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**COMPUTERIZED
MAINTENANCE MANAGEMENT
SYSTEM – SIERRA LEONE
(CMMS - SL)
MANUAL
FOR
Ministry of Health and Sanitation
Sierra Leone**

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Terminologies

Software - Is a set of instructions, data or programs used to operate computers and execute specific tasks. E.g., CMMS

Customization – In the context of software is the action of modifying something to suit an individual or task.

User Accounts - A user account is an identity created for a person in a computer or computing system. It's comprised of a username, password and any information related to the user.

Field - A **field** in computing is a user interface element designed for entering data. Many software applications include **fields** that allow you to provide input using your keyboard.

Browser - A web **browser** (commonly referred to as a **browser**) is a software application for accessing information on the World Wide Web. When a user requests a web page from a website, the web **browser** retrieves the necessary content from a web server and then displays the page on the user's device.

Website - A set of related web pages located under a single domain name (URL), typically produced by a single person or organization.

Homepage - The main web page of a website. The term may also refer to the start page shown in a web browser when the application first opens.

Open Source - A software for which the original **source** code is made freely available and may be redistributed and modified according to the requirement of the user.

Acronyms

CMMS – Computerized Maintenance Management System

MoHS – Ministry of Health and Sanitation

PM - Preventive Maintenance

CM - Corrective Maintenance

URL - Uniform Resource Locator

1.0 Introduction and Overview of CMMS

This section gives an overview of the software used by the Maintenance staff, its features, importance, and the reasons for selecting it among many other software products that can be used by Hospitals Maintenance units.

1.1 Background of CMMS

Maintenance activities has been viewed as a “cost centre” where too much money goes with little measurable return. Management is beginning to realize that maintenance offers real opportunities in reducing cost and increase productivity.

Maintenance can account for as much as 60% of controllable and substantially reduced equipment operating costs. The most important factors to consider for an electronic system for maintenance relate to reduce cost, but also consider such results as better organizational methods, reduced paperwork, and improved reporting and communications.

1.2 About the Software - CMMS

Computerized Maintenance Management Systems (CMMS) is a tool that can help automate maintenance management (plan preventive and corrective maintenance) to increase overall equipment efficiency.

It helps to standardize data with the ability to run useful reports. It gives a realistic picture of the hospital maintenance activities and assist staff in maintenance planning.

CMMS is a customisation of the workflows adopted from Odoo Maintenance module for use by Maintenance unit staff at all Hospitals and DHMTs in Sierra Leone.

Odoo is an open-source software which required high cost of license fee if all its features are to be utilized.

CMMS is developed using **dotnet core** and **Microsoft SQL Server** technology from scratch uniting Odoo workflows aligned with the country maintenance processes.

The information included in the CMMS is the:

- medical equipment inventory
- service history
- preventive maintenance procedures
- equipment and staff performance indicators
- Spare parts and costing information and reporting.

1.3 Features of CMMS

- Customisation of the CMMS to the country's maintenance units needs
- Facilitate equipment and infrastructure data collection and regular updating (**asset inventory**) in Hospitals and health facilities
- Standardization of data collected (allowable entries for equipment's, preventive and corrective maintenance activities, technicians' profile).
- One-time entry of each equipment
- Ability to track equipment's and spare parts supplies/donations
- Ability to run reports as specified by the hospital management or other key stakeholders
- Institutionalize maintenance services documentation and reporting
- Automatic scheduling and email alerting for maintenance tasks
- Set up a system/network for maintenance and management of health physical assets involving MOHS and the health facilities

1.4 Importance of the CMMS

- Easy to update and manage inventory
 - ✚ Better management of health physical assets; maintenance scheduling, improve uptime, efficient use of manpower and time resources, monitoring real time status of assets.

- ✚ monitor equipment performance indicators such as mean time between failures, down time, and maintenance costs for equipment of the same model, type, or manufacturer.
 - ✚ monitor staff performance indicators such as repeated repairs by the same staff member for the same problem, average down time associated with individuals, and productive work time.
 - ✚ standardize and harmonize Inventory data / information.
- Evidence-based decision making in maintenance and management
 - Maintenance activities reporting will be a breeze. Reports can be generated to:
 - ✚ plan user training programmes based on equipment failure trends in certain departments or health facilities.
 - ✚ assist in the monitoring and improvement of the productivity, effectiveness, and performance of hospitals staff.

1.5 Composition of the CMMS users and their roles

MOHS ICT/DPPI/HSS or MOHS Asset Office In-charge – CMMS Administrator



- Manage users and the CMMS software,
- Controls users accounts for the system as necessary
- Maintains and manages system documentation

Maintenance Heads/Hospital Secretary/M & E/DHMT



- Register/update Asset Register at facility level
- Log maintenance request from Hospital/PHU staff
- Complete the Work order form for equipment maintenance and track progress
- Maintain a list of all maintenance staff with their skills/professional background
- Request user access for maintenance staff from their facility to CMMS Admins
- Generate monthly/quarterly reports as requested by Management.

Maintenance Technicians



- Received job order
- Prepare job order progress report and submit to the maintenance head

SCBU In charges / Pediatricians



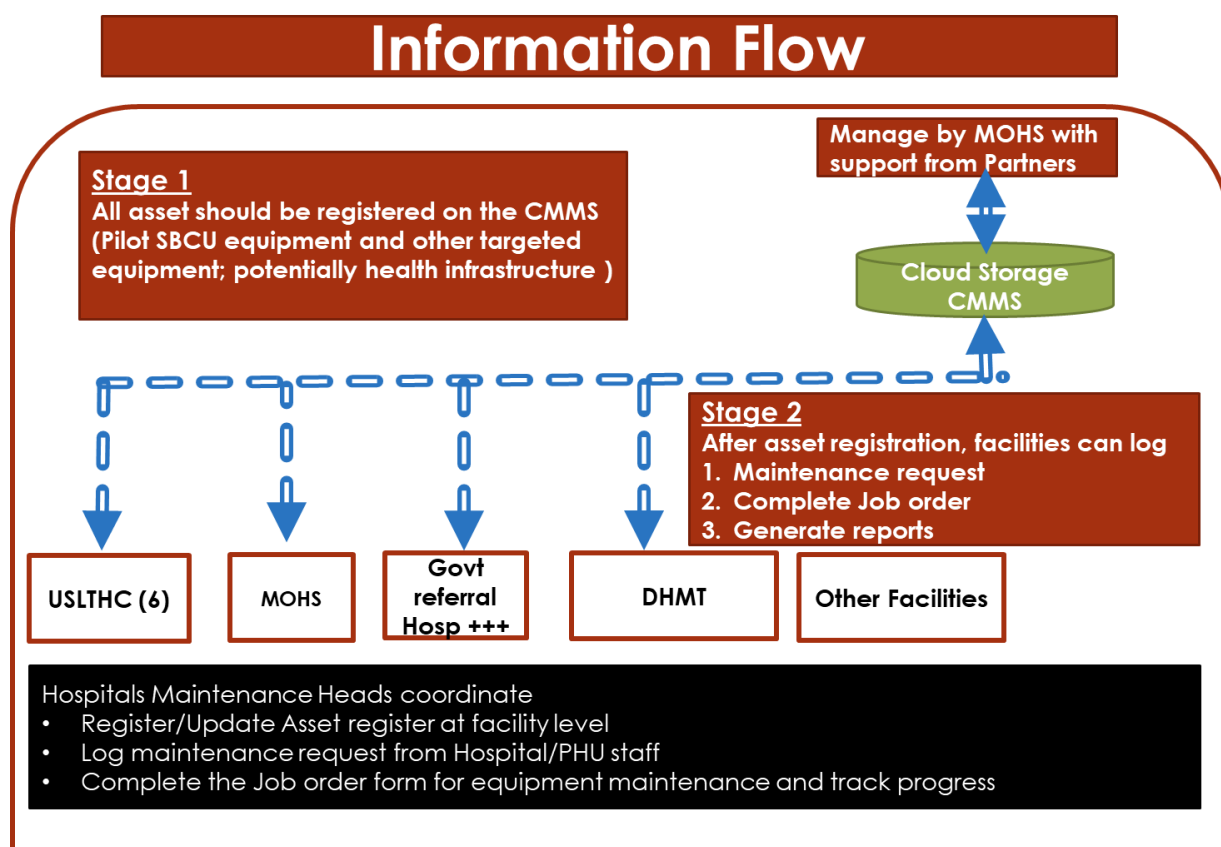
- Submits maintenance request to technicians
- Monitor progress of request

Partners

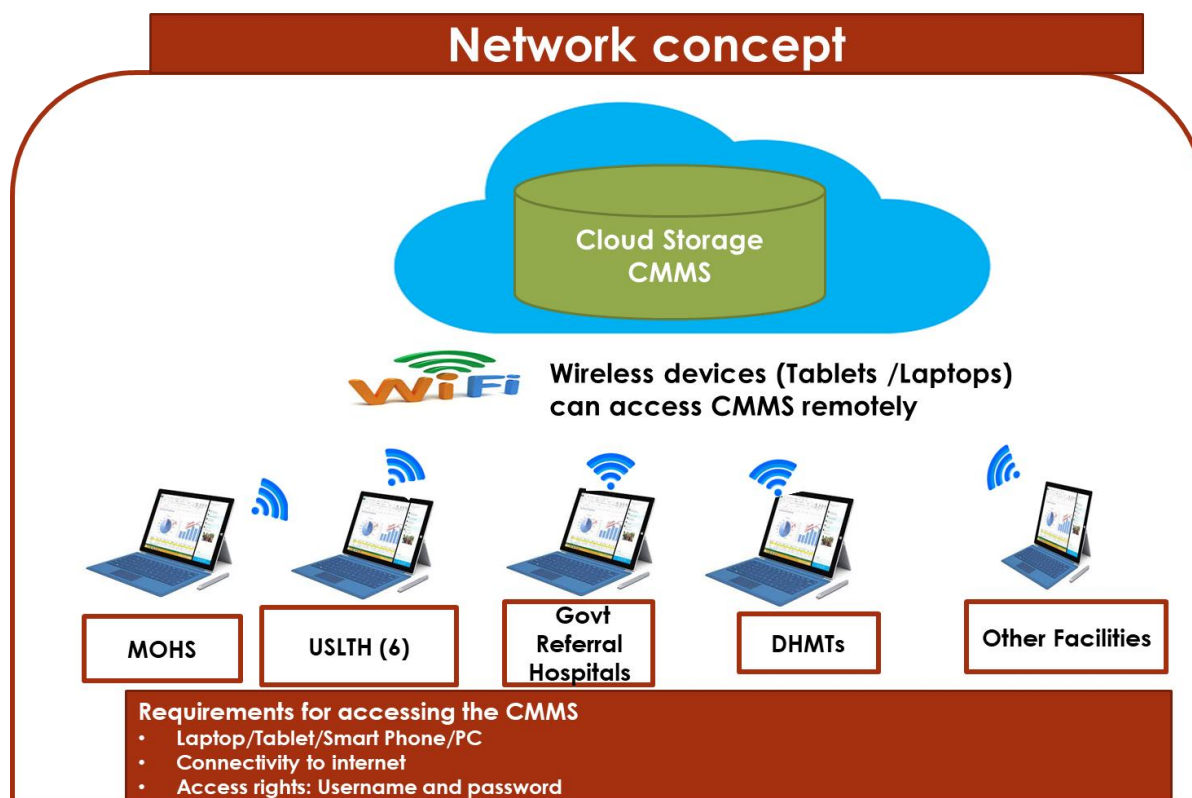


- Support CMMS development/upgrade, deployment, and use.
- Hospitals Equipment Inventory and maintenance data sharing/access

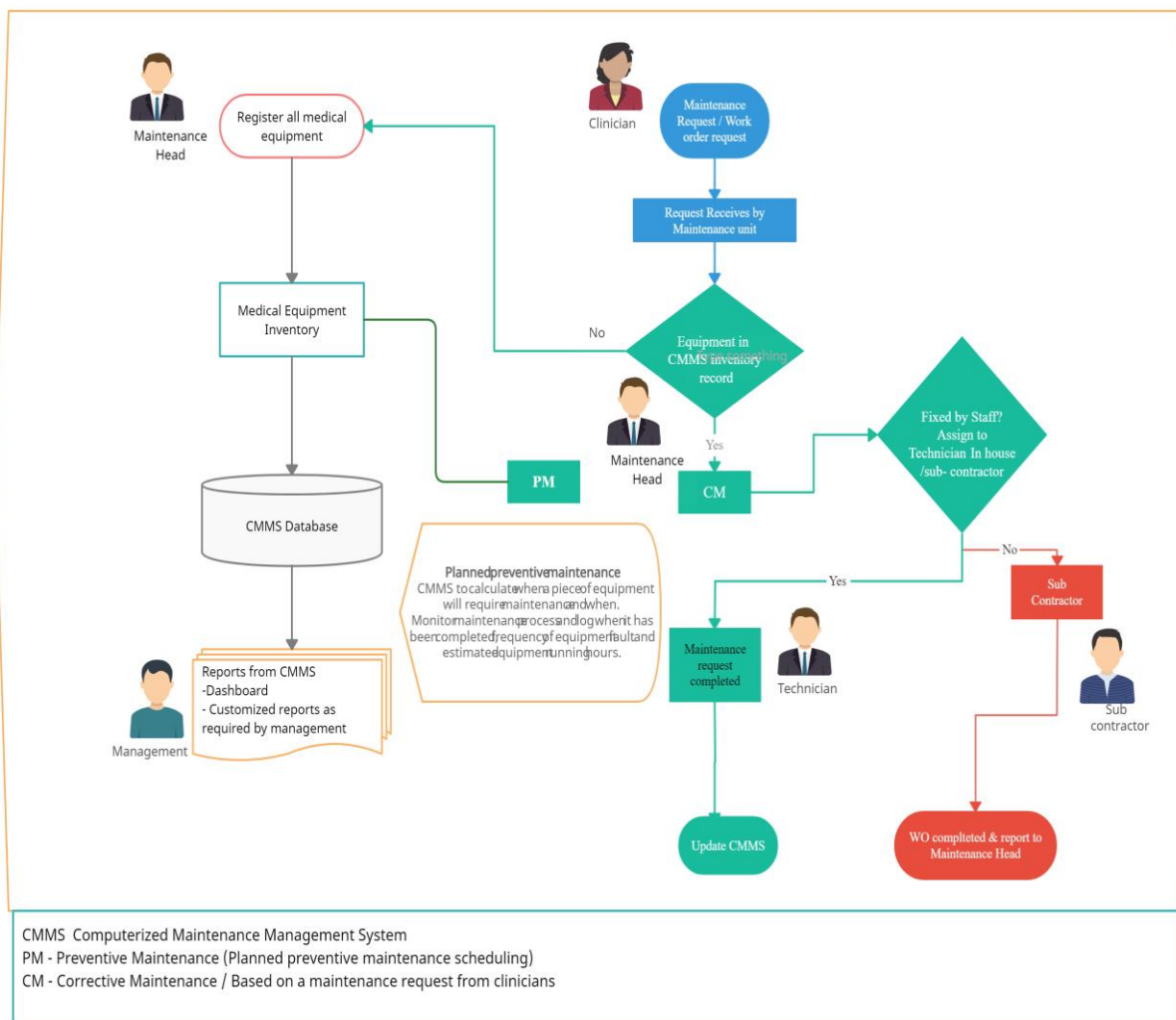
1.6 CMMS Information Flow



1.7 CMMS Infrastructure/Network concept



1.8 CMMS Workflow



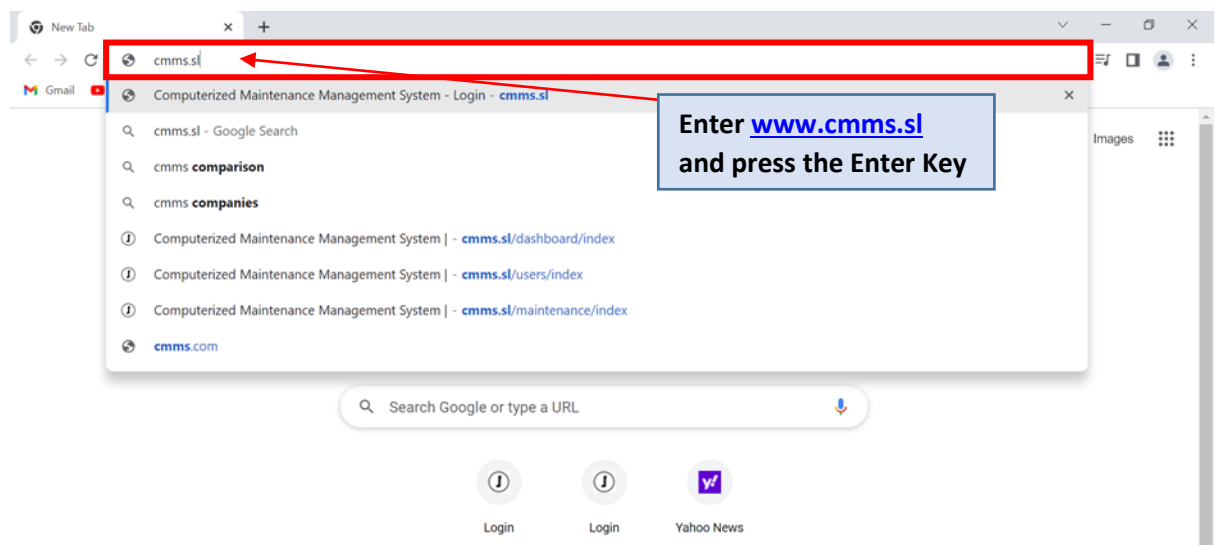
2.0 Accessing CMMS

To launch the CMMS application, users need to:

- Connect to the **internet**
- Locate a **Browser (Chrome, Firefox, Microsoft Edge etc.)** on a mobile device (smart phone, tablet), or a laptop/Personal computer and **double click** it.



- **Enter** the CMMS Uniform Resource Locator (URL) in the address bar. Press the **Enter key** on the keyboard or Click **Go**




- The browser will take the user directly to the **login** page

2.1 Login page

The login page is the same for all users accessing the CMMS application.

In the **login page**, users can view and download the

 **CMMS user manual**

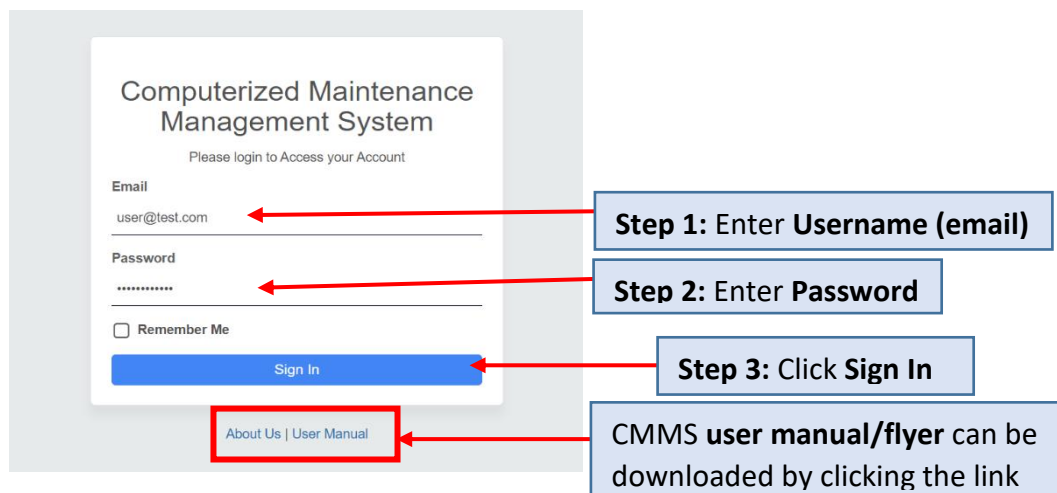
 a brief background on CMMS (**About CMMS**)

To login to CMMS

Step 1: Enter the **username** provided to you by the CMMS Administration/Admin_Staff.

Step 2: Enter the **Password** given to you

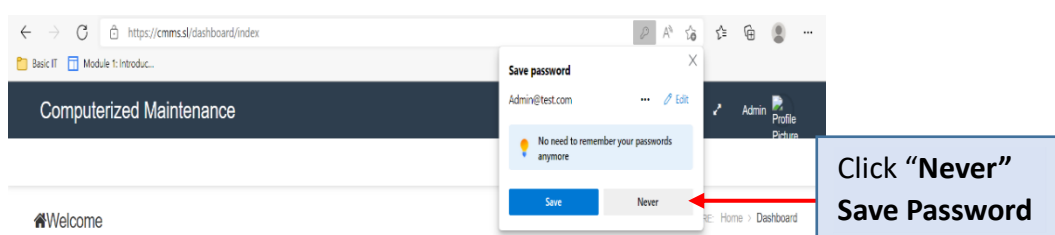
Step 3: Click the **Sign In** button



In most cases, the browser popup will ask if a user want to save the password as shown in the dialog box below,

☐ Click **Never**. This prevents storing the **username** and **password** on the browser.

This will prevent other users using the same laptop to automatically **Sign In** to your account with your username and password.



When you log in successfully as an authorised user, the content you have access to will vary depending on the **rights and privileges** given to you by the **CMMS Administrator**

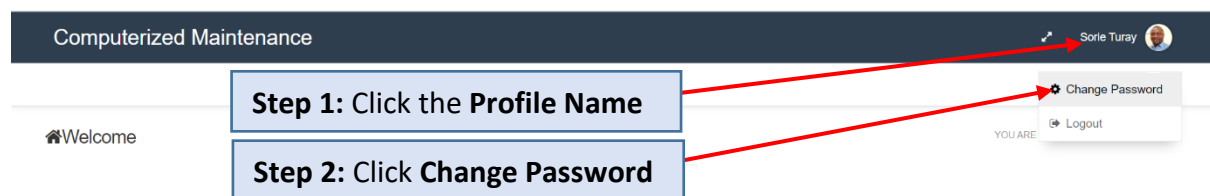
2.2 Change Password

All users are **required** to change their passwords given to them by the CMMS Administrator after they successfully sign-in for the first time.

To Change Password

Step 1: Click the **Profile name** on the top right.

Step 2: Select **Change Password**



In the Change Password dialog box

Step 1: Enter **Old Password** given to you by the CMMS administrator.

Step 2: Enter **New Password**

Step 3: Confirm **New Password**

Step 4: Click **Submit**

Note: Use a combination of Uppercase and Lowercase letters, Numbers, and Special characters for strong passwords (8 Characters minimum).

The screenshot shows the 'Change Password' dialog box within the 'Computerized Maintenance' system. The dialog box has three input fields: 'Old Password', 'New Password', and 'Confirm Password'. Below these fields is a green 'Submit' button. Four blue callout boxes with red arrows indicate the steps: 'Step 1: Enter Old Password' points to the 'Old Password' field, 'Step 2: Enter New Password' points to the 'New Password' field, 'Step 3: Confirm New Password' points to the 'Confirm Password' field, and 'Step 4: Click Submit' points to the 'Submit' button. The top navigation bar shows 'Dashboard', 'Maintenance', 'Equipment Inventory', 'Reporting', and 'Configuration'.

3.0 CMMS Administration Overview

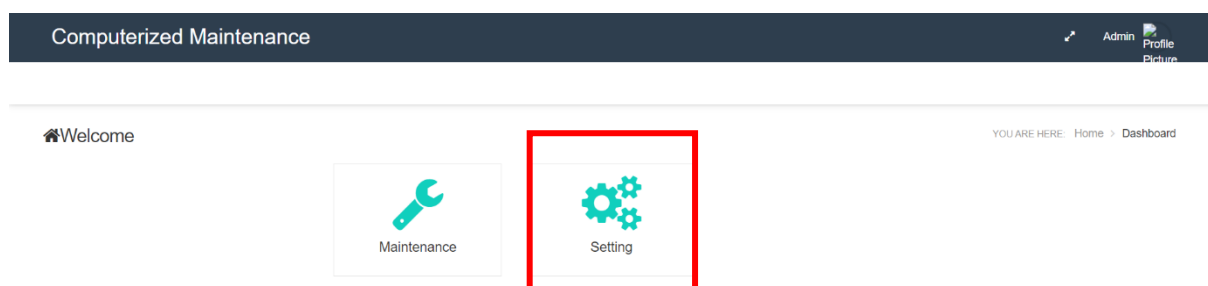
Administering CMMS can be done by the **Admin_Staff** at facility level and the designated **CMMS administrator** at central level (MOHS/DPPI). The role will involve:

- Creating user accounts and assigning role to maintenance staff.
- Changing configurations and editing fields in the modules

When you login as an **administrator**, you have access to the:

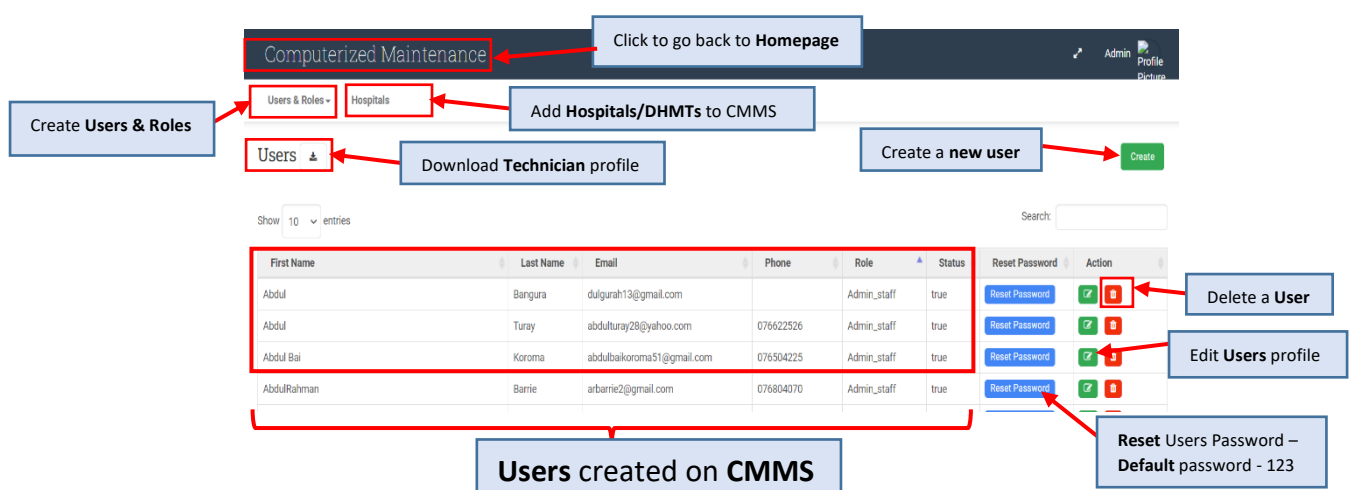
- **Settings Module** – Used to add/edit Health Facilities (Hospitals and DHMTs), Users, and roles,
- **Maintenance Module** – Setting **Configurations** for Maintenance module use for Inventory management, Maintenance Request, Spare Parts, Scheduling and Reporting.

To access the **Setting Module**, Click on **Setting** from the home page as shown below.



3.1 Settings Module

Below is the interface for the **Settings** module



3.1.1 Creating Hospitals/DHMTs

To create/add a hospital to CMMS

Step 1: Select the **Hospitals** tab.

Step 2: Click **Create**

The screenshot shows the 'Computerized Maintenance' dashboard. The 'Hospitals' tab is selected under the 'Users & Roles' menu. A table lists existing hospitals. A green 'Create' button is visible in the top right corner of the table area.

Name	Address	Phone No.	Email	Action
Koidu Government Hospital	Koidu	088000000	kgh@gmail.com	
Princess Christian Maternity Hospital	Freetown	077000000	pcmh@gmail.com	
CMMS Admin	MOHS	123456789	acdad1@gmail.com	

In the Add Hospital form

Step 1: Enter the **Hospital/DHMT Information** (name, Address, Phone Number and Email of Designated head/contact person).

Step 2: Click **Submit** to Save

The screenshot shows the 'Add Hospital' form. A red box highlights the input fields: Name, Address, Phone No., Email, and Facility Type. A green 'Submit' button is at the bottom left. A blue callout box points to the form fields with the text 'Step 1: Enter Hospital/DHMT Information'. Another blue callout box points to the 'Submit' button with the text 'Step 2: Click Submit'.

3.1.2 Navigating, Creating Roles and Permissions

To open the roles form, Select **Roles** from the **Users & Roles** dropdown menu

Step 1: Select **Roles** from the **Users & Roles** dropdown and click **Roles**

Step 2: Click **Create** to add a new **Role**

Step 3: Click **Edit** to modify a **Role**

Step 4: Click **Edit** to modify Permissions for a **Role**

Step 5: Click **Delete** to remove a **Role**

Role Name	Action
Admin	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Assigned	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Responsible	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Responsible Staff	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Technician	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Vendor	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

3.1.3 Role Permission (E.g., Role: Admin)

The **Role Permission** define which **module** a role/user can access.

To **Edit** a **Role Permission**, Select the **Edit button** highlighted in **step 4** above.

The Role Permission form will display as shown below.

- **Select/Tick** from the list of modules you want the selected role to **View**, **Create**, **Edit** and **Delete** data from.
- Click **Save** to update permission changes

Role Permission (Role : Admin)

Modules

Name	View	Create	Edit	Delete
Dashboard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Users & Roles	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Dashboard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Hospitals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Maintenance	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Equipment Inventory	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Reporting	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Configuration	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

3.1.4 Creating Users

To create users,

Step 1: Select **Users** from the **Users & Roles** dropdown menu

Step 2: Click **Create**

The screenshot shows the 'Computerized Maintenance' interface. At the top, there's a navigation bar with 'Admin' and 'Profile' links. Below it, a 'Users & Roles' dropdown menu is open, showing 'Users' and 'Roles' options. A red arrow points to 'Users' with the text 'Step 1: Select Users from the Users & Roles dropdown'. To the right, a green 'Create' button is highlighted with a red arrow and the text 'Step 2: Click Create to add a new User'. Below the dropdown, there's a table of existing users with columns: First Name, Last Name, Email, Phone, Role, Status, Reset Password, and Action. The table contains four rows of user data.

First Name	Last Name	Email	Phone	Role	Status	Reset Password	Action
Abdul	Bangura	dulgurah13@gmail.com		Admin_staff	true	Reset Password	✓ ✗
Abdul	Turay	abduturay28@yahoo.com	076622526	Admin_staff	true	Reset Password	✓ ✗
Abdul Bai	Koroma	abdulbaikoroma51@gmail.com	076504225	Admin_staff	true	Reset Password	✓ ✗
AbdulRahman	Barrie	arbarrie2@gmail.com	076804070	Admin_staff	true	Reset Password	✓ ✗

In the **Add User** form, complete the fields for user's information as shown below.

The screenshot shows the 'Add User' form in the 'Computerized Maintenance' system. The form has several fields: First Name, Last Name, Phone, Email, Password, Role (a dropdown menu), Employment Status, Allowed Hospital/Health Facility, and Default Hospital/Health Facility. Red arrows point to various fields with step-by-step instructions:

- Step 1:** Enter User Personal Information (points to First Name and Last Name fields)
- Step 2:** Enter a temporary **Password** for user (minimum 6 characters) (points to Password field)
- Step 3:** Click to **upload** a user photo (points to a camera icon)
- Step 4:** Select a user **Role** (points to the Role dropdown menu)
- Step 5:** Select **hospitals** you want the user to access (points to Allowed Hospital/Health Facility dropdown)
- Step 6:** Select a **Default Hospital** for user (points to Default Hospital/Health Facility dropdown)

The form also includes 'Submit' and 'Cancel' buttons at the bottom.

Note:

- **Picture upload** - allows admins to add a user photo
- **Password textbox** - allows admins to add a temporary password for users (8 characters minimum)
- **Employment status** – allows admins to indicate whether a technician is pin coded or a volunteer
- **Allowed health facilities** – Users can be given access to more than one facility.
- **Default Hospital** – The actual health facility assigned to users.
- **Role** – Is the permission given to a user. This allows/restricts a user from accessing a particular module.

When the **Technician Role** is selected from the dropdown, additional fields will be displayed, allowing the CMMS Administrator to capture a complete profile of the technicians.

In the **Add User** form, when a **technician** role is selected in the dropdown, the following fields will display as shown below.

The diagram illustrates the 'Add User' form for a technician role. It features a central form with the following fields: 'Speciality' (a dropdown menu with 'Select Speciality' as the placeholder), 'Qualification' (a text input field with an 'Add Qualification' button below it), and 'Trainings' (a text input field with an 'Add Training' button below it). At the bottom of the form are 'Submit' and 'Cancel' buttons. Four numbered steps are shown in blue boxes with red arrows pointing to the corresponding form elements: Step 7 points to the Speciality dropdown, Step 8 points to the Qualification field, Step 9 points to the Trainings field, and Step 10 points to the Submit button.

Step 8: Enter a user **Qualification**

Step 9: Add **Trainings** completed by user

Step 10: Click **Submit** to save user profile

Step 7: Select a Technician **Speciality** from the dropdown

Note: For the **Qualification** and **Trainings**, users should press the **ENTER KEY** after each entry.

3.1.5 Exporting users' information

To export technicians' detail to MS Excel


Step 1: On the Users form, Click the **Download** button near Users.

The downloaded Excel sheet will display on the taskbar

















Step 2: Click on the **options dropdown** and select Open


Computerized Maintenance

Users & Roles ▾ Hospitals








Users  **Step1: Click Download** Create

Show 10 ▾ entries Search:

First Name	Last Name	Email	Phone	Role	Status	Action
Sorie Iron-Sky	Turay	sorielronskyturay@yahoo.com	23278633490	Admin	true	 
Sorie Ironn - Sky		sorielronskyturay@yahoo.com	+23278633490	Assigned	true	 
Sorie	Turay	ironsky86@gmail.com	+23277479087	Technician	true	 
Mr. IB	Kumason	ibkumason@test.com	77777777	Technician	true	 
Tandel Investments		ttandelinvestments.com	23278567654	Vendor	true	 
Albert		koh@gmail.com	076102030	Technician	true	 
Joe Davis				Responsible	true	 
Matron Heien					true	 

Users.xlsx  **Step 2: Select dropdown on the downloaded excel file and select** Show all >

The open Excel file with users' details will display as shown below.

AutoSave        Users (1) - Excel Search

File Home Insert Draw Page Layout Formulas Data Review View Help Share Comments

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	A	B	C	D	E	F	G	H	I	J	K	L	M
1	FirstNa	LastNa	Email	Phone	Role	Speciality	Qualification	Trainings	Company				
2	Sorie	Turay	ironnky86	+2327747	Technician	Biomedical technician	B Sc,B Ed		CMMS Admin				
3	Mr. IB	Kumason	ibkumason	77777777	Technician	Biomedical technician	BMET Diploma,BMET Certificate		CMMS Admin				
4	Joe Davis				Responsible				Makeni Government Hospital				
5													

4.0 CMMS Maintenance Overview

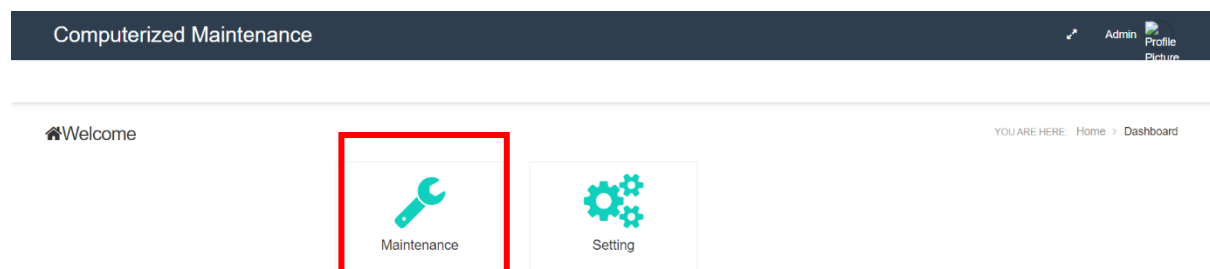
The maintenance module allows users to:

- Configure CMMS dropdown fields (Equipment Name, Donors, Equipment Category, Current Location, Used in Location etc). **CMMS Administrators Only.**
- Record/update Asset Register at facility level
- Log maintenance request
- Complete the Job order for equipment maintenance and track progress
- Record spare parts supplies and consumption
- Generate monthly/quarterly reports as requested by Management.

When you **Sign-In** as Technician, you have access to the:

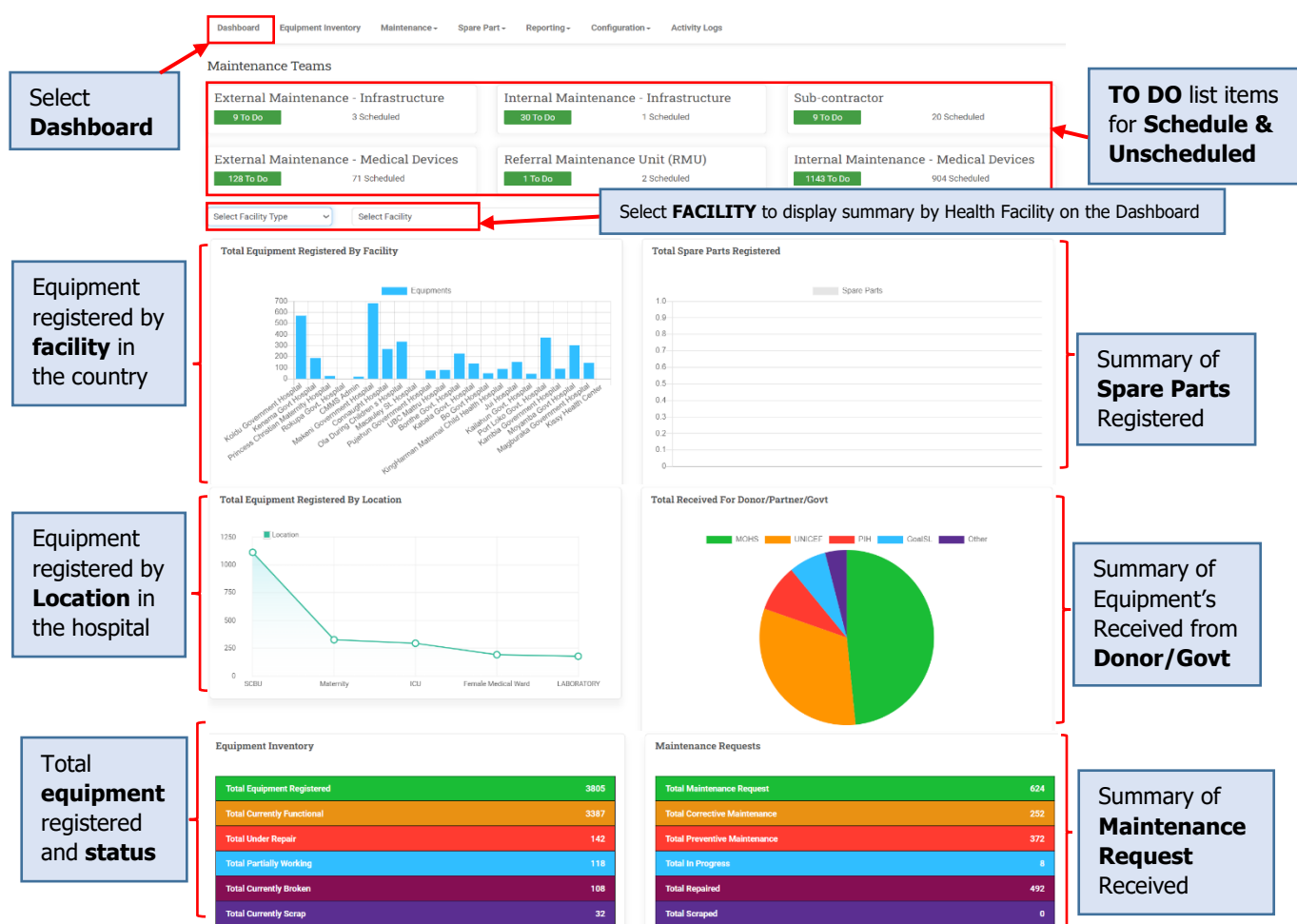
- **Maintenance Module** – Use for Inventory management, Maintenance Request, Scheduling and Reporting.
- **Spare Parts Module** – Use for recording supplies and consumption of equipment's parts.
- Based on the **permissions and role, other users** are restricted from using the **Settings Module** and the **Configuration module**.

To update hospital daily maintenance management activities, select the **Maintenance** module from the home page as shown below.



The screen below (**Dashboard**) will display after selecting maintenance.

4.1 Dashboard



The dashboard displays information about tasks for internal and external maintenance, Referral Maintenance Unit as well as sub-contractors for medical devices and infrastructure. Maintenance teams will populate the dashboard by creating both corrective and preventive maintenance scheduling.

The instance requests will be listed under the maintenance teams. These requests are categorised as **TO DO** items **scheduled** and **Unscheduled**. If you click on any of the Teams, you'll be taken to the requests listed.

By default, the dashboard shows a summary of all CMMS activities country wide. The dashboard also has a drop-down option to select a facility and the summary of activities of the selected facility will display on the dashboard.

The information displayed on the dashboard includes:

- Equipment Registered by hospital
- Spare Parts registered
- Equipment Registered by Location in the hospital
- Equipment received from donor/partners/government,
- Total equipment Registered and their status
- Number of requests received

4.2 Configurations Module (CMMS Administrators Only)

Managing configurations is done by the CMMS Administrator. This involves creating **Equipment master list, Maintenance Teams, Equipment Categories, Current Location, Used in Location, Donor/Partner/Govt etc.**

4.2.1 Maintenance Teams

This involves segmenting the maintenance staff into teams so that job order can be assigned to staff based on speciality.

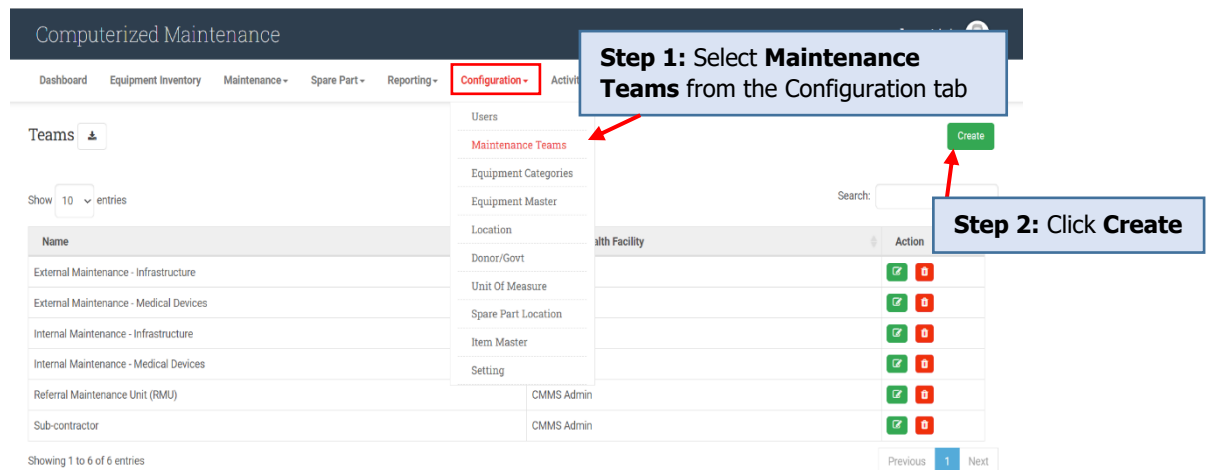
The maintenance teams for CMMS are:

- **Internal maintenance – Medical devices:** Technician within the facility specialized in repairing medical devices.
- **External maintenance – Medical devices:** Technician outside the facility (from another health facility) specialized in repairing medical devices.
- **Internal maintenance – Infrastructure:** Technician within the facility specialized in repairing hospital infrastructure.
- **External maintenance – Infrastructures:** Technician outside the facility (from another health facility) specialized in repairing facility infrastructure.
- **Referral Maintenance Unit (RMU)** – Zonal maintenance units setup to support the DHMT technicians and other health facilities that does not have highly skilled technicians.
- **Sub-contractor** – Someone contacted to provide service for the hospital.

To create a Maintenance Team,

Step 1: From the **Configuration** Tab, Select **Maintenance Teams**.

Step 2: Click the **Create** button on the Teams form on the right



In the add **team** dialog box,

Step 3: Enter **Team name**.

Step 4: Select **health facility** for the team from the dropdown and Click Save



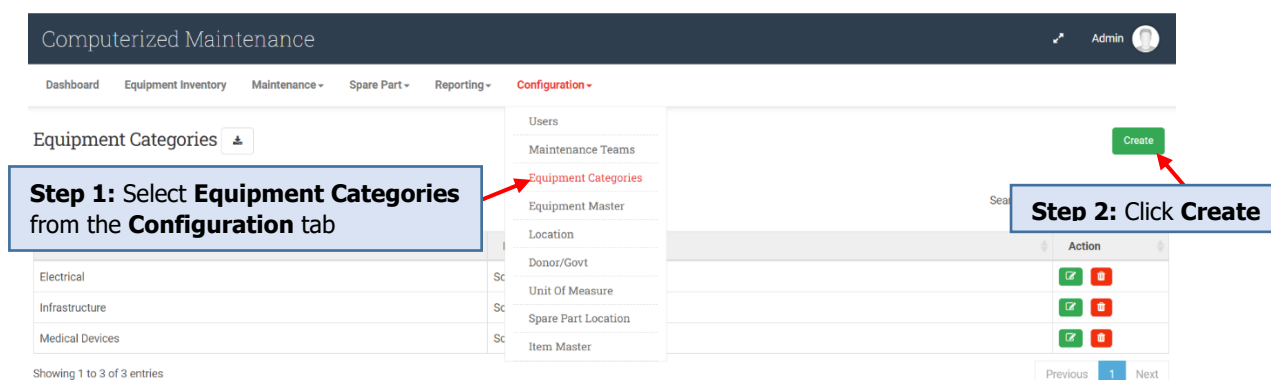
4.2.2 Equipment Category

Creating and maintaining Equipment categories can help in the efficient management of various types of equipment.

To create and manage equipment categories,

Step 1: Go to the **Configuration** tab on the maintenance module's dashboard and select **Equipment Categories** from the drop-down menu.

As illustrated below, a new page will appear.



In the add Category dialog box,

Step 3: Enter Category Name, Responsible Technician, and Description

Step 4: Click Save.



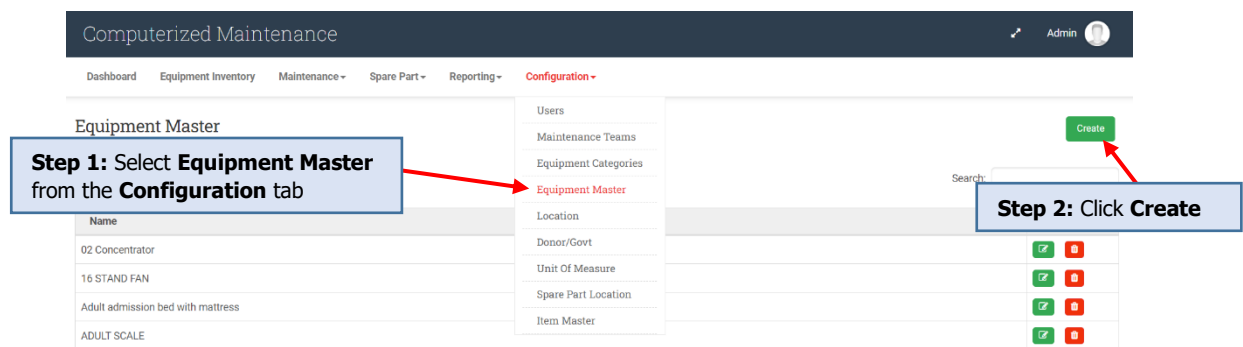
4.2.3 Equipment Master

Creating and maintaining Equipment Master list can help in the standardization of medical equipment names for easy analysis. All equipment added will display on the dropdown for Equipment Name on the Inventory Module.

To create and manage equipment master list,

Step 1: Go to the **Configuration** tab on the maintenance module's and select **Equipment Master** from the drop-down menu.

As illustrated below, a new page will appear.



In the add/Edit Equipment dialog box,

Step 3: Enter Equipment Name

Step 4: Click Save.



4.2.4 Equipment Location

Creating and maintaining Equipment Locations list can help in the determining the current location of equipment's and the department/section in the hospital they are used. This makes it easy tracking the movement of equipment's.

To create and manage equipment location,

Step 1: Go to the **Configuration** tab on the maintenance module's dashboard and select **Location** from the drop-down menu.

In the new window, select **Create** on the top right. A new dialog box will appear as illustrated below.



Step 1: Enter Equipment Name

Step 2: Click Save

NOTE:

Use the similar steps as above to populate dropdown list for:

- 🚦 **Donor/Partners/Govt** – The displays the institutions supplying/donating equipment's to the facilities.
- 🚦 **Unit of Measure (Spare Parts)**
- 🚦 **Spare Part Location** – Locations where spare parts are from
- 🚦 **Item master** - Spare part Name
- 🚦 **Primary Facility** – PHUs name at the DHMTs
- 🚦 **Setting** – To upload an updated flyer and manual for CMMS

4.3 Equipment Inventory

This is considered the first activity in Maintenance management. All equipment's **MUST** be registered in the CMMS **Equipment Inventory** module before a maintenance request can be submitted.

On the **Equipment Inventory** tab, Technicians can

- Search for an equipment
- Register/update an equipment
- Schedule Preventive Maintenance
- Download to MS Excel list of registered equipment.

The screenshot shows the 'Equipment Inventory' module in the CMMS. The interface includes a top navigation bar with 'Maintenance', 'Equipment Inventory', 'Reporting', and 'Configuration'. Below this is a search and filter section with dropdowns for 'Select', 'Serial Number', 'Select Donor/Partner/G', 'Select Facility', 'Select Current Location', 'Select Used in Location', and 'Select Status', along with a 'Search' button. To the right are 'Bulk Upload' and 'Create' buttons. The main area displays a list of equipment items, each with details like 'Model Number' and 'Serial Number', and a 'Request' button. Five numbered steps are overlaid on the screenshot:

- Step 1:** Click **Equipment Inventory** Tab
- Step 2:** Search for an Equipment based on search criteria e.g., Status
- Step 3:** Click **Bulk Upload** to register equipment's from an Excel file
- Step 4:** Click **Create** to register an equipment
- Step 5:** Download list of registered equipment to MS Excel

A red box highlights the equipment list, and a label at the bottom points to it: **List of Equipment registered on CMMS**.

To register a new equipment

- Click the **Create** button in **Step 4** above under the Equipment Inventory tab
- In the **add Equipment** form, complete the fields as shown below.

The screenshot shows the 'Add Equipment' form with the following fields and tabs:

- Equipment Name:** Select (dropdown)
- Equipment Category:** Select (dropdown)
- Current Location:** CHC (dropdown)
- Used in Location:** Adult Resource (dropdown)
- Primary Care Facility:** Select (dropdown)
- Responsible Staff:** Select (dropdown)
- Maintenance Team:** Select (dropdown)
- Technician:** Select (dropdown)
- Hospital/Health Facility:** CMMS Admin (dropdown)

Below the dropdowns are three tabs: **Description**, **Product Information** (highlighted with a red box), and **Maintenance**. A red arrow points from the **Product Information** tab to a callout box that says: "Click tab to complete the **Product Information** fields".

At the bottom of the form are **Save** and **Cancel** buttons.

Key Fields

Equipment Name – Select from the dropdown. If not on the list, contact the CMMS Administrator to add equipment in the master list.

Current Location – If users select CHC, PHU, MCHP, BEMONC, then the new field “**Primary Care Facility**” will display allowing users to write the name of the PHU facility. **Note:** This field is used to track equipment’s from the PHU’s.

- Click the **Product Information** tab in the **add Equipment** form, complete the fields as shown below.

The screenshot shows the 'Add Equipment' form with the **Product Information** tab selected. The form contains the following fields:

- Supplier/Manufacturer:** ---Select---
- Supplier/Manufacturer Reference:**
- Country of Origin:**
- Make/Model:**
- Serial Number:**
- Asset ID:**
- Wattage:**
- Donor/ Partner /Govt:**
- Year of manufacture:**
- Date Facility Received:**
- Price of Acquisition (Le):**
- Estimated Useful Life Years:**
- Date commission:**
- Warranty Expiration Date:**
- Equipment Status:** (dropdown menu with options: Functional, Partially Working, Under repairs, Broken, Scrap)

At the bottom of the form are **Save** and **Cancel** buttons.

- Click the **Maintenance** tab in the **add Equipment** form, complete the fields to **schedule Preventive maintenance** as shown below.

✚ Enter a **Preventive Maintenance** Frequency and **maintenance Duration**.

✚ **CMMS** will automatically calculate the **Next Preventive Maintenance** date as shown on the right

Click **Save** to complete equipment registration

CMMS automatically calculate and set **Next Preventive Maintenance** date

- Click the **Save** button to save an equipment.

4.3.1. Editing / Deleting an equipment

To Edit/delete and equipment,

✚ Click the **ellipses (...)** on the equipment name and select

Click **ellipses (...)** on the equipment name

- **Edit** – Make changes to the fields you desire and click save
- **Delete** – Permanently remove the equipment from the inventory list

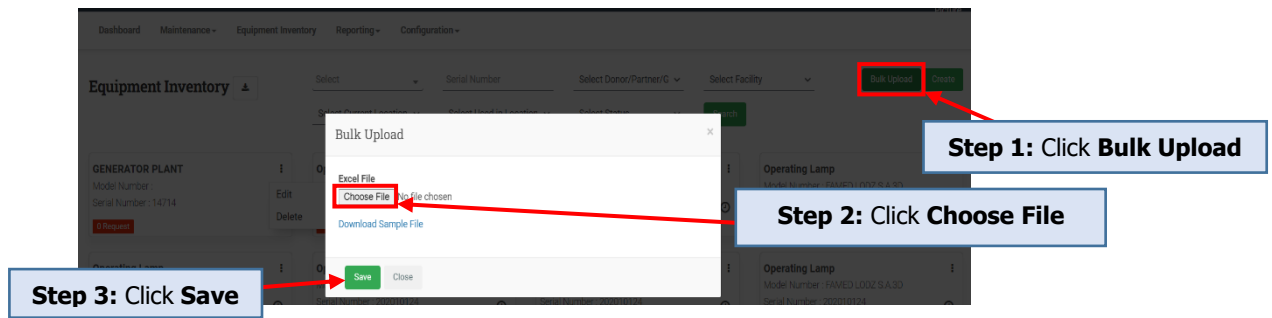
4.3.2 Using the Bulk Upload

To upload a list of equipment's entered in an excel sheet offline,

Step 1: Click the **Bulk Upload** button above as shown below.

Step 2: Click **Choose file** to upload the excel sheet

Step 3: Click **Save** to update your equipment register



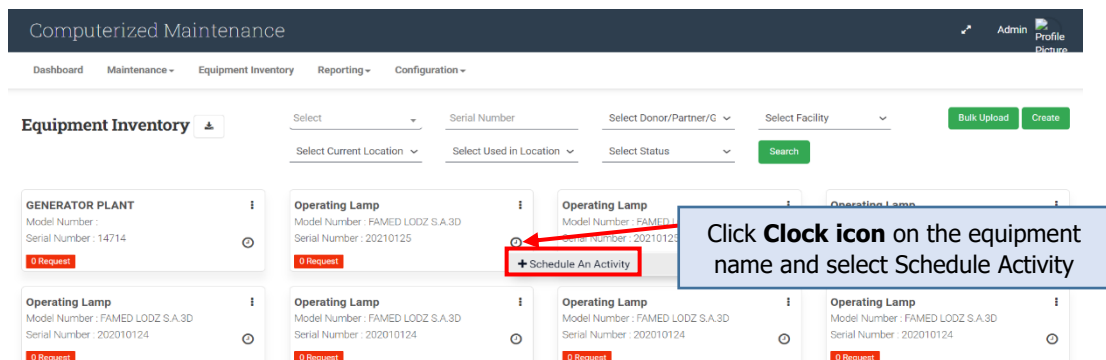
NOTE:

- Click on the Sample Excel file to download it
- Make sure the Excel file to be uploaded is in the same format as the sample
- Save the Excel file as a comma delimited file before uploading.

4.3.3 Scheduling an Activity for an equipment

To schedule an activity,

Step 1: Click on the **Clock icon** close to the equipment, select **Schedule Activity**



In the new window, complete the activity fields as shown below

Step 2: Click on the **Schedule** button to update the **Schedule Activity**

4.3.4 Export/Download Equipment Inventory list to MS Excel

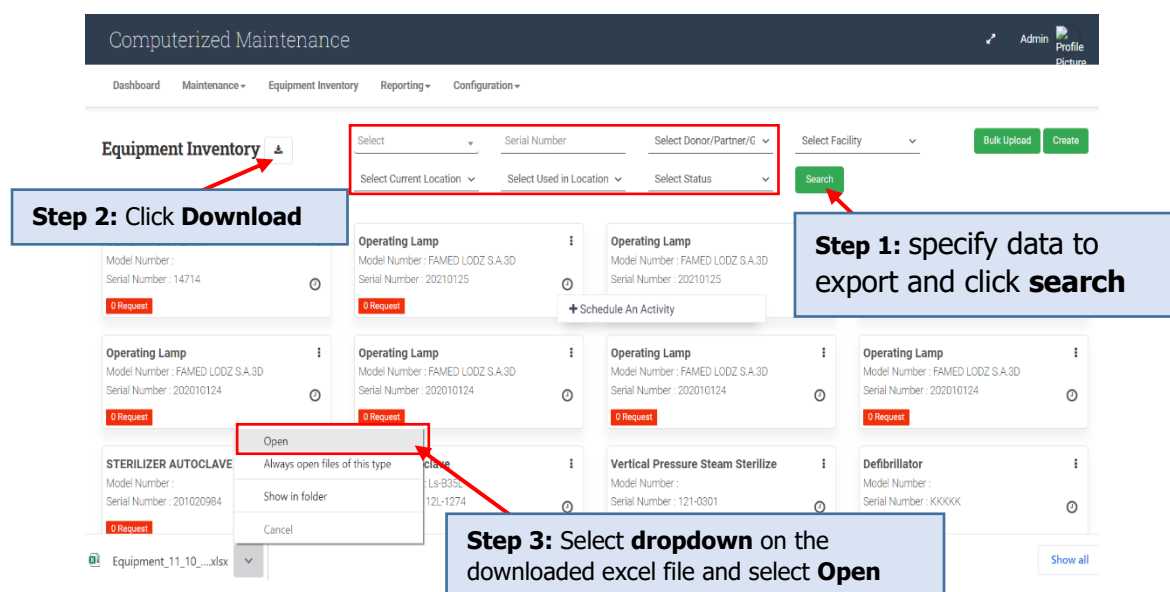
To export Equipment Inventory list to MS Excel

Step 1: On the Equipment Inventory form, specify from the **search options** which data you want to view/export into MS Excel and click search e.g., Equipment Name, Donor/Partner/Govt, Location, Status etc.

Step 2: Click the **Download**  button

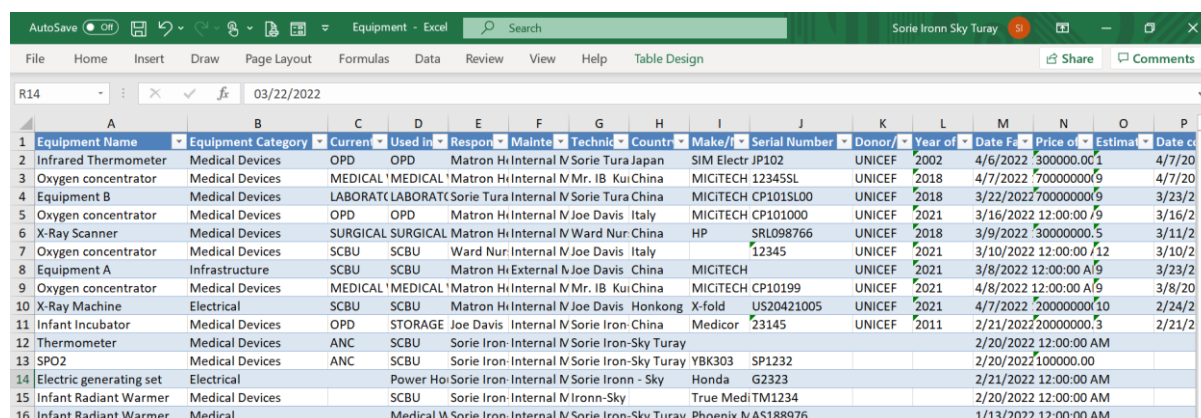
The downloaded Excel sheet will display on the taskbar

Step 3: Click on the **options dropdown** and select Open



The screenshot shows the 'Equipment Inventory' form in the 'Computerized Maintenance' system. The form includes search filters for Select, Serial Number, Select Donor/Partner/G, Select Current Location, Select Used in Location, and Select Status. A 'Search' button is present. Below the filters, a list of equipment items is displayed, including 'Operating Lamp' and 'STERILIZER AUTOCLAVE'. A 'Download' button is highlighted with a red arrow and a callout box labeled 'Step 2: Click Download'. A 'Show all' button is also visible. A callout box labeled 'Step 1: specify data to export and click search' points to the search filters. A callout box labeled 'Step 3: Select dropdown on the downloaded excel file and select Open' points to the 'Open' option in the dropdown menu of the downloaded Excel file.

The open Excel file with Equipment's list will display as shown below.



The screenshot shows an Excel spreadsheet titled 'Equipment - Excel' with the following data:

Equipment Name	Equipment Category	Current	Used in	Respon	Mainte	Technic	Count	Make/	Serial Number	Donor/	Year of	Date Fa	Price of	Estima	Date c
1 Infrared Thermometer	Medical Devices	OPD	OPD	Matron Hi	Internal N	Sorie Tura	Japan	SIM Electr	JP102	UNICEF	2002	4/6/2022	300000.00	1	4/7/20
2 Oxygen concentrator	Medical Devices	MEDICAL	MEDICAL	Matron Hi	Internal N	Mr. IB	Kui China	MICITECH	12345SL	UNICEF	2018	4/7/2022	700000000.9		4/7/20
3 Equipment B	Medical Devices	LABORAT	LABORAT	Sorie Tura	Internal N	Sorie Tura	China	MICITECH	CP101SL00	UNICEF	2018	3/22/2022	700000000.9		3/23/2
4 Oxygen concentrator	Medical Devices	OPD	OPD	Matron Hi	Internal N	Joe Davis	Italy	MICITECH	CP101000	UNICEF	2021	3/16/2022	12:00:00	9	3/16/2
5 X-Ray Scanner	Medical Devices	SURGICAL	SURGICAL	Matron Hi	Internal N	Ward Nur	China	HP	SRL098766	UNICEF	2018	3/9/2022	30000000.5		3/11/2
6 Oxygen concentrator	Medical Devices	SCBU	SCBU	Ward Nur	Internal N	Joe Davis	Italy		12345	UNICEF	2021	3/10/2022	12:00:00	12	3/10/2
7 Equipment A	Infrastructure	SCBU	SCBU	Matron Hi	External N	Joe Davis	China	MICITECH		UNICEF	2021	3/8/2022	12:00:00	A	3/23/2
8 Oxygen concentrator	Medical Devices	MEDICAL	MEDICAL	Matron Hi	Internal N	Mr. IB	Kui China	MICITECH	CP10199	UNICEF	2021	4/8/2022	12:00:00	A	3/8/20
9 X-Ray Machine	Electrical	SCBU	SCBU	Matron Hi	Internal N	Joe Davis	Honkong	X-fold	US20421005	UNICEF	2021	4/7/2022	200000000.10		2/24/2
10 Infant Incubator	Medical Devices	OPD	STORAGE	Joe Davis	Internal N	Sorie Iron	China	Medicor	23145	UNICEF	2011	2/21/2022	20000000.3		2/21/2
11 Thermometer	Medical Devices	ANC	SCBU	Sorie Iron	Internal N	Sorie Iron-Sky	Turay	YBK303	SP1232			2/20/2022	100000.00		
12 SPO2	Medical Devices	ANC	SCBU	Sorie Iron	Internal N	Sorie Ironn - Sky		Honda	G2323			2/21/2022	12:00:00	AM	
13 Electric generating set	Electrical		Power Ho	Sorie Iron	Internal N	Sorie Ironn - Sky						2/21/2022	12:00:00	AM	
14 Infant Radiant Warmer	Medical Devices		SCBU	Sorie Iron	Internal N	Ironn-Sky		True Medi	TM1234			2/20/2022	12:00:00	AM	
15 Infant Radiant Warmer	Medical		Medical W	Sorie Iron	Internal N	Sorie Iron-Sky	Turay	Phoenix N	AS188976			1/13/2022	12:00:00	AM	

4.4 Maintenance Request

The Maintenance module allow the users to carry out maintenance in two different ways:

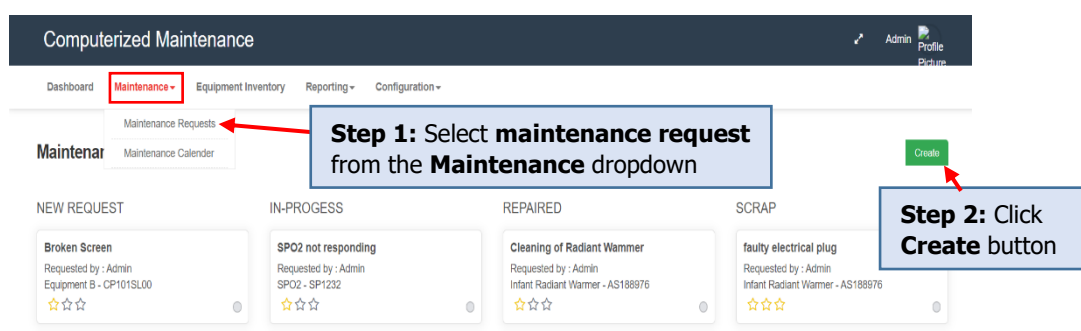
- **Preventive** – Is carried out to prevent machine dysfunction by offering routine maintenance support. Technicians can schedule maintenance in advance and carry out all activities on time. This prevents the equipment from suffering from unexpected damages and ensures maximum utilization of the machines.
- **Corrective** – Though the maintenance team carry out regular maintenance work, some equipment may go defunct at times. This issue must be addressed quickly, and corrective maintenance comes to the rescue in such situations. A user can register a maintenance request and alert the maintenance team about the issue. This helps the team to immediately address the issue.

Even though there are two types of maintenance, the process for creating maintenance requests is almost the same.

4.4.1 Creating a Maintenance Request

To create a Maintenance request

- **Step 1:** Click the **Maintenance tab** and select **Maintenance Request**



- **Step 2:** Click the **Create** button on the top right. The maintenance requests form will appear, as shown below.

In the Maintenance Request form, the user can add the details of the request (problem reported), equipment name with serial number, request date, request submitted by, maintenance team, schedule date, duration, priority, and email addresses to copy request. Users can also add **Internal Notes**, giving a more detailed description of the how the problem will be solved, what spares may be required, and what was done to resolve the problem.

The user can generate **corrective maintenance** requests and **preventing maintenance** requests.

The screenshot shows the 'Maintenance Request Create' form with several annotations:

- Describe the request:** Points to the 'Request (Problem Reported)' field with the example 'e.g. Screen Not working'.
- Select the equipment from the search textbox by typing equipment name:** Points to the 'Equipment' dropdown menu.
- Enter details of staff making the request:** Points to the 'Request Submitted by' field, which includes 'Request Date', 'Responsibility/Title', and 'Contact number of staff'.
- Select the Maintenance type:** Points to the 'Maintenance Type' radio buttons for 'Corrective' and 'Preventive'.
- Enter additional notes on the Maintenance:** Points to the 'Internal Notes' text area.
- Indicate stage of the request:** Points to the top navigation tabs: 'New Request', 'In Progress', 'Repaired', and 'Scrap'.
- Assign request to a team and a technician:** Points to the 'Team' and 'Responsible Technician' dropdowns.
- An outcome date is required when stage of maintenance change to Repaired or Scrap:** Points to the 'Outcome Date/Date' field.
- Send a copy of the request to specific recipients. Separate the emails address by a comma, to send to multiple emails:** Points to the 'Email cc' field.
- Step 3: Click Save button:** Points to the 'Save' button at the bottom left.

- **Step 3:** Click **Save** button to update a request

4.4.2 Export/Download Maintenance requests to MS Excel

To view/export Maintenance requests to MS Excel

Step 1: On the Maintenance Request form, specify from the **search options** which data you want to view/export into MS Excel and click search e.g., Equipment Name, Maintenance Type (Preventive or Corrective), Date range request capture, Status etc.

Click the **Download**  button

The downloaded Excel sheet will display on the taskbar

Step 2: Click on the **options dropdown** and select Open

The screenshot shows the 'Computerized Maintenance' dashboard with the following annotations:

- Step 1: Click Download:** Points to the 'Download' button in the 'Maintenance Requests' section.
- Stage of the request:** Points to the top navigation tabs: 'NEW REQUEST', 'IN-PROCESS', 'REPAIRED', and 'SCRAP'.
- Step 2: Select dropdown on the downloaded excel file and select Open:** Points to the 'Open' option in the dropdown menu that appears when clicking the downloaded file 'MaintenanceRequ...xlsx'.

The open Excel file with Equipment's list will display as shown below

	Request	Equipment	Equipment Serial No	Request Date	Request Submitted by	Responsibility/Title	Maintenance Type	Team	Scheduled Date	Duration	Priority	Hospital/Health Facility	Stage
1													
2	faulty electrical plug	Infant Radiant Warmer	AS188976	2022-01-13			Corrective	Internal Maintenance - Infrastructure	2022-01-24	3	1	CMMS Admin	Scrap
3	Broken Screen	Equipment B	CP101SL00	2022-03-22	Mr Test	Incharge	Corrective	External Maintenance - Medical Devices	2022-03-24	2	1	CMMS Admin	NewRequest
4	Cleaning of Radiant Wammer	Infant Radiant Warmer	AS188976	2022-01-13			Preventive	Internal Maintenance - Medical Devices	2022-02-23	1	1	CMMS Admin	Repaired
5	Screen Not Working2			2021-11-29			Corrective	Internal Maintenance - Infrastructure	2021-11-29	1	1	CMMS Admin	Scrap
6	Broken Icd	Oxygen concentrator	12345	2022-03-10	Mr Test	Laborator	Corrective	Internal Maintenance - Medical Devices	2022-03-14	2	2	CMMS Admin	Repaired
7	Dead Battery	Oxygen concentrator	12345SL	2022-04-07	Mr. S Kamul	Incharge	Preventive	Internal Maintenance - Infrastructure	2022-04-30	1	2	CMMS Admin	NewRequest
8	SPO2 not responding	SPO2	SP1232	2022-02-20			Preventive	Internal Maintenance - Medical Devices			1	CMMS Admin	InProgress
9	Computer Not Working			2021-11-29			Corrective	Internal Maintenance - Infrastructure	2021-11-29	2	2	CMMS Admin	Repaired
10	Screen Not Working			2021-11-29			Corrective	Internal Maintenance - Infrastructure	2021-11-29	1	1	CMMS Admin	Scrap
11	Light Not Working			2021-11-29			Corrective	Internal Maintenance - Infrastructure	2021-11-29	3	3	CMMS Admin	Repaired
12	Battery Replacement	Infrared Thermometer	JP102	2022-04-08	Joe Joe	Incharge	Preventive	Internal Maintenance - Medical Devices	2022-04-30	1	1	CMMS Admin	NewRequest
13	Faulty Infant Incubator	Infant Incubator	23145	2022-02-21	Matron Isha	Incharge	Preventive	Internal Maintenance - Medical Devices	2022-03-30		1	CMMS Admin	InProgress

5.0 Spare Parts Overview

The spare parts module allows users to:

- Record/update information about the type and quantity of spares received from MOHS/Donors/Partners
- record information on the quantity of spares parts use at facility level and for which equipment's they are used for.

When you **Sign-In** as Technician, you have access to the:

- **Spare Part supplies** – Use to update supplies received for spare parts from MOHS/Donors.
- **Spare Parts Consumption** – Use for recording consumption of equipment's parts.

5.1 Spare Parts Supplies

On the **Spare Parts Supplies** form, Technicians can

- Search for spares
- Register/update spare parts

To create/add a new spare part supplied into the CMMS

- **Step 1:** Click the **Spare Parts tab** and select **Spare Parts Supplies**

Computerized Maintenance

Dashboard Equipment Inventory Maintenance **Spare Part** Reporting Configuration Activity Logs

Step 1: Select Spare Parts Supplies

Sparepart Supplier Select It Spare Part Supplies Spare Part Consumption Select Location

Click download button to export Spare Parts Supplies to MS Excel

Step 2: Select Create

List of Spare Parts Supplies registered

Part Name	Part No	Category	Location	Quantity	UOM	Price	Min. Stock	Max. Stock	Action
Fuse	2001	Medical	Hospital Stores	2,000	Piece	20.00	2,000	10,000	

Showing 1 to 1 of 1 entries

Click to Edit Spare Parts Supplies

Click to Delete Spare Parts Supplies

- **Step 2:** Click the **Create** button on the top right. The **Add Spare Parts** form will appear, as shown below.

Complete the form by enter data in the field shown in the form

NOTE:

Fields highlighted in **RED** are REQUIRED fields and must be completed before the form will be saved.

The screenshot shows the 'Add SparePart' form with the following fields and values:

Part Name	Category	Description
Fuse (2001)	Medical	
Location	Quantity in Stock	Unit Of Measure
Hospital Stores		Select Unit Of Measure
Vendor/Supplier	Date Received	Unit Price (USD)
Select Vendor/Supplier	mm/dd/yyyy	
Donor/Partner/Govt	Hospital/Health Facility	
Select Donot/Partner/Govt	CMMS Admin	

At the bottom of the form are two buttons: **Submit** and **Cancel**. A red arrow points from a blue box labeled **Step 3: Select Submit to save** to the **Submit** button.

- **Step 3:** Click the **Submit** button to save and **Cancel** to discard the changes.

5.2 Spare Parts Consumption

On the **Spare Parts Consumption** form, Technicians can

- Search for used spares parts
- Record spare parts used for maintenance

To create/add a used spare part supplied into the CMMS

- **Step 1:** Click the **Spare Parts** tab and select **Spare Parts Consumption**

Computerized Maintenance

Step 1: Select **Spare Parts Consumption**



Dashboard Equipment Inventory Maintenance **Spare Part** Reporting Configuration Activity Logs

Spare Part Consumption

Click download button to export **Spare Parts Consumption** to MS Excel

Step 2: Select **Create**

List of **Spare Parts Consumption** registered

Part Name	Part No	Equipment	Quantity	Price	Total Price	Action
Fuse	2001	02 concentrator CON-HOS -FEMALE OXYGEN CONCENTRATOR 001	4.000	20.00	60.00	 

Showing 1 to 1 of 1 entries

Click to Edit **Spare Parts Consumption**

Click to Delete **Spare Parts Consumption**

- **Step 2:** Click the **Create** button on the top right. The **Add Spare Parts Consumption** form will appear, as shown below.

Complete the following fields

- Enter **Consumption Date** – Date Spare part was used for equipment repairs
- Select **Part Name** from dropdown – **Part Name & number** is queried from **Spare parts supplies** i.e. Part name should have been added in the Spare parts supplies
- Select **Equipment Name** – Equipment name & Serial No is queried from Equipment Inventory list i.e. Equipment should exist in the inventory
- Enter **Quantity** – Number of spares used to do the maintenance

Computerized Maintenance

Dashboard Equipment Inventory Maintenance Spare Part Reporting Configuration Activity Logs

Add SparePart Consumption

Home > SparePart Consumption List > Add SparePart

Consumption Date
mm/dd/yyyy

Part Name
Fuse (2001)

Equipment Name
02 concentrator - CON-HOS -FEMALE OXYGEN CONCENTRATOR 001

Quantity

Submit Cancel

Step 3: Select **Submit** to save

Step 3: Click the **Submit** button to Save and **Cancel** to discard the changes.

6.0 ACTIVITY LOG

The **CMMS Activity Logs** provide immediate, basic information about what is happening in the CMMS, and how users are interacting with the system modules.

Auditing is a review and analysis of management, operational, and technical controls. The **Activity Logs** shows a **sequential record of all the activity on the CMMS**.

By reviewing **Activity logs**, systems administrators can track user activity, and security teams can investigate breaches and ensure compliance with regulatory requirements.

To view **CMMS Activity Logs**:

- **Step 1:** Click the **Activity logs tab** from the main menu

The screenshot shows the 'Computerized Maintenance' system interface. The top navigation bar includes 'Dashboard', 'Equipment Inventory', 'Maintenance', 'Spare Part', 'Reporting', 'Configuration', and 'Activity Logs'. The 'Activity Logs' tab is highlighted. Below the navigation bar, the 'Activity Logs' section contains a date range selector with 'From Date' and 'To Date' fields (both set to 'mm/dd/yyyy') and a 'Submit' button. A search box is located below the date range selector. The main content area displays a table of activity logs. Annotations with red arrows point to the 'Activity Logs' tab, the date range selector, and the search box. A blue box labeled 'CMMS Activity Log report' points to the table.

Step 1: Select Activity Logs

Step 2: Specify a date range and click Submit

Use the **Search box** to extract information on activity based on **user or action**

CMMS Activity Log report

Date	User	Action
3/28/2023 4:02:04 AM	Abdul Salam Rahim	Maintenance Request Status Change : Repaired
3/28/2023 4:01:57 AM	Abdul Salam Rahim	Maintenance Request Created - Inspections Preventive Maintenance
3/28/2023 3:59:10 AM	Abdul Salam Rahim	Maintenance Request Created - Inspections Preventive Maintenance
3/28/2023 3:57:59 AM	Abdul Salam Rahim	Maintenance Request Created - Inspections Preventive Maintenance
3/28/2023 3:22:00 AM	Emanuel M Taylor	Equipment Created - Name : Infrared Thermometer
3/27/2023 5:10:05 AM	Wilfred R. E. Smith	Equipment Created - Name : Pulse Oximeter
3/27/2023 5:10:05 AM	Wilfred R. E. Smith	Equipment Created - Name : Standing Scale




- **Step 2:** To see activity that took place during a specific period, enter a start and end date next to From and To Date, and click **Submit**

The activity list report for the period will be displayed as shown above

7.0 REPORTING

CMMS reporting module gives every user, irrespective of technological expertise, the ability to analyse data in real time via intuitive charts. Viewing any form of information using graphics makes data easier to understand, analyse, and process into actionable insights.

Three types of reports can be viewed/generated in CMMS

-  Maintenance request
-  Equipment Inventory
-  Spare Parts

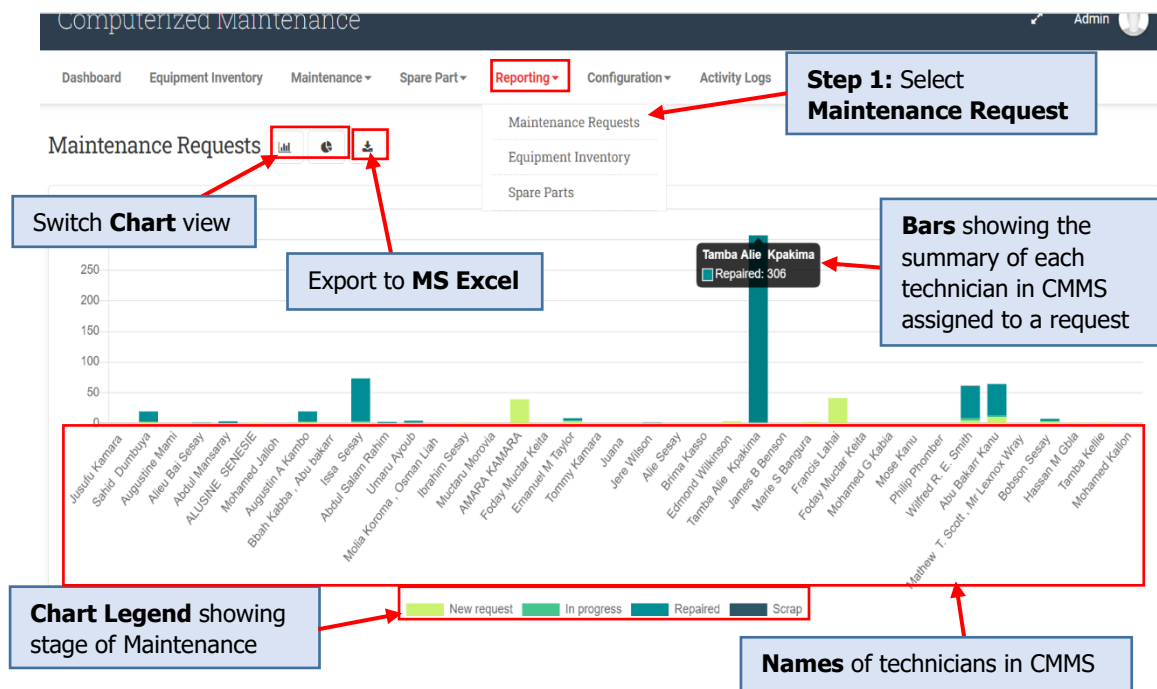
7.1 Maintenance request Reports

The **Maintenance request report** displays activities and performance of technicians on their routine maintenance activities using the work order system. The report displays a summary on the number of **requests** submitted by each technician and the **stage** of each request (New request, In progress, Repaired and Scrap).

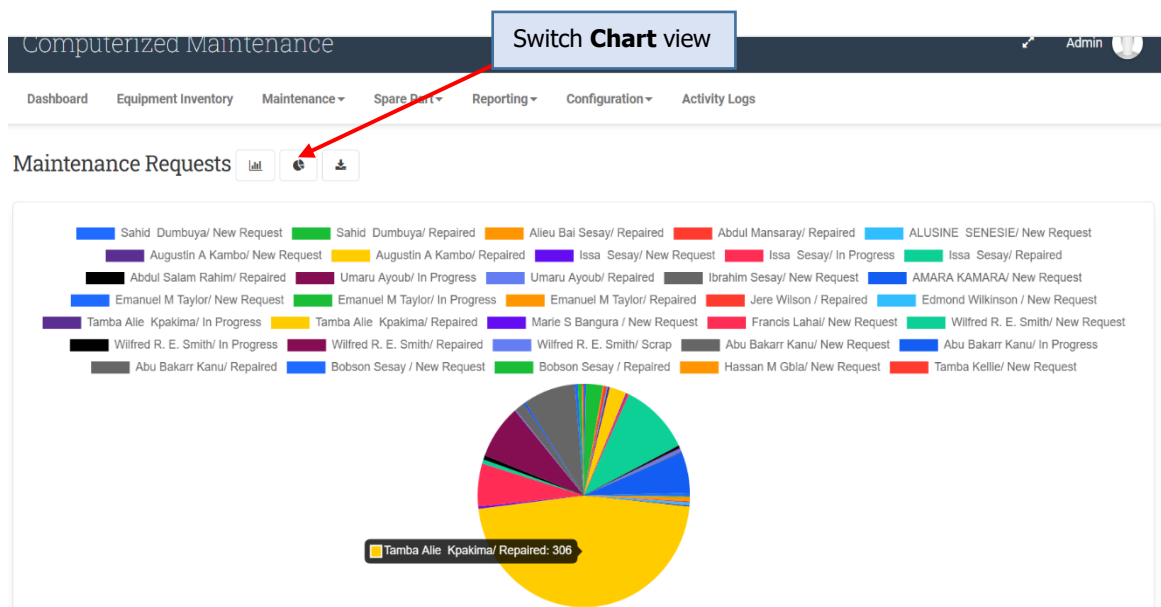
By default, the form is display using a **bar chart**. Users can switch the view to a **Pie chart** and as well **download** the report to MS Excel.

To view **Maintenance requests** reports:

- **Step 1:** Click the **Reporting tab** from the main menu and select **Maintenance request**



- **Step 2:** Click the **Switch chart** button to see the technician's performance in a **Pie Chart**



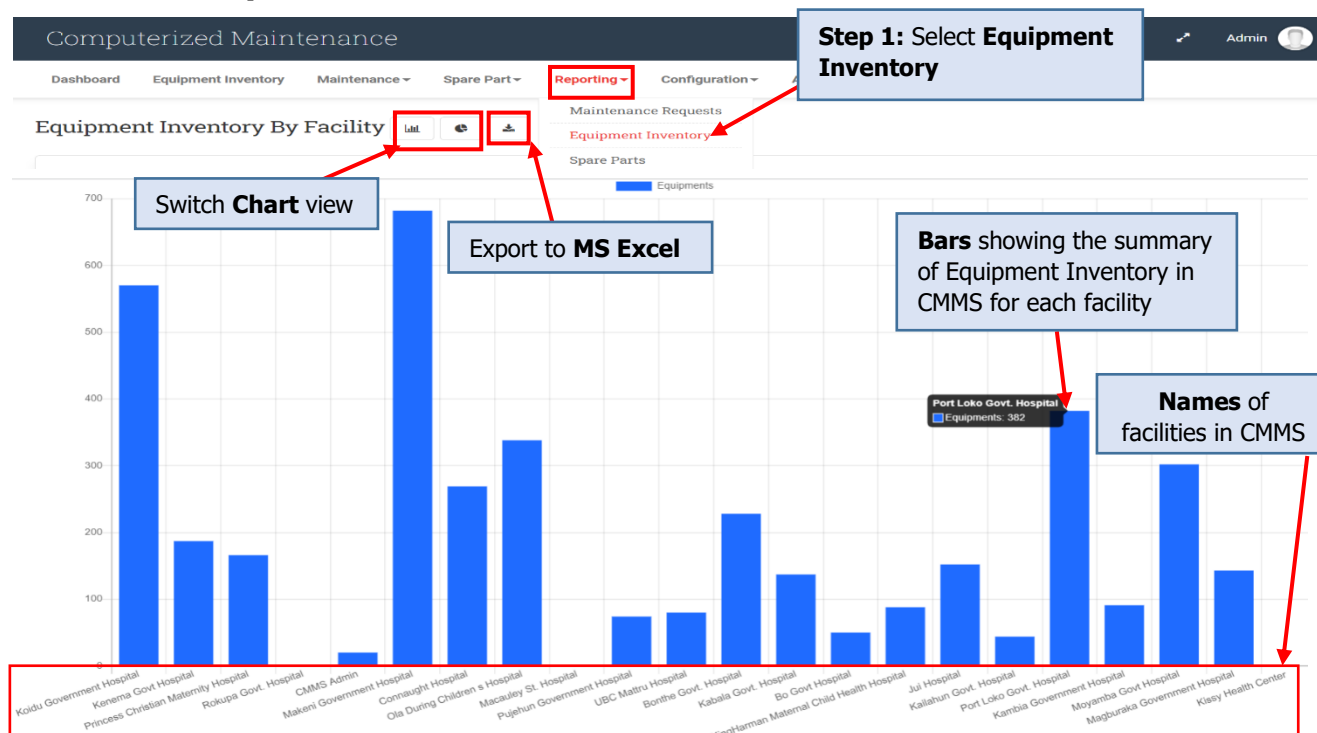
7.2 Equipment Inventory Report

The **Equipment Inventory report** displays the total number of equipment's registered at each facility using the CMMS Inventory Module.

By default, the form is display using a **bar chart**. Users can switch the view to a **Pie chart** and as well **download** the report to MS Excel.

To view **Equipment Inventory** reports:

- **Step 1:** Click the **Reporting tab** from the main menu and select **Equipment Inventory**.



Step 2: Click **Switch chart** button to see Equipment Inventory by Facility in a **Pie Chart**



7.3 Spare Parts Report

The **Spare Parts report** displays the total number of used and unused spares for all facilities in the CMMS.

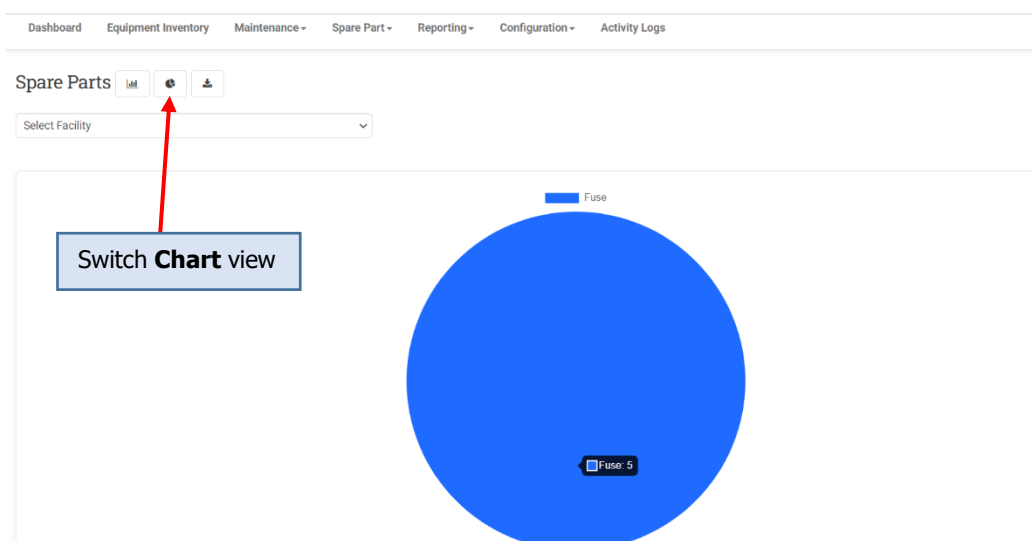
By default, the form is display using a **component bar chart**. Users can switch the view to a **Pie chart** and as well **download** the report to MS Excel.

To view **Spare Parts** reports:

- **Step 1:** Click the **Reporting tab** from the main menu and select **Spare Parts**.



Step 2: Click **Switch chart** button to see Spare Parts by Facility in a **Pie Chart**



To view Spare Parts supplies and Consumption by Facility,

Step 3: Click the dropdown button and select the name of the facility you want to view.



8.0 GENERATING CUSTOM REPORTS (DATA ANALYSIS)

Data analysis involves a process of cleaning, studying, and displaying data to discover useful information for decision-making. The goal is to find meaning in data so that the derived knowledge can be used to make informed decisions.

The Data Analysis Process involves:

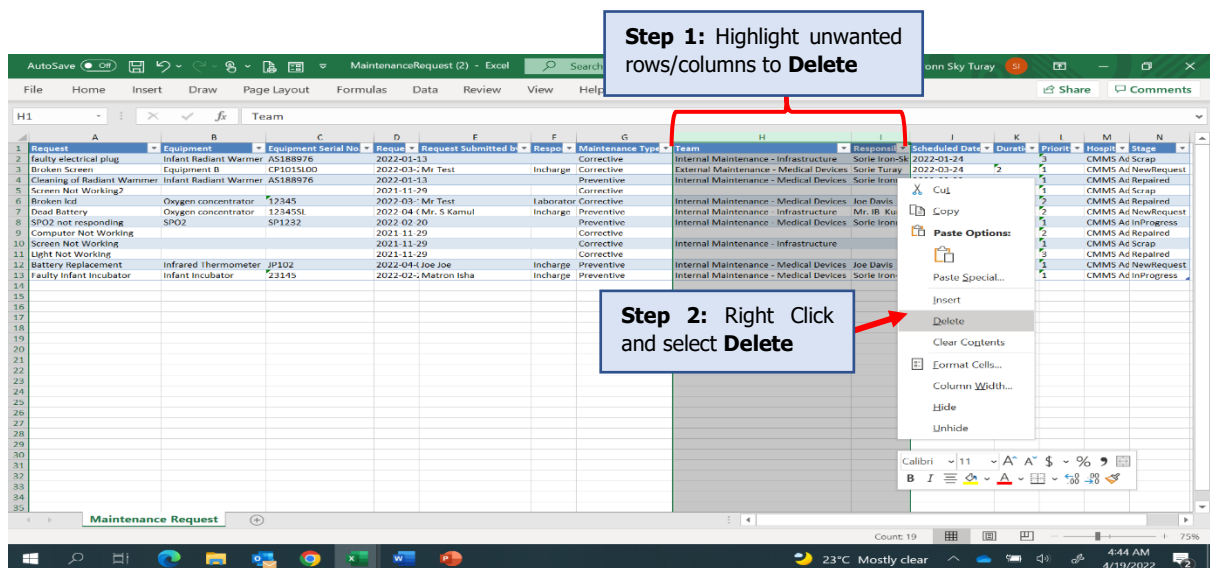
- **Data Collection:** Data collection has been defined in the CMMS application already. Users only need to know what data they are planning to analyse and how to get the data exported from CMMS to an Excel spreadsheet for analysis.
- **Data Cleaning:** Not all the data exported from CMMS will be useful for a specific report, so it's necessary to clean it. This process of data cleaning is where you remove white spaces, duplicate records, and basic errors. Data cleaning is mandatory before data analysis.
- **Data Analysis:** Here you use data analysis software and other tools to help you interpret and understand the data and arrive at conclusions. Basic data analysis tool is Excel, other tools exist like SPSS, Microsoft Power BI etc.
- **Data Interpretation and Visualisation:** To deduce the result and determine the best courses of action, based on the findings. Visualisation helps to derive valuable insights by helping you compare datasets and observe relationships graphically.

8.1 Preparing the spreadsheet for analysis

8.1.1 Clean the Data

We are taking the Maintenance request report as our example. Export/Download Maintenance requests to MS Excel and Delete unwanted data (unnecessary rows and columns)

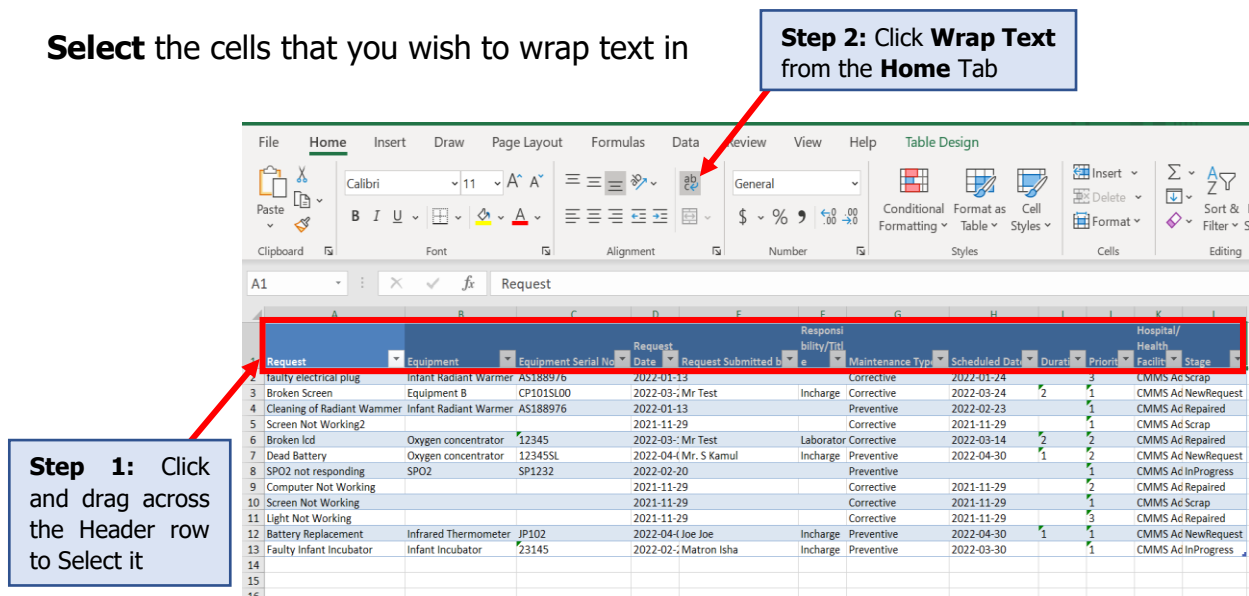
Step 1: Highlight the rows/columns you want to delete.



Step 2: Right click and select Delete

8.1.2 Wrap text

Select the cells that you wish to wrap text in



8.1.3 Freezing the top row

You may want to see certain rows or columns all the time in your worksheet, especially **header cells**. **Freezing** rows or columns allows you to scroll through your content while continuing to view the frozen cells.

Freezing the top row of **titles** makes it easier to identify what column you're looking at as you scroll through the data set.

Step 1: Select row 1 by clicking on the number 1 on the far left of the page. This will highlight all cells in this row

Step 2: Select the "View" tab at the top of the page

Step 3: click on the "Freeze Top Row" option

The screenshot shows the Excel interface with the 'View' tab selected. A callout box for Step 1 points to row number 1 in the left margin. Another callout box for Step 2 points to the 'Freeze Panes' option in the 'View' tab ribbon. A third callout box for Step 3 points to the 'Freeze Top Row' option in the 'Freeze Panes' dropdown menu. The spreadsheet data is visible in the background.

Request	Equipment	Equipment Serial No.	Request Date	Request Submitted by	Response	Request Status	Request Stage
1	faultry electrical plug	Infant Radiant Warmer AS188976	2022-01-13	2022-03-2 Mr Test	Incharge	Corrective	min. Scrap
2	Broken Screen	Equipment B CP1015L00	2022-01-13		Incharge	Corrective	min. NewRequest
3	Cleaning of Radiant Wammer	Infant Radiant Warmer AS188976	2022-01-13			Preventive	min. Repaired
4	Screen Not Working2		2021-11-29			Corrective	
5	Broken lcd	Oxygen concentrator 12345	2022-03-1 Mr Test	Laborator	Corrective	2021-11-29	1
6	Dead Battery	Oxygen concentrator 12345SL	2022-04-0 Mr. S Kamul	Incharge	Preventive	2022-03-14	2
7	SPO2 not responding	SPO2 SP1232	2022-02-20		Preventive	2022-04-30	1
8	Computer Not Working		2021-11-29		Corrective	2021-11-29	1
9	Screen Not Working		2021-11-29		Corrective	2021-11-29	1
10	Light Not Working		2021-11-29		Corrective	2021-11-29	1
11	Battery Replacement	Infrared Thermometer JP102	2022-04-0 Joe Joe	Incharge	Preventive	2022-04-30	1
12	faultry Infant Incubator	Infant Incubator 23145	2022-02-2 Matron Isha	Incharge	Preventive	2022-03-30	1
13							
14							

This will now mean when you scroll down the page, the titles of each row will remain visible

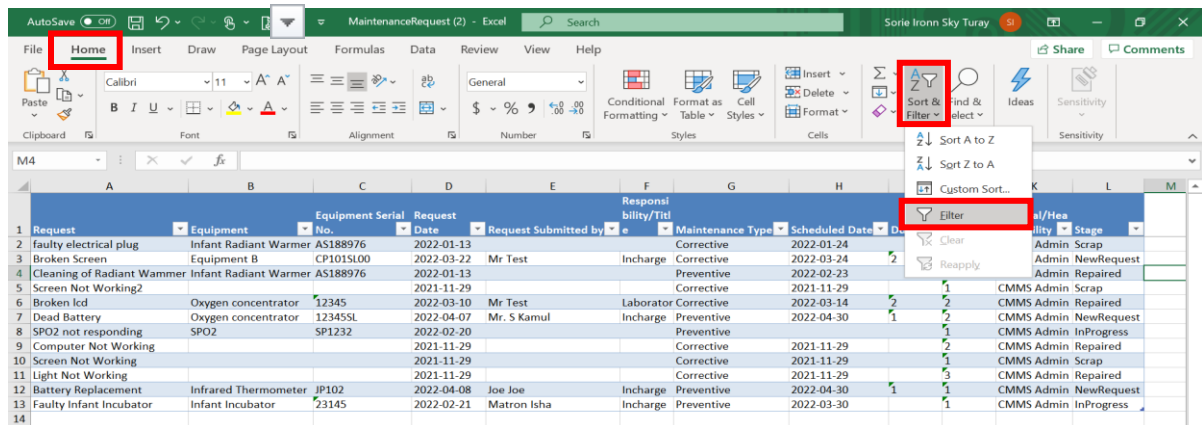
- To **unfreeze** rows or columns, click the **Freeze Panes** command, then select **Unfreeze Panes** from the drop-down menu.

8.1.4 Enable filters

Filters allow you to quickly organise and separate out information that you need from the dataset. They are essential to extract data needed based on the criteria.

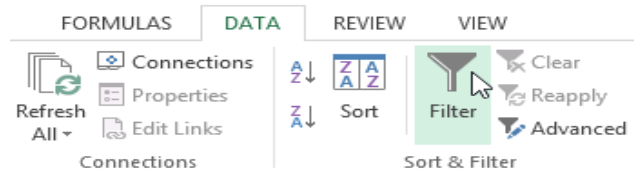
If your worksheet contains a lot of content, it can be difficult to find information quickly. **Filters** can be used to narrow down the data in your worksheet, allowing you to view only the information you need. By default, all data exported to MS Excel from CMMS has filters enabled. However, if filters are not enabled,

- To enable filters, click on the **Home** tab and select **Sort & Filter** command and select **Filter**



When filters are activated, a **drop-down arrow** will appear in the header cell for each column.

- Filtering options can also be accessed from the **Filter** command on the **Data** tab



8.1.5 Using filters

To filter a data column e.g., Column L (**Stage**)

Step 1: Click the **drop-down arrow** for the column you want to filter. In our example, we will filter column **L** to view equipment based on stage of maintenance.

Step 2: **Uncheck** the box next to **Select All** to quickly deselect all data.

Step 1. Click Dropdown arrow for the Stage Column

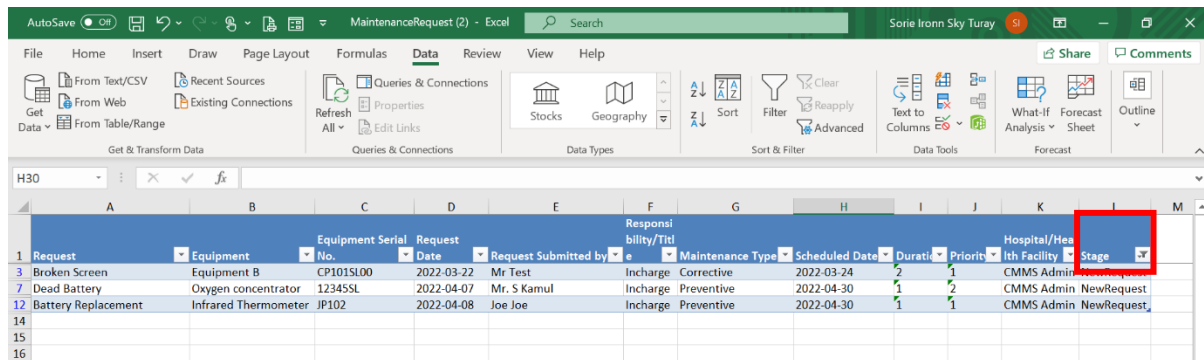
Step 2: Uncheck the boxes to deselect the data you don't want to display

Step 3. Click Ok

Step 3: Check the boxes next to the data you want to filter, then click **OK**.

In this example, we will check **NewRequest** to view only new maintenance request.

The data will be **filtered**, temporarily hiding any content that doesn't match the criteria. In our example, only **NewRequest** maintenance stages are visible as shown below.



Request	Equipment	Equipment Serial No.	Date	Request Submitted by	Responsibility/Title	Maintenance Type	Scheduled Date	Duration	Priority	Hospital/Health Facility	Stage
Broken Screen	Equipment B	CP101SL00	2022-03-22	Mr Test	Incharge	Corrective	2022-03-24	2	1	CMMS Admin	NewRequest
Dead Battery	Oxygen concentrator	12345SL	2022-04-07	Mr. S Kamul	Incharge	Preventive	2022-04-30	1	2	CMMS Admin	NewRequest
Battery Replacement	Infrared Thermometer	JP102	2022-04-08	Joe Joe	Incharge	Preventive	2022-04-30	1	1	CMMS Admin	NewRequest

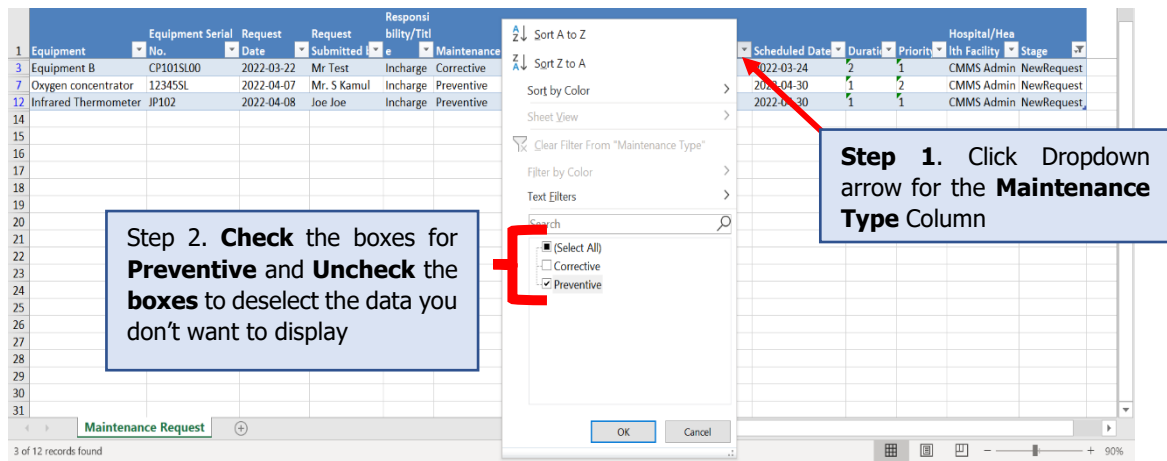
8.1.6 Applying multiple filters

Filters are **cumulative**, which means you can apply **multiple filters** to help narrow down your results. In this example, we've already filtered our worksheet to show **New Request** stage of maintenance, we'd like to narrow it down further to only show **New Request** for **Preventive** maintenance.

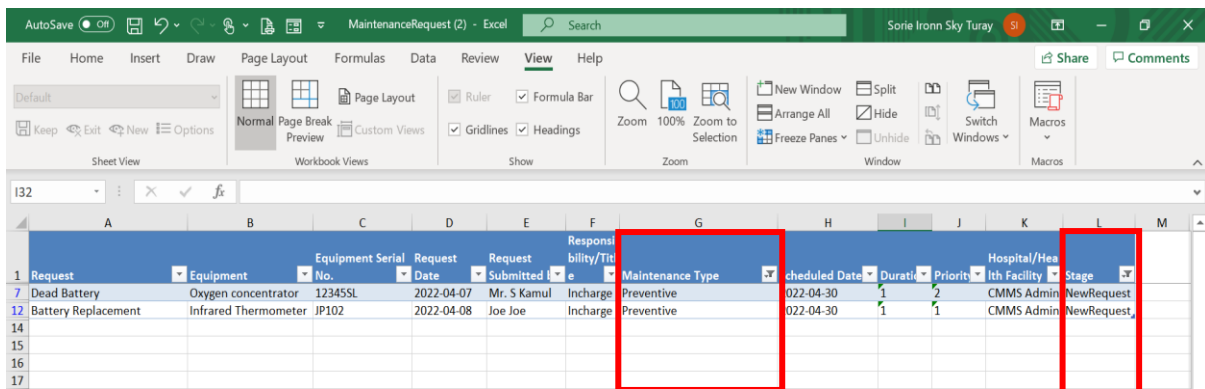
- Step 1: Click the **drop-down arrow** for the column you want to filter. In this example, we will add a filter to column **G** to view information by **Maintenance Type**.

The **Filter menu** will appear.

- Step 2: **Check** or **uncheck** the boxes depending on the data you want to filter, then click **OK**. In the example below, we'll uncheck everything except for **Preventive**.



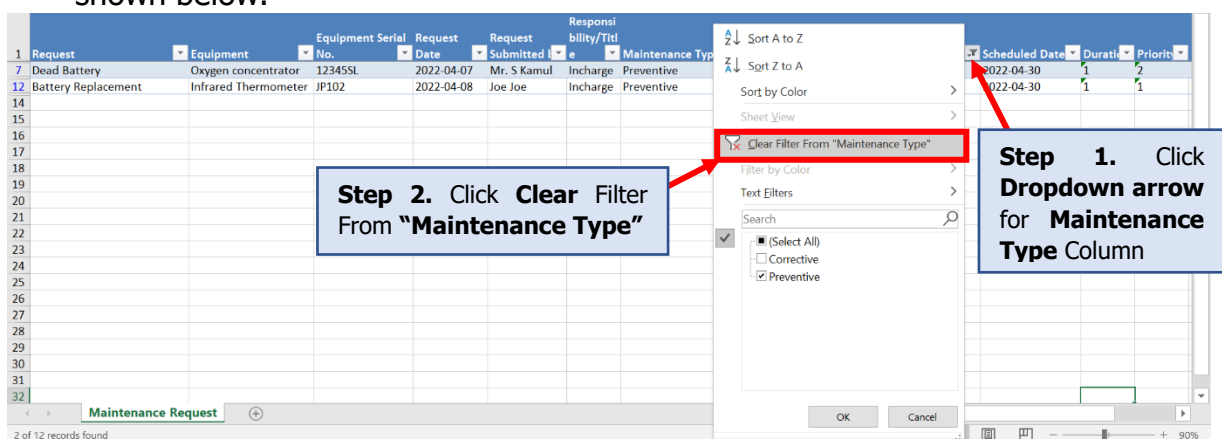
The new filter will be applied. In our example, the worksheet is now filtered to show only **New Request** for **Preventive** Maintenance.



8.1.7 Clear a filter

After applying a filter, you may want to remove—or **clear**—it from your worksheet so you'll be able to filter content in different ways.

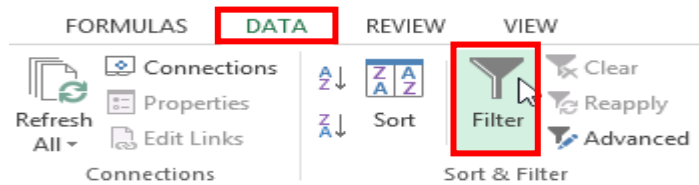
- Step 1: Click the **drop-down arrow** for the filter you want to clear. In our example, we'll clear the filter in column **G**. The **Filter** menu will appear as shown below.



- Step 2: Choose **Clear Filter From [COLUMN NAME]** from the Filter menu.
In our example, we'll select **Clear Filter From "Maintenance Type"**.

The filter will be cleared from the column. The previously hidden data will be displayed.

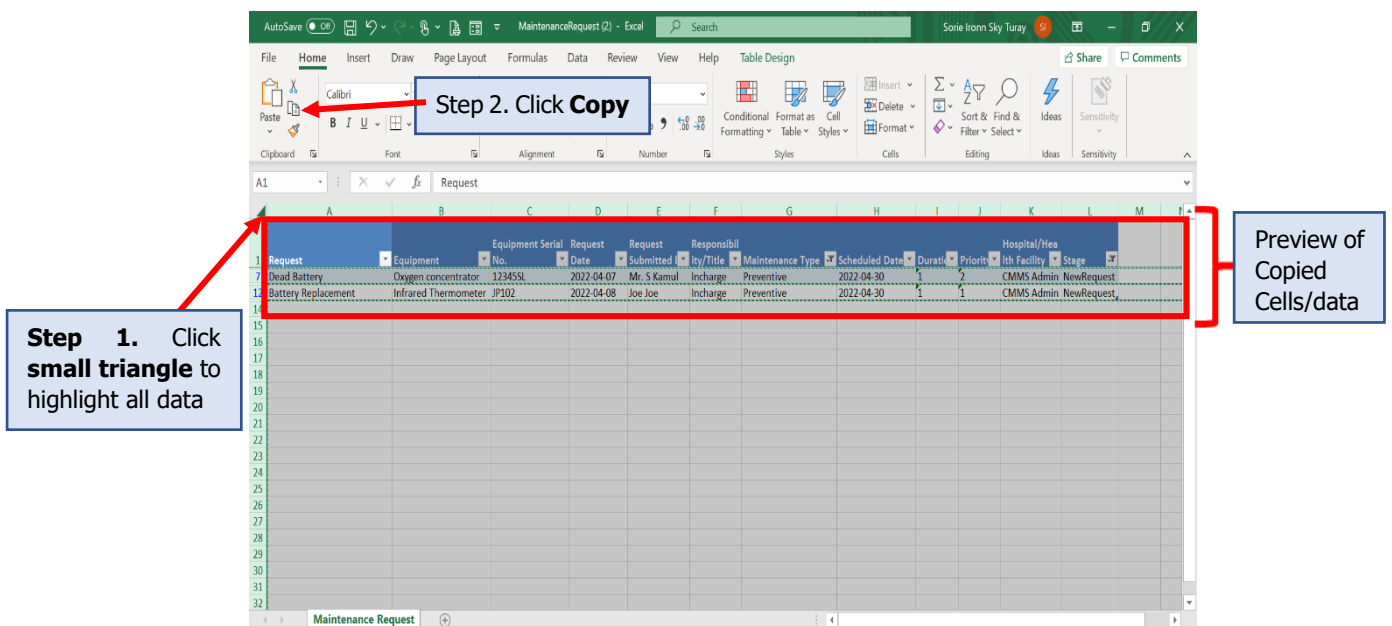
To remove all filters from your worksheet, click the **Filter** command on the **Data** tab.



8.1.8 Copying and Moving Filtered data to a new Sheet

We are moving/copying our filtered data to a **new worksheet** for analysis.

- Step 1: **Select/Highlight** the data you want to move to a new sheet
- Step 2: Select the **Copy**



8.1.9 Creating a new worksheet

A **workbook** is an **Excel file**, while a **worksheet** is **one of the spreadsheets in that file**. A workbook can contain multiple worksheets.

Step 1: Click the **add worksheet button** near the worksheet tabs:

Step 2: On the new sheet, Click **on the first Cell "A1"**

Step 3: Click Paste

Step 4: To rename the new sheet, **Right click** on the new sheet and select **Rename**.

E.g., **Preventive Maintenance Schedule**

Step 1: Click + to add a new **worksheet**

Step 2: Click on the first Cell "A1"

Step 3: Click Paste

Step 4: Right click on the new sheet and select **Rename**. E.g., **Preventive Maintenance Schedule**

It will always be the **right-most sheet** in your workbook.

Below is the data we have moved to a new sheet.

	A	B	C	D	E	F	G	H	I	J	K	L
	Request	Equipment	Equipment Serial No.	Request Date	Request Submitted by	Responsibility/Title	Maintenance Type	Scheduled Date	Duration	Priority	Hospital/Health Facility	Stage
1	Dead Battery	Oxygen concentrator	12345SL	2022-04-0	Mr. S Kamul	Incharge	Preventive	2022-04-30	1	2	CMMS Admin	NewRequest
2	Battery Replacement	Infrared Thermometer	JP102	2022-04-0	Joe Joe	Incharge	Preventive	2022-04-30	1	1	CMMS Admin	NewRequest
3												
4												
5												
6												
7												
8												
9												
10												
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17												
18												
19												

8.2 PivotTables

For data analysis and reporting, different datasets will be exported to Microsoft Excel, these includes Users profile, Equipment Inventory, Maintenance request and Spare parts consumption.

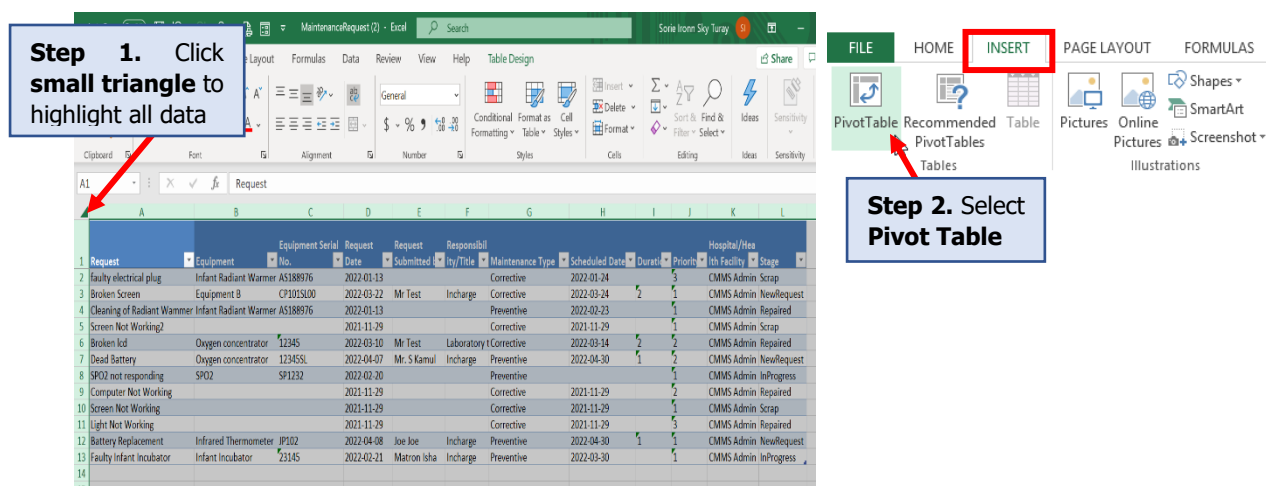
8.2.1 Using Pivot Tables to generate reports

When you have a lot of data, it can sometimes be difficult to analyse all the information in your worksheet. **PivotTables** can help make your worksheets more manageable by **summarising** data and allowing you to **manipulate** it in different ways.

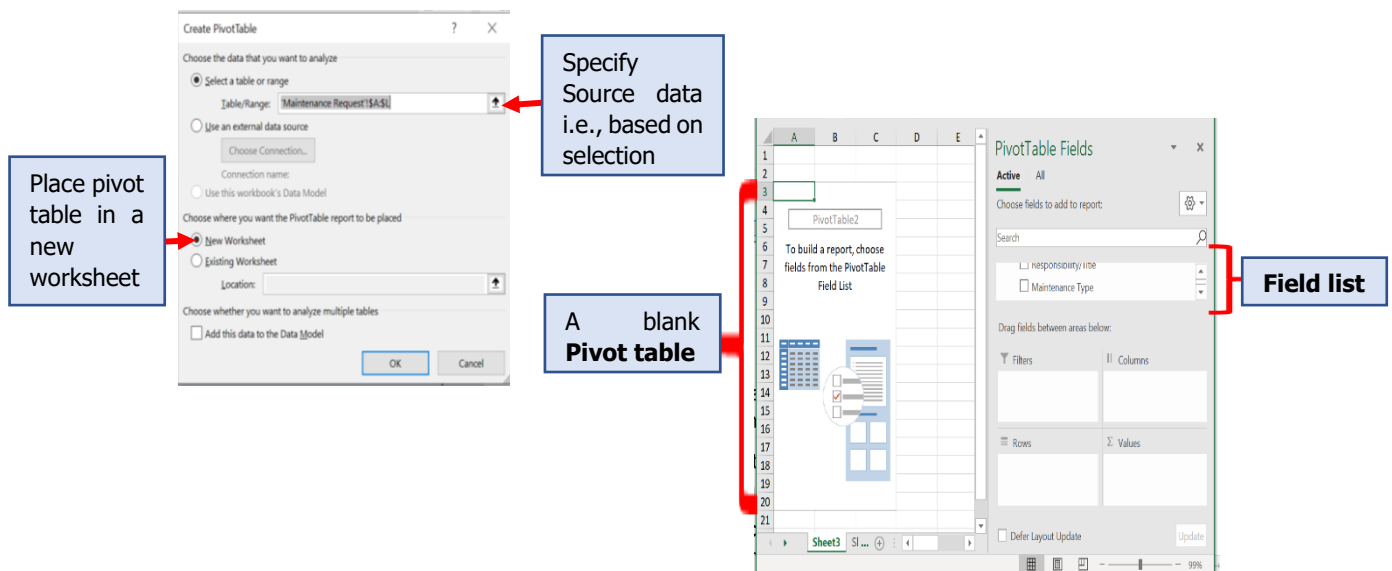
To create a PivotTable:

Step 1: Select the **table** or **cells** (including column headers) containing the data

Step 2: From the **Insert** tab, click the **PivotTable** command.



The **Create PivotTable** dialog box will appear as shown below. Choose your settings, then click **OK**. In our example, we'll use **Maintenance Request** as our source data and place the PivotTable on a **new worksheet**.

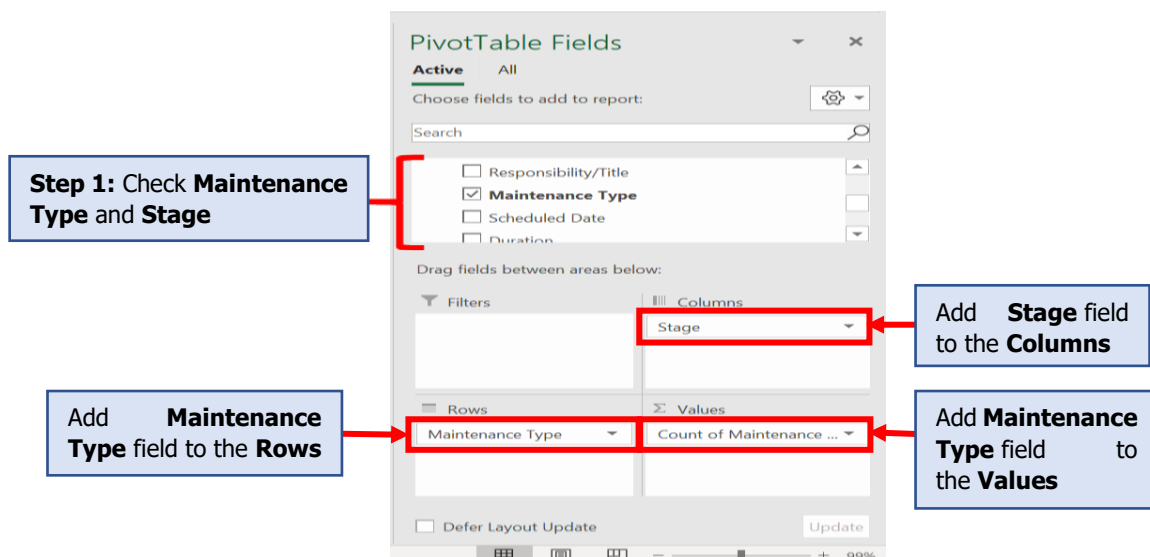


A blank **PivotTable** and **Field List** will appear on a new worksheet.

Once you create a PivotTable, you'll need to decide which **fields** to add. Each field is simply a **column header** from the source data.

In the **PivotTable Field List**, check the box for each field you want to add. In our example, we want to know for different **Maintenance Type** by **Stage**, so we'll

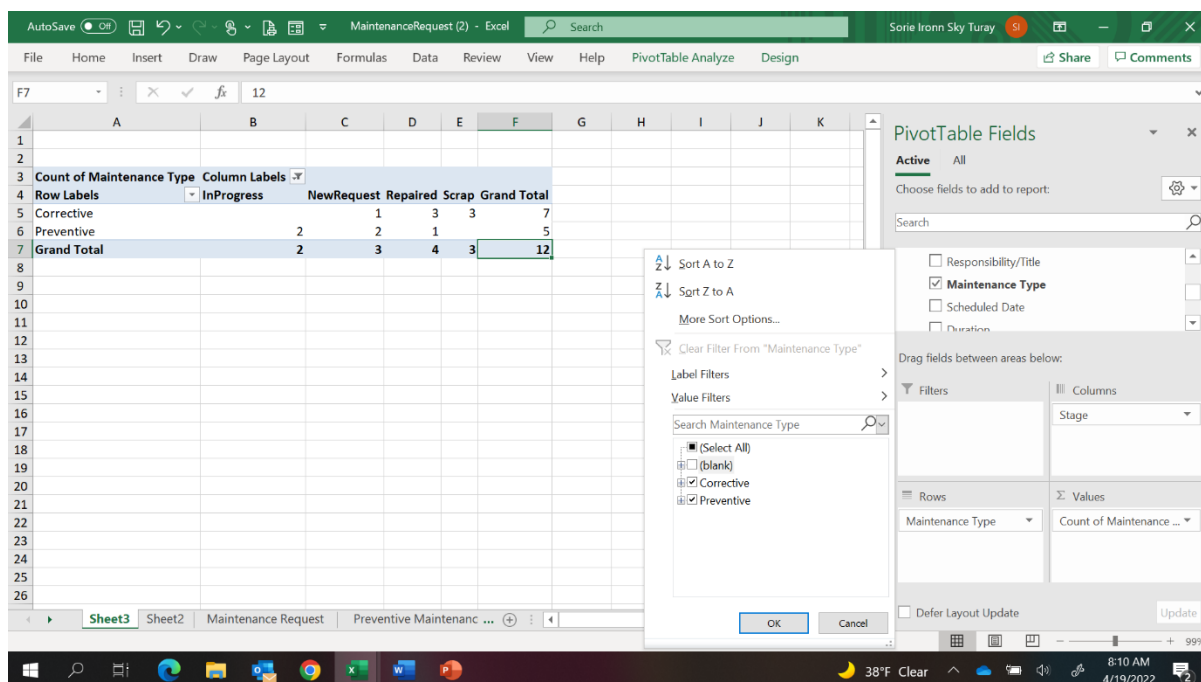
- **Step 1:** check the **Maintenance Type** and **Stage** fields



The selected fields will be added to one of the four areas below the Field List. In our example, the **Stage** field has been added to the **Column** area and **Maintenance Type** to **Rows**.

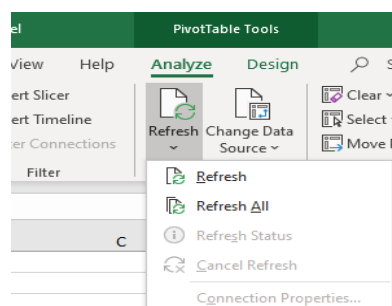
Adding the **Maintenance Type** to the **Values** area.

Alternatively, you can click, hold, and drag a field to the desired area.



The PivotTable will calculate and summarize the selected fields. In our example, the PivotTable shows the total **number of requests submitted** for different **maintenance type** by **stage**.

If you change any of the data in your source worksheet, the PivotTable **will not update automatically**. To manually update it, select the PivotTable and then go to **Analyse > Refresh**.



8.3 Pivoting data

One of the best things about PivotTables is that they can quickly **pivot** - or reorganise - data, allowing you to look at your worksheet data in different ways. Pivoting data can help you answer **different questions** and even **experiment** with the data to discover new trends and patterns.

In our example, we used the PivotTable to answer the question: **How many maintenance requests were submitted at the facility for the different Maintenance types by Stage?** But now we'd like to answer a new question:

What Priority was used for each Maintenance type based on Stage?

We can do this by simply changing/adding a field in the **Rows or Values** area.

To change the row:

- Click, hold, and drag any existing **fields** out of the **Rows** area. The field will disappear.

To add a new row:

Step 1: Drag a new field from the **Field List** into the **Values** area. In our example, we'll use the **Type** field.

Step 2: Use the **Filter** options to remove blank cells

Step 3: Deselect/Unchecked Blank

Step 4: Click **Ok** to apply filters and preview data

Converting **Values** to **Percentages** and displaying the result on a **Chart**

Step 1: Click on the field in the value box e.g., **Count of Gender** and select **Value Field Setting.....**

The image shows a screenshot of an Excel PivotTable and its 'Value Field Settings' dialog box. The PivotTable has 'Maintenance Type' in the Rows area and 'Count of Maintenance' in the Values area. A red box highlights the 'Count of Maintenance' field in the Values area, with a red arrow pointing to the 'Value Field Settings...' option in the context menu. The 'Value Field Settings' dialog box is open, showing 'Source Name: Gender', 'Custom Name: Count of Gender', and 'Summarize Values By: Show Values As'. The 'Show values as' dropdown is set to '% of Grand Total'. The 'Base field' is 'Gender' and the 'Base item' is 'Hospital ID'. A red arrow points to the '% of Grand Total' option in the dropdown. A blue box on the right says 'Step 2: Click dropdown Select "% of Grand Total" Click "OK" when done'. A blue box on the left says 'Step 1. Click dropdown on the field in the values area. Select "Value Field Settings...."'. The 'Number Format' button is at the bottom left of the dialog box.

Step 1. Click dropdown on the field in the values area. Select "Value Field Settings...."

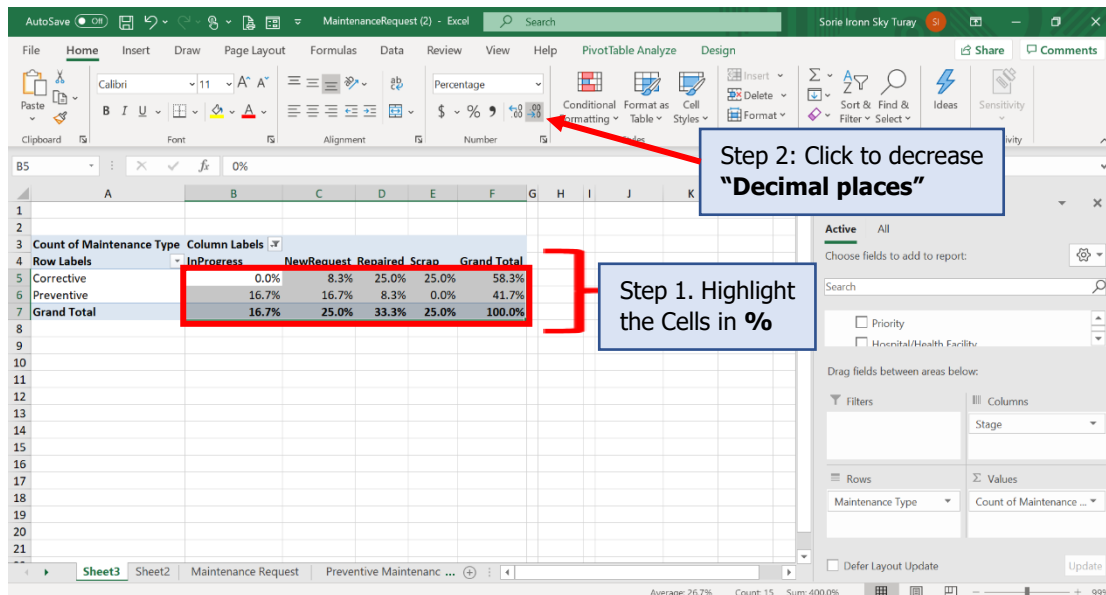
Step 2: Click dropdown Select "% of Grand Total" Click "OK" when done

Step 2: From the **Value Settings** Dialog box, Select **Show Values As >> % of Grand Total** from the dropdown and Click **Ok** when finish.

To Decrease the Decimal places,

Step 1: Highlight the cells in %

Step 2: From the **Home Tab**, Click the **Decrease Decimal** icon.



8.4 Pivot Charts

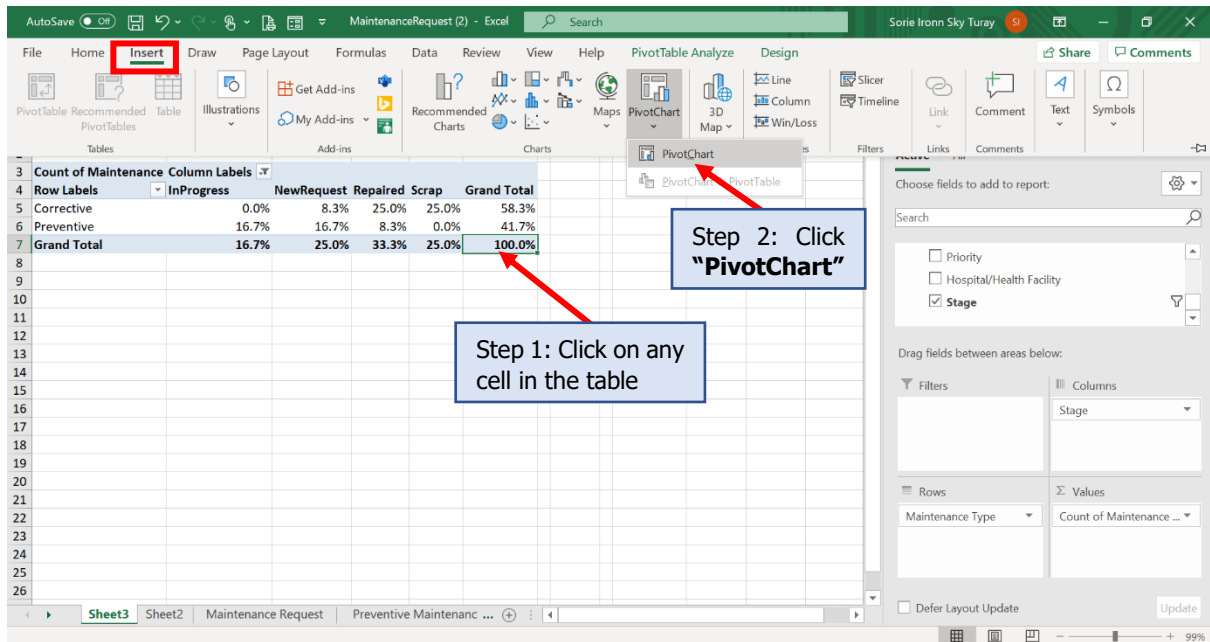
Pivot Charts are like regular charts, except they display data from a **PivotTable**. Just like regular charts, you'll be able to select a **chart type**, **layout**, and **style** that will best represent the data.

To create a PivotChart:

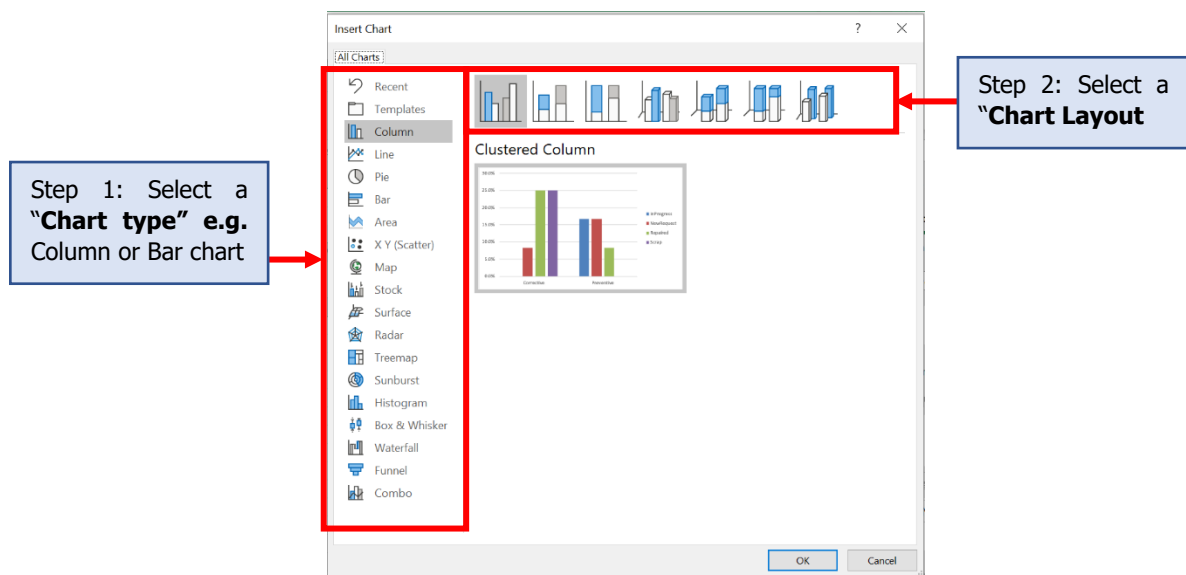
In this example, our PivotTable is showing the percentage **Maintenance type**. We'll use a **PivotChart** so we can see the information more clearly.

Step 1: Select/Click any cell in your PivotTable.

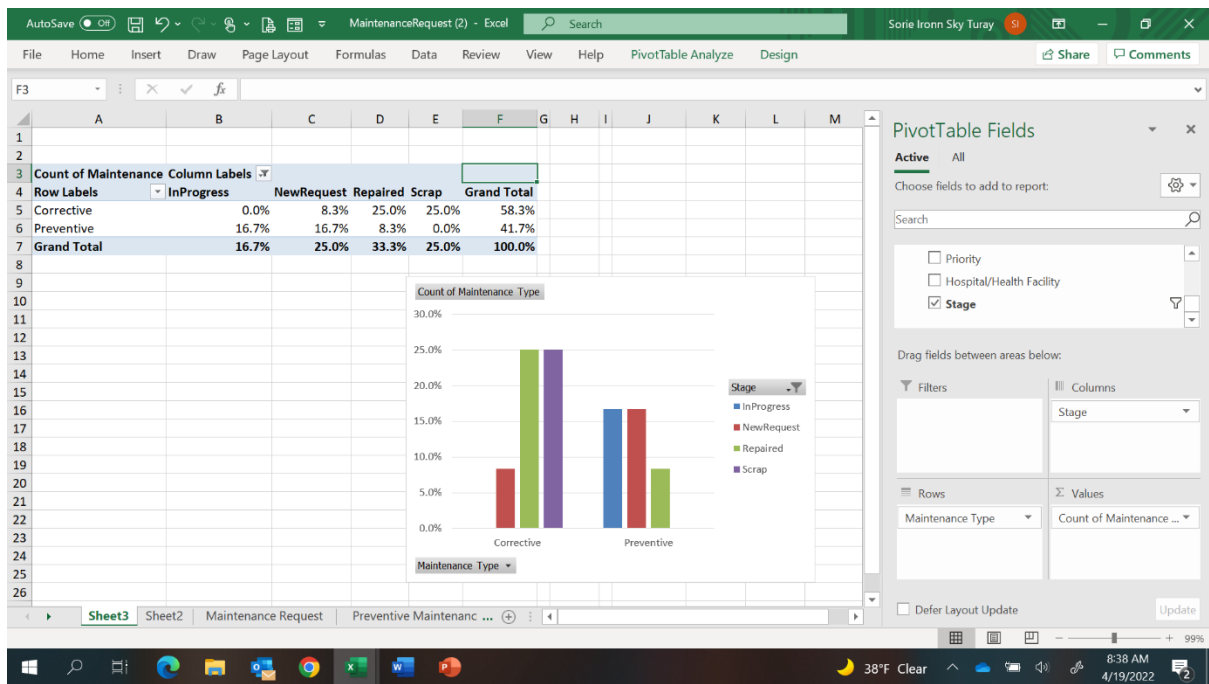
Step 2: From the **Insert** tab, click the **PivotChart** command.



The **Insert Chart** dialog box will appear. Select the desired **chart type** and **layout**, then click **OK**.



The PivotChart will appear as shown below.



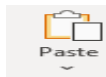
To copy a chart/table to a word document

- Select the **chart/table**
- Click **Copy**

Switch to the document window you want to move your chart/table.

Move the cursor where you want to paste.

From the **HOME tab**, Click **Paste**



9.0 POLICIES FOR CMMS USERS

1. ASSET MANAGEMENT
2. USER MANAGEMENT POLICY – CMMS
3. Data Protection Policy

9.1 ASSET MANAGEMENT

9.1.1 Introduction

This asset management policy provides a framework for the appropriate and effective management of IT equipment (hardware and software) as well as other workshop tools from procurement to disposal for Maintenance Units.

It defines responsibilities that relate to the implementation of this policy and is designed to ensure that assets are:

- Managed appropriately from the point of acquisition to the time of disposal in a way that is compliant with health facility policies and regulatory obligations.
- Registered within the hospital asset management system for tracking and auditing purposes.
- Supported and maintained throughout their lifecycle so that they deliver best value for the investment.
- For IT asset, ensured they are controlled effectively to protect the data and information that are stored or transmitted.
- Managed for the identification of risk and business continuity planning.

This policy does not stand in isolation and shall be implemented in conjunction with the wider range of assets, information security, procurement and financial related policies of MOHS.

9.1.2 Policy Scope

This policy applies to all physical assets purchased by the government or procured by partners for the health facility specifically the Maintenance Units that form part of the maintenance unit asset and infrastructure.

A physical asset is defined as:

- All IT assets,
 - desktop and laptop computers and related cables.
 - Dongles/modems, portable storage devices, other network infrastructure etc; System software, client applications and associated licences.
 - Any other IT peripheral devices (such as mouse, keyboard etc).
- Workshop tools and equipment's for maintenance activities

This policy applies to all hospital staff and other associates of maintenance unit, including partner organisations, and suppliers, who request or hold assets purchased on behalf of maintenance units.

9.1.3 Policy Intent

This policy is produced to provide a clear instruction on the appropriate management of assets to help ensure that the maintenance unit is meeting its legal, regulatory, contractual obligations. This policy has also been developed to help the maintenance units to maximise the investment in resources and technology and secure the best value for money from its assets.

9.1.4 Policy Provisions and Principles

a. Management of Assets

- All assets purchased for use by the maintenance unit are the property of the facility and will be utilised in a way that is deemed most effective for addressing the units needs and objectively demonstrates value for money.

- For compatibility and efficiency reasons, assets will be issued on a 'fit for purpose' basis based on predefined roles.
- Enquiries about and requests for individual assets must be submitted to the head of maintenance via the Hospital Secretary in accordance with current ordering processes and procedures.
- For IT asset replacement, DPPI will assess requests for new equipment's fulfil them with standard IT equipment that best fit the requirement by aiming to reissue assets held in the centralised store in the first instance. Requests for non-standard IT equipment or specialist IT equipment will be assessed by the hospital management and approved via a business case through the appropriate channels. The total cost of the assets will be added to the maintenance unit budget in the AWP if the purchase is authorised by the Hospital Management.

The procurement of IT assets must be undertaken in consultation with DPPI from inception. DPPI is responsible for engaging with the Procurement Team and ensuring that the best procurement practice is followed as per the MOHS policies and applicable legislation.

The hospital management will not, without adequate and suitable further justification, approve or proceed with the procurement of IT assets that do not comply with the requirements of the maintenance unit Strategic Plan.

End users are not allowed to install unapproved software on devices. Requests should be made to DPPI-MOHS IT Service Desk to have additional software that is not on the approved hardware and software list installed on to a device.

- End users must always contact HS & DPPI-MOHS IT Service Desk if they need to move, reassign, or return IT equipment.
- In order to ensure the confidentiality of information, any IT asset that has been used to process or store personal or sensitive information will be wiped before being reissued.

- All assets purchased (excluding consumable items, e.g., printing paper, printer cartridge) will be registered in the asset register and be asset tagged before being issued or put into use.
- Information about all assets will be held in the asset register, which will be maintained by the HS, to enable them to be tracked, managed, and audited throughout their entire lifecycle.

The maintenance unit must comply with this policy. A breach of this policy may result in being prevented from using maintenance unit provided equipment's/tools. A breach may also need to be dealt with in accordance with relevant policies

Individual users or the unit will be held responsible for protecting ALL assets that have been assigned to them against physical or financial loss whether by theft, mishandling or accidental damage by using appropriate physical security measures.

b. Responsibilities

Head of Maintenance

The head of maintenance is accountable for the implementation of this policy in the unit. The Maintenance head will be responsible for:

- Coordinating asset audit activity such as annual inventory checks for management reporting including the annual audit report for the hospital management
- Updating and maintaining the accuracy of the asset register as soon as a change is made (including office moves, reports of lost or stolen equipment and disposals)
- Ensuring that asset/tools signed for by end users when they are assigned and is recorded in a register
- Ensuring that all assets are processed, and asset tagged before they are issued to end users
- Ensuring that any asset that is retired is disposed of in accordance with relevant policies

- Giving correct and appropriate advice to users on the correct handling of asset/tools
- Reporting any incorrect disposal or misuse of an asset to an appropriate manager within the hospital as soon as possible.

End users

End users assigned with assets/other workshop tools will be responsible for:

- Retaining responsibility for an asset/tool assigned to them
- Ensuring that asset/tools are not moved to another location (if fixed) or transferred to another person or department without the consent of the unit head;
- Reporting the loss or theft of IT assets/tools immediately to the unit head
- Reporting immediately any defects to IT assets/tools that are not operating normally to the relevant authority via the unit head.

9.1.5 Compliance

Any actual or suspected breach of this policy, the maintenance head will take appropriate action and inform the relevant internal and external authorities.

9.2.0 USER MANAGEMENT POLICY – CMMS

9.2.1 Introduction

This document defines the user access management policy for the Computerised Maintenance Management System ensuring account access is authorised and underpins the requirements of relevant policies

9.2.2 Policy Statement and scope

- This document defines the user access management policy for all users and this policy applies to CMMS and services hosted both internally and externally, included nationally hosted systems.
- The policy describes the registration and de-registration process of user accounts and applies to staff (including new starter and leavers) and those moving roles as well as temporary staff (including students, volunteers, third party and contract staff)
- Access to the CMMS will be subject to approval by the DPPI-MOHS relevant system administrators through a request to HSS from the head of maintenance or HS.

9.2.3 Objectives

This policy will ensure that appropriate procedures are in place to manage the process for new user accounts, amendments to user privileges for staff that have left the institution to ensure the confidentiality of hospital inventory and maintenance data.

9.2.4 Procedures

The unit head with IT support will follow the relevant procedure to grant access to new users, deactivation of staff leaving their unit/facility and role changes are undertaken in line with requirements of the maintenance unit.

9.2.4.1 New Users

- Access to the CMMS shall be controlled through a formal user registration process beginning with a formal request from unit heads to DPPI through HSS.

- Each user shall be identified by a unique user identification. Temporary password will be given to the user for which users are required to change password at first login.
- To request access, a formal written request will be submitted to the DPPI through HSS.
- Each user will be required to sign a compliance form to ensure a record of their access rights and that they understand the conditions of access and abide by the policy and procedures.
- Passwords will be issued to the user upon submission of a filled and signed compliance form
- A separate procedure will be in place for short-term accounts (including volunteers and students) are managed appropriately

9.2.4.2 Change of User Requirements

- Changed requirements will normally relate to an alteration to the modules used. Changed requirements must be requested by the unit head using the relevant electronic form which is available.

9.2.4.3 Change of Password

- All users will be required to change their password every 90 days.
- Where a user has forgotten their password, the unit head is authorised to request a password reset to the systems administrator, provided the user already has access to the CMMS. Where access was not granted earlier, the users' needs to complete a formal request.

9.2.4.4 Removal of Users

- As soon as a staff leaves his/her role for reason of resignation, retirement, severance, dismissal or any other legal cause, all logins must be revoked.
- As part of the employee termination or transfer process to another facility, the maintenance head will have a notification from HSS. Once received s/he will disable the account.

9.2.4.5 review of user access rights

- The CMMS administrator will institute a review of all access rights to the systems once a quarter which is designed to positively confirm all users.
- Annually the CMMS administrator will institute a review of access to the CMMS. This will be done in co-operation with the unit heads and will be designed to positively re-confirm all users; all other logons will be deleted. In exceptional circumstances (including Maternity Leave) accounts which have not been used for some time will not be deleted but will continue to be monitored.

The review will be conducted as follows:

- The CMMS administrator will generate a list of all users and their access rights
- The list will be sent to the unit heads/hospital management who will confirm that all users are authorised to still use the system
- Any users who are no longer authorised to use the system will be removed from the system

The Unit head will maintain records of:

- Audits completed
- System administrator responses
- Actions taken

9.2.5 Responsibilities

End Users

All users of CMMS must be made aware of the contents and implications of the user access management policy and the general requirement to ensure system security.

Irresponsible or improper actions by users may result in disciplinary actions(s).

End users must:

- Keep their user details up-to-date, accurate and confidential.
- Report to the unit head if a user considers they have inappropriate permissions or access.

- Ensure any requests for new user accounts or modification to access permissions are completed using the compliance forms which are sent to the unit head
- Keeping their password secure and ensure it is neither disclosed to nor used by other parties, under any circumstances.
- Only access the system using their own login and password. All staff are accountable for any activity carried out under their login and password, and this is audited.
- Notify their manager that their access rights should be changed and ensure that they do not continue to use access privileges from a previous role if a user changes their role.

System Administrator

The system administrator(s) must:

- Ensure the production of all relevant operating procedures reflecting the requirements of this policy
- Ensure all staff are aware of their responsibilities in line with this policy
- Undertake review of access rights to the CMMS application and act on the results of these audits
- Ensure records are accurate and kept up to date
- Monitor and check compliance with this policy
- Promote awareness and providing guidance on this policy

Head of Maintenance

The unit head must:

- Ensure all staff are made aware of their security responsibilities as indicated in this policy
- Ensure that all users under their management are given the appropriate access rights for their role

9.2.6 Training

Training relating to this policy must take place during the induction programme for new staff or as part of refresher training at least every year

9.2.7 Review

This Policy will be reviewed after 3 years, or sooner, as required.

9.3.0 DATA PROTECTION POLICY

9.3.1 Introduction

The CMMS comprises of assets to the Hospital, HSS and MOHS. The assets include hardware devices, software, and data, essential to the effective and continuing operation of the maintenance unit.

The data for and in this system is confidential and sensitive, and it is necessary for all information systems to be protected against any events, accidental or malicious, which may put at risk the data or the activities of unit and the hospital.

This policy applies to all electronic and manual data collection systems used by maintenance unit. All staff are required to adhere to this policy.

9.3.2 Policy Statement and scope

- This policy describes the processes for improving and maintaining security of the CMMS.
- Further,
- This policy describes the processes to ensure that the hospital maintenance units comply with current statutory obligations and observes standards of good practice.
- This policy describes the processes to minimise the risk of data security breach.

9.3.3 Policy Overall

DPPI-MOHS is committed to developing and maintaining CMMS infrastructure, which has an appropriate level of security and data protection. All systems will have a minimum-security framework.

CMMS is managed by Admin-Staff at facility level with support from DPPI - MOHS IT support team on behalf of HSS. In the case of hospital maintenance unit, it is the responsibility of unit head to ensure compliance with this policy.

Sharing of information with other organisations or individuals is subject to approval by hospital management and HSS.

Specifically, the principles require that data:

- Shall be processed fairly and lawfully and shall not be shared unless specific conditions are met.
- Shall be obtained only for one or more specified and lawful purposes and shall not be further processed in any manner incompatible with that purpose or those purposes.
- Shall be adequate, relevant, and not excessive in relation to the purpose or purposes for which they are processed.
- Shall be accurate and, where necessary, kept up to date.
- Appropriate measures shall be taken against unauthorised or unlawful processing of data Therefore, Hospital maintenance unit will:
- Observe fully conditions regarding the fair collection and use of information.
- Meet its obligations to specify the purposes for which data is used.
- Collect and process appropriate data, and only to the extent that it is needed to fulfil operational needs or to comply with any legal requirements.
- Ensure the quality of data used.

In addition, hospital maintenance units will ensure that:

- There is someone with specific responsibility for data protection in the unit.
- Everyone managing and handling personal information understands that they are contractually responsible for following good data protection practice.
- Anybody wanting to make enquiries about handling personal information knows what to do.
- Queries about handling personal information are promptly and courteously dealt with.
- Methods of handling personal information are clearly described.

This concludes the current Data Protection Policy that hospital maintenance units have agreed to abide by. The information presented here does not constitute legal advice. For personal legal advice on this or other areas you should consult a solicitor.

9.4.0 RELATED DOCUMENT

Proof for reading and understanding policies

9.4.1 DOCUMENT ATTESTATION RECORDS

I have read and understood the following document(s):			
NAME	SIGNATURE	DESIGNATION	DATE

I have read and understood the following document(s):

[illegible]