Faculty of Engineering Cairo University

Systems and Biomedical Engineering Department

CMMS for hospitals

Prepared by: Team No. 2

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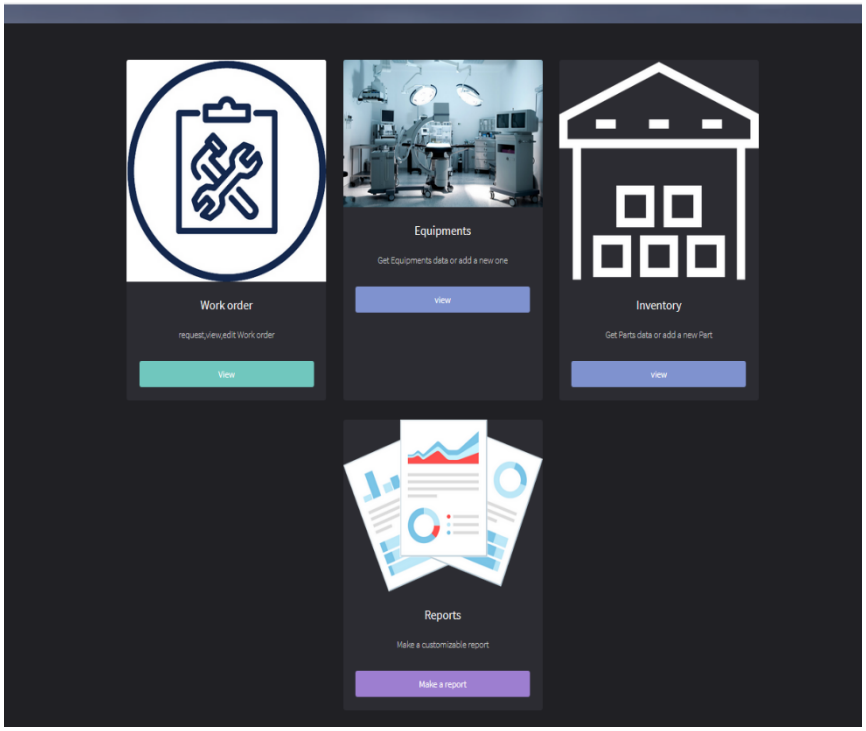
1. Introduction:

This CMMS system is Web based system it was implemented using Python and Flask, for the database we used PHPMyadmin as our local server.

The website consists of four icons.

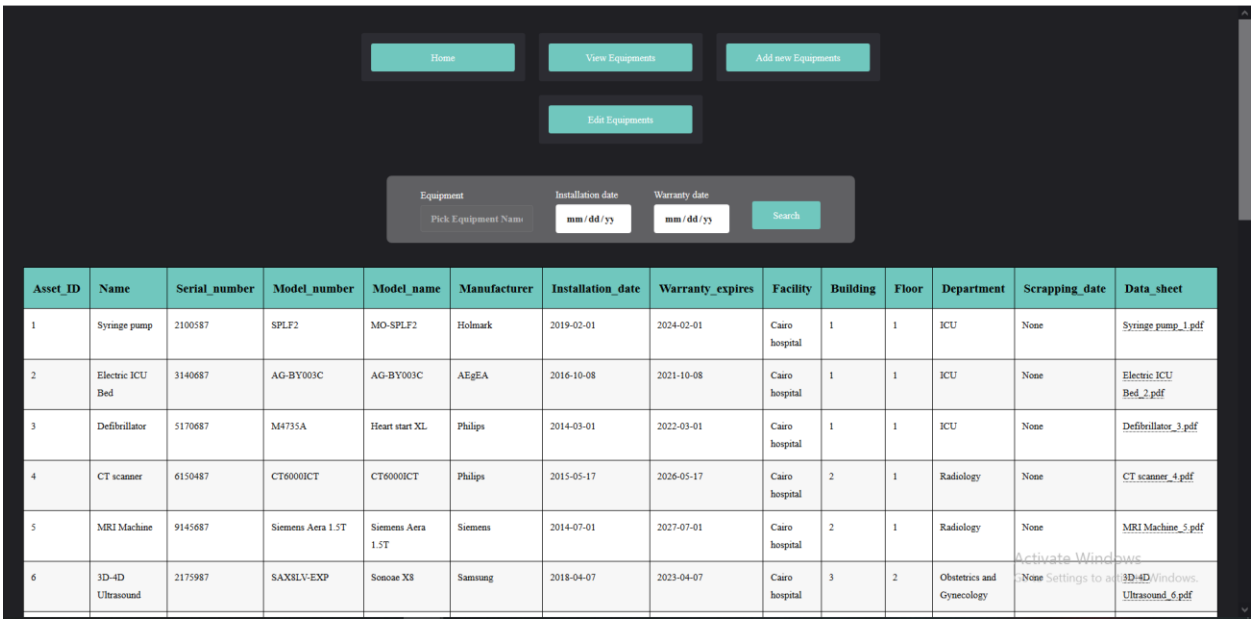


2. Equipment Icon:

In the equipment icon a user can view current equipment in the database, and search for them by three fields , the equipment name the, the installation date and the warranty expiration date, the user can also add a new equipment or edit an existing one also a user can open the data sheet of each equipment.

2.1 view and search

Once the user clicks on the view equipment button he equipment table will appear

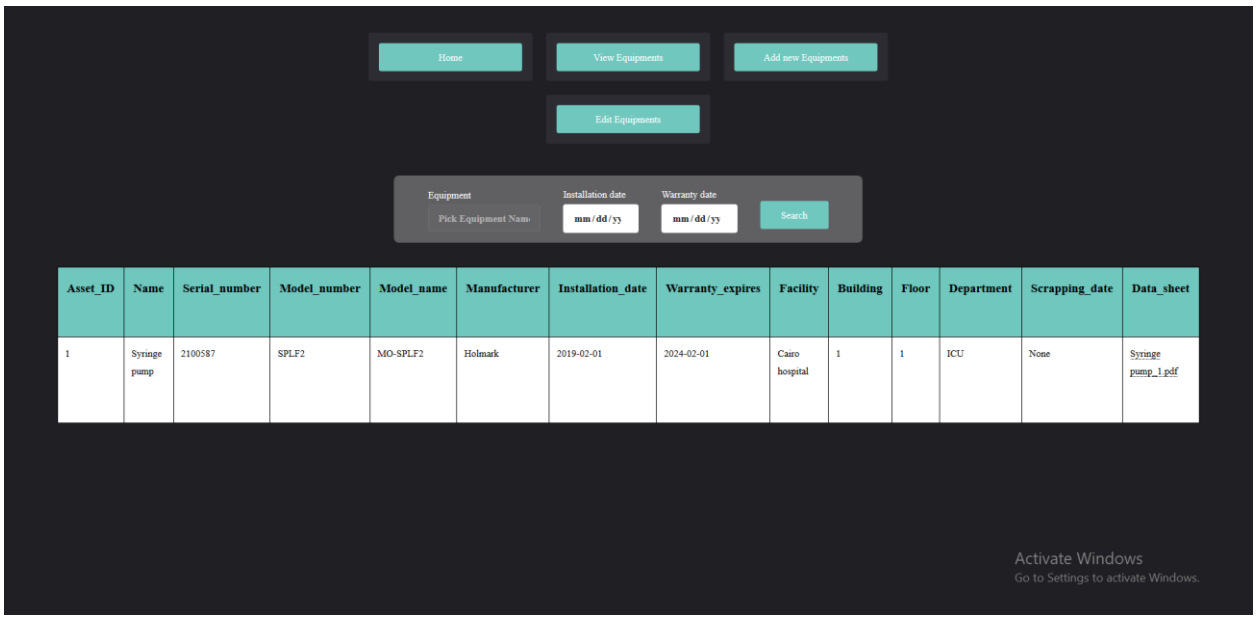


Asset_ID	Name	Serial_number	Model_number	Model_name	Manufacturer	Installation_date	Warranty_expires	Facility	Building	Floor	Department	Scrapping_date	Data_sheet
1	Syringe pump	2100587	SPLF2	MO-SPLF2	Holmark	2019-02-01	2024-02-01	Cairo hospital	1	1	ICU	None	Syringe pump_1.pdf
2	Electric ICU Bed	3140687	AG-BY003C	AG-BY003C	AEgEA	2016-10-08	2021-10-08	Cairo hospital	1	1	ICU	None	Electric ICU Bed_2.pdf
3	Defibrillator	5170687	M4735A	Heart start XL	Philips	2014-03-01	2022-03-01	Cairo hospital	1	1	ICU	None	Defibrillator_3.pdf
4	CT scanner	6150487	CT6000ICT	CT6000ICT	Philips	2015-05-17	2026-05-17	Cairo hospital	2	1	Radiology	None	CT scanner_4.pdf
5	MRI Machine	9145687	Siemens Aera 1.5T	Siemens Aera 1.5T	Siemens	2014-07-01	2027-07-01	Cairo hospital	2	1	Radiology	None	MRI Machine_5.pdf
6	3D-4D Ultrasound	2175987	SAX8LV-EXP	Sonoae X8	Samsung	2018-04-07	2023-04-07	Cairo hospital	3	2	Obstetrics and Gynecology	None	3D-4D Ultrasound_6.pdf

Activate Windows
Go to Settings to activate Windows.

We can search for an equipment by entering its name:

The following screen shot was taken when entering Syringe pump in the first field.

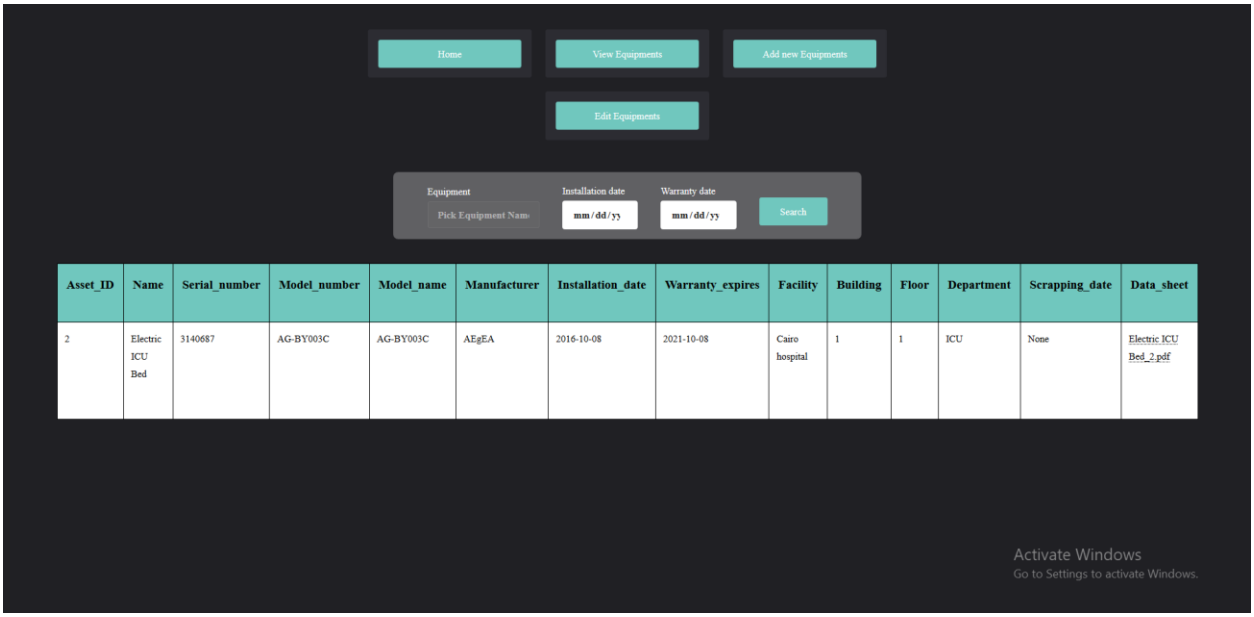


Asset_ID	Name	Serial_number	Model_number	Model_name	Manufacturer	Installation_date	Warranty_expires	Facility	Building	Floor	Department	Scrapping_date	Data_sheet
1	Syringe pump	2100587	SPLF2	MO-SPLF2	Holmark	2019-02-01	2024-02-01	Cairo hospital	1	1	ICU	None	Syringe pump_1.pdf

Activate Windows
Go to Settings to activate Windows.

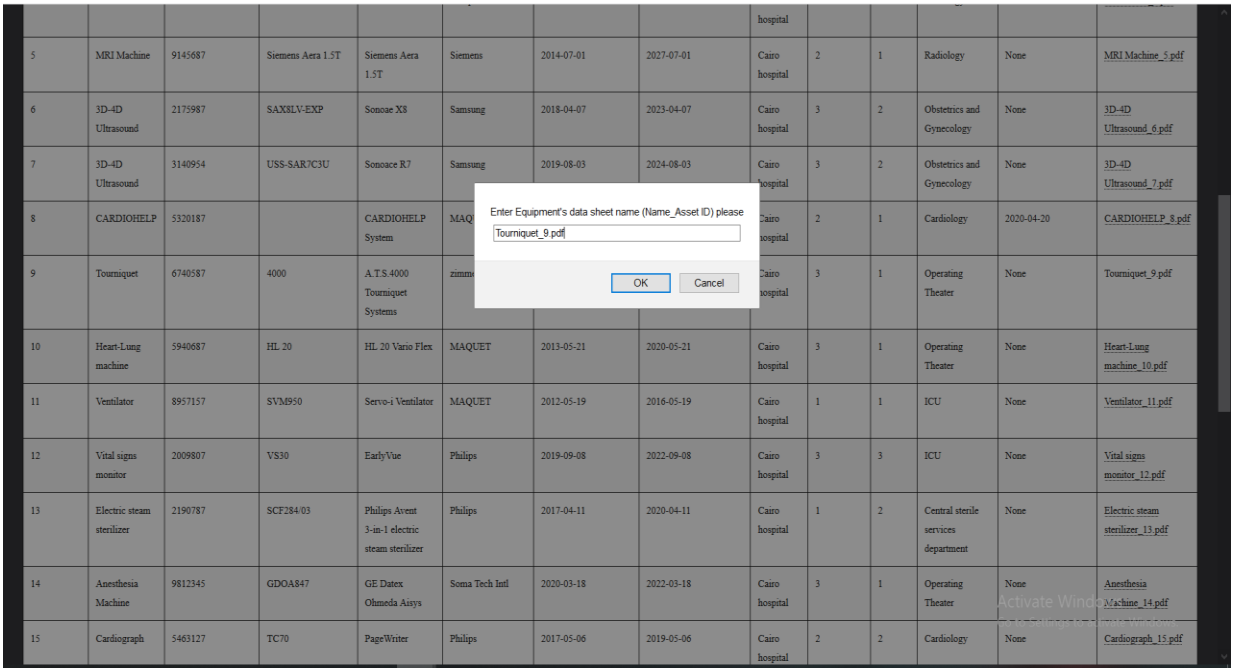
Or by entering the installation and warranty expiration dates:

The following screen shot was taken by entering 2016-10-08 in the second field and 2021-10-08 in the last field.



Asset_ID	Name	Serial_number	Model_number	Model_name	Manufacturer	Installation_date	Warranty_expires	Facility	Building	Floor	Department	Scrapping_date	Data_sheet
2	Electric ICU Bed	3140687	AG-BY003C	AG-BY003C	AEgEA	2016-10-08	2021-10-08	Cairo hospital	1	1	ICU	None	Electric ICU Bed_2.pdf

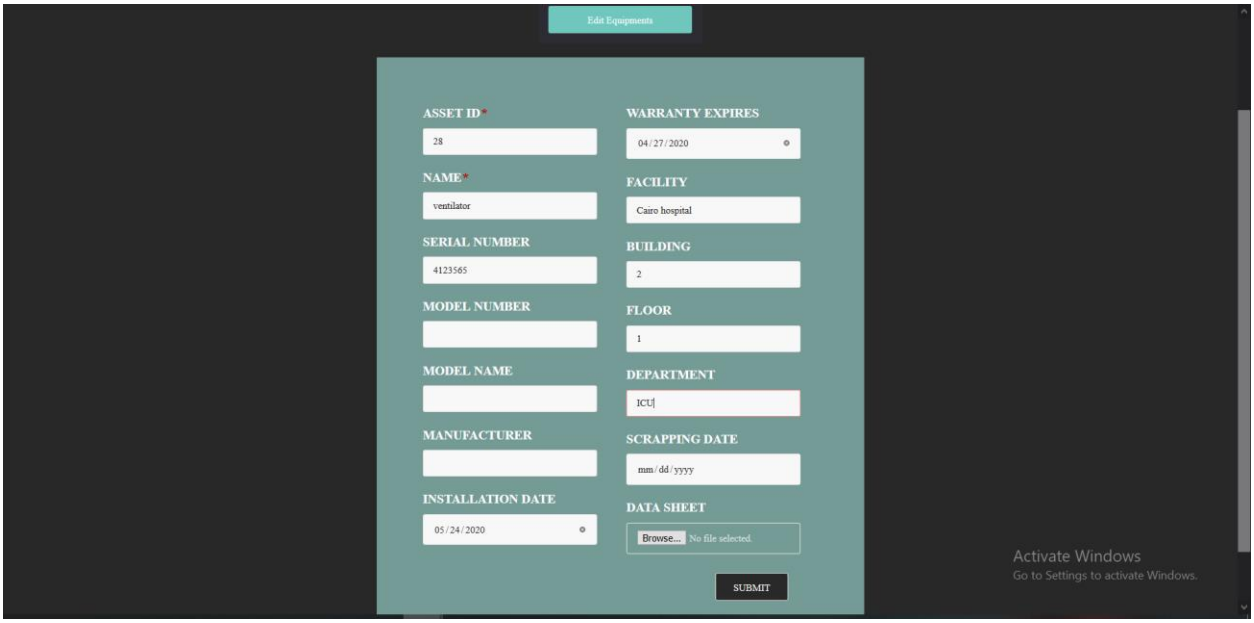
The user can open an equipment data sheet by clicking on the data sheet name in the data sheet column, a window will pop up and asking for the data sheet name by filling it we can open the data sheet as in the following screen shots:

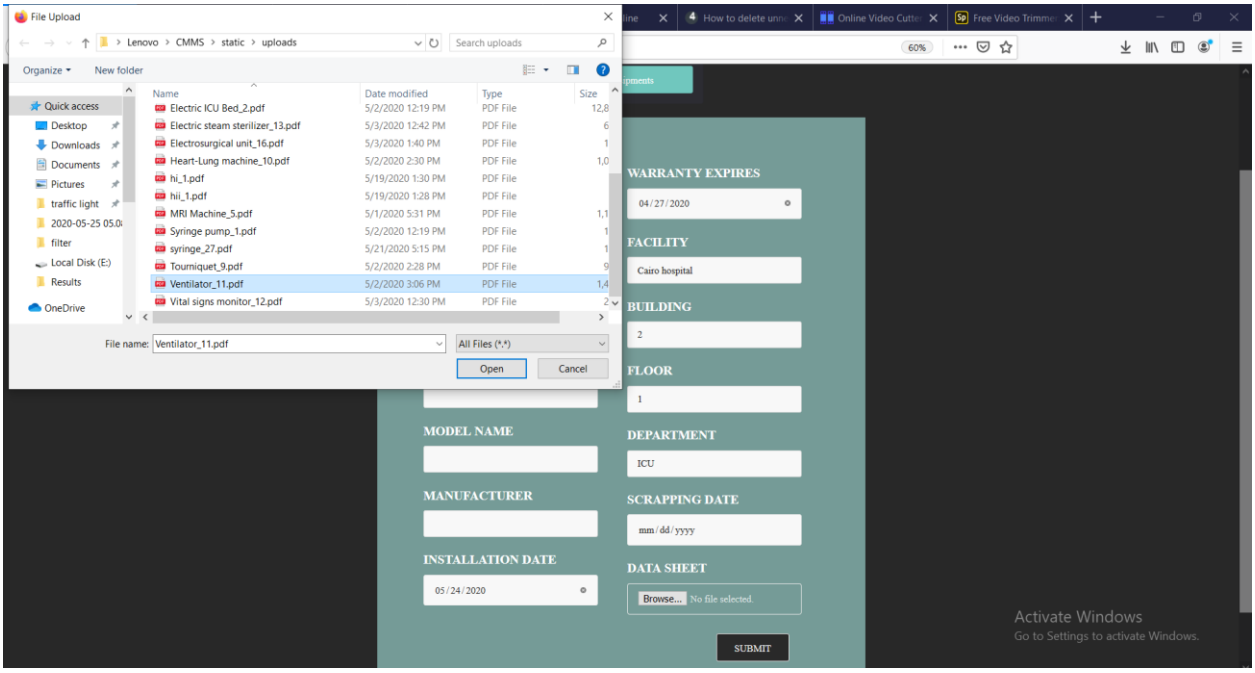


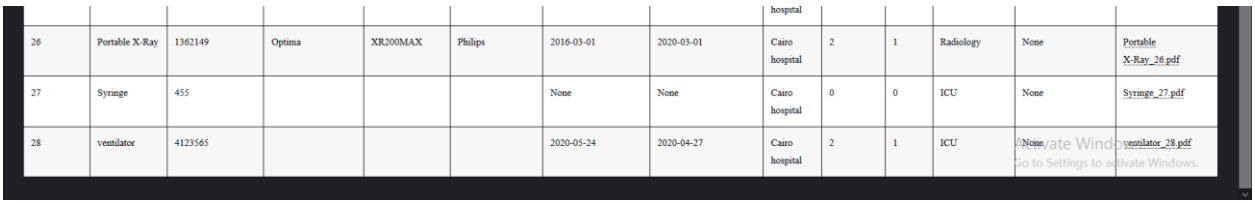
								hospital					
5	MRI Machine	9145687	Siemens Aera 1.5T	Siemens Aera 1.5T	Siemens	2014-07-01	2027-07-01	Cairo hospital	2	1	Radiology	None	MRI Machine_5.pdf
6	3D-4D Ultrasound	2175987	SAX8LV-EXP	Sonoae X8	Samsung	2018-04-07	2023-04-07	Cairo hospital	3	2	Obstetrics and Gynecology	None	3D-4D Ultrasound_6.pdf
7	3D-4D Ultrasound	3140954	USS-SAR7C3U	Sonoace R7	Samsung	2019-08-03	2024-08-03	Cairo hospital	3	2	Obstetrics and Gynecology	None	3D-4D Ultrasound_7.pdf
8	CARDIOHELP	5320187		CARDIOHELP System	MAQ			Cairo hospital	2	1	Cardiology	2020-04-20	CARDIOHELP_8.pdf
9	Tourniquet	6740587	4000	A.T.S.4000 Tourniquet Systems	zimm			Cairo hospital	3	1	Operating Theater	None	Tourniquet_9.pdf
10	Heart-Lung machine	5940687	HL 20	HL 20 Vario Flex	MAQUET	2013-05-21	2020-05-21	Cairo hospital	3	1	Operating Theater	None	Heart-Lung machine_10.pdf
11	Ventilator	8957157	SVM950	Servo-i Ventilator	MAQUET	2012-05-19	2016-05-19	Cairo hospital	1	1	ICU	None	Ventilator_11.pdf
12	Vital signs monitor	2009807	VS30	EarlyVue	Philips	2019-09-08	2022-09-08	Cairo hospital	3	3	ICU	None	Vital signs monitor_12.pdf
13	Electric steam sterilizer	2190787	SCF284/03	Philips Avent 3-in-1 electric steam sterilizer	Philips	2017-04-11	2020-04-11	Cairo hospital	1	2	Central sterile services department	None	Electric steam sterilizer_13.pdf
14	Anesthesia Machine	9812345	GDOA847	GE Datex Ohmeda Aisys	Soma Tech Intl	2020-03-18	2022-03-18	Cairo hospital	3	1	Operating Theater	None	Anesthesia Machine_14.pdf
15	Cardiograph	5463127	TC70	PageWriter	Philips	2017-05-06	2019-05-06	Cairo hospital	2	2	Cardiology	None	Cardiograph_15.pdf

2.2 Add new equipment:

We can add a new equipment by filling the following for we can also upload a pdf data sheet while adding the equipment.

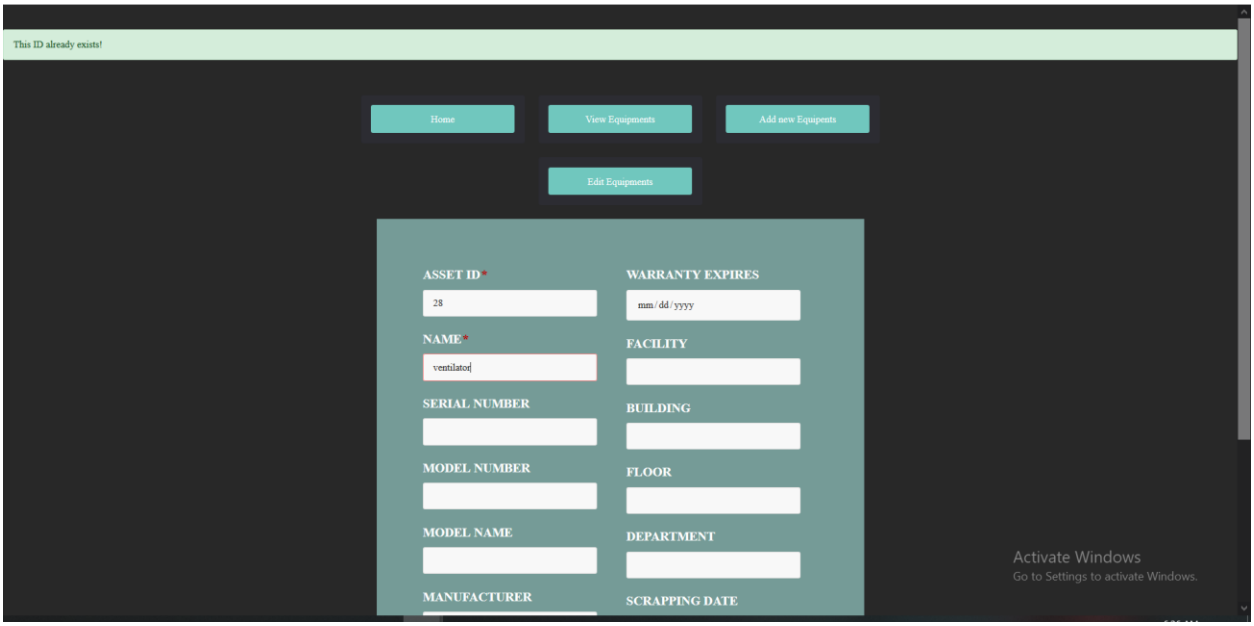






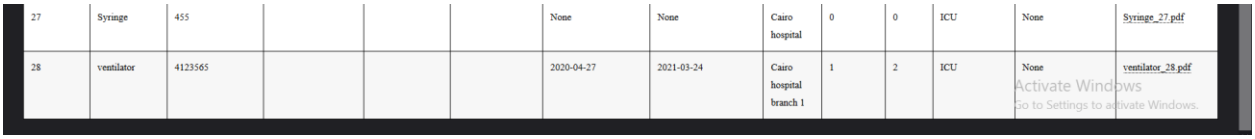
								hospital					
26	Portable X-Ray	1362149	Optima	XR200MAX	Philips	2016-03-01	2020-03-01	Cairo hospital	2	1	Radiology	None	Portable X-Ray_26.pdf
27	Syringe	455				None	None	Cairo hospital	0	0	ICU	None	Syringe_27.pdf
28	ventilator	4123565				2020-05-24	2020-04-27	Cairo hospital	2	1	ICU	None	ventilator_28.pdf

When we try to add an existing equipment we get a message that it is already existed:



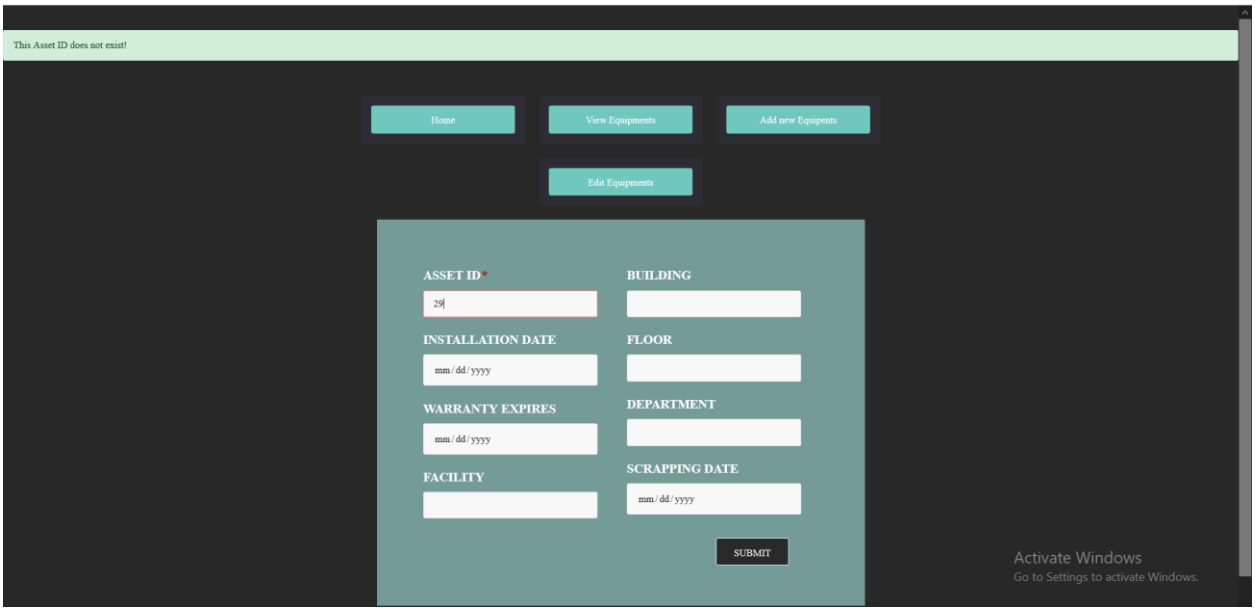
2.3 Edit an existed equipment:

By entering the equipment ID we can edit it:



27	Syringe	455				None	None	Cairo hospital	0	0	ICU	None	Syringe_27.pdf
28	ventilator	4123565				2020-04-27	2021-03-24	Cairo hospital branch 1	1	2	ICU	None	ventilator_28.pdf

When we try to edit an equipment by entering a non-existing asset ID we get a message:



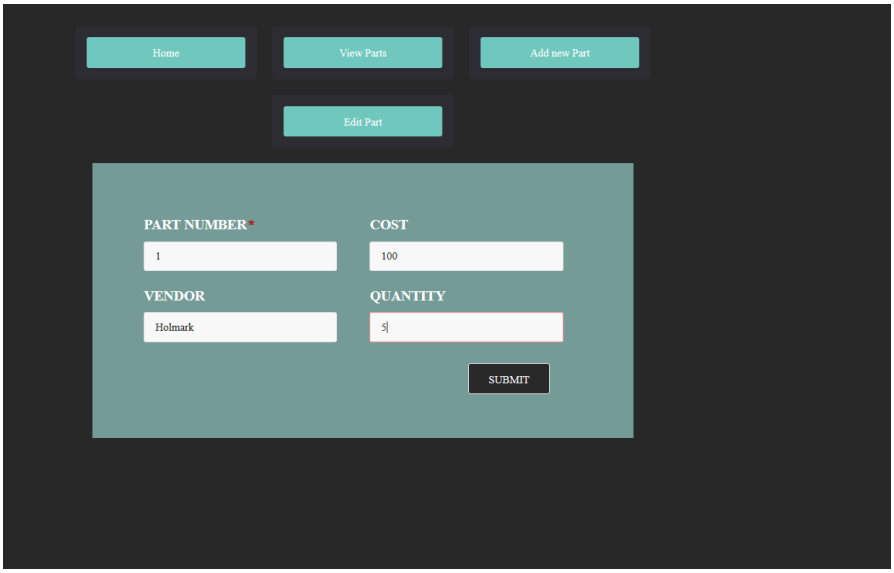
3. Inventory Icon:

In this icon we can view the spare parts of each equipment, add a new part or edit an existing part.

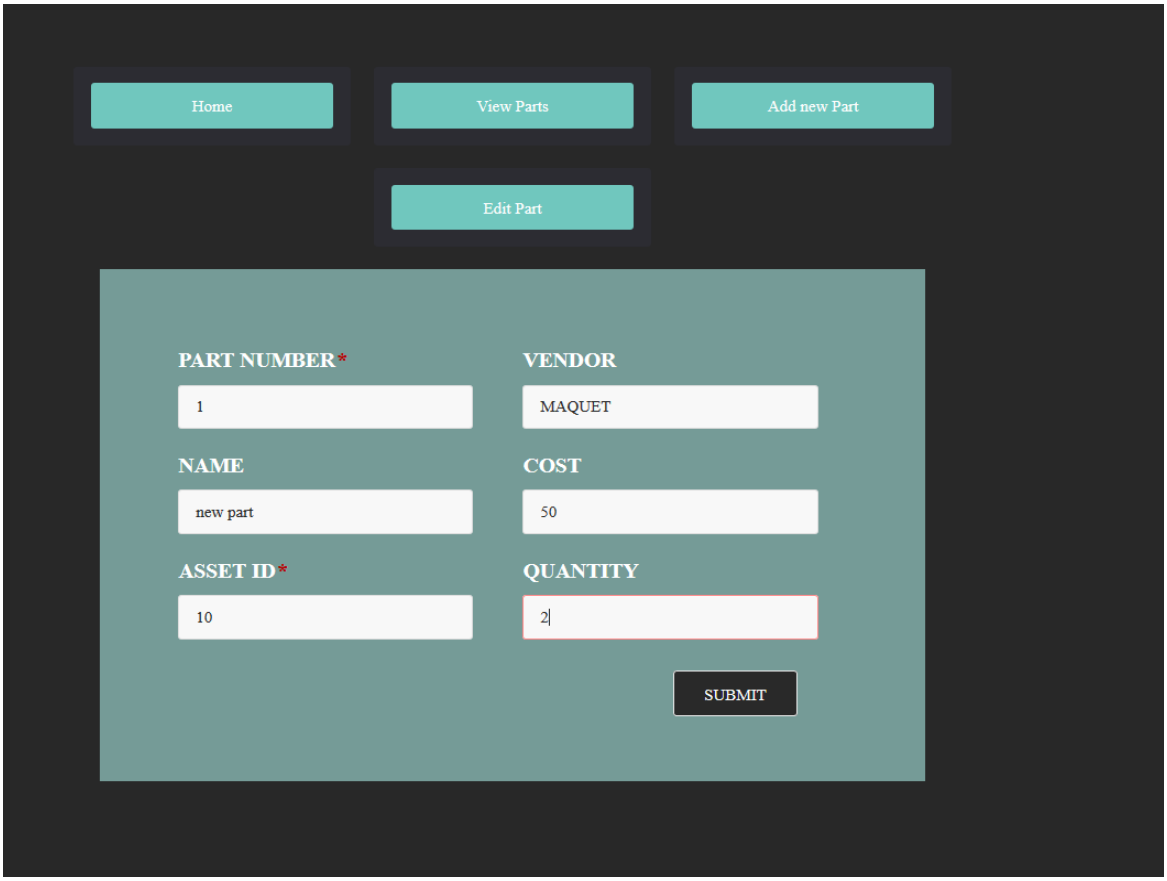
3.1 View parts

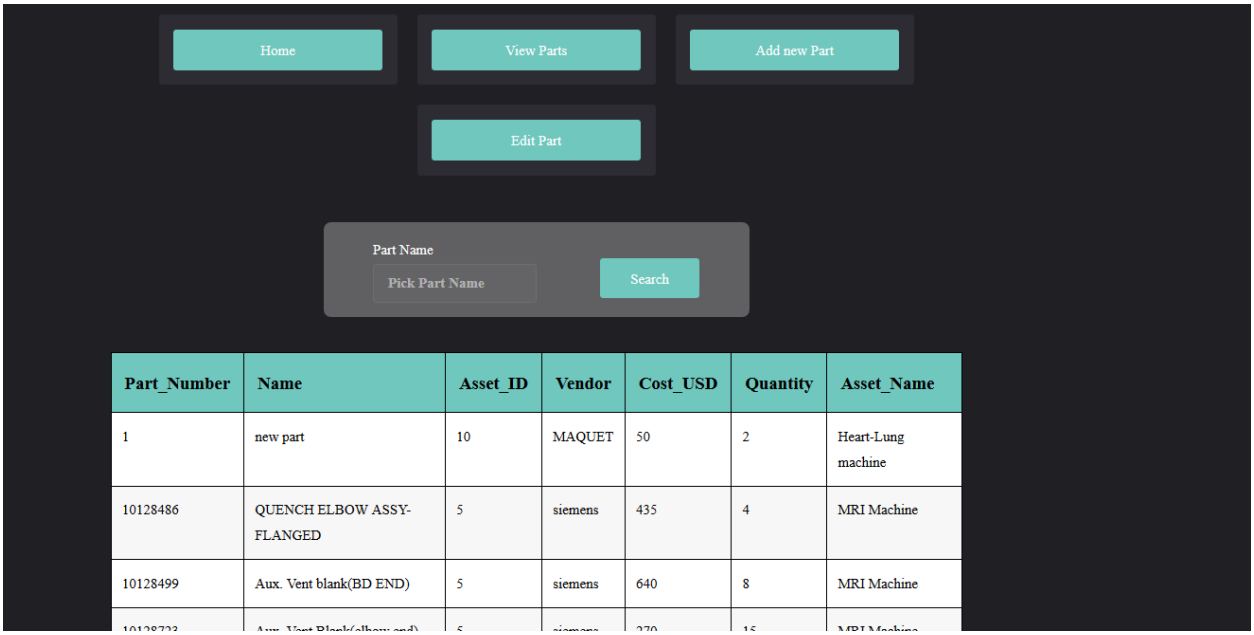
When we click on the view parts icon we can see the parts table, we can also enter a part name and search for it.

Part_Number	Name	Asset_ID	Vendor	Cost_USD	Quantity	Asset_Name
10128486	QUENCH ELBOW ASSY-FLANGED	5	siemens	435	4	MRI Machine
10128499	Aux. Vent blank(BD END)	5	siemens	640	8	MRI Machine
10128723	Aux. Vent Blank(elbow end)	5	siemens	270	15	MRI Machine
10128733	De-Mountable pin fitting kit	5	siemens	890	1	MRI Machine
10128734	QV elbow fitting kit	5	siemens	2700	1	MRI Machine
10128742	air and sea Freight assy	5	siemens	750	5	MRI Machine
10128924	Li battery	5	siemens	250	10	MRI Machine
10128974	de-coupler fitting kit	5	siemens	375	1	MRI Machine
10129376	4k filtered PRV adapter	5	siemens	360	6	MRI Machine



3.2 Add new part





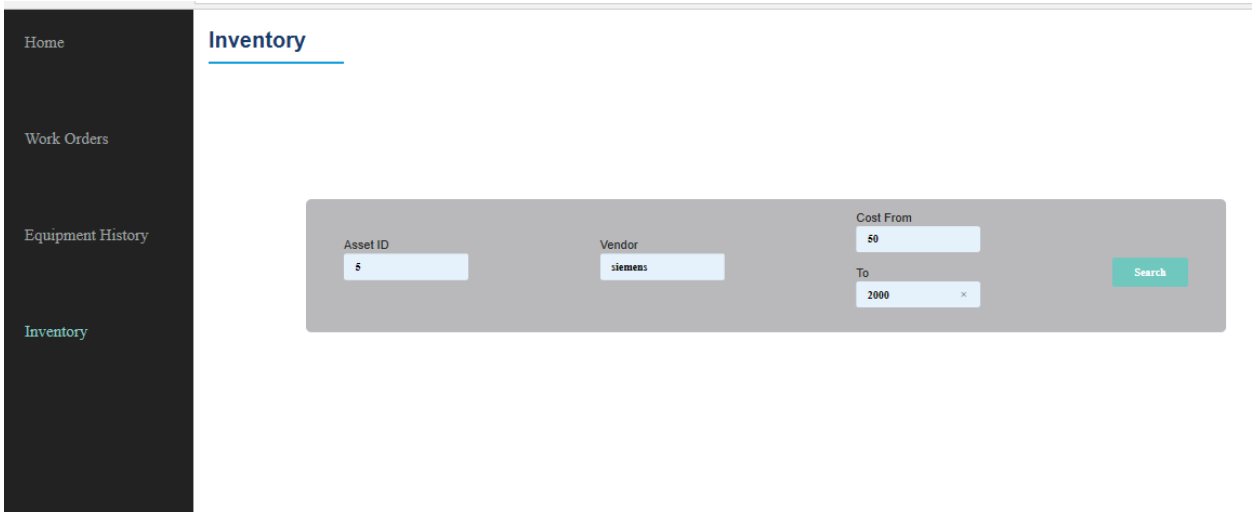
Part_Number	Name	Asset_ID	Vendor	Cost_USD	Quantity	Asset_Name
1	new part	10	MAQUET	50	2	Heart-Lung machine
10128486	QUENCH ELBOW ASSY-FLANGED	5	siemens	435	4	MRI Machine
10128499	Aux. Vent blank(BD END)	5	siemens	640	8	MRI Machine
10128723	Aux. Vent Blank(elbow end)	5	siemens	270	15	MRI Machine

3.3 Edit an existing part:

When we try to edit a non-existing part we get a message:

4.Report Icon:

4.1 Inventory report:



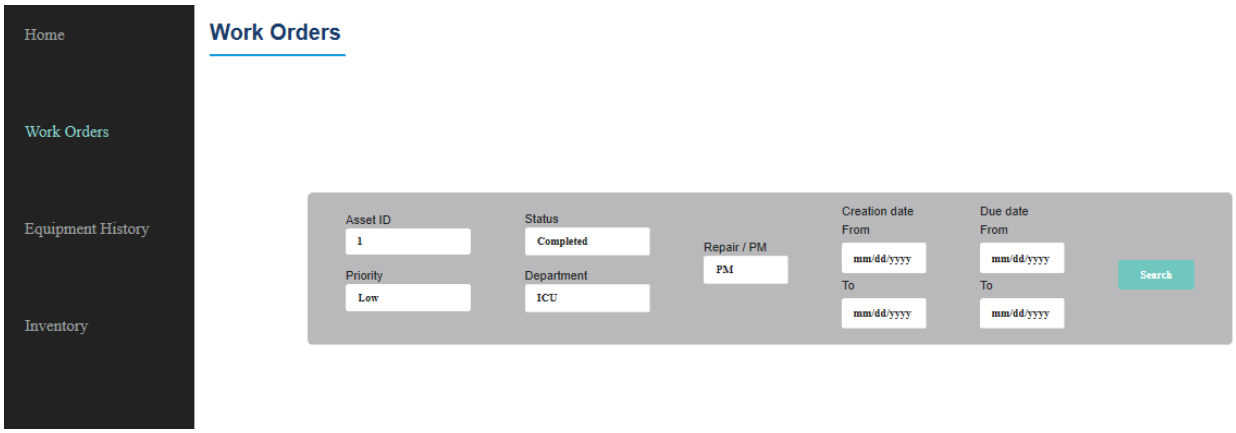
DATE
2020-05-25

Inventory report

DATE
2020-05-25

Part_Number	Name	Asset_ID	Vendor	Cost_USD	Quantity
10128486	QUENCH ELBOW ASSY-FLANGED	5	siemens	435	4
10128499	Aux. Vent blank(BD END)	5	siemens	640	8
10128723	Aux. Vent Blank(elbow end)	5	siemens	270	15
10128733	De-Mountable pin fitting kit	5	siemens	890	1
10128742	air and sea Freight assy	5	siemens	750	5
10128924	Li battery	5	siemens	250	10
10128974	de-coupler fitting kit	5	siemens	375	1
10129376	4k filtered PRV adapter	5	siemens	360	6
10129669	OR98 pipe set kit	5	siemens	500	3
10129671	FCL pin kit	5	siemens	2000	2
10129672	quench valve	5	siemens	1500	1

4.2 Work orders report:

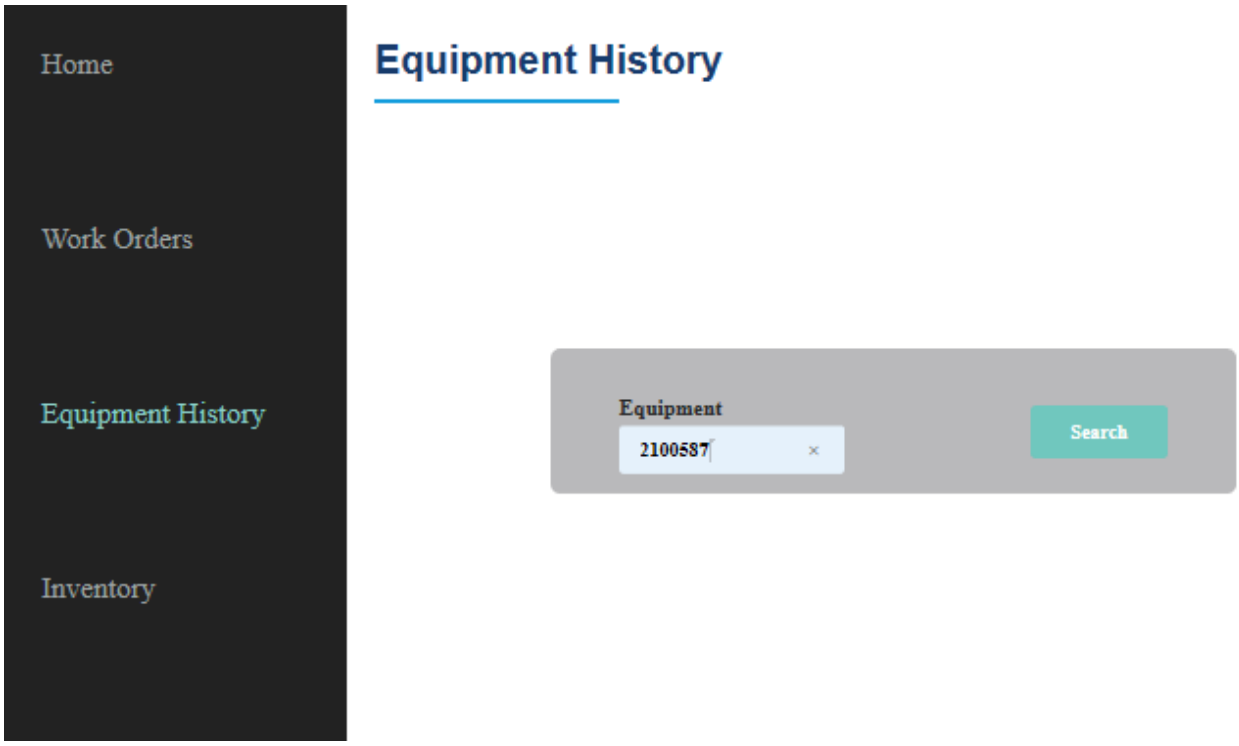


DATE
2020-05-25

Work orders report

Order_number	Asset_ID	Name	Status	Creation__date	Repair/PM	Due_date	PM_date	PM_frequency	Priority	Description	Repair_cost	Department	Technition SSN	Technition phone	Technition Name
1	1	Inspection, PM	Completed	Wed, 15 Apr 2020 00:00:00 GMT	PM	Fri, 01 May 2020 00:00:00 GMT	Fri, 01 May 2020 00:00:00 GMT	Monthly	Low	Checked power, battery, alarms, tubes, cleaning and calibration		ICU	2147483647	101234798	Ahmed
1	1	Inspection, PM	Completed	Wed, 15 Apr 2020 00:00:00 GMT	PM	Fri, 01 May 2020 00:00:00 GMT	Fri, 01 May 2020 00:00:00 GMT	Monthly	Low	Checked power, battery, alarms, tubes, cleaning and calibration		ICU	1365987450	1289751264	Khaled
1	1	Inspection, PM	Completed	Wed, 15 Apr 2020 00:00:00 GMT	PM	Fri, 01 May 2020 00:00:00 GMT	Fri, 01 May 2020 00:00:00 GMT	Monthly	Low	Checked power, battery, alarms, tubes, cleaning and calibration		ICU	546896213	1111647852	Ashraf
15	1	Inspection, PM	Completed	Sat, 22 Feb 2020 00:00:00 GMT	PM	Sun, 01 Mar 2020 00:00:00 GMT	Sun, 01 Mar 2020 00:00:00 GMT	Monthly	Low	Check power, battery, alarms, tubes, cleaning and		ICU	None	None	None

4.3 Equipment history report:



Syringe pump

Name:	Syringe pump	**Asset Code:**	1
Manufacturer:	Holmark	**Department:**	ICU
Model:	SPLF2	**Location:**	Building 1, Floor 1
Installation Date:	Fri, 01 Feb 2019 00:00:00 GMT	**Frequency of PM:**	Monthly
Serial Number:	2100587	**Warranty Expiration:**	Thu, 01 Feb 2024 00:00:00 GMT

Completed Work Orders

Order_number	Repair/PM	Completion date	Description	Repair_cost
1	PM	Fri, 01 May 2020 00:00:00 GMT	Checked power, battery, alarms, tubes, cleaning and calibration	
15	PM	Sun, 01 Mar 2020 00:00:00 GMT	Check power, battery, alarms, tubes, cleaning and calibration	
16	PM	Wed, 01 Apr 2020 00:00:00 GMT	Check power, battery, alarms, tubes, cleaning and calibration	

Back Home

5.Work order Icon:

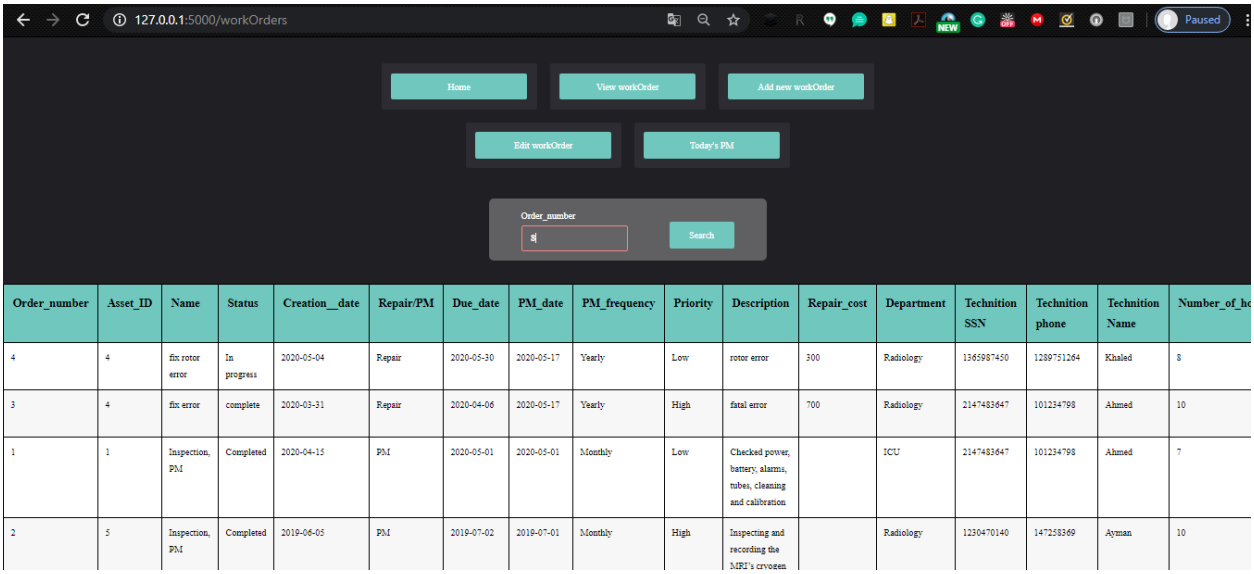
In the workorder icon a user can view current workorder in the database, and search for them by order number, the user can also add a new order or edit an existing one also a user can view today's pm orders.

5.1 view and search:

Once the user clicks on the view workorder button he equipment table will appear

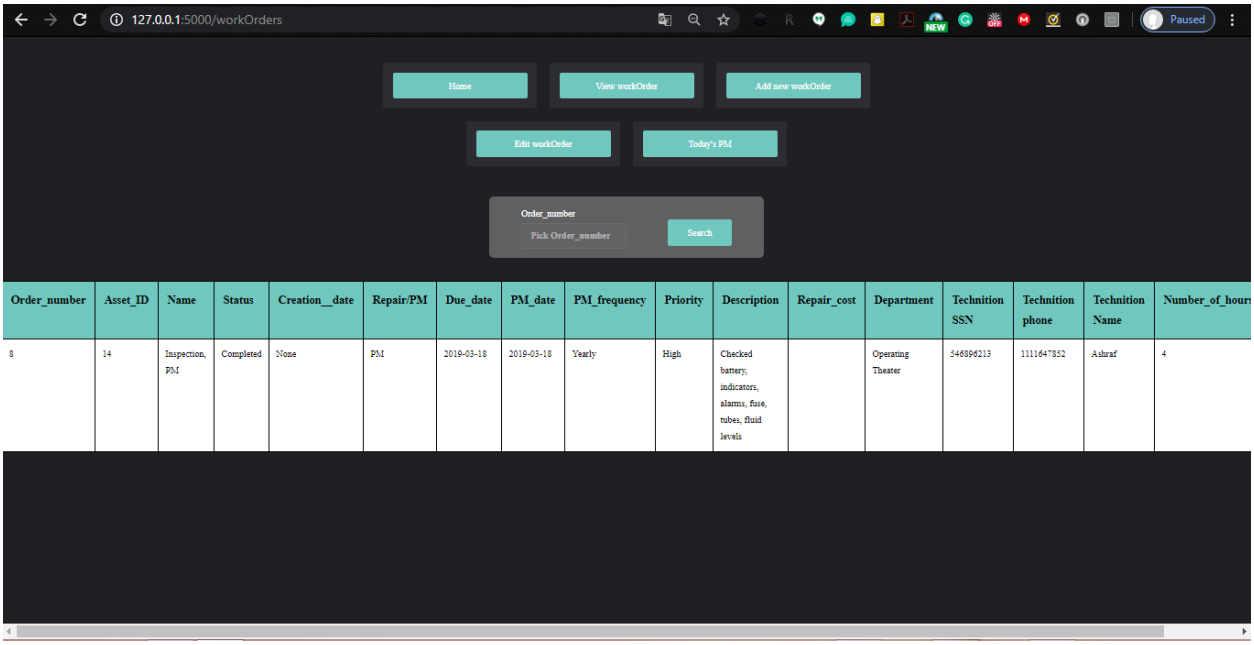
Order_number	Asset_ID	Name	Status	Creation__date	Repair/PM	Due_date	PM_date	PM_frequency	Priority	Description	Repair_cost	Department	Technition SSN	Technition phone	Technition Name	Number_of_ho
4	4	fix rotor error	In progress	2020-05-04	Repair	2020-05-30	2020-05-17	Yearly	Low	rotor error	300	Radiology	1365987450	1289751264	Khaled	8
3	4	fix error	complete	2020-03-31	Repair	2020-04-06	2020-05-17	Yearly	High	fatal error	700	Radiology	2147483647	101234798	Ahmed	10
1	1	Inspection, PM	Completed	2020-04-15	PM	2020-05-01	2020-05-01	Monthly	Low	Checked power, battery, alarms, tubes, cleaning and calibration		ICU	2147483647	101234798	Ahmed	7
2	5	Inspection, PM	Completed	2019-06-05	PM	2019-07-02	2019-07-01	Monthly	High	Inspecting and recording the MRI's cryogen levels		Radiology	1230470140	147258369	Ayman	10

The user can search for a certain order by inserting order number: for example searching for order number 8



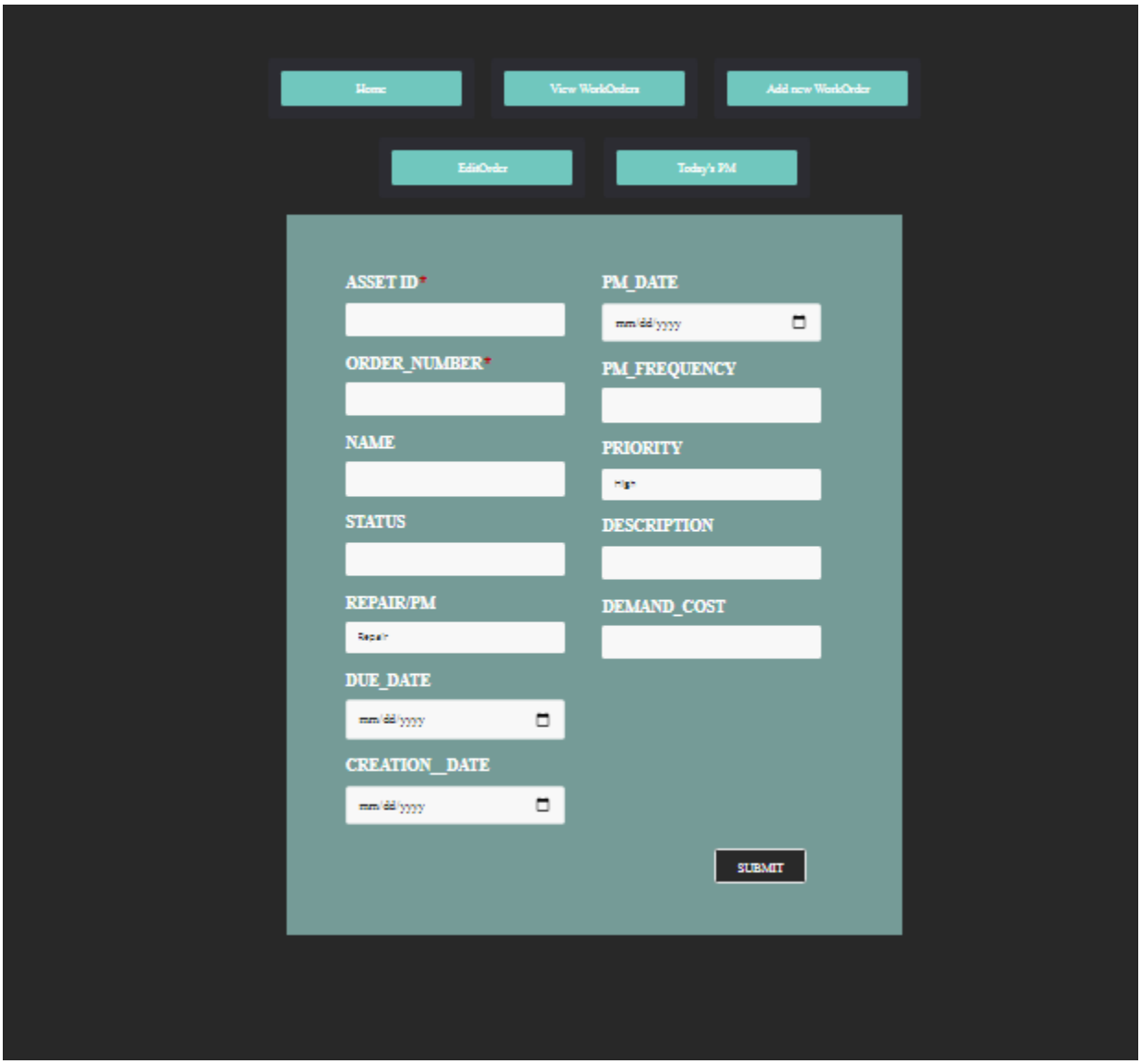
Order_number	Asset_ID	Name	Status	Creation__date	Repair/PM	Due_date	PM_date	PM_frequency	Priority	Description	Repair_cost	Department	Technition SSN	Technition phone	Technition Name	Number_of_ho
4	4	fix rotor error	In progress	2020-05-04	Repair	2020-05-30	2020-05-17	Yearly	Low	rotor error	300	Radiology	1365987450	1289751264	Khaled	8
3	4	fix error	complete	2020-03-31	Repair	2020-04-06	2020-05-17	Yearly	High	fatal error	700	Radiology	2147483647	101234798	Ahmed	10
1	1	Inspection, PM	Completed	2020-04-15	PM	2020-05-01	2020-05-01	Monthly	Low	Checked power, battery, alarms, tubes, cleaning and calibration		ICU	2147483647	101234798	Ahmed	7
2	5	Inspection, PM	Completed	2019-06-05	PM	2019-07-02	2019-07-01	Monthly	High	Inspecting and recording the MRI's cryogen		Radiology	1230470140	147258369	Ayman	10

Then:



Order_number	Asset_ID	Name	Status	Creation__date	Repair/PM	Due_date	PM_date	PM_frequency	Priority	Description	Repair_cost	Department	Technition SSN	Technition phone	Technition Name	Number_of_hours
8	14	Inspection, PM	Completed	None	PM	2019-03-18	2019-03-18	Yearly	High	Checked battery, indicators, alarms, fuse, tubes, fluid levels		Operating Theater	546896213	1111647852	Ashraf	4

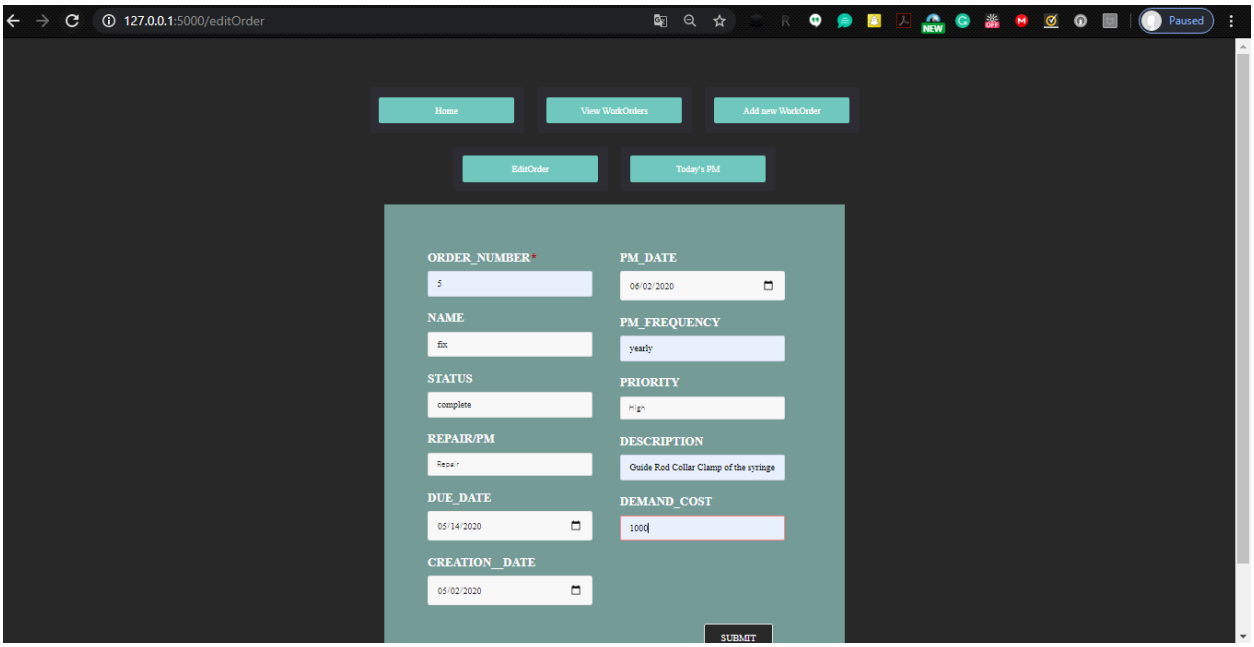
5.2 Add new work order:We can add a new work order by filling the following:



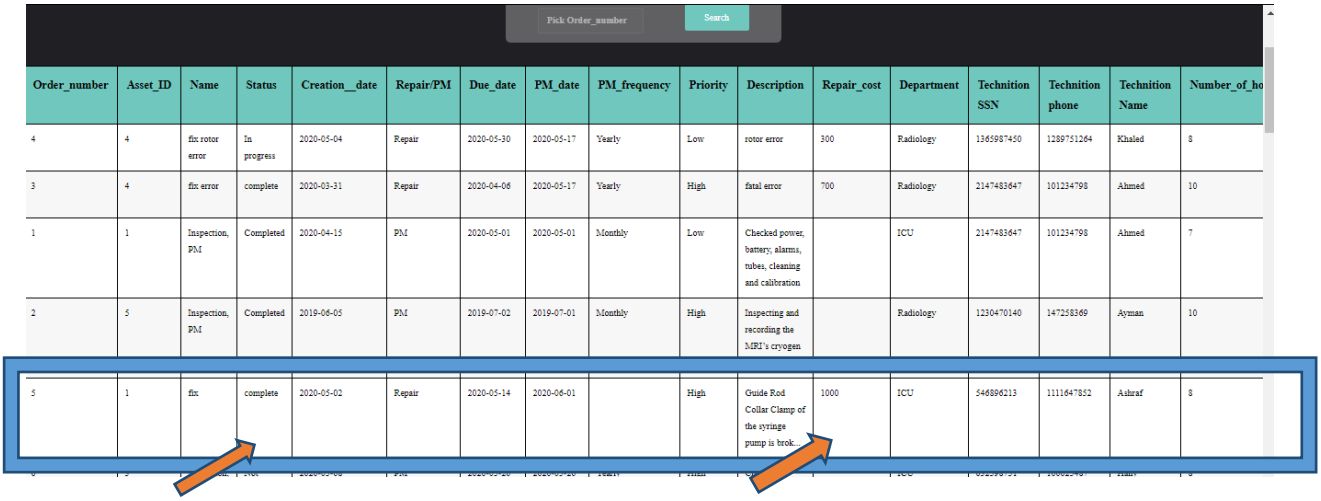
5.3 Edit an existed work order:

For example if we want to edit work order number 5:

Order_number	Asset_ID	Name	Status	Creation__date	Repair/PM	Due_date	PM_date	PM_frequency	Priority	Description	Repair_cost	Department	Technition SSN	Technition phone	Technition Name	Number_of_ho
4	4	fix rotor error	In progress	2020-05-04	Repair	2020-05-30	2020-05-17	Yearly	Low	rotor error	300	Radiology	1365987450	1289751264	Khaled	8
3	4	fix error	complete	2020-03-31	Repair	2020-04-06	2020-05-17	Yearly	High	fatal error	700	Radiology	2147483647	101234798	Ahmed	10
1	1	Inspection, PM	Completed	2020-04-15	PM	2020-05-01	2020-05-01	Monthly	Low	Checked power, battery, alarms, tubes, cleaning and calibration		ICU	2147483647	101234798	Ahmed	7
2	5	Inspection, PM	Completed	2019-06-05	PM	2019-07-02	2019-07-01	Monthly	High	Inspecting and recording the MRI's cryogen		Radiology	1230470140	147258369	Ayman	10
5	1	fix	not started	2020-05-02	Repair	2020-05-14	2020-06-02	yearly	High	Guide Rod Collar Clamp of the syringe pump is brok...	1000	ICU	546896213	1111647852	Ashraf	8
6	3	Inspection, PM	Not Started	2020-05-08	PM	2020-05-20	2020-05-20	Yearly	High	Checking electrodes, battery,		ICU	632598751	100025487	Hany	8



Then:



Order_number	Asset_ID	Name	Status	Creation__date	Repair/PM	Due_date	PM_date	PM_frequency	Priority	Description	Repair_cost	Department	Technition SSN	Technition phone	Technition Name	Number_of_ho
4	4	fix rotor error	In progress	2020-05-04	Repair	2020-05-30	2020-05-17	Yearly	Low	rotor error	300	Radiology	1365987450	1289751264	Khaled	8
3	4	fix error	complete	2020-03-31	Repair	2020-04-06	2020-05-17	Yearly	High	fatal error	700	Radiology	2147483647	101234798	Ahmed	10
1	1	Inspection, PM	Completed	2020-04-15	PM	2020-05-01	2020-05-01	Monthly	Low	Checked power, battery, alarms, tubes, cleaning and calibration		ICU	2147483647	101234798	Ahmed	7
2	5	Inspection, PM	Completed	2019-06-05	PM	2019-07-02	2019-07-01	Monthly	High	Inspecting and recording the MRI's cryogen		Radiology	1230470140	147258369	Ayman	10
5	1	fix	complete	2020-05-02	Repair	2020-05-14	2020-06-01		High	Guide Rod Collar Clamp of the syringe pump is brok...	1000	ICU	546896213	1111647852	Ashraf	8

5.4 show today's pm work order:

User can view today's PMs on pressing this button .this screen shoot was taken on 23-5-2020

Order_number	Asset_ID	Name	Status	Creation__date	Repair/PM	Due_date	PM_date	PM_frequency	Priority	Description	Repair_cost
2	5	Inspection, PM	Completed	2019-06-05	PM	2019-07-02	2020-05-23	Monthly	High	Inspecting and recording the MRI's cryogen levels.	
1	1	Inspection, PM	Completed	2020-04-15	PM	2020-05-01	2020-05-23	Yearly	Low	Checked power, battery, alarms, tubes, cleaning and calibration	
18	13	Inspection, PM	Completed	2020-03-20	PM	2020-04-11	2020-04-11	Weekly	High	Checked and cleaned sensors, steam lines, replaced filter, verified temperature	