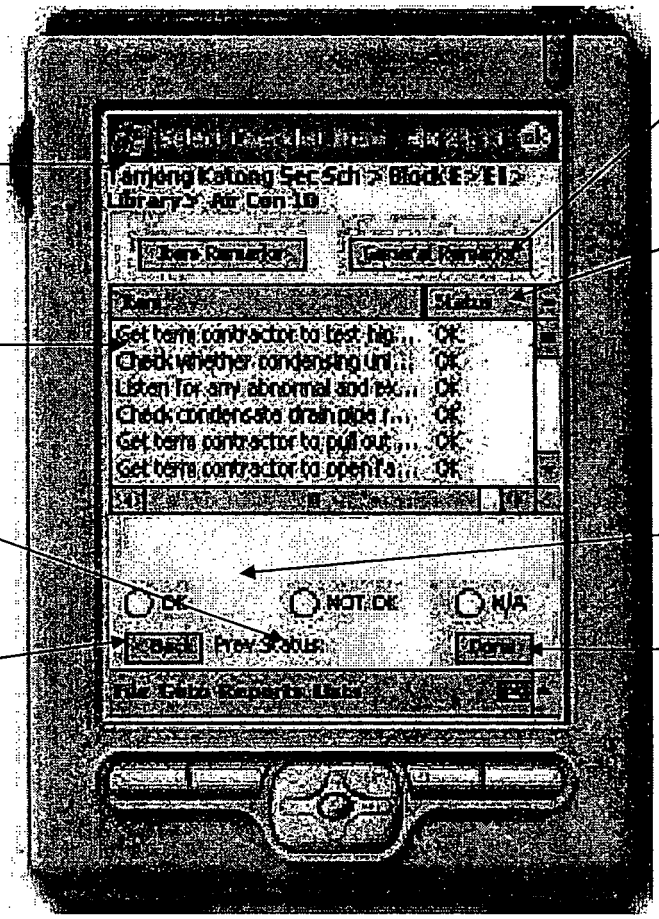
- In this location driven hierarchy, this is the lowest you can go. Therefore, the user accesses the Audit Maintenance.
- User clicks on the Audit Maintenance button, he goes to the Select Asset Page.

The user selects AUDIT MAINTENANCE and accesses the Select Asset page



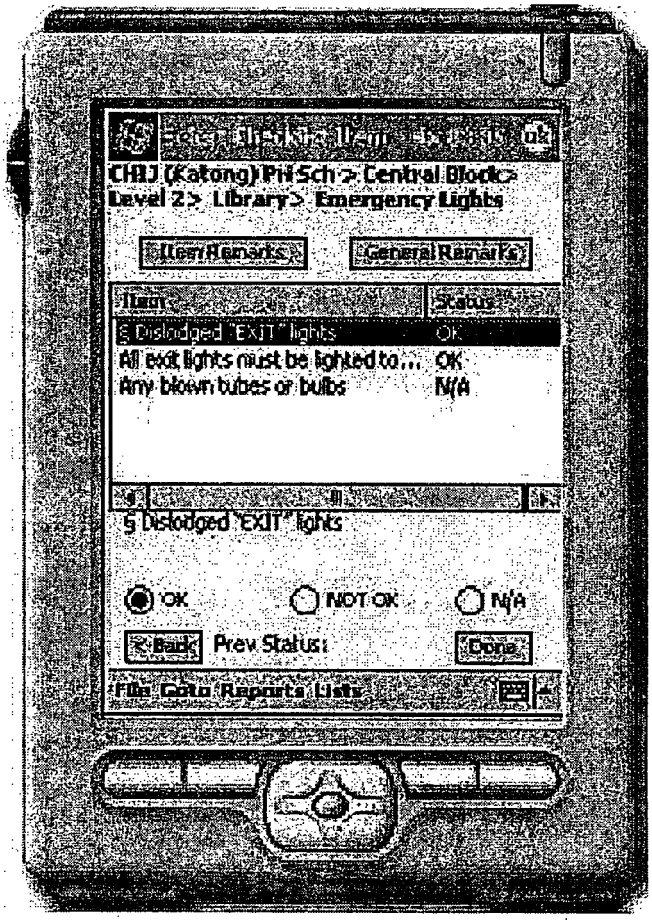
- User selects the assets and clicks Check this Asset button to access the checklist page.
- For assets with items that are all ok, the user can click on the particular item and click the All Items OK button.

The user clicks CHECK THIS ASSET and accesses the checklist page.

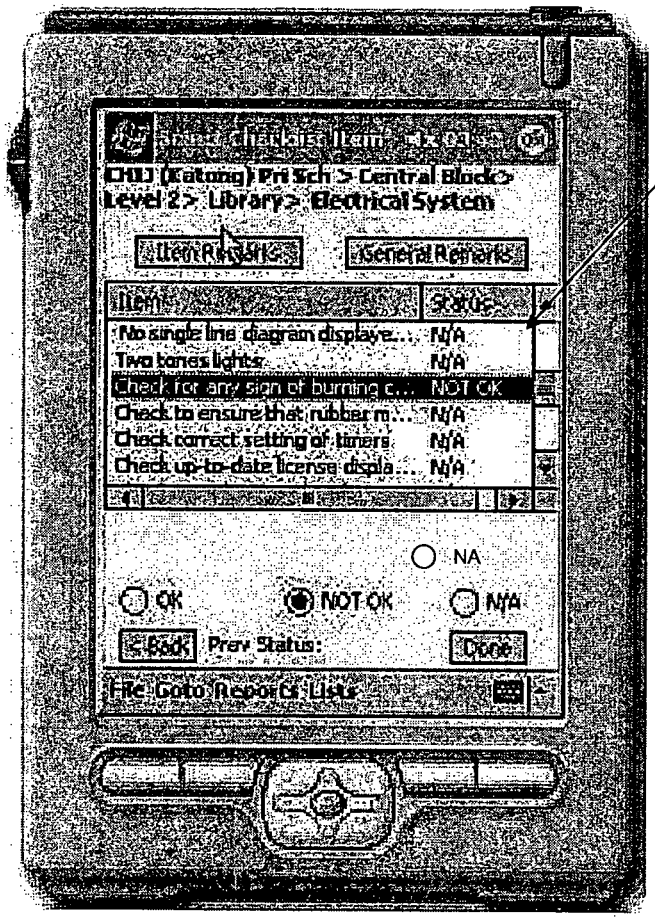


- The first time the user arrives on the page, the item's status is not specified (because the previous status is OK).
- User selects the checklist item. The checklist item details are displayed on the lower portion of the screen.
- User selects the radio button option and the status is updated.

If the user selects OK, the status will be changed.

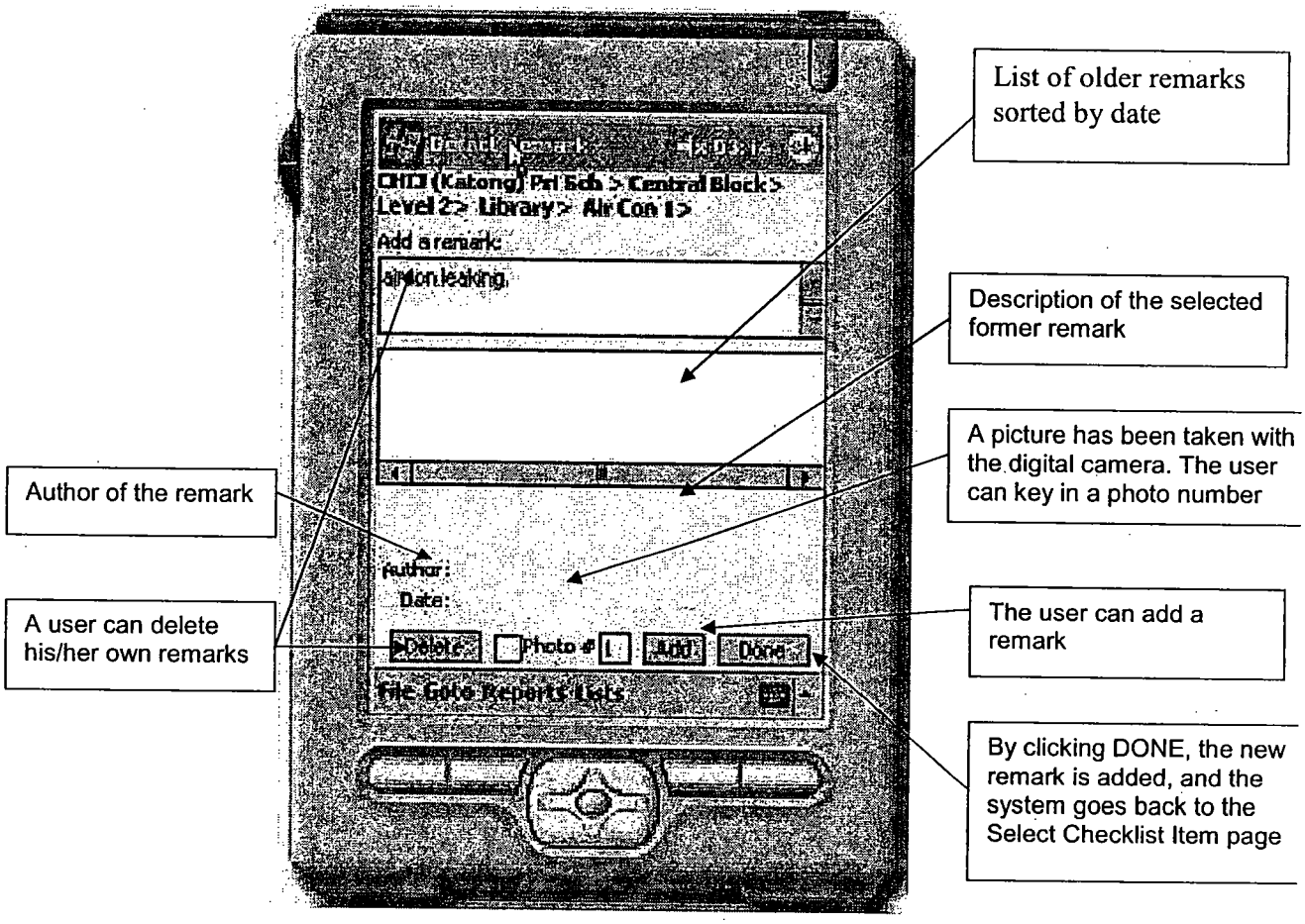


Similarly, if user selects not OK, the status is updated accordingly



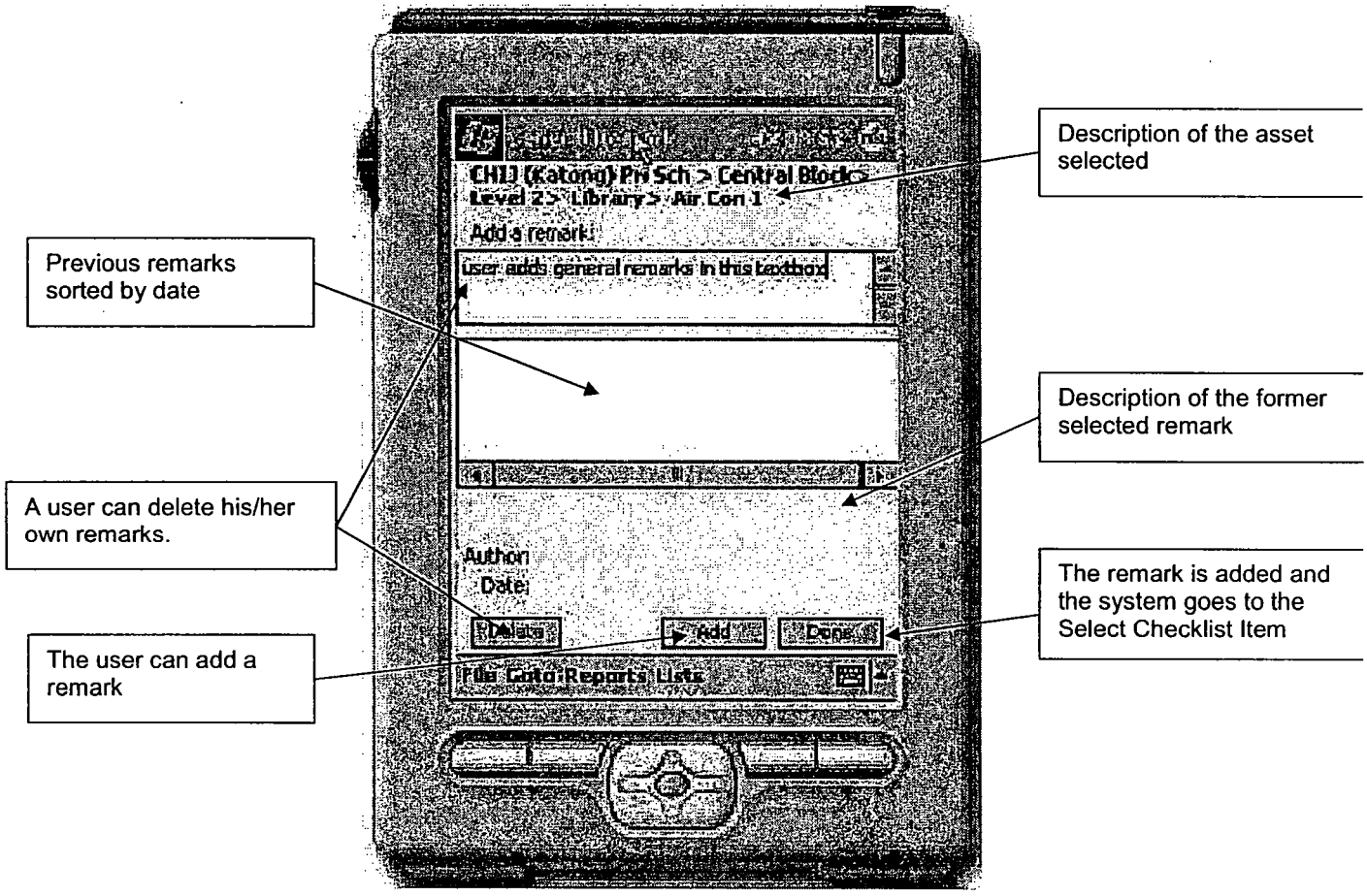
The status has changed

The status is NOT OK... the system opens a remark page for this specific item



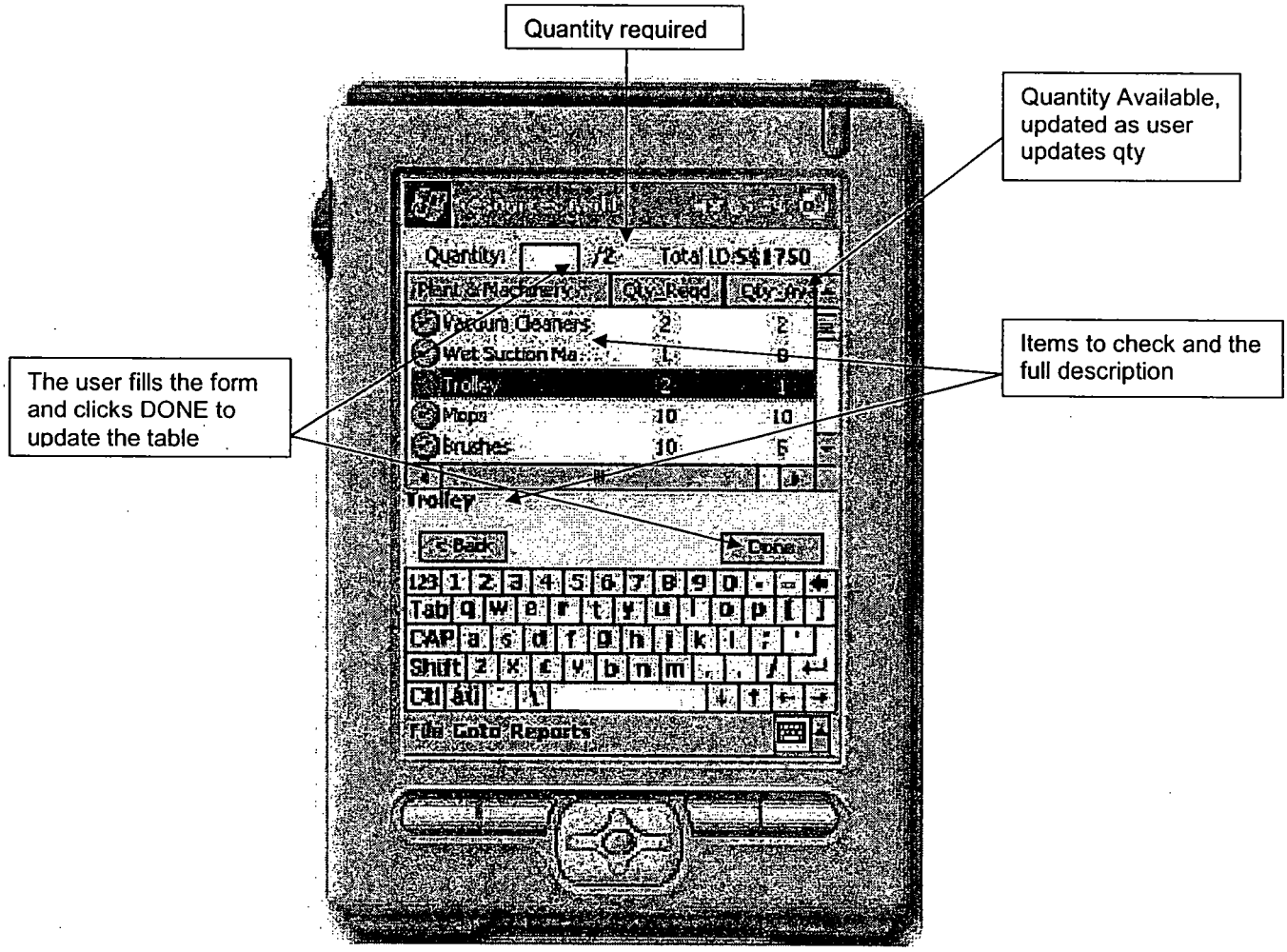
- When "not OK" is selected, the screen displays a Remark Page whereby the user is able to document Remark. User can delete or edit his remarks.
- Screen also shows a history of 5 previous remarks pertaining to this asset.
- User is able to indicate that the photo is taken and the photo number for easy reference.
- User clicks done and screen goes back to the Select Checklist Item Page.

The user wants to add a general remark about this asset



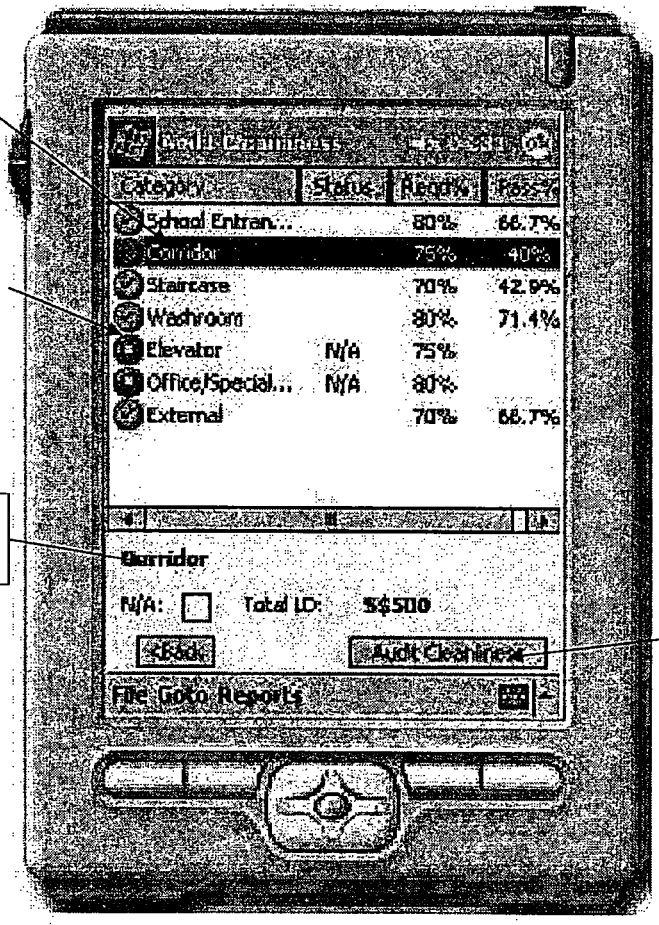
- From the Select Asset Checklist Item, user is able to document General Remarks with regards to the selected asset. User clicks on the General Remarks button, screen displays the list of last 5 remarks that was documented previously(if any).
- User is able to key in the latest remarks. He is able to delete or edit his own remarks.
- User clicks done and the latest remark is added to the list and the system return to the Select Checklist Item page.

Resources Audit (Not Applicable for MOE building)



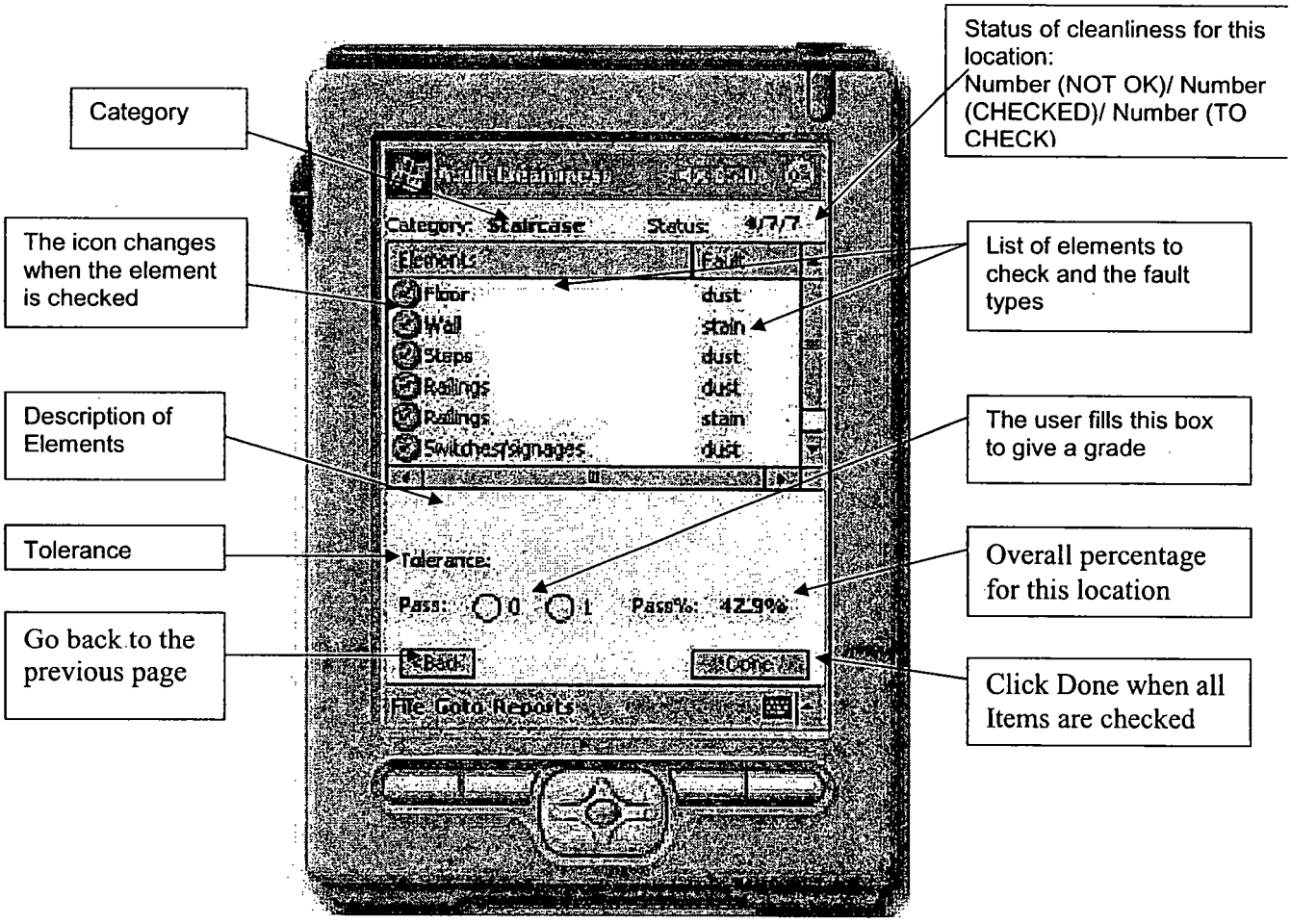
- From the Select Audit Screen, the user accesses the RESOURCES AUDIT screen (N/A for MOE building) by clicking on the Resources Audit Button
- User selects the Resources. Once the item is selected. The item detail is displayed on the lower portion of the screen.
- User keys in the quantity and click Done. The item quantity available is updated on the screen.
- The Total LD (If any) is computed automatically and updated and displayed accordingly on the screen.

CLEANLINESS AUDIT SCREEN



- The user accesses the CLEANLINESS page (N/A for MOE building)
- On the first page of the Cleanliness audit, the system displays the list of Categories.
- The icons next to each category indicates whether the audit for that category has been completed. Green icon indicates that it has been completed while red icon indicates that it has not been completed
- User selects the category and click on the Audit Cleanliness Button. Screen shows the list of elements associated with the category

AUDIT CLEANLINESS ELEMENTS



- Screen displays the list of elements associated with the Category.
- User selects the elements, the lower portion of the screen displays the details of the selected elements.
- User keys in the score/grade of the selected element and click "Done". The overall score is computed and updated accordingly.

REPORTS

There are 3 different types of PDA reports, namely

1) Resources Report
2) Cleanliness Report
3) Unsatisfactory Assets

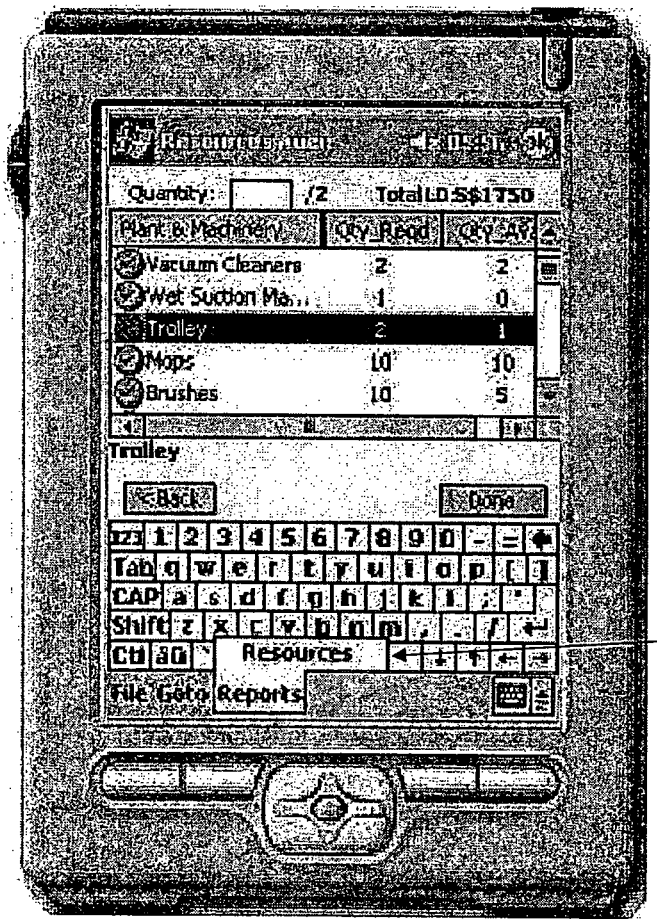
Resources Report summarizes the list of Resources (Plants and Machineries) that have been audited in the work process. In this report, the signatures of the Technical Staff, the Contractor and the Operation Manager/OM (the person IC of the premise) are captured.

Cleanliness Report summarizes the scoring/grading that has been collected in the Cleanliness Audit process displayed according to category. It shows the overall score as well as the status (pass or fail). The overall performance and the global status is also computed at the end of the page and there are text boxes that capture the name, the designation and signatures of the Technical Staff, the Contractor and the Operation Manager/OM.

Unsatisfactory Assets Report summaries the number/quantity for each group of assets that was marked as not OK during the audit process. It gives a quick listing of the assets group with items that did not pass the maintenance process. In this report, the signatures of the Technical Staff, the Contractor and the Operation Manager/OM (the person IC of the premise) are captured.

To navigate to the reports, the user selects from the menu bar, REPORTS >. There are 3 choices of reports, Resources, Cleanliness and Unsatisfactory items.

RESOURCES REPORT (N/A for MOE building)

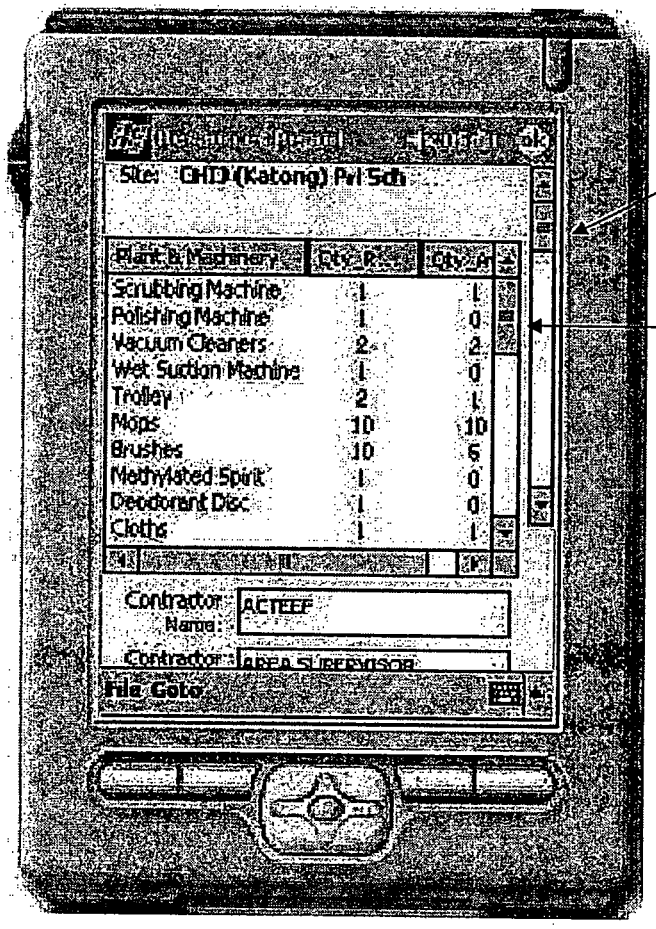


To get to the Resource Audit Report page from, user selects Resources Report from the REPORTS menu bar

- Resources Report summarizes the list of Resources (Plants and Machineries) that have been audited in the work process. In this report, the signatures of the Technical Staff, the Contractor and the Operation Manager/OM (the person IC of the premise) are captured.

- User, from the lower Menu Bar, selects Reports and selects Resources to arrive at the Resources Report Screen

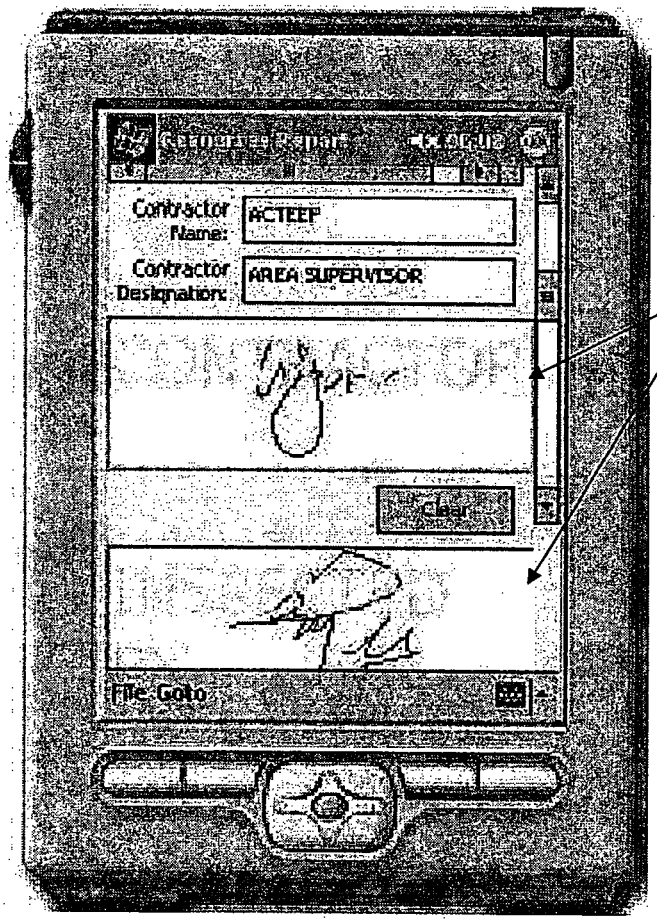
Resource Report (Resource Listing)



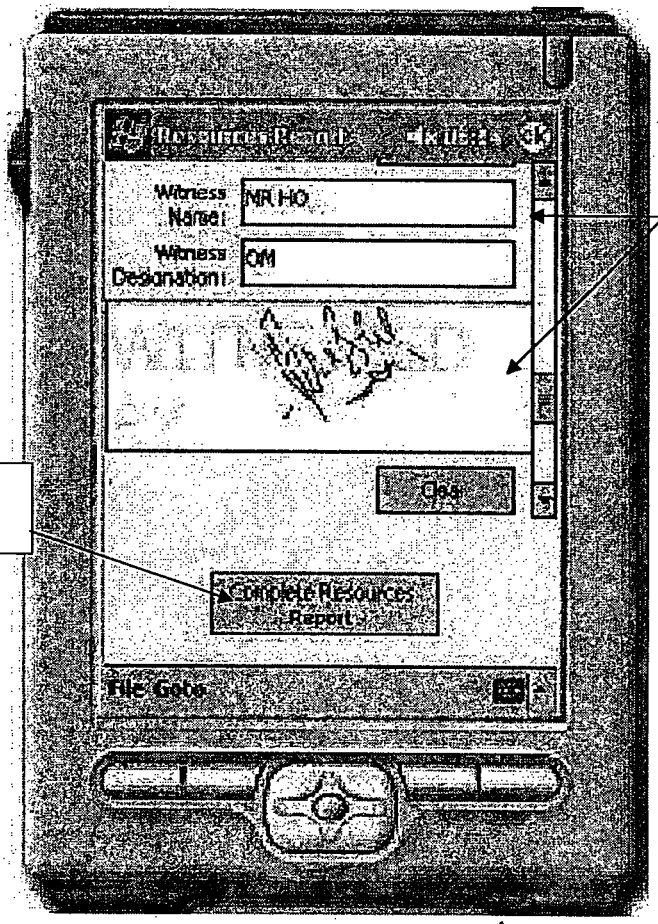
The user can scroll down to capture the signatures

User can scroll down to see the Qty_ Required and Qty_Available for each resource item

Resource Report (Capturing Authorized Signatures)



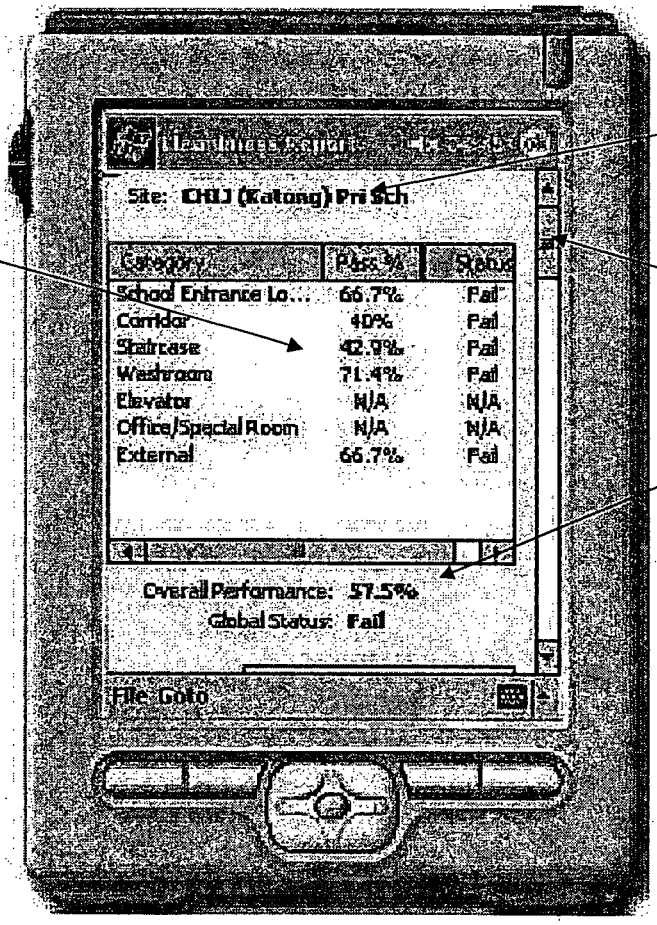
To capture the signature of the School Contractor and CPG FM staff



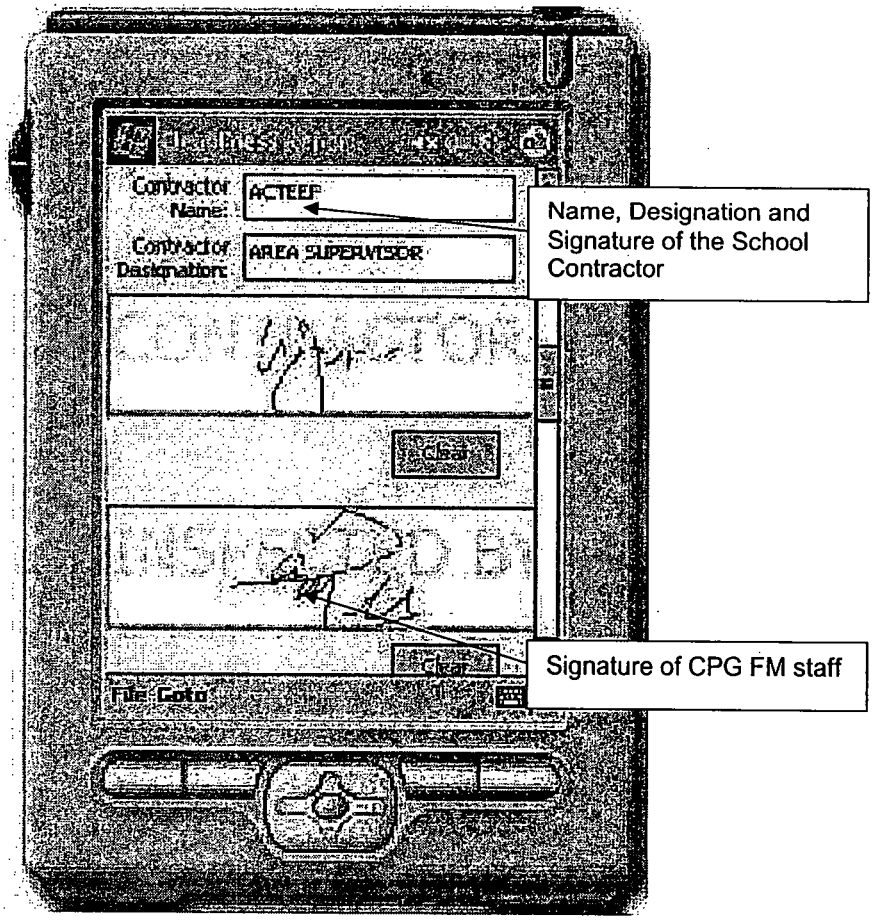
Name and Signature of the School Contact Person/ Witness

Save the report and the signature locally

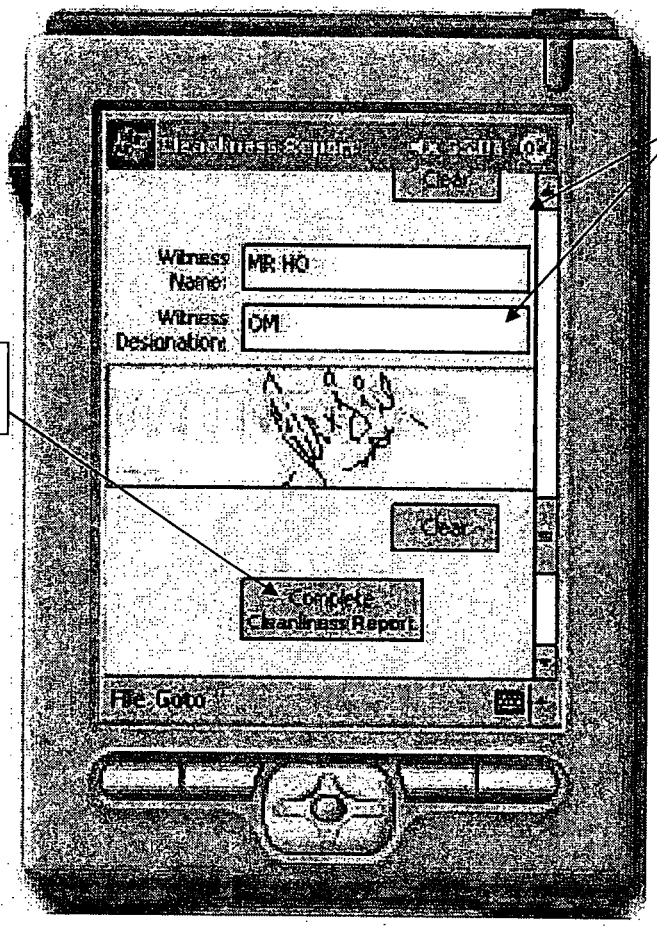
CLEANLINESS REPORT (N/A for MOE building)



- Cleanliness Report summarizes the scoring/grading that has been collected in the Cleanliness Audit process displayed according to category. It shows the overall score as well as the status (pass or fail). The overall performance and the global status is also computed at the end of the page and there are text boxes that capture the name, the designation and signatures of the Technical Staff, the Contractor and the Operation Manager/OM.



- User Scrolls down the page to capture the Name, Designation and Signature of the Technical Staff, the OM and the contractor.

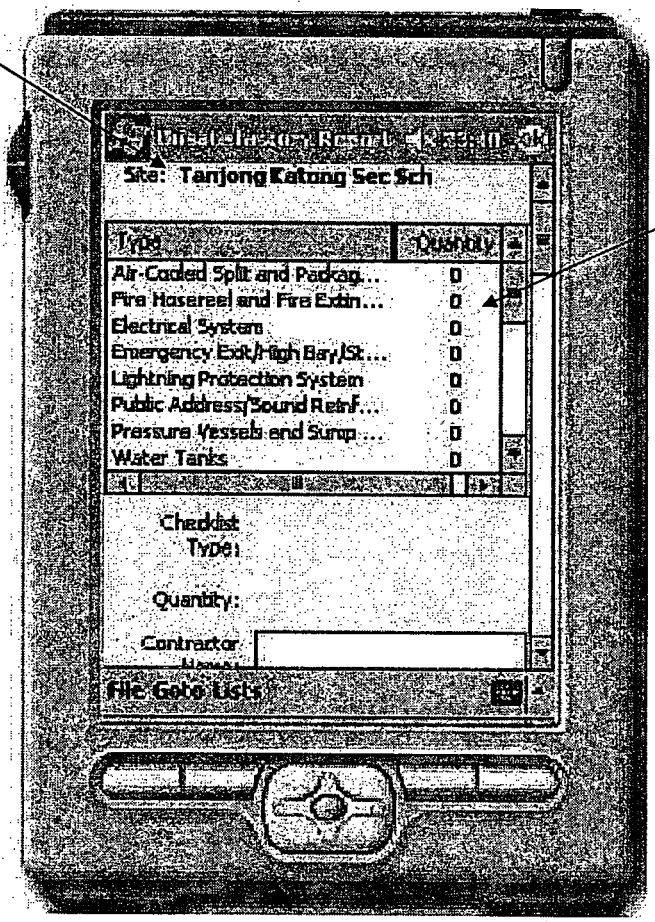


Name and Signature of the School Contact Person/ Witness

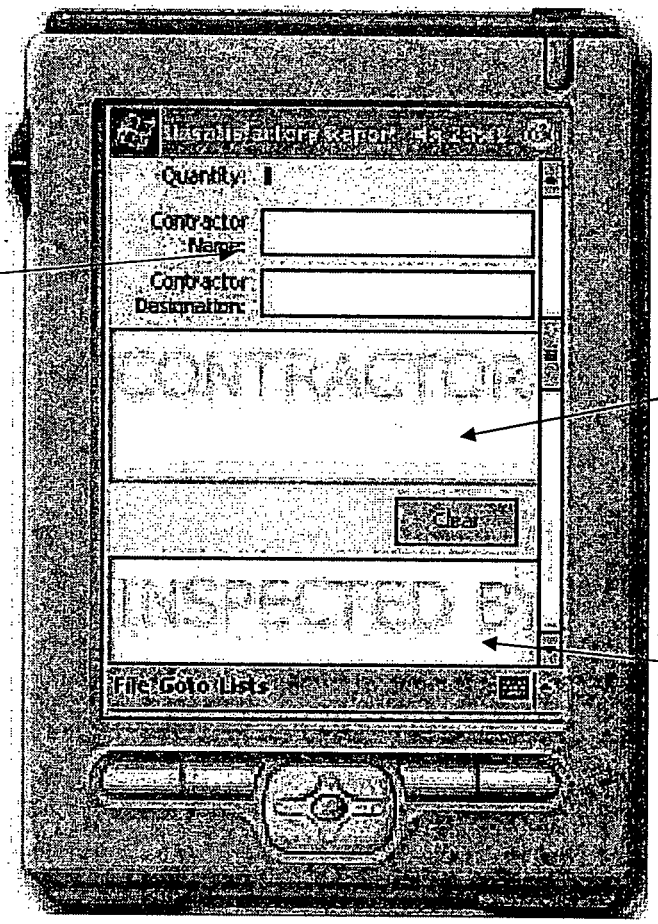
Save the report and the signature locally

UNSATISFACTORY ASSETS REPORT

Site name, Date and Time



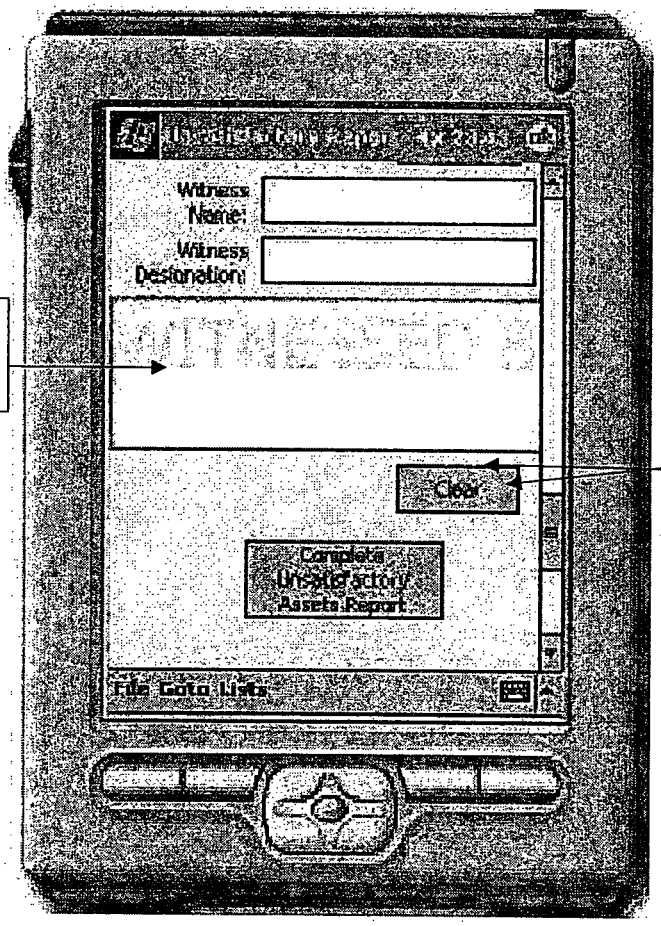
Data from the Maintenance Audit



Name and Designation of the Contractor

Signature from the School Contactor

Signature from EMS staff



Signature of the School Witness/ Contact Person

Clear Button to allow for correction

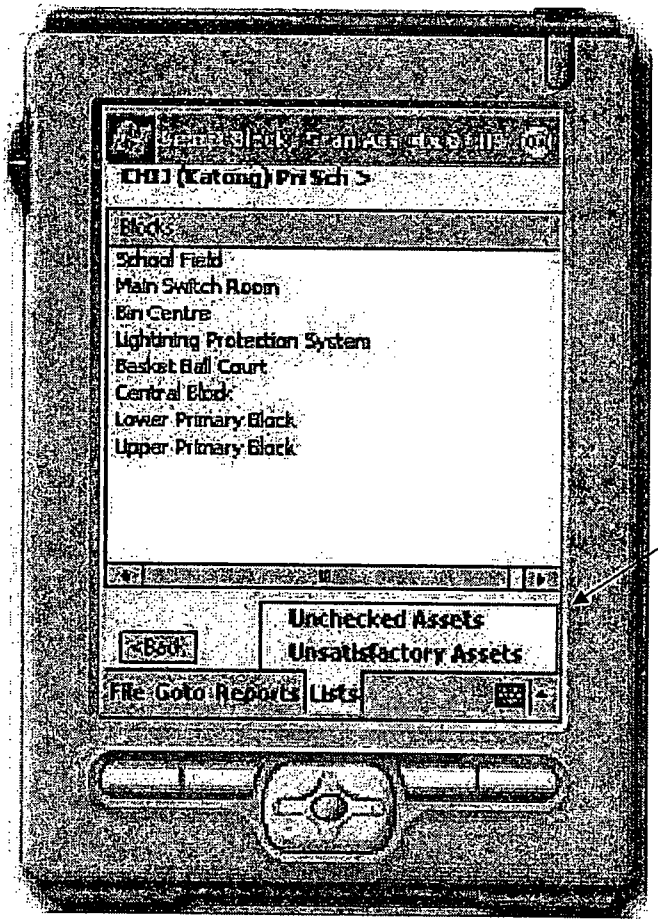
Save report and signatures locally

Detailed Listings

There are 2 quick listing whereby the user has quick access to

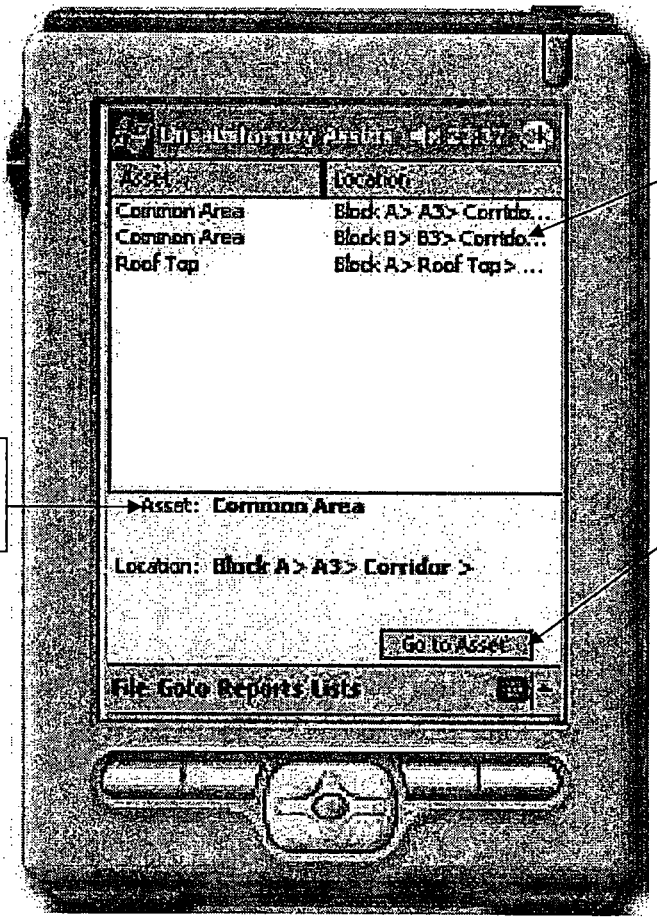
1) List of Unchecked Assets
2) List of Unsatisfactory Assets

User is able to access these quick listing by selecting, on the lower menu bar, the LIST menu



The Lists menu for user to access the Unchecked Assets list and the Unsatisfactory Assets List

UNSATISFACTORY ASSETS LISTING (DETAILED)



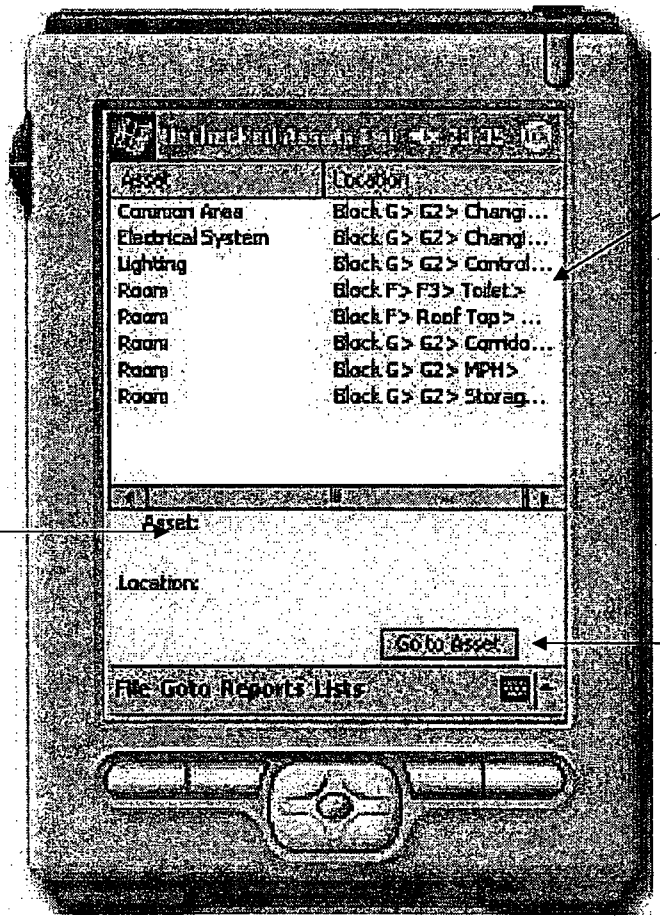
List of Unsatisfactory Assets and their location

Description of the selected asset: Asset Type, Location and Last Remark

Go directly to the checklist page of the selected item

- Screen shows the list of Unsatisfactory Items

UNCHECKED ASSETS(DETAILED)



List of unchecked items and their location

Description of the selected asset: Asset Type, Location and Last Remark

Go directly to the checklist page of the selected item

- Screen shows a list of Unchecked Assets.

buildfolio NETalk CPG FACILITIES MANAGEMENT

CPG FM Mobile Facility Management System

-Wireless Scheduling & Monitoring of Contractor's Work-

Training Manual
(mFMS Central Server User Interface)
Module 2

Version	Date	Author	Remarks
0.1	26/08/2002	Lau Mee Ping	
0.2	24/09/2002	How Ai Ling	

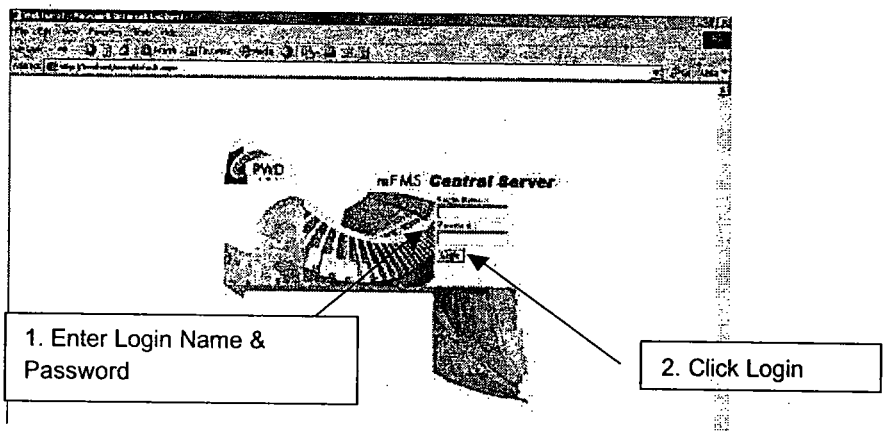
APPENDIX 3

Introduction

The Wireless Scheduling & Monitoring of Contractor's Work module schedules jobs and tracks maintenance activities on site.

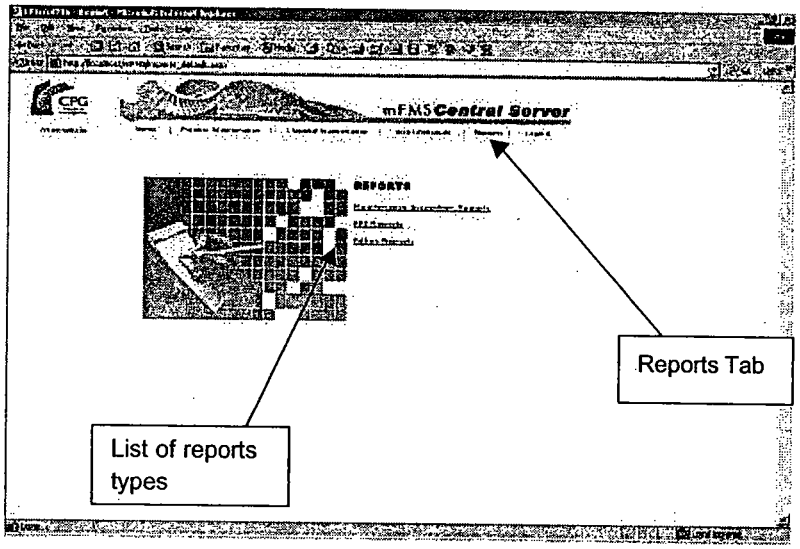
Login Page

User keys in the Login Name and the Password.



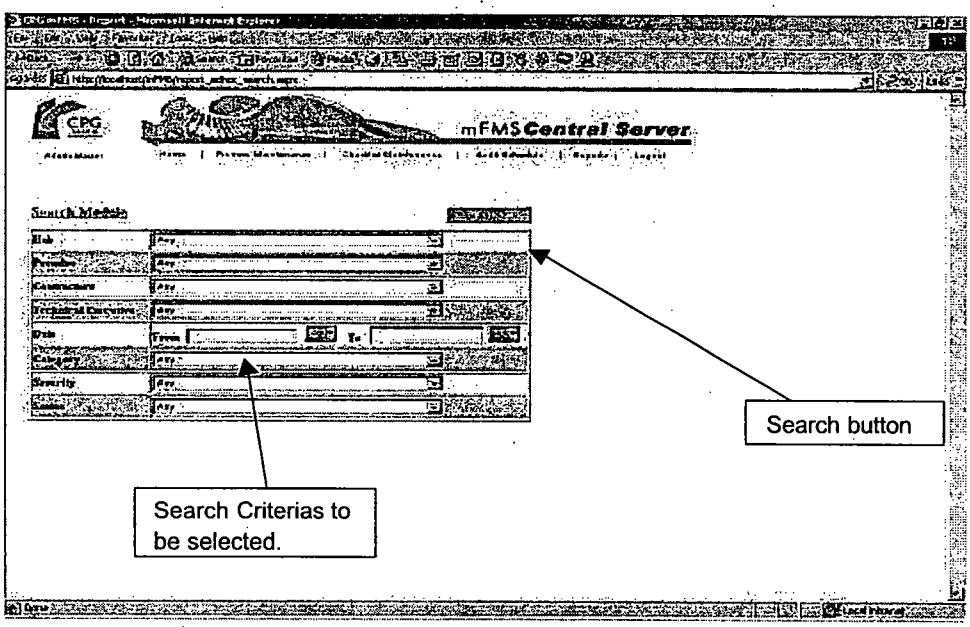
Reports Main Page

To view the "KPI Reports" and "Adhoc Reports", at the main page, the user clicks on the "Reports" tab of the top panel. The user would be brought to this screen that allows the user to select the relevant report to retrieve.



Search Module for Generation of Adhoc Reports

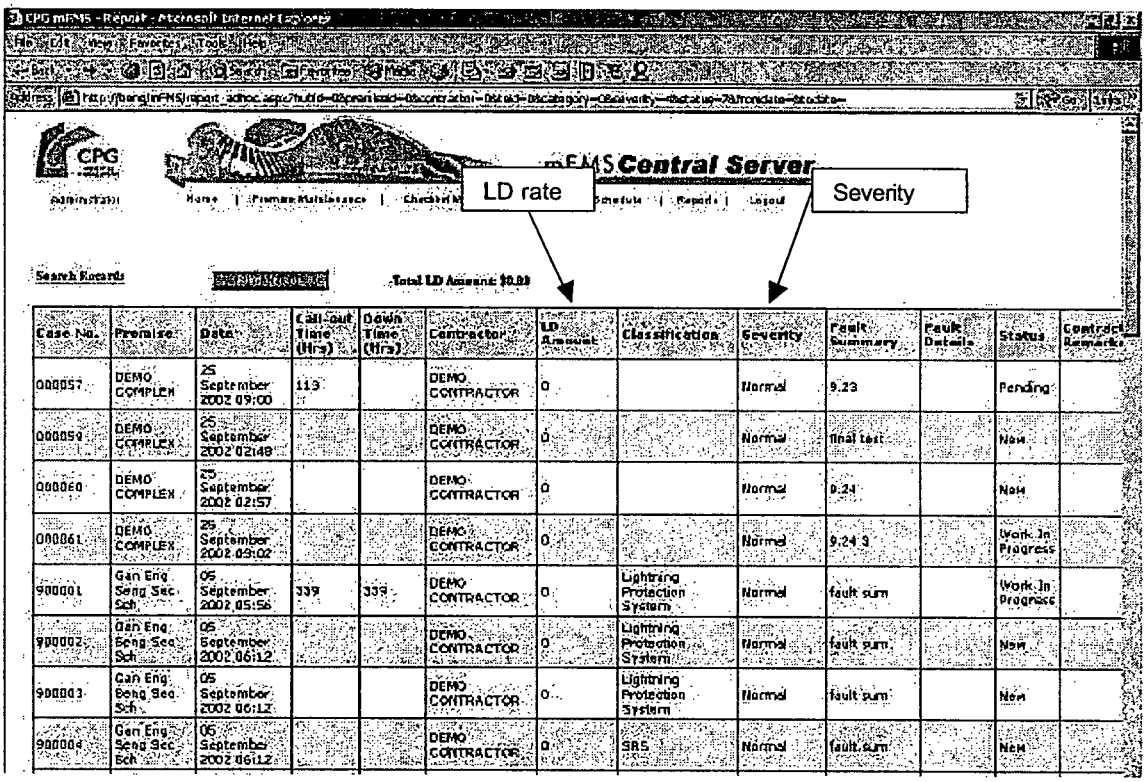
User clicks "Adhoc Reports" from the Reports main page. This page allows the user to input search criterias for the Adhoc report. User click the Search button after the relevant search criterias are entered.

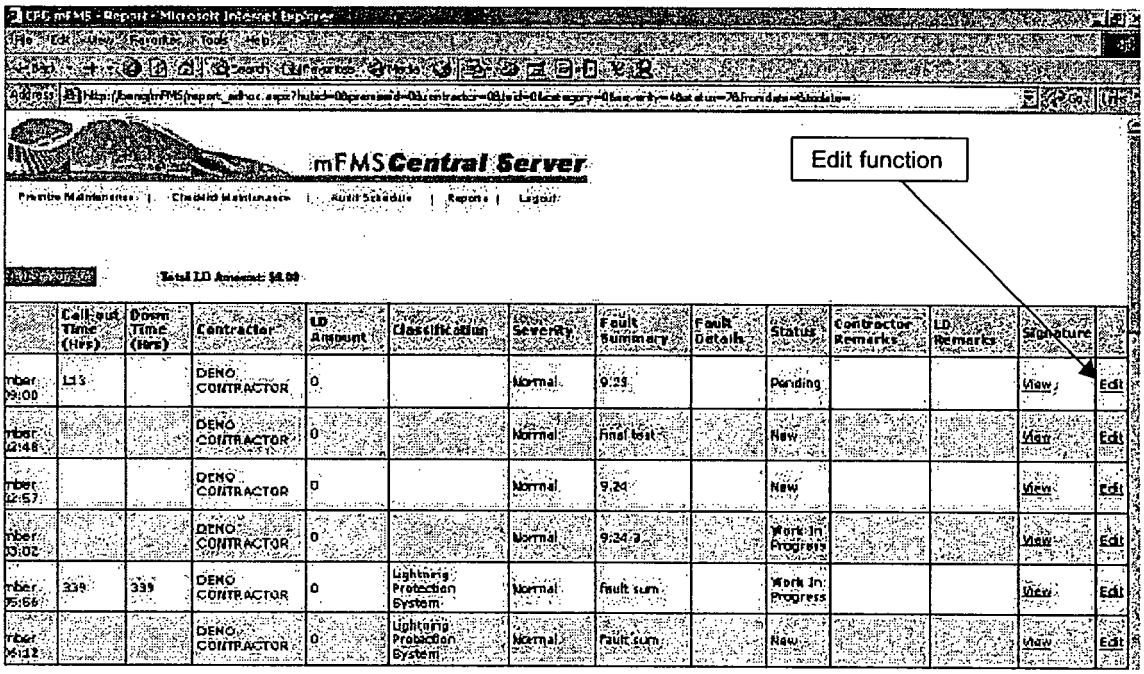


Adhoc Reports
User sees the result of the search. A list of cases with the following information.

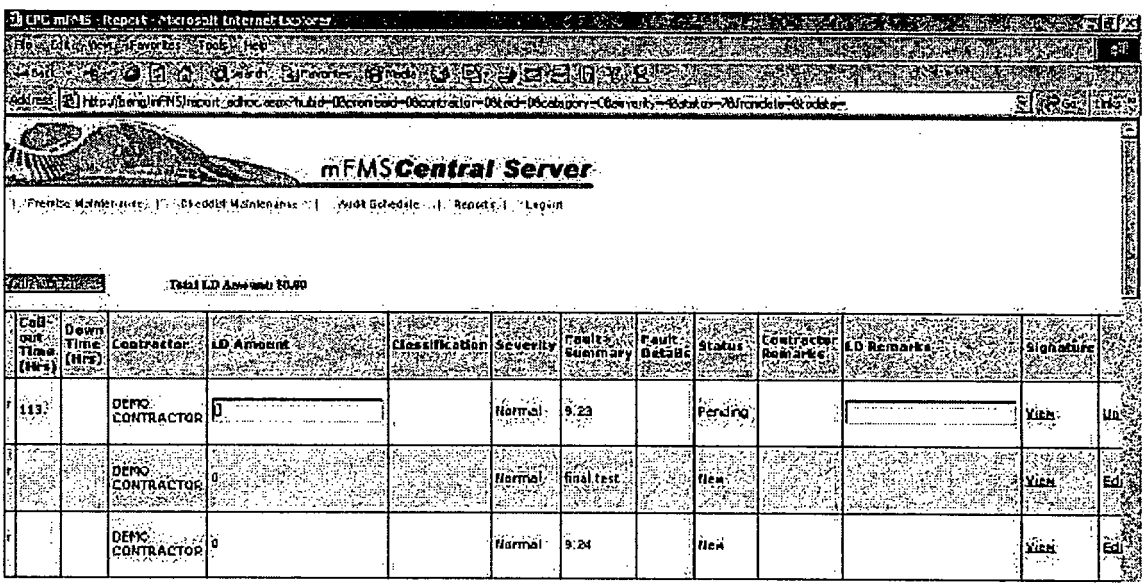
- Case no
- Premise
- Description
- Date
- Call-Out Time
- Down Time
- LD rate
- Classification
- Severity
- Fault Summary
- Fault Details
- Status
- Remarks
- Total LD Rate.

The user can edit the LD rate chargeable by clicking on the "Edit" Function. User click on the Edit column of the case, the LD Amount and the LD Remark textbox allows user to amend the LD amount and key in remarks in the text box.



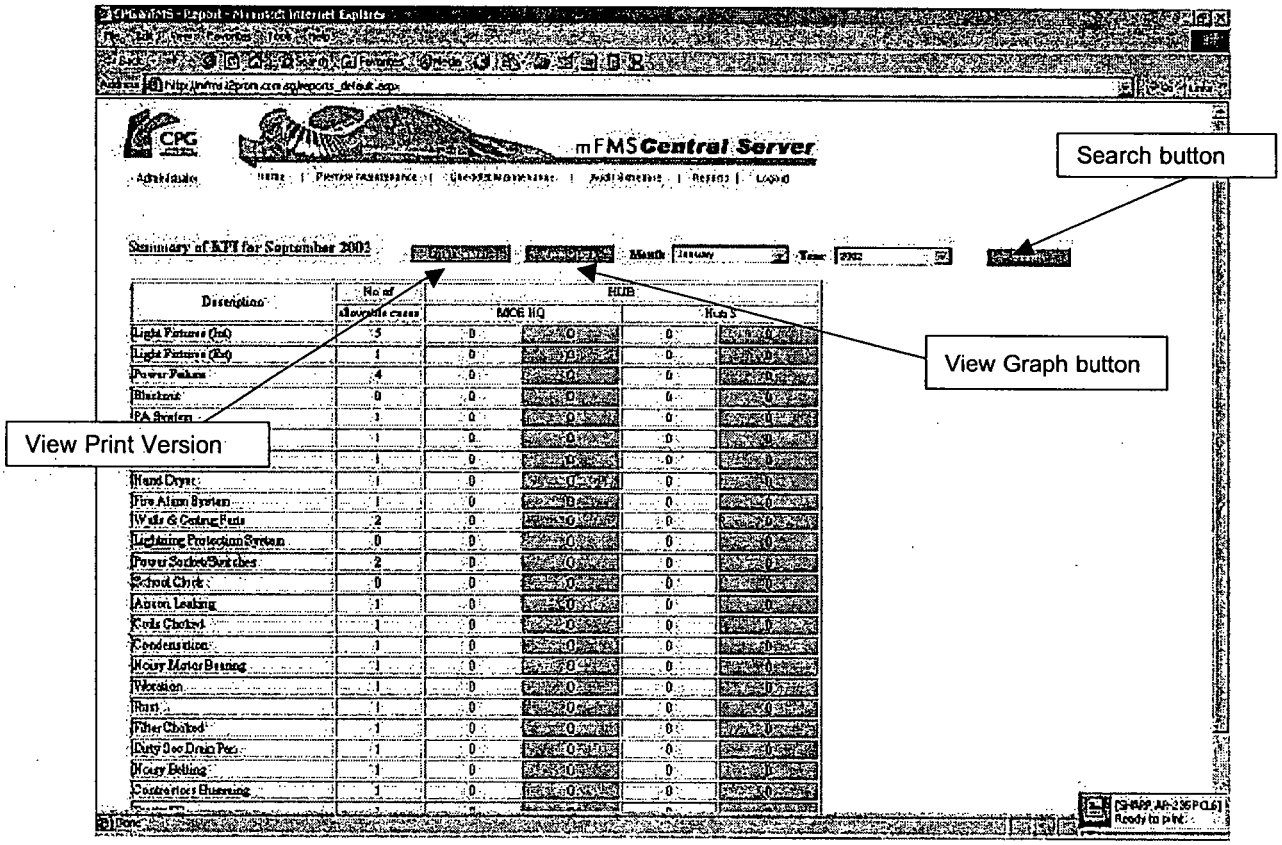


User clicks on Edit Function, the text box allows user to amend the LD Rate and add LD remarks

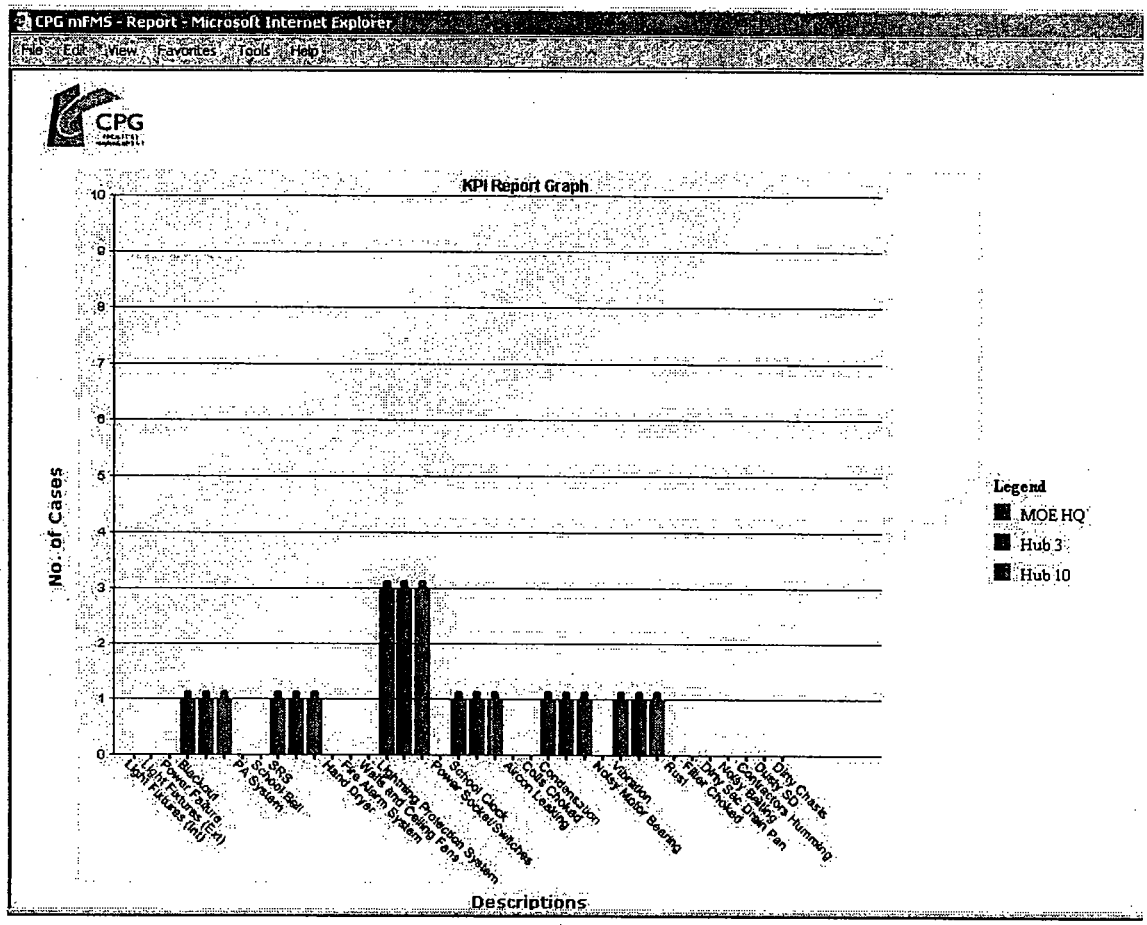


M&E KPI Summary Report

User clicks "KPI Reports" from the Reports main page. The user sees the latest summary of KPI on screen. User can search for the required KPI report by selecting the month and year option and click "Search" button. The user can also view a graphical representation of the number of cases under each fault type.



When user clicks the View Graph button, the KPI Report graph below is displayed:-

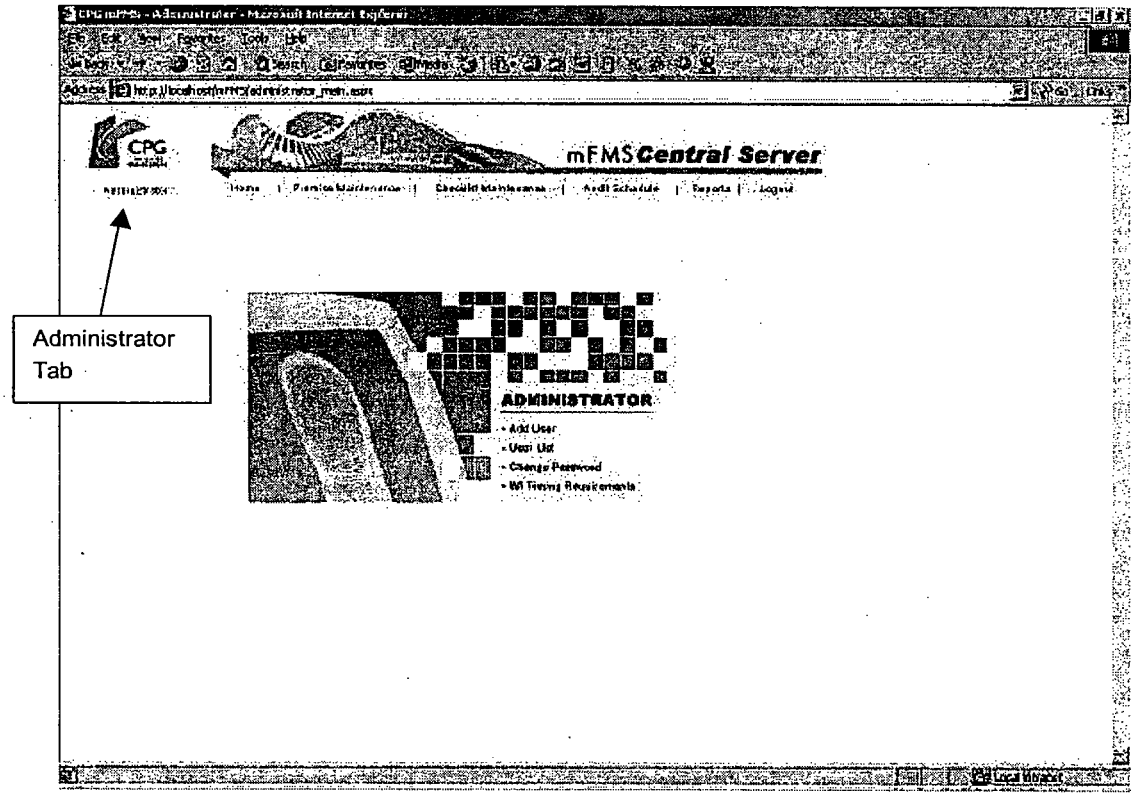


Administration of LD rates

Authorized users are allowed to administer the LD rates for Call-Out Time and Down Time of each corresponding type of Work Priority.

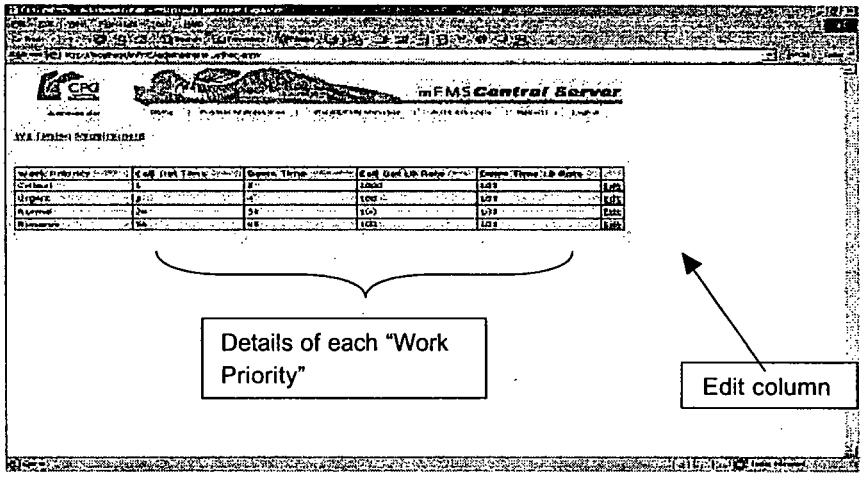
Administrator Main Page
The authorized user can access the Administrator Main Page by clicking the "Administrator" tab at the top panel. The following Administrator function would be accessable,

- Add User
- User List
- Change Password
- WI Timing Requirement



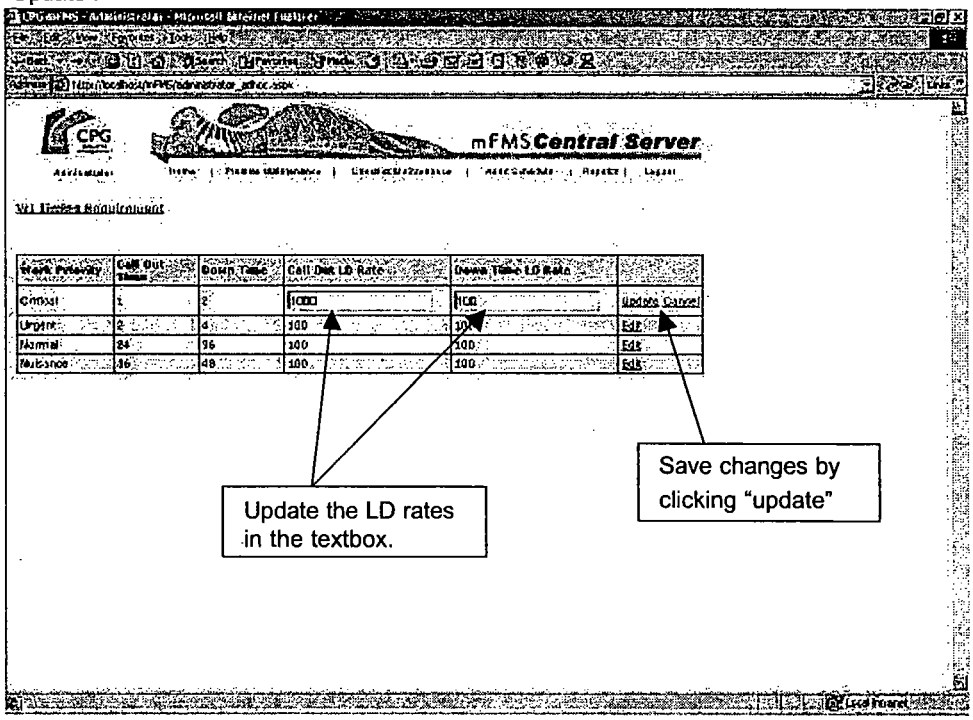
WI Timing Requirements

User clicks "WI Timing Requirements" from the Administrator Main Page. A list of Work Priority and its corresponding Call Out Time, Down Time and LD rates would be listed.

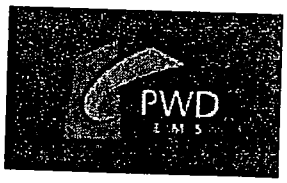


Edit LD Rates

User can edit the Call Out LD Rate and/ or Down Time LD Rate of any of the Work Priority by clicking the corresponding "Edit" column. User can make changes to the LD Rate and save the changes by clicking "Update".



Buildfolio



PWD EMS Wireless Facility Management Facility

-Mobile Work Instruction-

(PDA User Interface prototype)
Module 2/4

Version	Date	Author	Remarks
0.1	27/05/2002	How Ai Ling/Lau Mee Ping	
0.2	26/08/2002	Lau Mee Ping	
0.3	4/09/2002	How Ai Ling	Change to latest Screen views

APPENDIX 4

Introduction

This module involves interaction between 3 different parties, namely:

1) The Help Desk Staff
2) The Technical in charge
3) The Contractors

There is integration between different systems as well. The systems involved:-

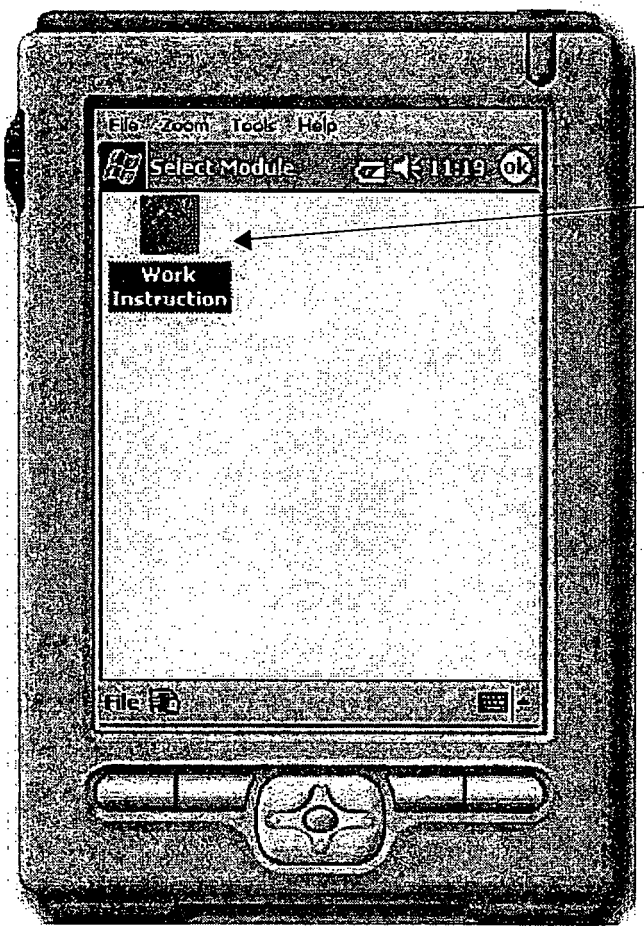
1) Remedy System - where the Help Desk Staff would raise the Work Instruction. The Work Instruction would be forwarded to the mFMS system.
2) mFMS System - The mFMS system receives the Work Instruction from REMEDY system, the mFMS system sends an SMS notification to Contractors and the Technical Staff in Charge.
3) The PDAs - Once the Technical Staff receive the SMS notification, he logs onto the PDA to retrieve the Work Instruction details. The Work Instruction is forwarded through GPRS to the PDA.
4) BMS System – When a fault is detected by the BMS system, the mFMS would forward an instruction to REMEDY to raise a Work Instruction. REMEDY would then in turn forward the information to mFMS to send a SMS to Contractor

LOGIN



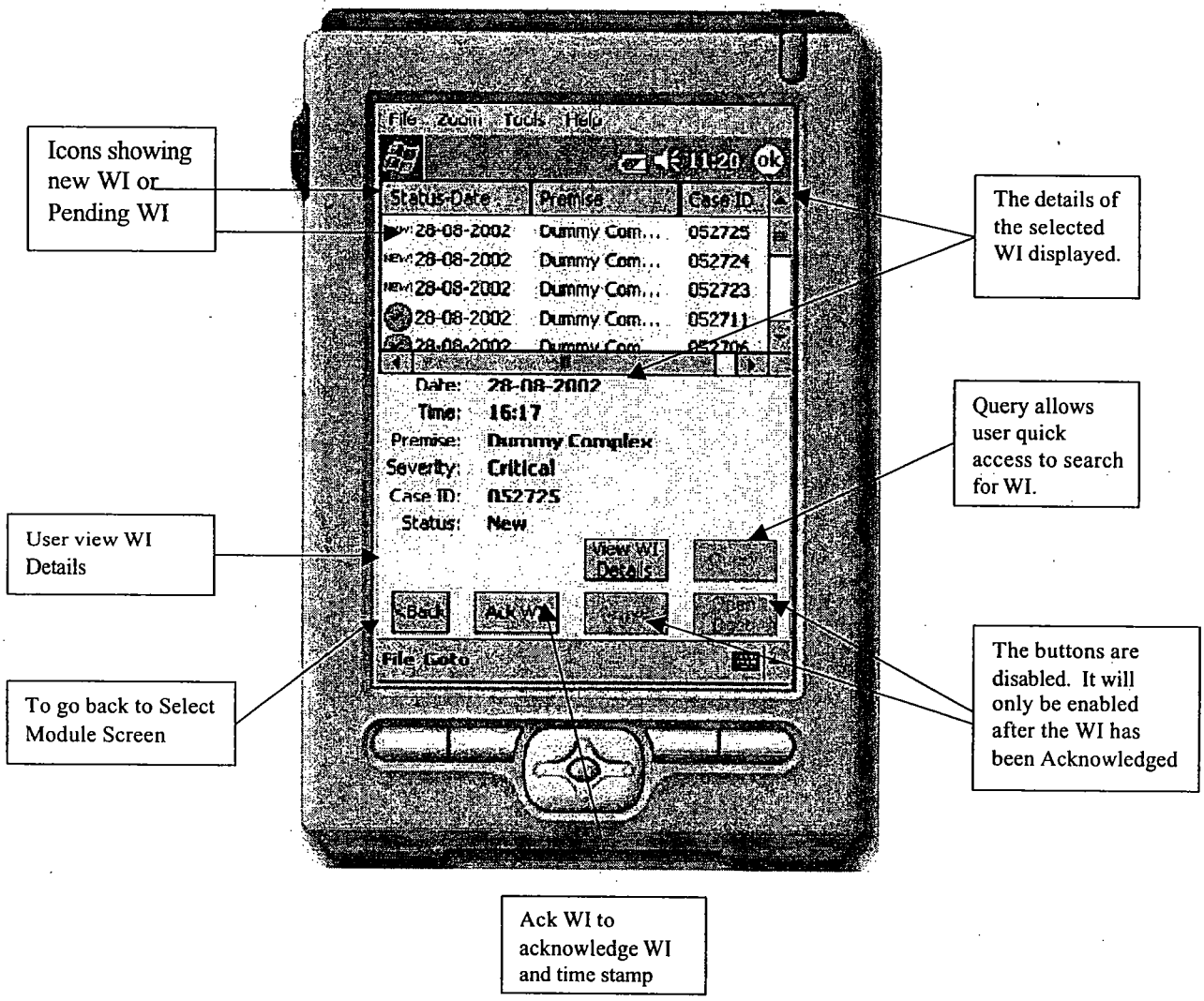
- User logs in by keying the Login ID and Password
- Depending on the access given to the user
  Contractor – Only Work Instruction Icon is visible
  Technical Staff – Maintenance Audit, Work Instruction + BMS Monitoring
- Only the Contractor is able to

SELECT MODULE (CONTRACTOR SCREEN)



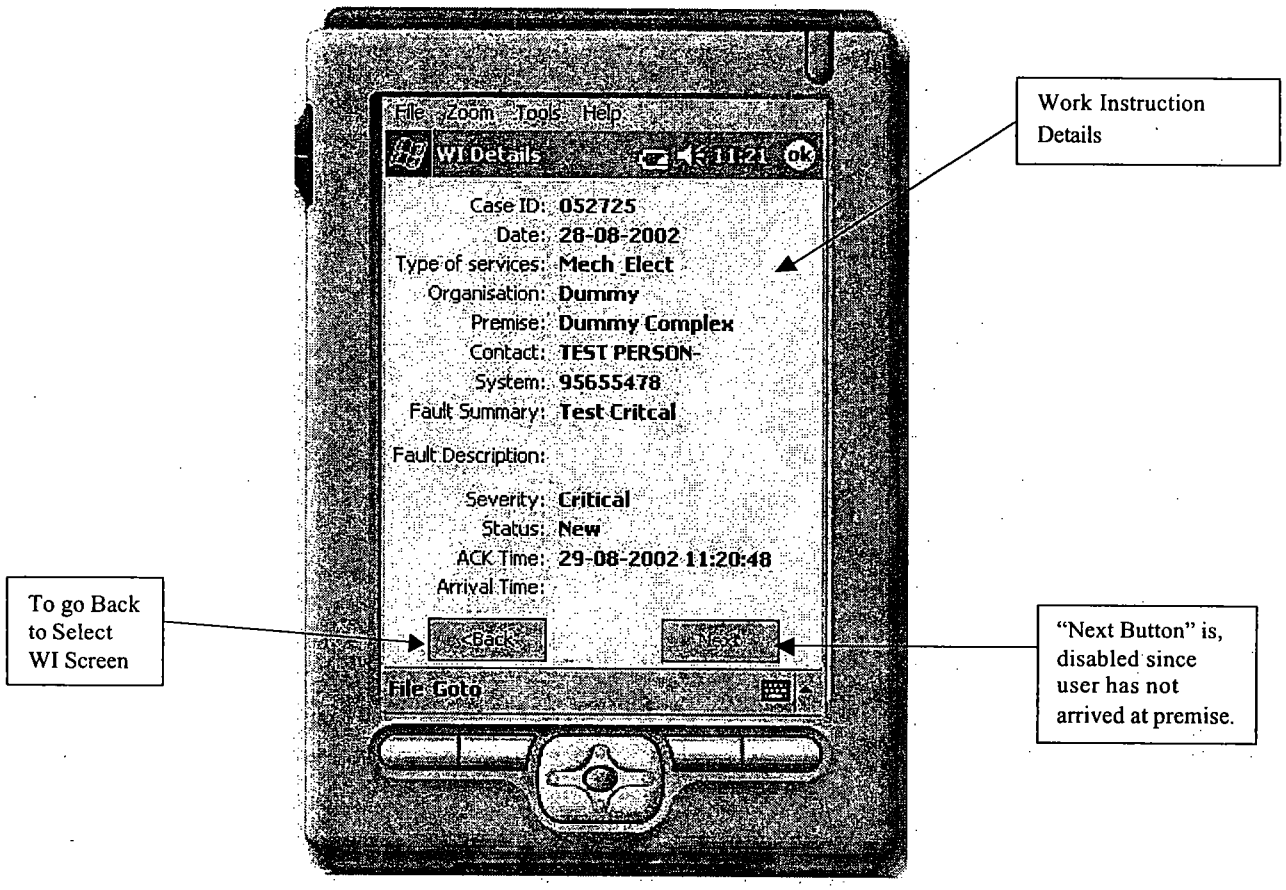
- User selects the Work Instruction module
- Contractor is only given access to Work Instruction Module

WORK INSTRUCTION MODULE (CONTRACTOR'S SCREEN)



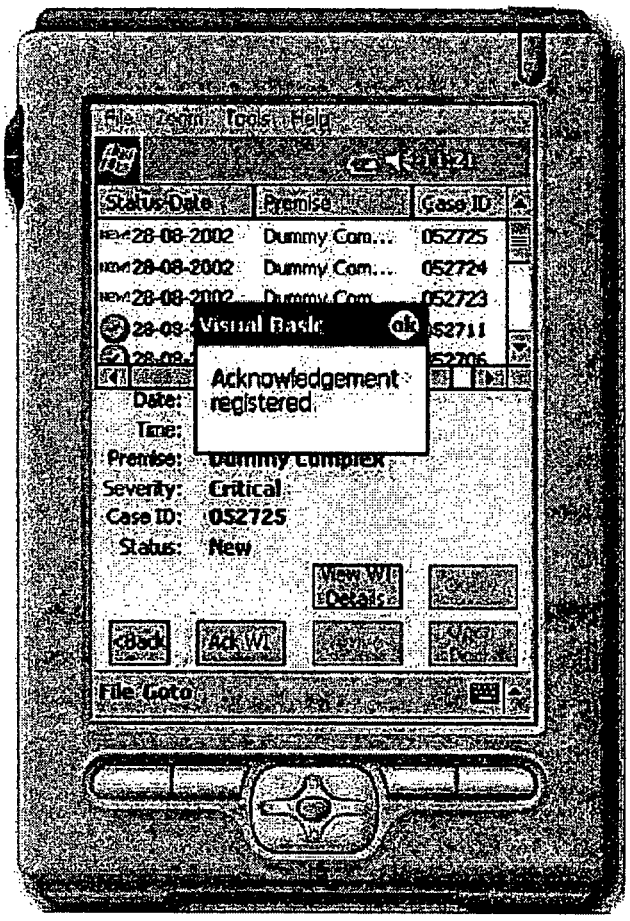
- User selects the Work Instruction.
- User acknowledges the Work Instruction by clicking the "Ack WI" button
- User is able to view WI Details by clicking the "View WI Details" button

WORK INSTRUCTION DETAILS



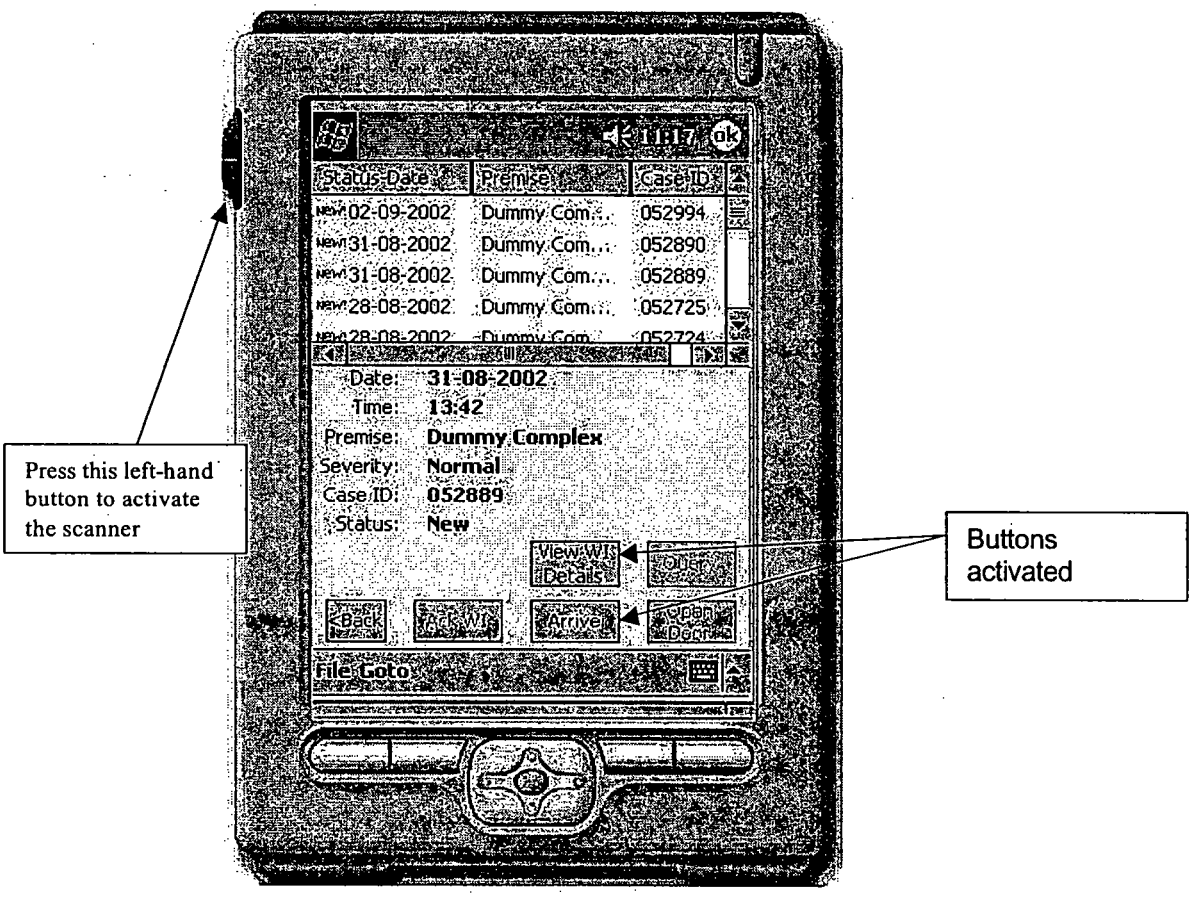
- When user clicks on the "View WI Details" button, screen displays the WI details
- "Back" Button is allowed user to navigate back to previous page.
- "Next" Button is disabled as the user has not arrived at the premise.

ACKNOWLEDGE WI



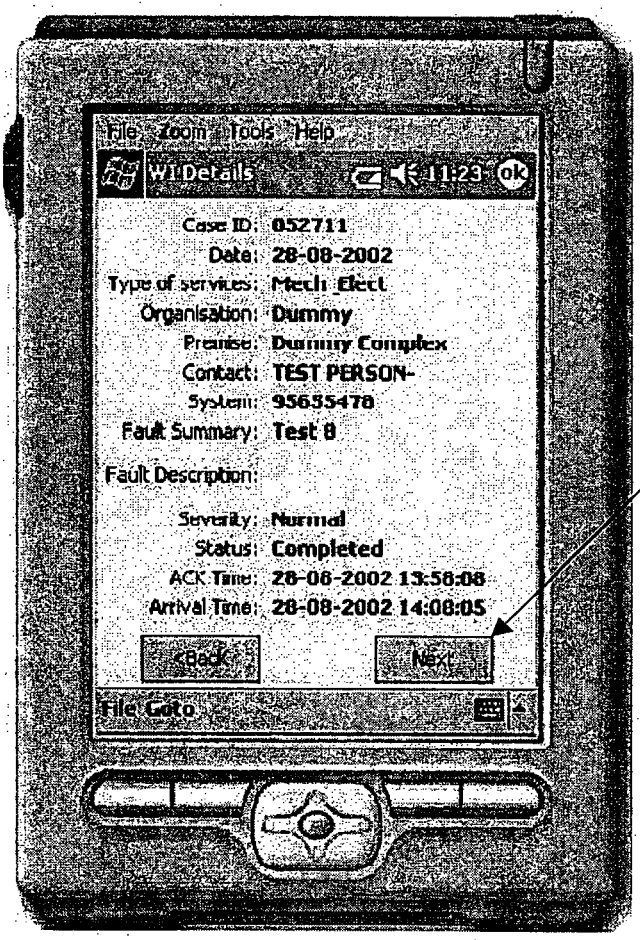
- The user clicks on the "Ack WI" button and sees a popup dialog box informing the user that the Acknowledgement registered.
- User clicks "OK" and is brought to the "Select WI" screen.
- The "Arrive" and "Open Door" (if applicable) buttons on the "Select WI" screen is enabled.

Arrive at Premise



- When user clicks "Arrive" button, user will be brought to the screen that instructs the user to scan the Premise Bar Code.
- Placing the attached scanner in front of the Premise Bar Code, user has to press the left-hand button on the PDA to activate the scanner.
- A pop-up screen would appear with the message " Your arrival time is captured by the system" and a "OK" button.
- User clicks the "OK" button to go back to the "WI Details" screen. Note that the "Next" button on the "WI Details" screen is enabled.

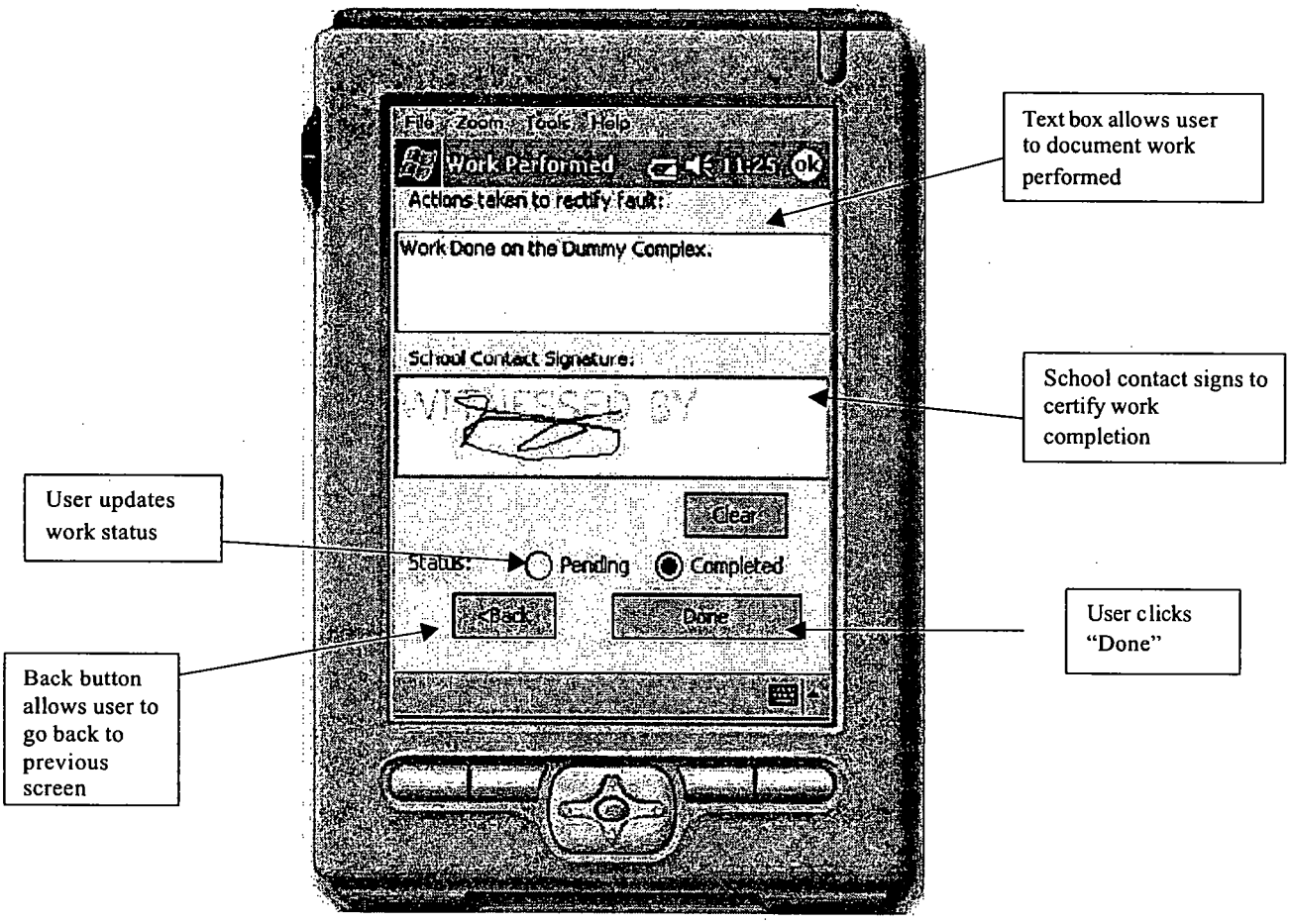
Work Order Details



Next button allows the user to document Work Performed Details

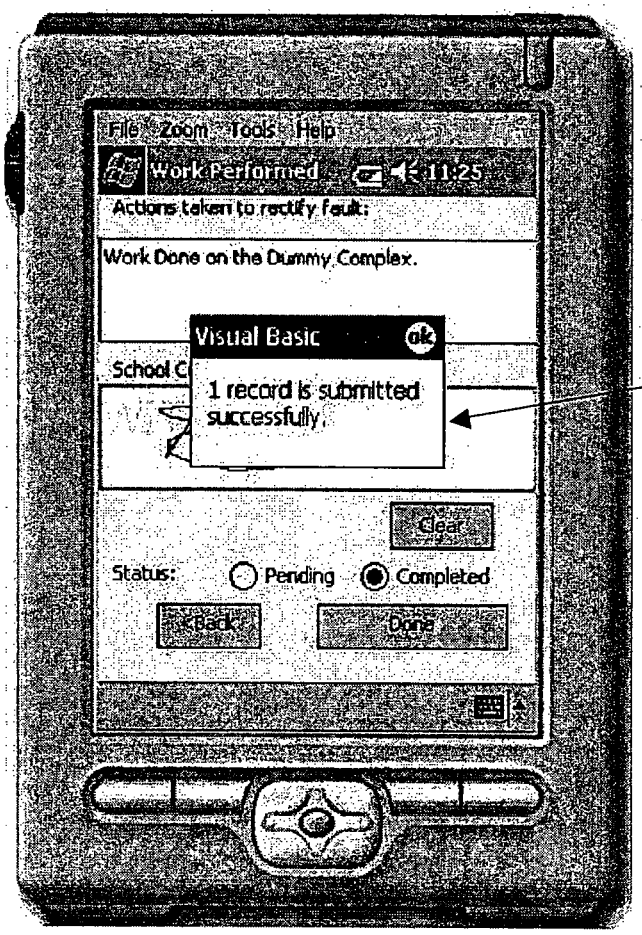
- User views Work Instruction details.
- User clicks on the "Next" button, next screen displays text box to allow user to update details of work performed.

WORK PERFORMED



- User sees the "Work Performed" screen.
- After performing the rectification work, user enters the Actions taken to rectify the fault in the textbox and indicate the status of the Work Instruction.
- User is required to obtain the School Contact's signature as a verification of work performed.
- User clicks "Done" when all information required are completed.

WORK PERFORMED



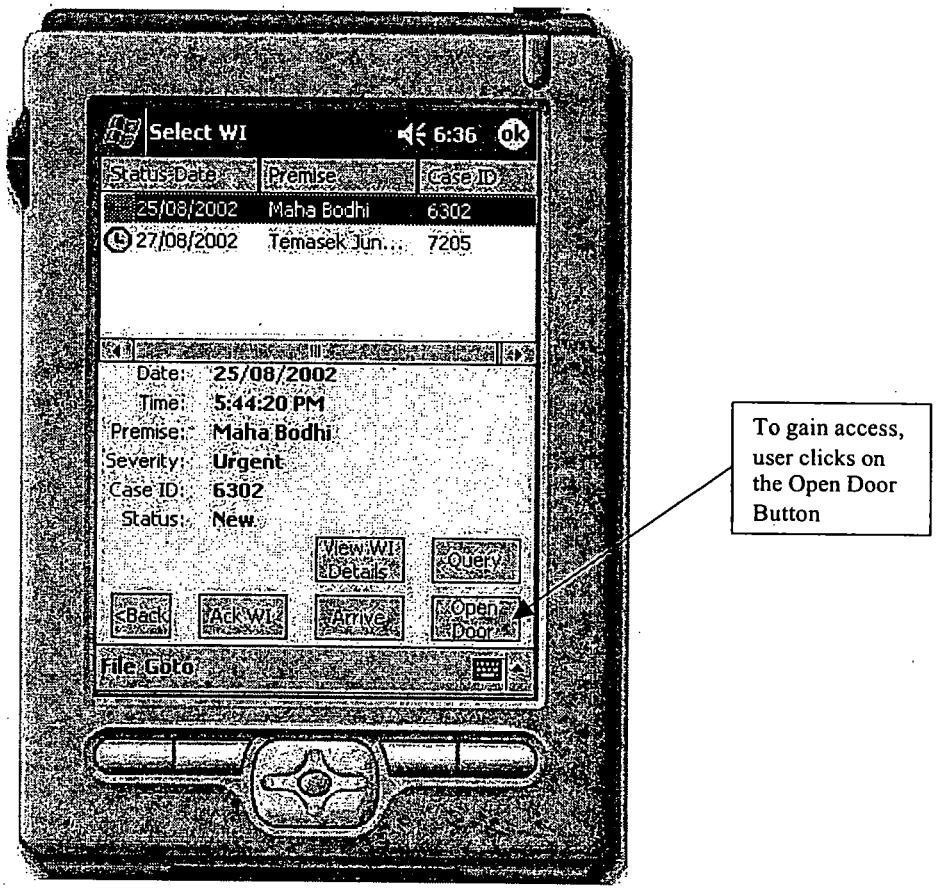
Pop up dialog box prompt user record has been submitted

- .Once the record has been submitted, user is brought the Select work instruction Screen.

Module 4 Access Control

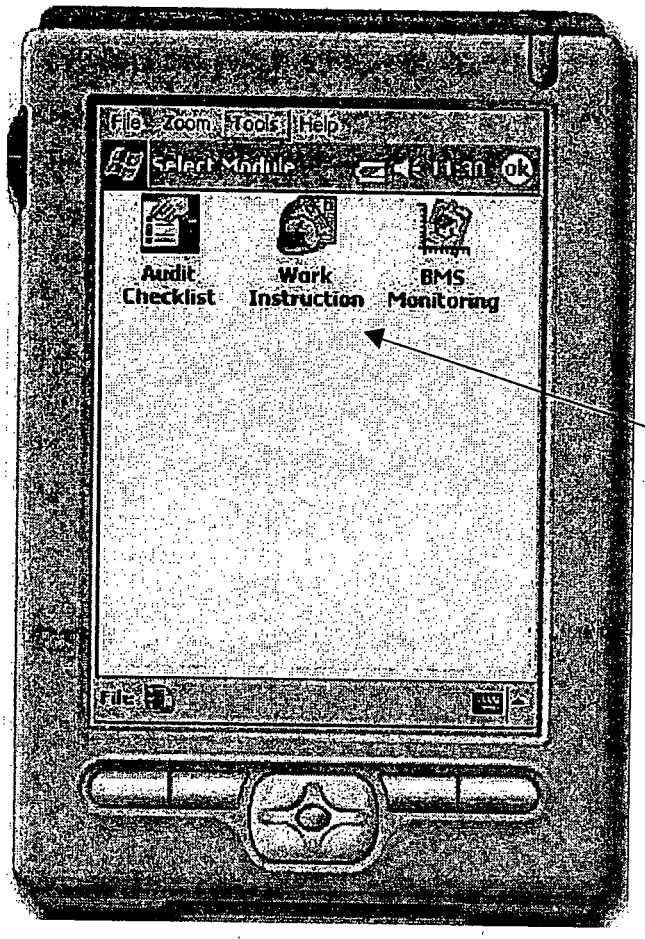
- For certain premises/certain rooms, whereby security is needed, access into this premise/room requires certain authorization and authentication.

- The Open Door button will be enabled if the following conditions are met:
  a) The location requires access control
  b) After the user clicks the "Arrive" button and scanned the premise barcode.



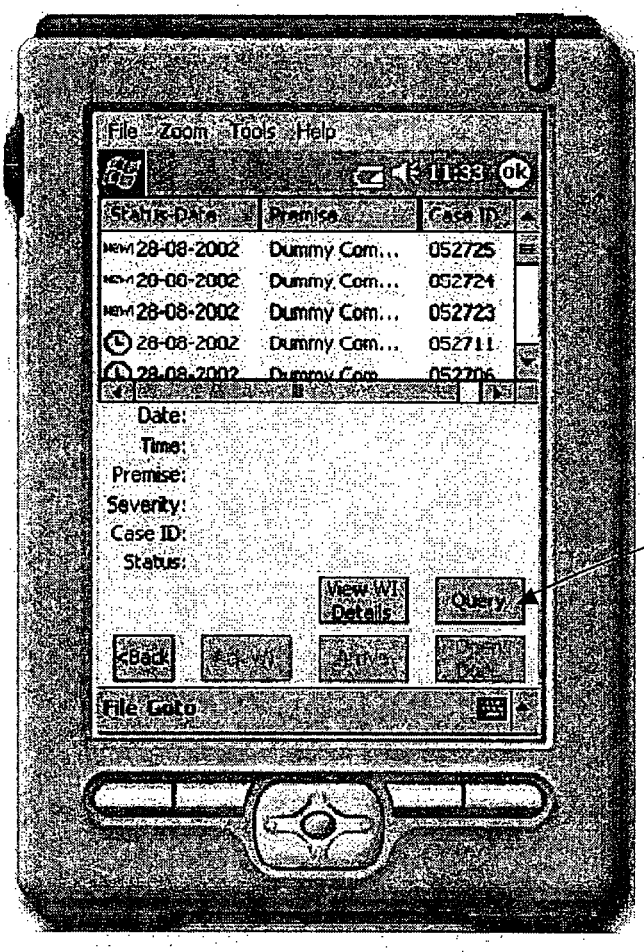
- Upon scanning the school contact bar code, the system verified user access.
- , user is able to click on the "Open Door" button to activate the transponder to send signal to the SimonVoss lock to unlock the door.

SELECT MODULE (TECHNICAL EXECUTIVE SCREEN)



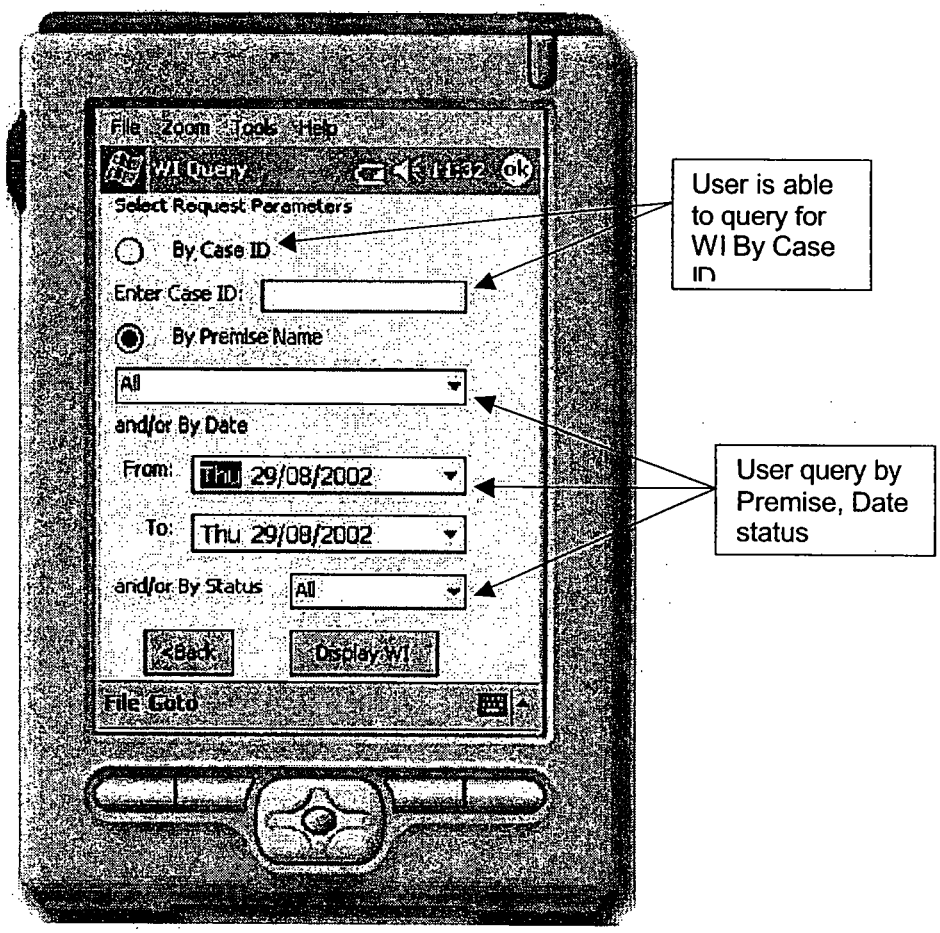
- Technical Staff is only given access to all modules,
  1. Audit Checklist
  2. Work Instruction
  3. BMS Monitoring
- User selects the Work Instruction module

SELECT WORK INSTRUCTION (TECHNICAL EXECUTIVE SCREEN)



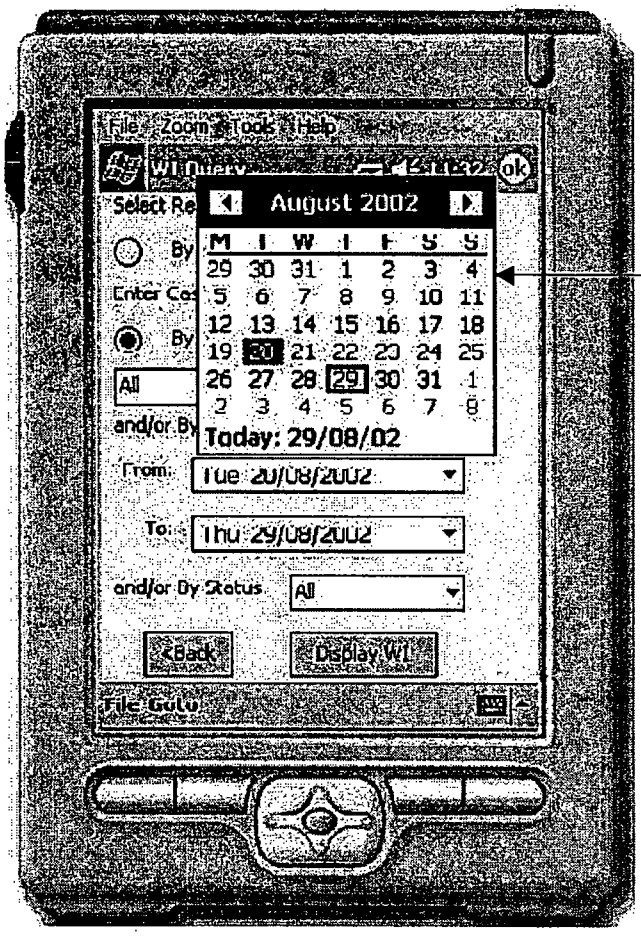
- Technical Executive is given access to search for Work Instruction by clicking on the Query Button
- Next Screen displays the Query WI

WI Query (TECHNICAL EXECUTIVE SCREEN)



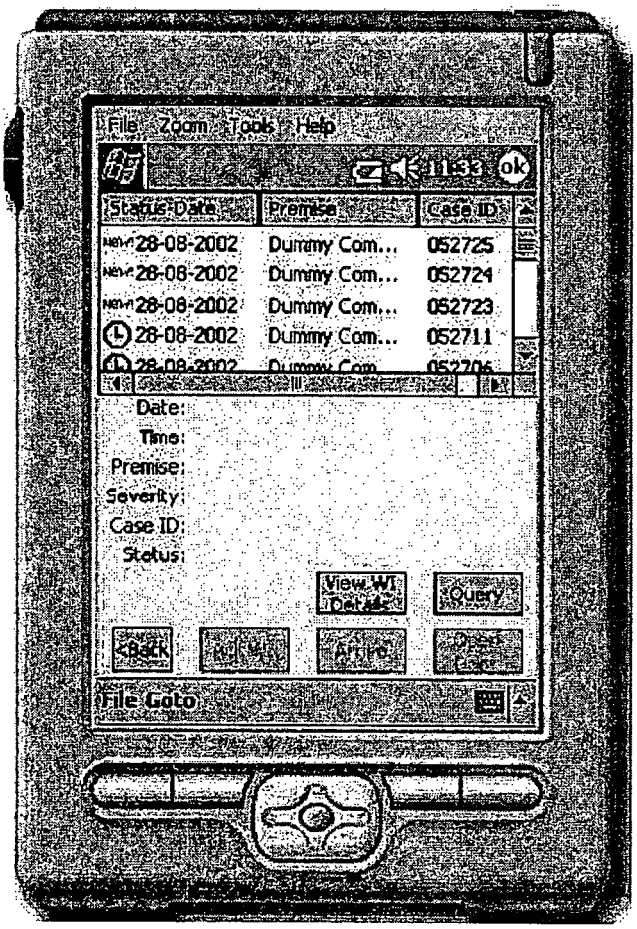
- User keys in the search Parameter(s)

WI Query



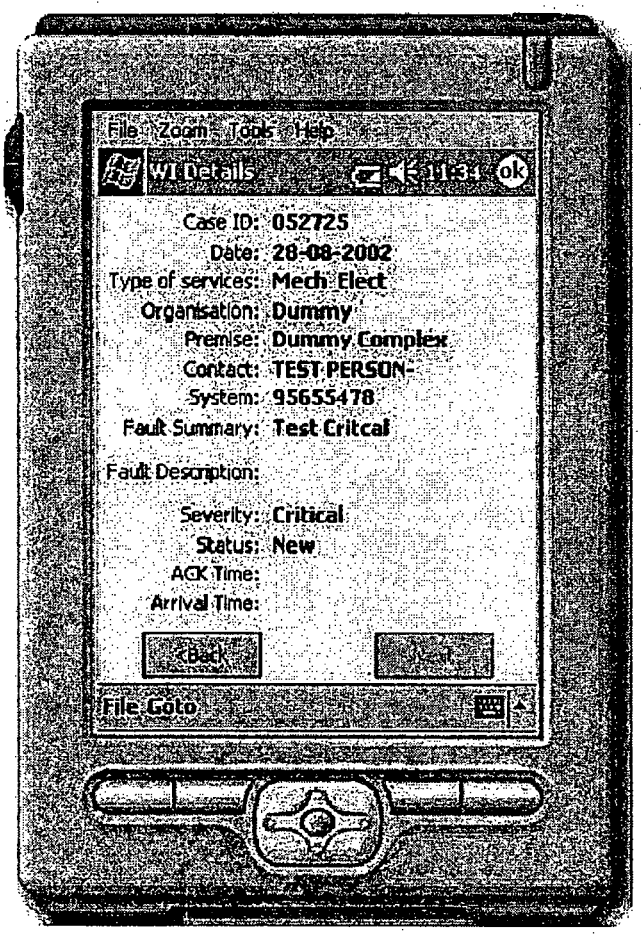
- User is able to select date from the Calendar pop up screen

Select WI



- User clicks on Display WI button, screen shows list of WI
- User able to view the WI details by clicking on View WI Details Button

View WI Details(Technical Executive Screen)



buildfolio NETalk CPG FACILITIES MANAGEMENT

PWD EMS Wireless Facility Management Facility

-Mobile Work Instruction-

(PDA User Interface prototype)
Module 3

Version	Date	Author	Remarks
0.1	2 Sep 2002	How Ai Ling	
0.2	9 Sep 2002	How Ai Ling	

APPENDIX 5

Introduction

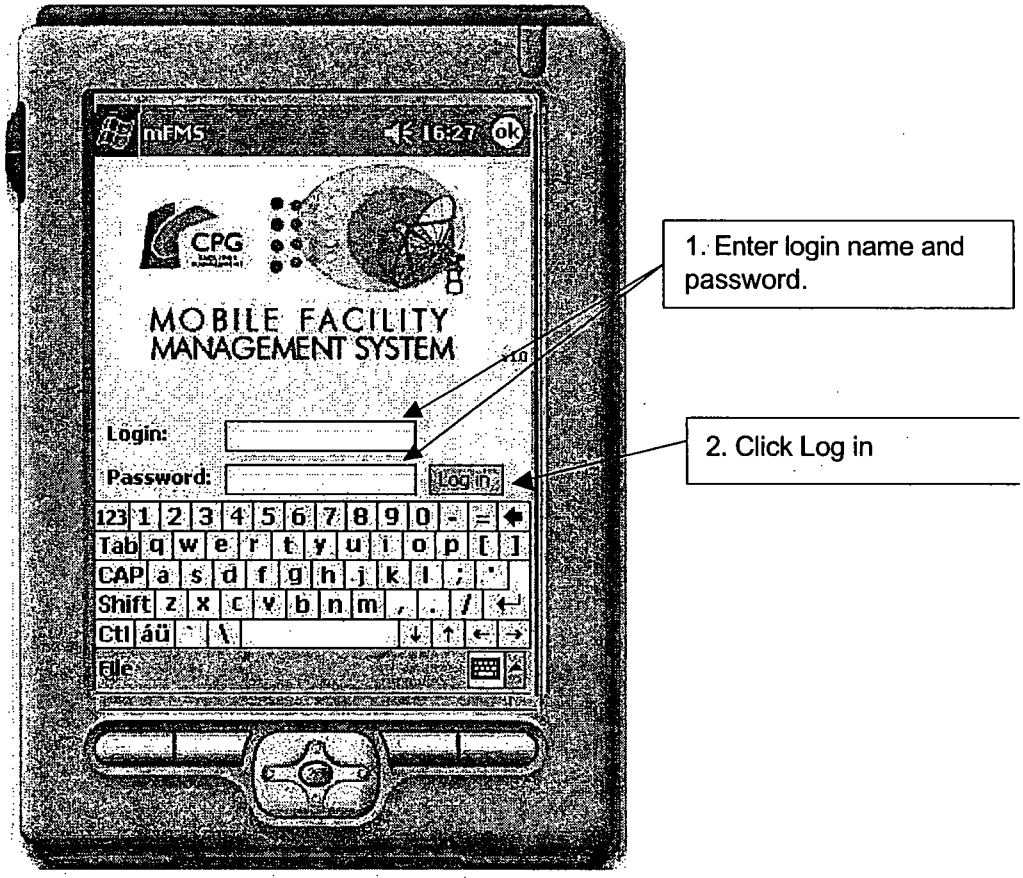
The Wireless Performance Monitoring System module enables remote collection of the temperature readings, tracking of fault alarms of different systems in the facilities and the auto-generation of job orders to rectify the fault identified. The central Building Management Systems (BMS) at PWD EMS will monitor the performance of the different systems in the clients' facilities.

When any fault is detected, the BMS will trigger an alarm that will send information to the mFMS Central Server. The mFMS Central Server forward the fault information to REMEDY. REMEDY generates work instruction (WI) and the WI is forwarded to the respective Contractors or Technical Executive in charge. This process triggers the workflow as in Module 2.

This module is used mainly by the Technical Executives for 2 main functions:

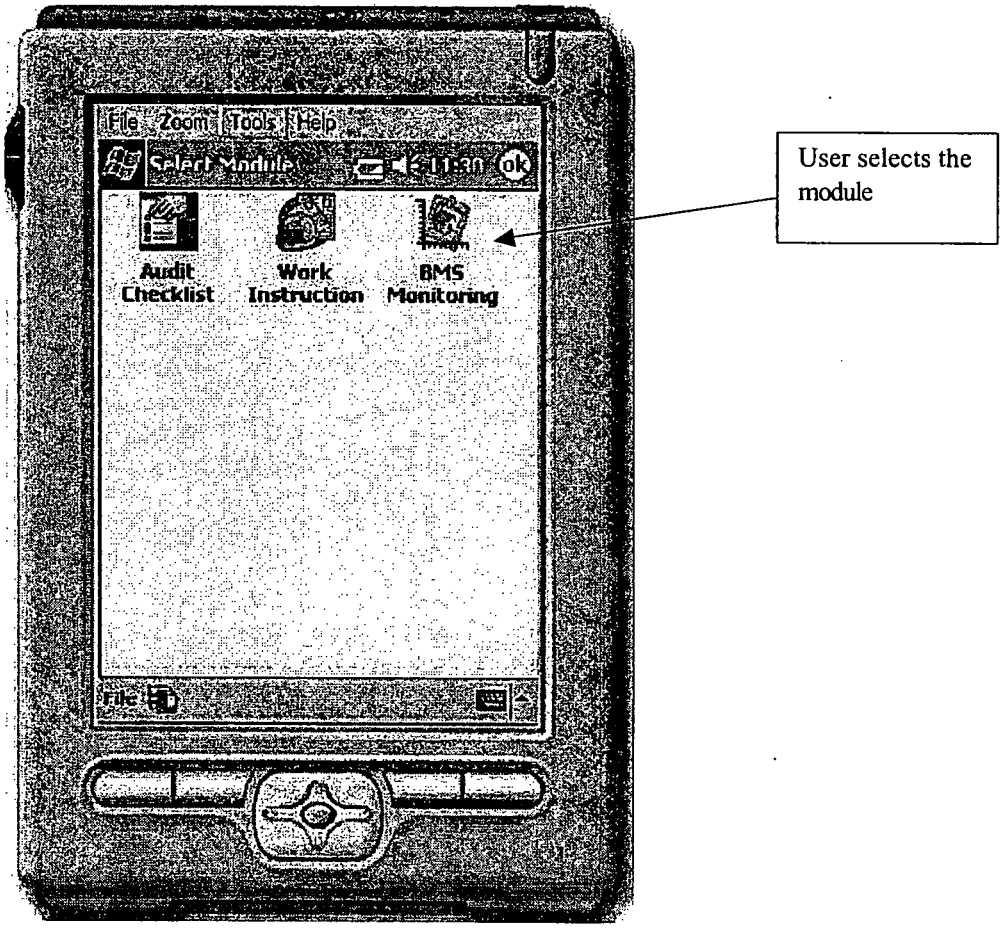
1. Data Reading
2. Fault Alarm Detection

LOGIN



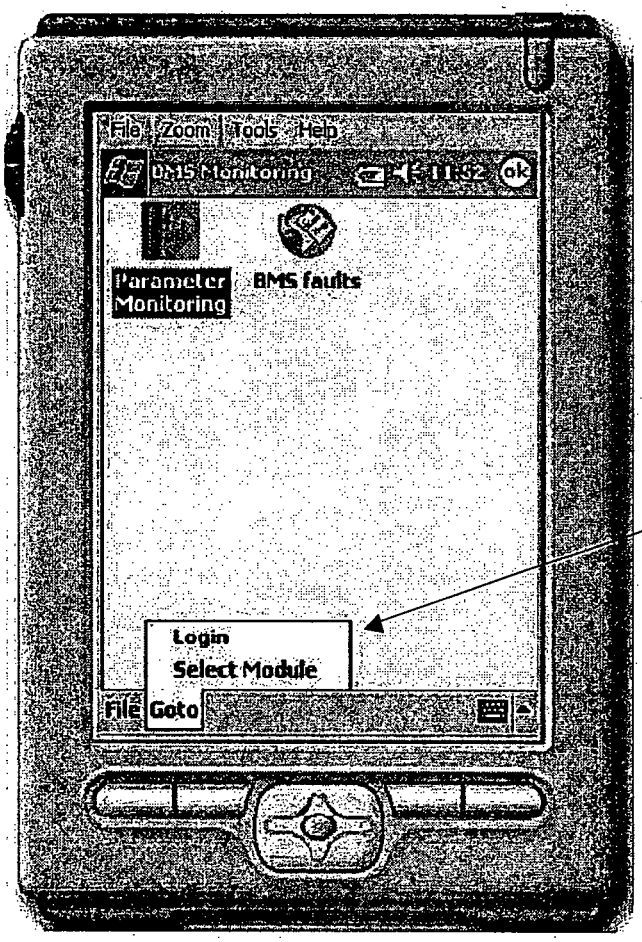
- User logs in by keying the Login ID and Password
- Only the Technical Executive in charge of the appropriate premise is given access to this module.

SELECT MODULE



- User selects the BMS Monitoring module

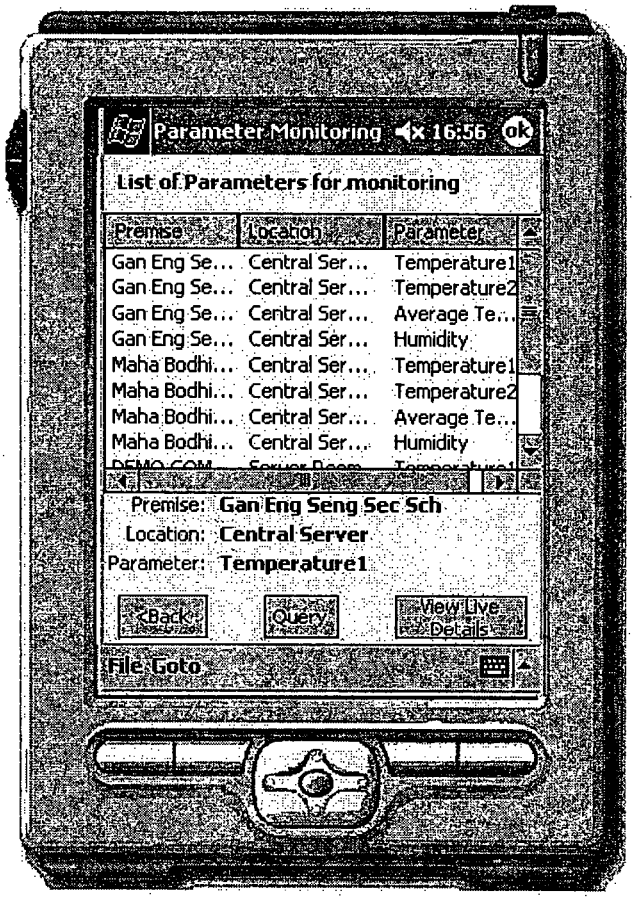
BMS Monitoring



User able to access to the Login and the Select Module page using the lower menu bar

- There are 2 sub-modules whereby the users are able to access to. They are
  1. Parameter Monitor
  2. BMS Faults

Parameter Monitor



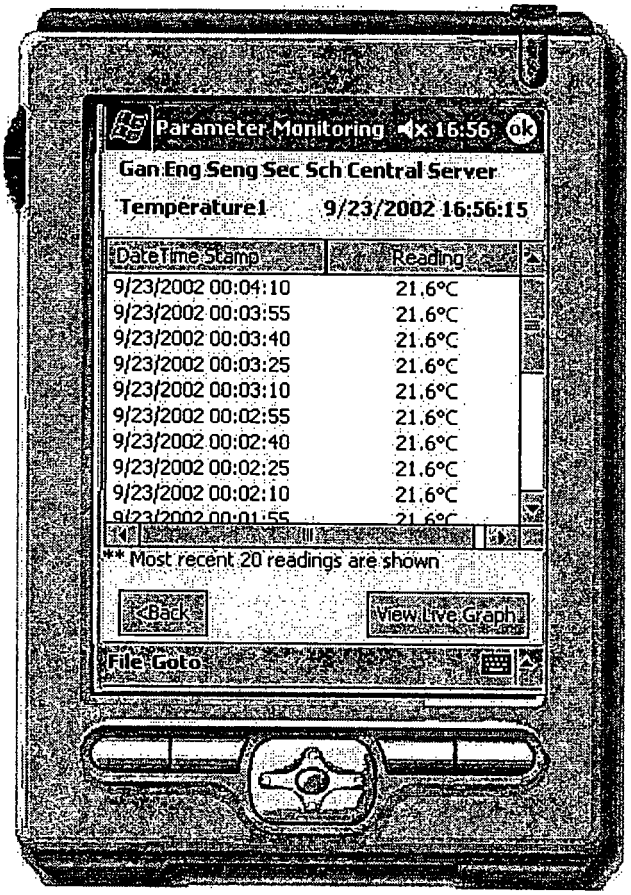
- When user clicks on the Parameter Monitor, the screen displays the List of Parameters (Such as Temperature, Humidity) for Monitoring.
- Users are only able to see the parameters from the premises that are under his care/charge.
- From this screen, user is able to make Query(search for Data) or View Live Details.



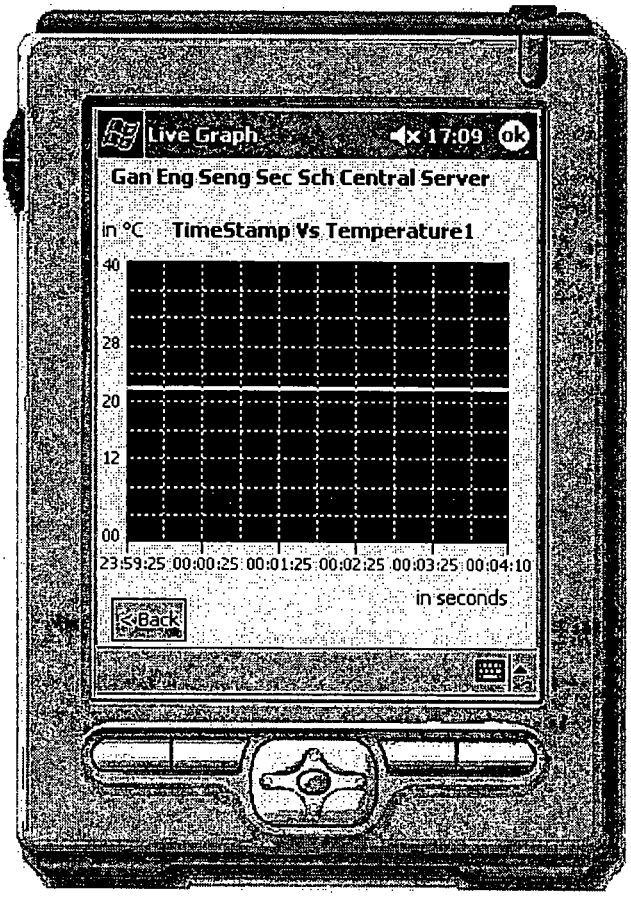
User is able to navigate to Login, Select or BMS Monitoring

- User is also able to navigate to Login screen, Select Module screen or BMS Monitoring Screen by using the Menu bar.

View Live Data

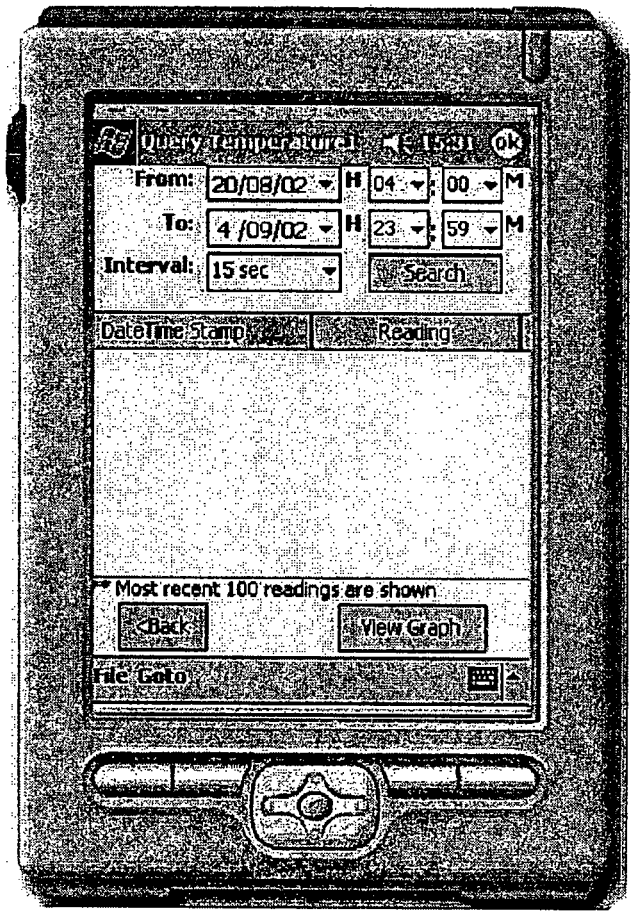


View Live Details



- When user clicks on View Live Details button,
- User is able to view the graphical representation of the parameter.

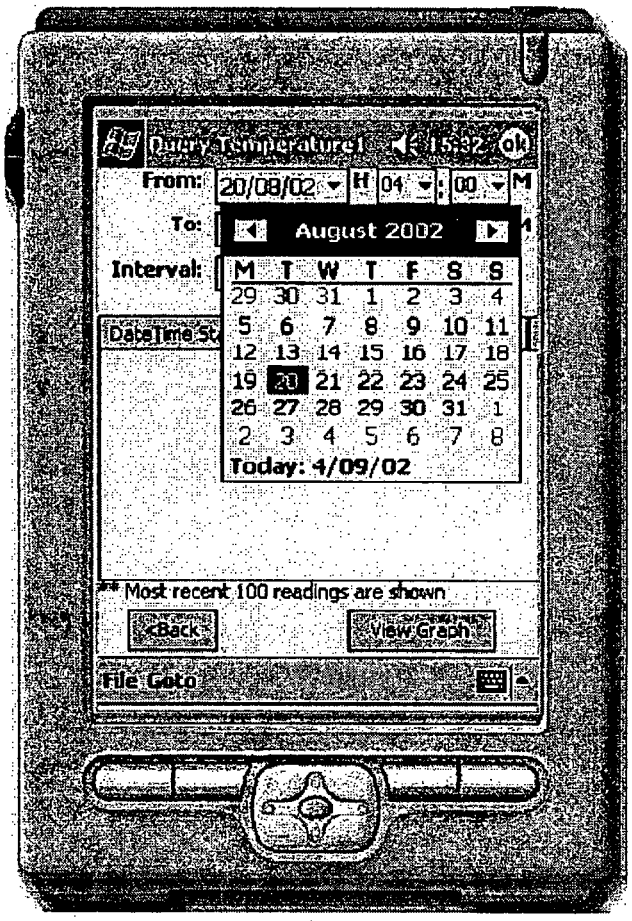
Query Screen



When user clicks on the Query button, the Query Screen allows user to select based on following selection criteria:

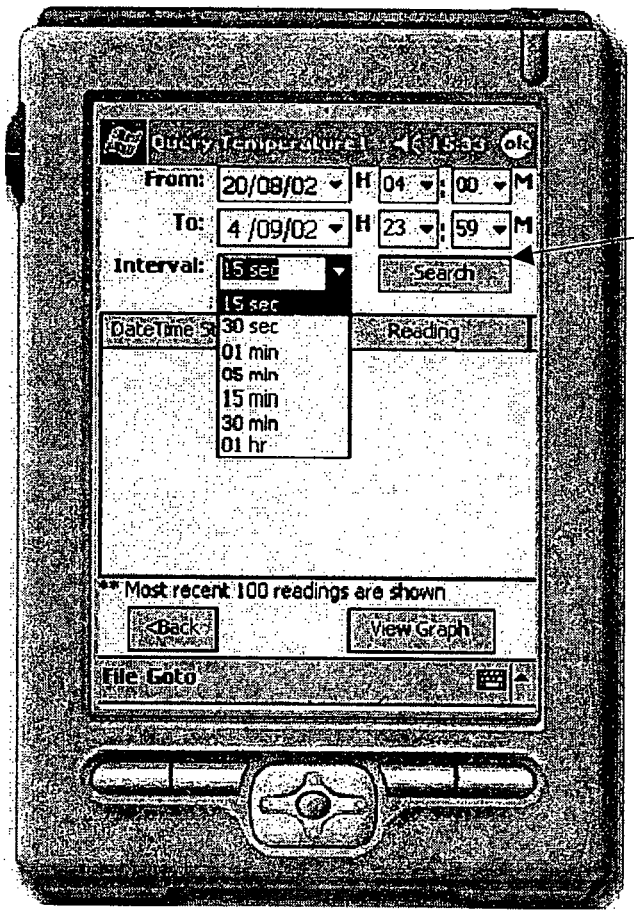
- Interval (Dropdown with intervals: 15s, 30s, 1min, 5mins, 15mins, 30 mins, 1 hr)
- Date and
- Time

Query Screen



- When user clicks on the date selection, the calendar pop up screen allows user to select the dates.
- User selects the time.

Query Screen

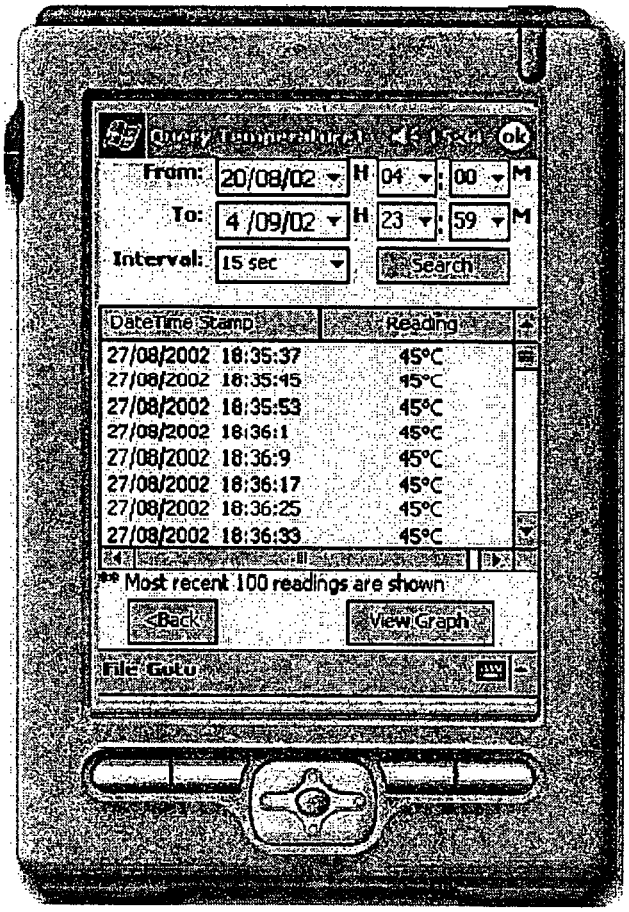


User clicks Search

User selects the Interval through a drop down list

- 15sec
- 30sec
- 01min
- 05min
- 15min
- 30min
- 01hr

Query Screen



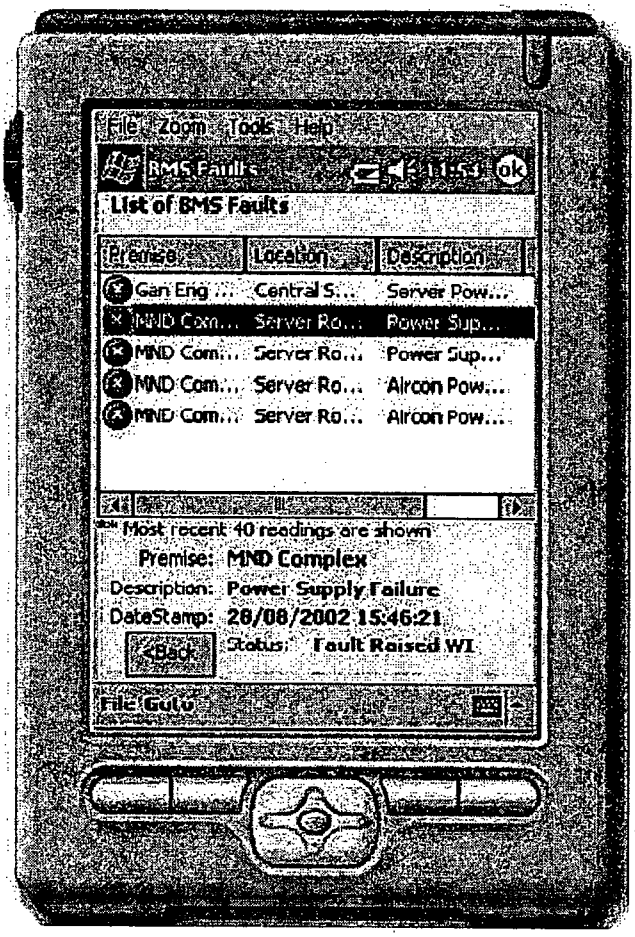
- Screen displays the list of data base on the search request
- User clicks on the View Graph Button and the next screen displays the graphical representation of the

Query Screen – View Graph



- When user clicks on the View Graph button, user is able to see the graphical representation of the temperature change with time. (Real Time)

List of BMS Faults



- When user clicks on the BMS Faults icon, screen displays List of BMS faults.
- Only Technical staff that is in charge of certain premise is given access to review the list of BMS faults.
- The List of BMS Faults displays the Premise, Location and the Fault Summary that has been detected by the BMS system.

  Note:- Once fault detected by BMS system, the FMS server would forward Work Instruction to REMEDY system and the work flow in Module 2 is triggered (see Module 2)