

A Project Report On

EQUIPMENT MANAGEMENT TOOL ADMIN

Submitted in Partial fulfillment of the requirements
for the award of the degree of

MASTER OF COMPUTER APPLICATIONS

of



Visvesvaraya Technological University

Belgaum, Karnataka

By

Lavanya T R

1CR17MCA12



CMR INSTITUTE OF TECHNOLOGY

132, IT Park Road, Kundalahalli, Bangalore-560037

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Under the guidance of

Internal Guide

Ms. Uma B

Asst. Professor, MCA Department,
CMR Institute of Technology,
Bangalore.

External Guide

Mr. Sidharatha Rath

Collins Aerospace,
Bangalore



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132, IT Park Road, Kundalahalli, Bangalore-560037

2019-2020

CMR INSTITUTE OF TECHNOLOGY
Department of Master of Computer Applications
Bangalore – 560 037



CERTIFICATE

This is to certify that the project work entitled

EQUIPMENT MANAGEMENT TOOL ADMIN

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*Master of Computer Applications of the
Visvesvaraya Technological University, Belgaum, Karnataka.*

Bonafide work carried out by

LAVANYA T R
1CR17MCA12

During the academic year 2019-2020.

Signature of the Guide
Ms. Uma B
Asst. Professor, MCA

Signature of the HOD
Ms.Gomathi.T
HOD, MCA

Signature of the Principal
Dr. Sanjay Jain
PRINCIPAL, CMRIT

External Viva

Name of the Examiners

Signature with date

- 1.
- 2.

CERTIFICATE

Goodrich Aerospace Services Pvt. Ltd.
Netra Tech Park, Old Plot #181, New Plot #40,
EPIP Industrial Area, Part of Sy #28
Kundalahalli Village, Krishnarajapuram Hobli,
Bangalore-560066.
Tel: +91 80 67380000
Fax: +91 80 67370005/6
www.Collinsaerospace.com
CIN: U85110KA1996PTC021327



Collins Aerospace

A United Technologies Company

May 26, 2020

Rectangular Snip

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. Lavanya Ramegowda** studying in **CMR Institute of Technology** whose USN is **ICR17MCA12** has successfully completed her Intern project with Collins Aerospace. She supported the IT team on "Equipment Management Tool Admin" project. Internship commenced from December 27, 2019 and will end on June 26, 2020 under the guidance of Mr. Sidhartha Rath.

We wish her good luck for future.
for Collins Aerospace

Sanjukta Sarkar
Director - Human Resources

DECLARATION

I, **LAVANYA T R**, student of 6th MCA, **CMR Institute of Technology**, bearing the USN **1CR17MCA12**, hereby declare that the project entitled “**EQUIPMENT MANAGEMENT TOOL ADMIN**” has been carried out by me under the supervision of External Guide **Mr. Sidhartha Rath**, Assistant Project Manager, and Internal Guide **Ms. Uma B, Assistant Professor, Dept. of Master of Computer Applications** and submitted in the partial fulfillment of the requirements for the award of the Degree of Master of Computer Applications by the **Visvesvaraya Technological University** during the academic year 2019-2020. The reports has not been submitted to any other University or Institute for the award of any degree or certificate.

Place: Bangalore

LAVANYA T R

Date:

(1CR17MCA12)

ACKNOWLEDGEMENT

I would like to thank all those who are involved in this endeavor for their kind cooperation for its successful completion. At the outset, I wish to express my sincere gratitude to all those people who have helped me to complete this project in an efficient manner.

I offer my special thanks to my external project guide **Mr. Sidhartha Rath**, Assistant Project Manager, Collins Aerospace, Bangalore, and to my Internal Project guide **Ms Uma B**, Department of MCA, CMRIT, Bangalore without whose help and support throughout this project would not have been this success.

I am thankful to **Dr. SANJAY JAIN**, Principal, CMRIT, Bangalore for his kind support in all respect during my study. I would like to thank **Mr. Sidhartha Rath**, Assistant Project Manager, Collins Aerospace., Bangalore, who gave opportunity to do this project at an extreme organization Most of all and more than ever, I would like to thanks my family members for their warmness, support, encouragement, kindness and patience. I am really thankful to all my friends who always advised and motivated me throughout the course.

LAVANYA T R
(1CR17MCA12)

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CHAPTER-1

INTRODUCTION

1.1 ABSTRACT

Equipment Management Tool is web Based Application for maintain of the different Equipment in the organization. Equipment Management Tool is developed through Collins Aerospace to provide their functionality to the user in easy way. This is helped to the IT team of Organization stake holders in order to maintain their equipment stocks in IT store.

Equipment management is one of the key factors for the quality management system kin an organization. A Proper maintenance of the equipment in the laboratory (equipment labs) is necessary to ensure most accurate, reliable, and testing An Efficient way of managing the different kinds of equipment makes utilization of the equipment correctly whenever they needed and it helps organization to keep track of the all the equipment easily.

The EMT tool If any lab equipment (i.e. desktops, RAM) required for the user then the user can login into this web portal and make request of the equipment for the selected period which is subject the availability (checking the equipment availability) of the equipment. Based On the transaction number of an user the tool Super user / Asset Owner will approve the equipment to the particular user based on their Transaction Number (i.e. TR98_22_19).Based on their utility of an equipment users has to pay the cost for utilization of the product. Selection of the Equipment is an easiest way in this tool, so it can be used in the organization in easy way.

This Software has been developed with user in mind. The software is designed to enable users with minimal computer experience to operate the menus and icons and access the desired options easily.

1.2 PROJECT DESCRIPTION

Equipment management Tool deals with different problems that secure an optimal process flow in organization areas of organizations or equipment rental organizations, and so on, in aspects such as planning, processing, request and return of the equipment.

The Tool functions as an equipment database for GEC- India Assets and GEC-India Test Lab Team will have the functionality to Add/ Update/Delete the Equipment. GEC-India Test Lab Team can approve and issue the equipment based on the request of the users and generate reports based on the transactions. The tool also provides PM and calibration details.

The Tool will have functionality to Add/ Update/Delete the Equipment, can issue the equipment based on the request of the customers and generate reports based on the transactions.

Equipment management Tool web based application this requirement offers a simple boundary to maintain the equipment in organization. The Tool will have functionality to Add/ Update/Delete the Equipment, can issue the equipment based on the request of the customers and generate reports based on the transactions.

This results in the following benefits

- productivity
- availability
- reliability
- performance
- safety

Manual tasks take time to maintain the details of the all the equipment in the organization. They should be completed linearly by those individuals who are likely to have errors and which are unable to meet the highest standards consistently. In order to overcome with this error we have developed an application Too called EMT. This tool provides an efficient way to manage equipment, generate report, payment and also return of the application.

Main Modules

- I. Super user- IT Team
 - II. Admin- Should have all the access as of Super Admin except New User, Edit User, Delete User, and Mail List under Settings Menu.
 - III. Users (Requestor) – Requesting/Cancelling request/Returning the Equipment- Details are fetched from the AD (Active Directory) and captured only for the requests.
 - IV. Issuing Focal - Can approve/ Reject and Issue/Reject an equipment request.
- **Super user**

Can see all the tabs Request Details, Approved Details, Issue Details and Equipment Due for return Details.
 - **Admin**

Can see all the tabs Request Details, Approved Details, Issue Details and Equipment Due for return Details.

 1. Admin should either input the values or can upload the Excel sheet. (This functionality will not be part of the tool-26 Apr 2018) One time data upload will be done directly from backend.
 2. Admin should have all the access to see the details of the equipment.
 3. Admin can generate report based on MMD (Monitoring and Measuring Devices) and LTT (Lab equipment tagging and tracking).
 4. Admin can initiate the invoice based on the template for Utilization. Utilization hours should be editable by admin/issuing focal. Hours can be more or less than the planned hours.
 5. Equipment owner and calibration owner name format is last name, first name (ex: Ganapathi, Nagaraju) as fetched from AD.
 6. Admin can see the equipment being allocated to requestor with a transaction id for each request.
 7. Admin can click on the Transaction Id to check for the request details.
- i. **Reports**
 1. Admin Need to Select from the Asset Ownership Dropdown.
 2. Based on the Selection Admin can export the report either in MMD Format or LTT Format.
 3. Chargeable and not chargeable option along with Site-1 or Site-2 test request no after the invoice is generated.

ii. **Downtime**

1. Admin can change the Service Status to Downtime and change the TM/TPM to Require the Equipment Breakdown Date and Time will be the current date and time.
2. Once the Maintenance activity is completed Admin needs to change the Service Status to Active and the Up Date and Time will be updated as per the Current date and time, thus the Downtime is calculated as the difference in Downtime and uptime.

iii. **PM/ TPM**

1. If the equipment has PM/TPM is marked as required, then Admin can fix the maintenance window by providing Maintenance down Time and Uptime.

iv. **Invoice Generation**

1. From the Dashboard Admin can go to the Generate Invoice Page.
2. A page will open with From Date, To Date, GEC Project ID filters.
3. Once all the transaction details are filled, Generate Invoice Button will be enabled and Admin can export to excel file based on the transactions.
4. Chargeable and not chargeable option along with Site-1 or Site-2 test request no after the invoice is generated.

v. **Master List**

Master List is the backbone of EMT Software. In this module, all the Equipment's available in the factory and grouping are given. Their specification cum detailed information with document attachment will be done. SBU, Project Name and ID master also can be added as the master data.

1. Admin can Add, Edit, Update, Delete the Master Lists used in the Asset Tracking.

• **User (Requestor)**

Can see Request Details, Issue Details and Equipment Due for return Details

1. Customer can see the equipment he has procured.
2. If the customer is the equipment owner he can see the transaction for the equipment he owns.
3. Customer can click on the Transaction Id to check for the equipment details.

Request

1. Customer should have the option to search for the Equipment in the search section using advanced search filters.
2. Once customer get the desired Equipment can go to the details page and click on the Book button by providing some input.
3. Mail will be triggered to the Admin/Issuing Focal/ Equipment owner with the requestor in CC with a Transaction No for the request.
4. Admin/Issuing Focal after getting the mail regarding the request can approve or reject the request and a mail will be triggered to the requestor.
5. Transaction ID will be running no and Test request No will be auto generated number month wise as per format TR-Running No-MM-YY
 1. (EX: TR-92-01-18).

Return

1. Customer logins to the tool navigates to the Dashboard page and can see all the equipment being allotted for him.
2. Customer can click on the Transaction No. and can initiate a return request.
3. Mail will be triggered to the Admin/Issuing Focal regarding the return.
4. Once Admin/Issuing Focal gets the return request mail, can fill in the rest of the details in the request form and generate Invoice for the same, calculate Utilization time.

- **Issuing Focal**

Can see all the tabs Request Details, Approved Details, Issue Details and Equipment Due for return Details. Requests based on the Location Main Cell (Site1, Site 2). E.g. Issuing Focal from Site 1 will see all the requests made for Site 1 Equipment and Issuing Focal from Site 2 will see all the requests made for Site 2 Equipment.

1.3 COMPANY PROFILE

The Collins Aerospace is biggest company in the suppliers of aerospace and defence products in this world. It's headquartered in Charlotte and North Carolina. The company was established in the year of August 2012. The United Technologies Corporation (UTC) is combined with Hamilton Sundstrand and formed a new Company called Goodrich Corporation. Then once more time is combines its new commercial enterprise with UTC systems into the Collins Aerospace. Collins Aerospace is composed of 78,000 employees and reported \$26 billion of combined sales in the year 2019.

By combining UTC systems and Rockwell Collins they formed a company Collins Aerospace in the year 2018. This company helps to give new different kind of shape to Aerospace and Defence Industries. In the initial stage Collins Aerospace company is identified as Radio Company in Cedar Rapids. By establishing the communications with Richard in South Pole, Rockwell Collins made his remark in the History. In the field of aviation, high integrity solutions, legacy of quality, trust, services to the customer the Collins Aerospace becomes Master compare to other different companies. As we know Collins Aerospace is consisting of different kinds of talented resource in company it is able to make good strategies to produce products to its customer and towards the future. Collins Aerospace offers all kinds of products and capabilities, different business team to encourage in services, sales, marketing and engineering business.

In the year 2008, Collins Aerospace establishes an Indian Design Centre in the place Hyderabad. That centre is capable of supporting local and international government, Equipment manufacturers, engineering design services with different defence contractors, these strategies will help to achieve short time to market in lower life cycle span, with new innovative solutions of good quality. Collins Aerospace serves the global community as a trusted source for innovative and reliable products. Collins Aerospace works continuously with its customer requirements.

Collins Aerospace is capable of manufacturing the products for Aerospace and servicing system and different kinds of components for helicopters, airports, and other different industries. Collins Aerospace follows 6 basic business units in its business process. In that Aero Structures and power & controls are important in its daily business.

CHAPTER-2

LITERATURE REVIEW

2.1 EXISTING SYSTEM

Equipment Management gives set of procedures to maintain and control the all the equipment in terms of renting concept. Usually different kinds of firms have huge number of equipment but it is difficult to track their maintenance by daily and also it requires maximum time of person.

If any of the equipment is damaged or loosed the amount which we spent on that particular machinery is completely loss of money, by considering all these factors in mind we have implemented the Equipment Management Tool.

In Business world every business is concerned about the management of the equipment (i.e. the ratio of what is needed and when it is actually needed) and cost for the utilization of the equipment by different users.

The manual management of the equipment require lots of time investment and patience of the person. For Example counting of a total number of equipment in the organization, categorising the equipment and separate process of damaged equipment needs much of time, As Time management is the important factor in the industry we came up with automated procedures to maintain of the equipment.

In the Existing System they have to manage the all the equipment in manual process like they have to maintain the equipment details in records. Maintenance of records is difficult process for the admin in order to keep track of the all the users who requested/ returned the equipment by date order. The maintenance of records in daily is difficult task and time consuming process in order to eliminate that came up with the process control called EMT.

PROPOSED SYSTEM

Equipment management system is concerned about the how much capacity of different types of equipment are there, the place in which it is located so that it is easy to use whenever it needed for a person.

Equipment should show in a group if there are multiple equipment with different Identification Tag but same description.

Equipment Management Tool is the process of utilization of the equipment, renting procedure for different equipment, equipment cost, availability of the equipment and generation of the report based of master data or PM Job.

It will help the Super Admin to manage the all types of customers for the equipment and allocating the cost for the use of equipment by date order.

If group of equipment is selected to check availability, then the search result should be shown for all the equipment in the group.

Once the item is selected then the Request from Date and Request To date should automatically appear. Hour wise booking should be allowed.

EMT tool is also performs the following tasks which will help the admin to maintain the following things

- Reports
- Invoice Generation
- PM job
- Input/Master List
- Add/delete/update user
- Approve/Reject the Request.

Benefits:

- i. **Improved customer experience:** With the help of EMT tool the customer can easily request/return the equipment when they wanted.
- ii. **Save time:** EMT will save the time utilization of the admin to manage the equipment, allocating the equipment for the users and generation of the report.
- iii. **Improved Efficiency:** EMT will reduces the manual work of a person to maintain the all the Equipment.
- iv. **Low operational risk:** By eliminating human errors such as fatigue or lack of knowledge, EMT reduces the rate of errors, thereby reducing the level of operational risk.

2.2 FEASIBILITY ANALYSIS

It concludes whether the project is meriting the investment in some instances. Also, a project may not deserve the profit. There are different approaches for this, including different varieties of resources.

The Main goal of feasibility study is as follows:

1. To check whether it meets the requirement or not.
2. To identify whether Software can be done using available system.
3. Increasing the success rate.

Feasibility study can be categorised in to 3 types those are as follows:

- ❖ **ECONOMIC FEASIBILITY**
- ❖ **TECHNICAL FEASIBILITY**
- ❖ **OPERSTIONAL FEASIBILITY**

1. ECONOMIC FEASIBILITY:

Economic Feasibility is to identify whether the software can meet the financial requirement of an organization. Based on this we can identify the financial gains of the company and the expenses of the company.

Software said to be economically feasible if it meets the following criteria:

- The Total cost invested in software development is able to produce the profit for the company.
- Investigation of the needed cost.
- Cost for training people, software, and hardware.

2. TECHNICAL FEASIBILITY

This is to identify what kind of technological and manufacturing requirements need to develop the software.

With the help of Technical Feasibility, we can identify the up-gradation of hardware or software or technologies that are required in the development process.

3. OPERATIONAL FEASIBILITY

Operational feasibility can be defined as step by step procedure to the develop the Software and meets the user requirements. This feasibility study is based on the development team and visualization of developed software is installed on the client side.

An Operational Feasibility study can perform whether the software is meeting the user requirement, developed software is working well at client side.

2.3 TOOLS AND TECHNOLOGIES

As started before, Collins Aerospace is working in multiple platforms. But the team I had been assigned to development team. So most of the things I learnt about technologies and the techniques to go through the development of the product based on the requirements which they have given.

2.3.1 Tool

In my internship at Collins Aerospace, I have used the below tools in development process of the application

- ❖ **Visual Studio Professional**
- ❖ **SQL Server Management Studio**

Visual Studio Professional

Visual Studio Professional includes the all the features like mobile app development, developing of native apps, .NET application, ios and windows desktop web application development coding and debugging of the different kinds of application. It is basically free software; one can download from the web and start developing the application for the real world thing.

This is user friendly tool which makes developer to develop the application so easily. To use this tool developer should have the knowledge of the .NET

Using visual studio the developer can develop the web based application, MVC application and API Which needed to data manipulation? And It helps to focused on the work by showing the code references for the particular error, makes changes to your code, display of the modified methods, identification of the number of parameters are passed in to a method and identifying the error in the return type of the method.

This is a very user-friendly drag and drop workflow based tool, in which some knowledge of .NET knowledge is required for scenarios. In my view, Visual Studio is a Windows Desktop software designed to empower business analysts to business processes within their companies.

Sequential Server Management Studio

Sequential Server Management Studio (SSMS) is database management domain for maintain the all SQL queries, structure of a tables or views and it store the data in the respected tables. SSMS provides the way to shape, scanner together with operate object with respect to the wait staff and the kind of database. We wield SSMS to locate, update too monitor of the pieces of data castoff next to the requisition, erect by the scribble.

We can also apply the Sequential garcon to query, blueprint of the tables and maintaining of the data collection and the warehouse in the Desktop or Cloud based.

Server Management Studio is used to ingress, arrange, run, conduct as well as development of every the bit of Sequential garcon, Cloud hub and the Sql Facts collection. It furnishes the value that coalesce the pictured aid with the enough integer of scrawl reviser prior to layout examine to Sequential garcon for Developer along with controller levels of skills.

In order to use the SSMS we have to install the the Sql Server in the local desktop.

2.4 SOFTWARE REQUIREMENTS & HARDWARE REQUIREMENTS

2.4.1 HARDWARE REQUIREMENTS

Tools Type	Specification
Computer Processor	Intel core i5 or above
Hard Disk	100GB
RAM	8GB or greater
Speed	3.20 GHZ

2.4.2 SOFTWARE REQUIREMENTS

Operating System	Windows7 or above
Front End	Visual Studio
Back End	Sql SSMS

CHAPTER-3

3.1 FUNCTIONAL REQUIREMENT

A Functional Requirement is a kind of description service of the software. it shows how the software System or it component works. Different kinds of input for the software system, its behavior and output of that software.

Functional Requirement can represent the dataflow between the modules, user interaction on what system is expected to perform and manipulation operation of the application.

The **EMT** Tool will have functionality to Add/ Update/Delete the Equipment, can issue the equipment based on the request of the customers and generate reports based on the transactions.

3.1.1 Login:

Before login to the Application A user should have the LDAP ID of the organization then Click “Internet Explorer” Type the web page address (For example: <http://blr0sv20/EMTWEB/LoginUTC.aspx>) Click “Enter Button” Type user name as assigned to you and press the tab key for password entry. Type password as assigned to you and press the Log-in Button, then below shown dashboard screen while display.

3.1.2 Dashboard:

Dashboard is the home for the different users like Admin, user and the asset owner based on their access privacy the data will displayed to the users.

For Admin the following things will display

REQUESTED

- Requested user details along with their transaction id will display.

APPROVED

- Approved equipment details, user details and transaction details will display.

ISSUED

- Issued equipment to the particular user will display.

DUE RETURN

- Shows the list of user details that are in due to return the equipment will display.

3.1.3 EQUIPMENT DETAILS ENTRY

Full specification details of the equipment description can be added in the form and files or document related to this equipment can also be uploading in this form as & when required

- a. Add Equipment Details
- b. Edit Equipment Details

3.1.4 Asset Ownership / Category / Service Master Input

To enter the master data for Asset Ownership, Category, Service Status which will used at the Time of creating specification details of any equipment.

3.1.5 PM Job

To give completion entry for PM/AMC/CALIBRATION Jobs and also capturing down time of the equipment's due to Break down or any miscellaneous work.

3.1.6 Logout

The users can logout of the application after manipulating the necessary things in the application from any page of the application.

3.2 NON-FUNCTIONING REQUIREMENTS

A specifies qualitiveness of a software system. It involves the set of steps to judge the particular Operation of a system.

A Non-Functional Requirement is required to ensure the efficiency and usefulness of the software system. If the software is not meeting the required specifications it means that it fails to satisfy the user's needs. Non-Functional Requirement allows to restrictions on the designing of the Software System across the development life cycle.

These are not always connected with independent system features; however these requirements include the characteristics of the system that are more crucial situation than functional requirements. Declining to fit these requirements can mean that the whole system is ineffective

Some of the important characteristics of Non Functional Requirements

- **Efficiency**
- **Reliability**
- **Maintainability**
- **Robustness**
- **Portability**

❖ **Efficiency**

An efficiency can be defined as the ratio of the r work done by a software to the work required in operating the System. An efficiency of any Software is always less than then that Software system is not worth.

❖ **Reliability**

It specifies what the conditions in which the software would fail are and what are the measure that needs to be carried on to get rid of it. For example, when there are multiple applications running the server would become busy which leads to slow response in this situation though the server is slow the data is not misused.

❖ **Maintainability**

It specifies the durability of the application. It checks the layout of the module and depicts the changes that have to be done.

❖ **Portability**

It should be made sure that the moving of the Application on different kinds of Platforms. The units should be compatible with all the platforms.

CHAPTER-4

SYSTEM DESIGN

4.1 SYSTEM PERSPECTIVE

A System development process can be defined as the collection of process those are analysis of the requirement, designing, development, maintain and testing process of the system.

System perspective involves different kinds of functionalities and performance of the system that defines the software system.

This is the initial process to determine solution to the development of the system from start of the system. Design phase is the intermediate stage of the development. The outcome of this phase is the design documentation. In the perspective of the system one should not consider the system is an isolated entity.

The System Perspective defines the different functionalities and the relationship between the Environment of the system and it specifies how the each module in the system is communicated In the development process and specifies the complete solution to the problem.

Main goal of the SDLC is identifying and upgrading the requirement of the system in code section. Here we define the different modules how they are communicating and the dependencies between the each module.

4.2 DATAFLOW DIAGRAM

DFD represents the data processing by the systems in terms of inputs and output. It used to identify the flow of data between the modules.

DFD Level:

It is photographic of movement of facts, between application and other external entities; it defines set of inputs and output of the system. Database in which the data is stored

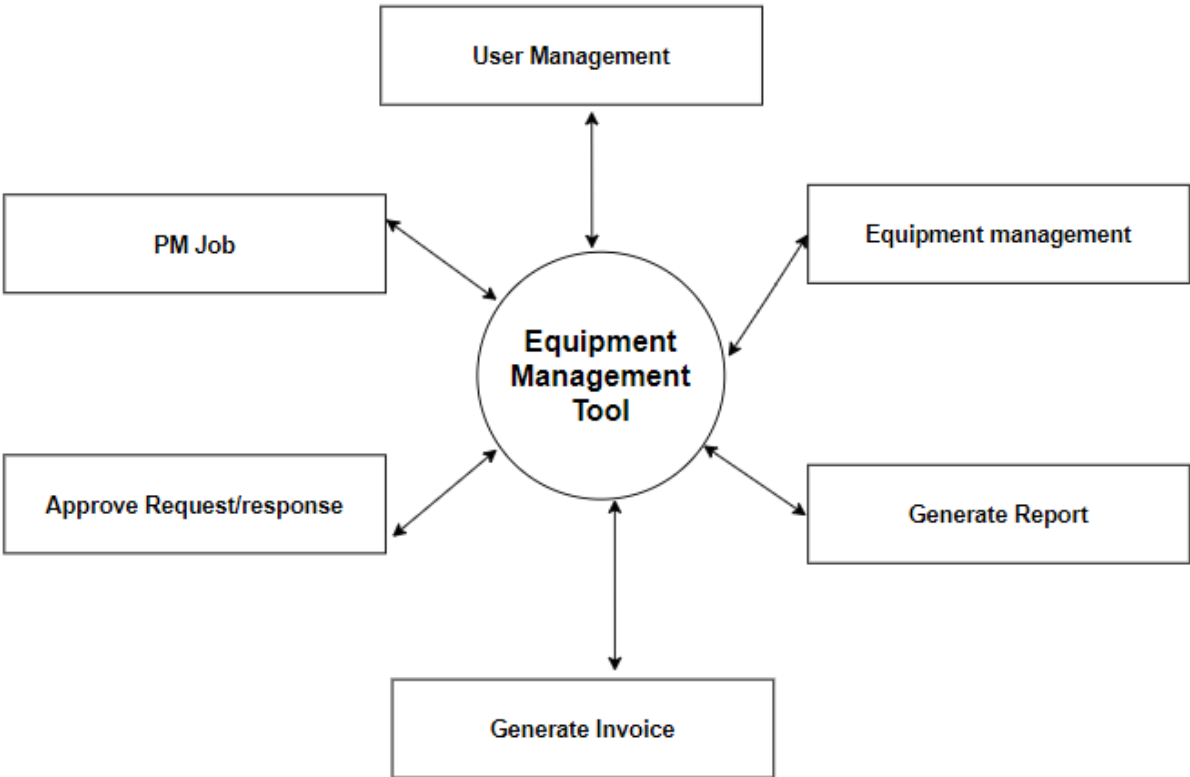


Fig. DFD Diagram for EMT Tool

CHAPTER-5

DETAILED DESIGN

5.1 USE CASE DIAGRAM

This outline act for relationship between user and application; it represents functionality of the system by actor and relationship between the actors.

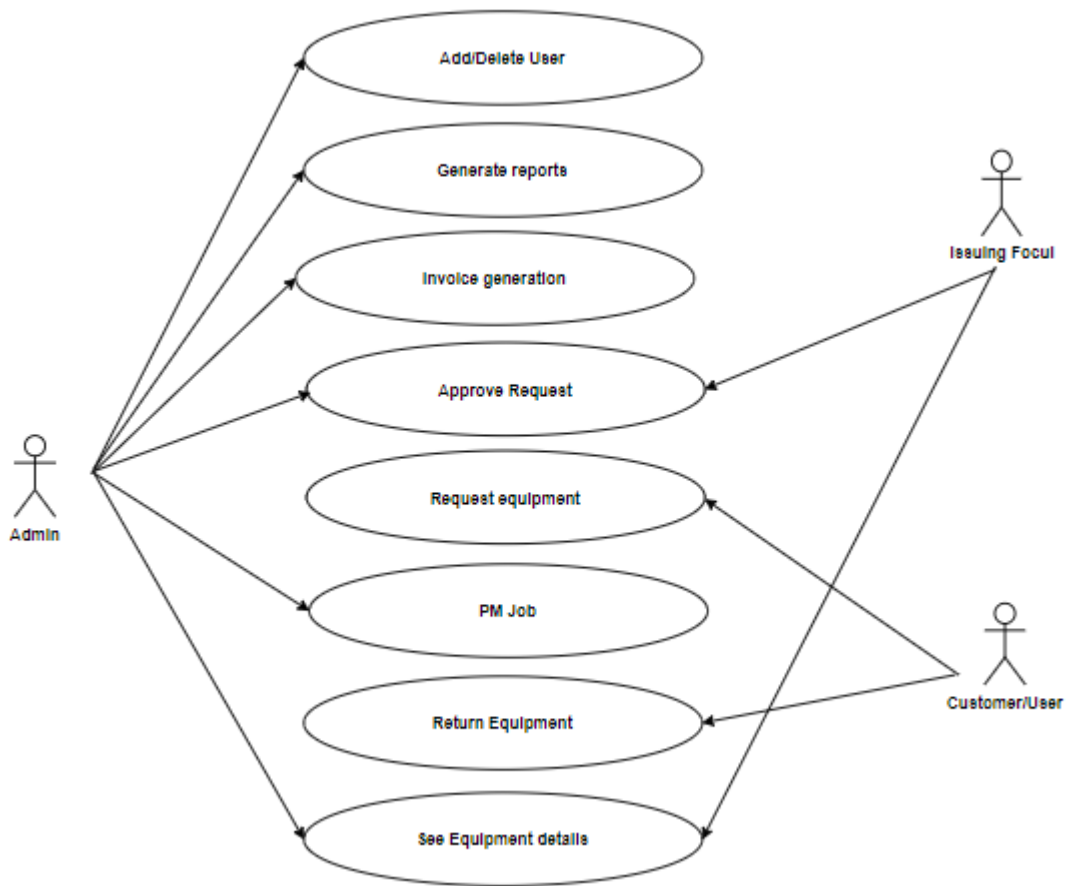


Fig. Use-Case Diagram for EMT Tool

5.2 SEQUENCE DIAGRAM

Sequence Diagram represents the sequential way of the message which is exchanged between the object. It shows the sequential flow of the application and it interacts with the objects sequentially. Sequential Diagram is kind of Event Diagram.

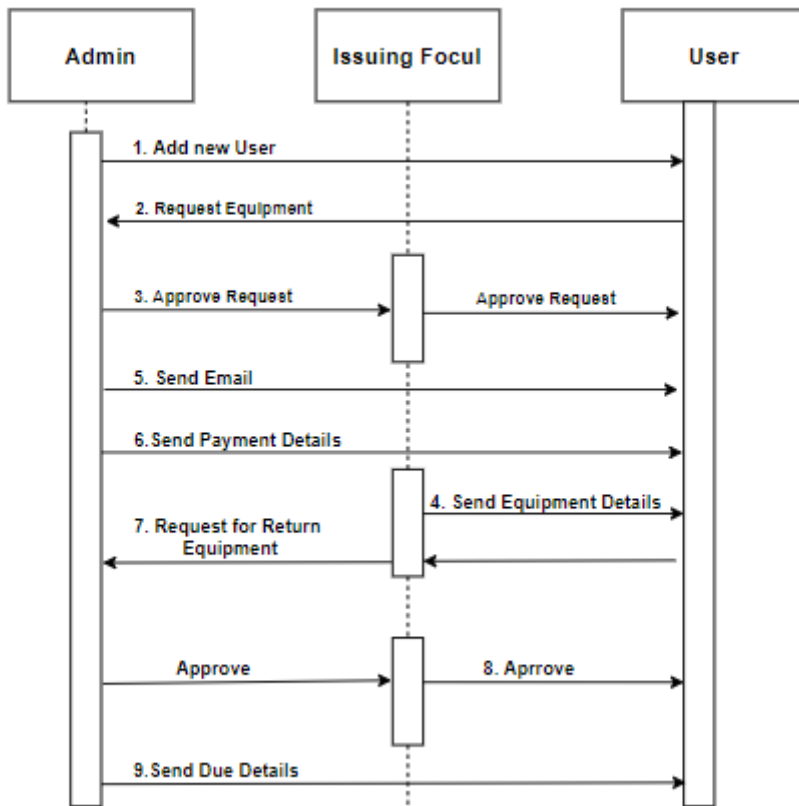


Fig. Sequential Diagram for EMT Tool

5.3 ACTIVITY DIAGRAM

These plans stand in for the set of scheme and actions workflow of the Software in iteration wise. It intended to model for both computational and processes of the related activities. Activity Diagram shows the flow data in the activities of the model.

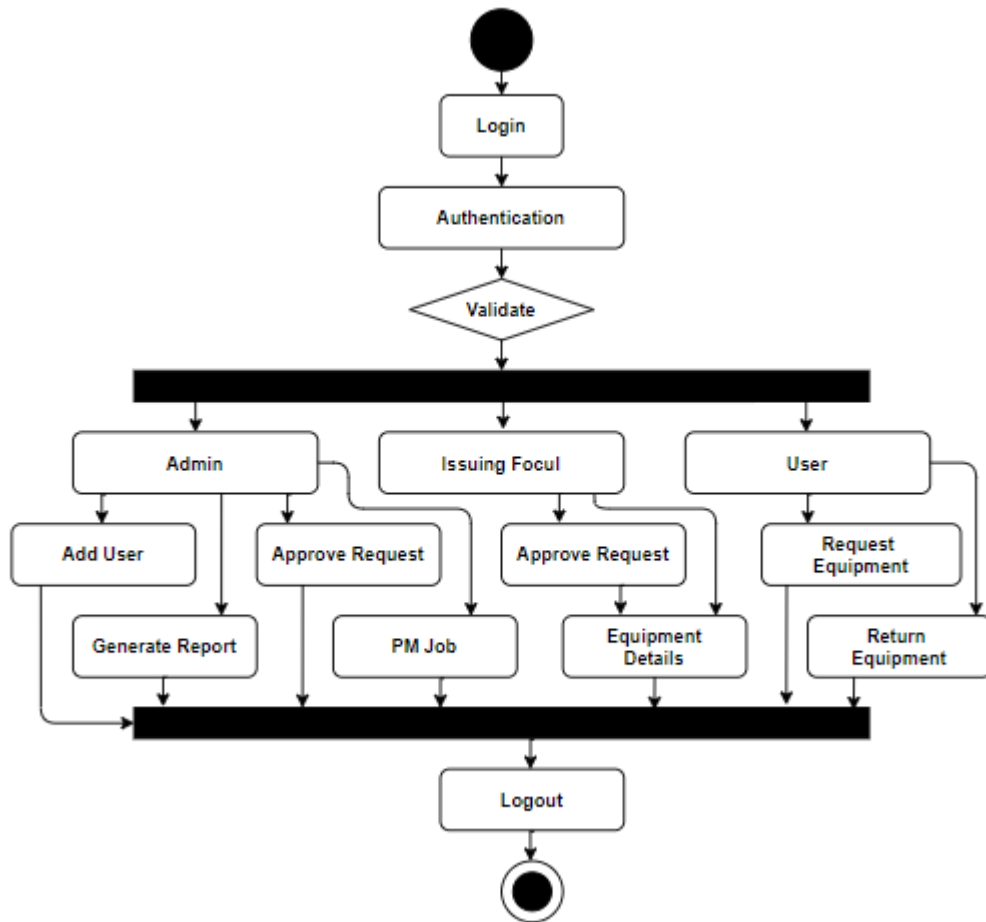


Fig. Activity diagram For EMT Tool

CHAPTER-6

IMPLEMENTATION

Implementation is a developing stage in the project development Phase. In This phase developer will analyse the requirements and then plan for the development of a particular requirements with a vision to get an expected output from project. A Complete Development ensures the effective Production of a Project.

During the implementation the developer can make use of Different kinds of languages in order to develop the needs of user requirements. The execution of the requirements is done through the Web Pages that represent the requirements.

In this Phase HTML (hypertext Mark-up Language) makes web pages, CGI for Gate Ways and .NET Web Api for the checking of the requirement. With bundle of these three will help the developer during implementation.

Implementation phase involves the following steps:

1. Proper Analysis
2. Planning
3. Determine terms and Conditions
4. Test for Final Output

Implementation phase also checks with the issues quality, performance, debugging of project. Following of the guidelines provided by the company is developer choice to follow. Final output of the implementation is product.

6.1 SCREENSHOTS

ADMIN

1. Login Page



Warning: Use of this system is restricted to Authorized Users

This computer system is the private property of the company and may only be used by those individuals authorized by Company management in accordance with Company electronic communications system policies. Unauthorized, illegal or improper use may result in disciplinary action and civil or criminal prosecution. Your use of this system is subject to monitoring and disclosure in accordance with Company policy and applicable law. By continuing to access this system, you agree that such access and use is subject to the foregoing. Please do not enter any technical, EAR/ITAR or any other controlled data in the application.

Fig. login page for EMT

2. Home Page

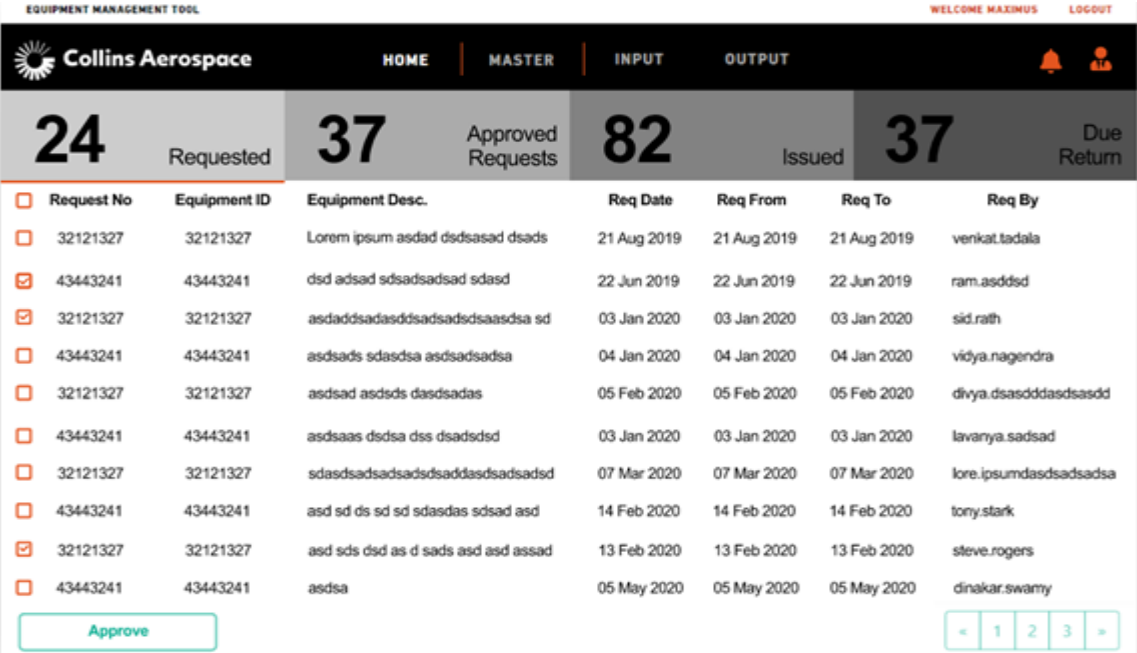


Fig. Home page for Admin

3. Master

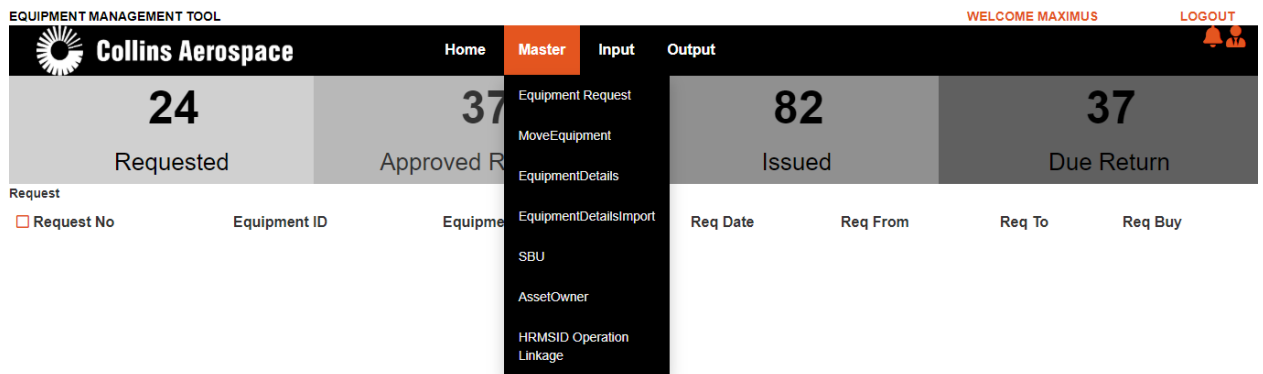


Fig. Master tab Of Admin home Page

3.1 Move Equipment

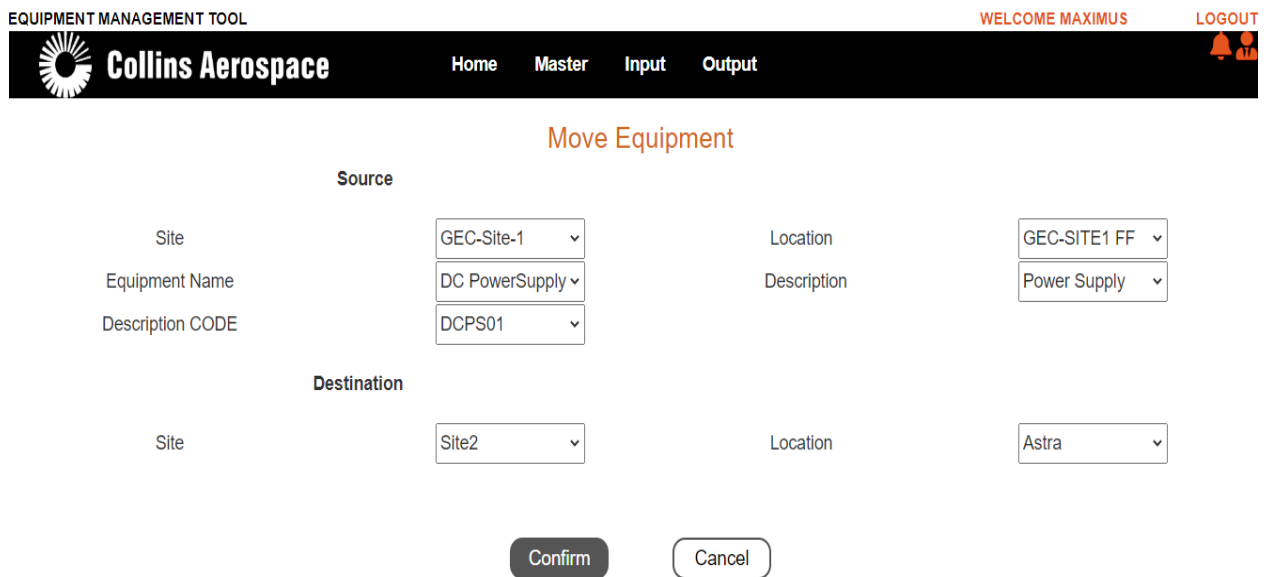


Fig. Move Equipment page

3.2 Equipment Details

Operation Add Edit

Subassembly Details


Selection

Site: GEC-Site-2	Location: Dhruv	Equip Name: DC power supply	Description: DC power supply
Asset No: 787945	PO No: 809807	Category: Equipment & MMD	
Bond No: 141	Bonding Date: 16-June-2020	Identification Tag: dcp525	
Invoice No: 967675	Total Quantity: 6	Supplier: pandal	
Calibration Source: site1	Service Status: Active	Equipment Owner: Harish	
Calibration Location: <input checked="" type="radio"/> OnSite <input type="radio"/> OffSite <input type="radio"/> NA	Equipment Type: <input checked="" type="radio"/> Analog <input type="radio"/> Digital <input type="radio"/> NA	Make: 75	Rate: 8000
Model: -----	Serial No: 5	Range/ Capacity: 500	Hours / Day: 5
Least Count: 2	Acceptance criteria: power supply	Check Method: testing	Asset Ownership: GEC-ASG
Operating Range: 52	Calibrated Range: 86	Remarks: good	
Import type: STPI	Purchase type: Non-F	MMD No:	Test certificate no:

Fig. Equipment Details page

3.3 Equipment Details Import

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 **Collins Aerospace** [Home](#) [Master](#) [Input](#) [Output](#)

Import Details

C:\Users\Lavanya.Ramegowda

Equipment.txt

Fig. Equipment Details import page

3.4 SBU

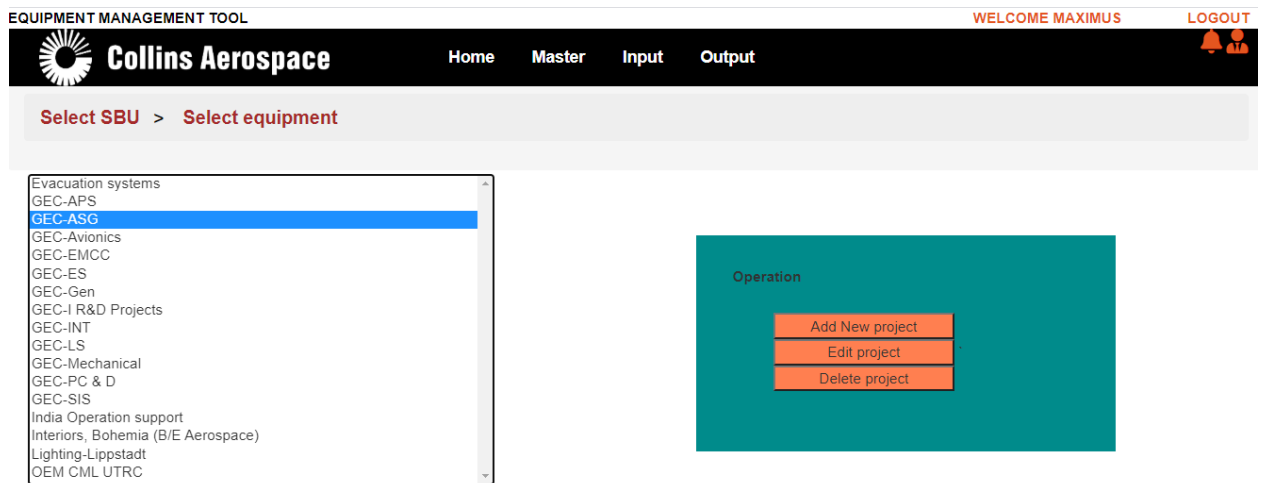


Fig. SBU selection page

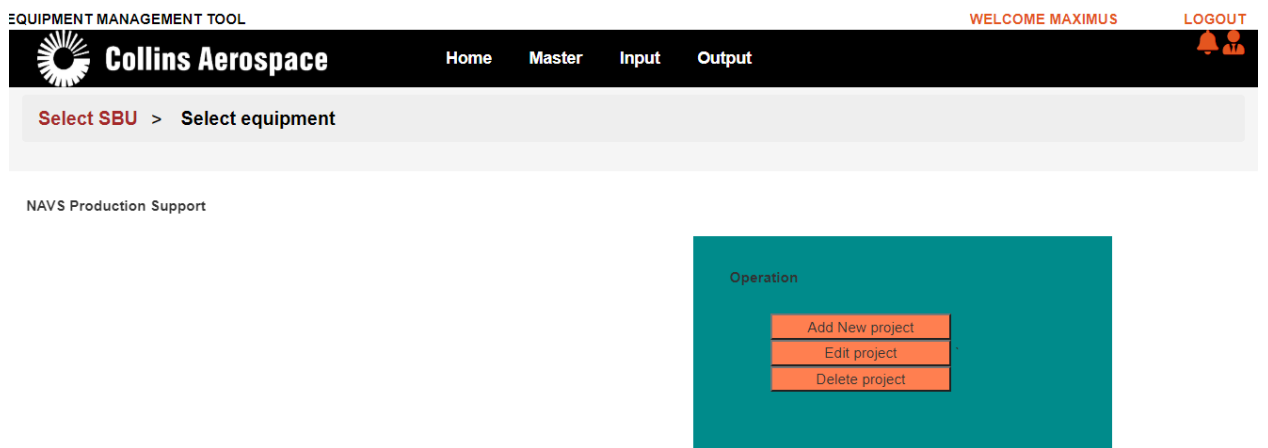


Fig. Selection of Project Page

3.5 Asset Owner, Category, Service Status

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[Asset Owner](#) [Category](#) [Service Status](#)

Asset Owner

Select	S.NO	Asset Ownership
<input type="checkbox"/>	1	ARCHIVE
<input type="checkbox"/>	2	CUSTOMERS
<input type="checkbox"/>	3	GEC-APS
<input checked="" type="checkbox"/>	4	GEC-ASG
<input type="checkbox"/>	5	GEC-AVIONICS
<input type="checkbox"/>	6	GEC-EECS
<input type="checkbox"/>	7	GEC-EMCC
<input type="checkbox"/>	8	GEC-ES
<input type="checkbox"/>	9	GEC-GENERAL
<input type="checkbox"/>	10	GEC-INT
<input type="checkbox"/>	11	GEC-LS
<input type="checkbox"/>	12	GEC-MECHANICAL SYSTEMS
<input type="checkbox"/>	13	GEC-SIS
<input type="checkbox"/>	14	OTHERS

Operation

Fig. Add, Edit and Delete of Asset owner Page

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[Asset Owner](#) [Category](#) [Service Status](#)

Category

Select	S.NO	Category
<input type="checkbox"/>	1	EQUIPMENT
<input type="checkbox"/>	2	EQUIPMENT & MMD
<input type="checkbox"/>	3	EQUIPMENT DETAIL
<input type="checkbox"/>	4	MMD
<input checked="" type="checkbox"/>	5	UUTS

Operation

Fig. Add, Edit and Delete of Category page

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[Asset Owner](#) [Category](#) [Service Status](#)

Services

Select	S.NO	Services
<input type="checkbox"/>	1	Active
<input type="checkbox"/>	2	InActive
<input checked="" type="checkbox"/>	3	Lost
<input type="checkbox"/>	4	NA
<input type="checkbox"/>	5	Obsolete
<input type="checkbox"/>	6	Reference

Operation

Fig. Add, Edit and Delete of Service Status page

3.6 HRMS & Operator

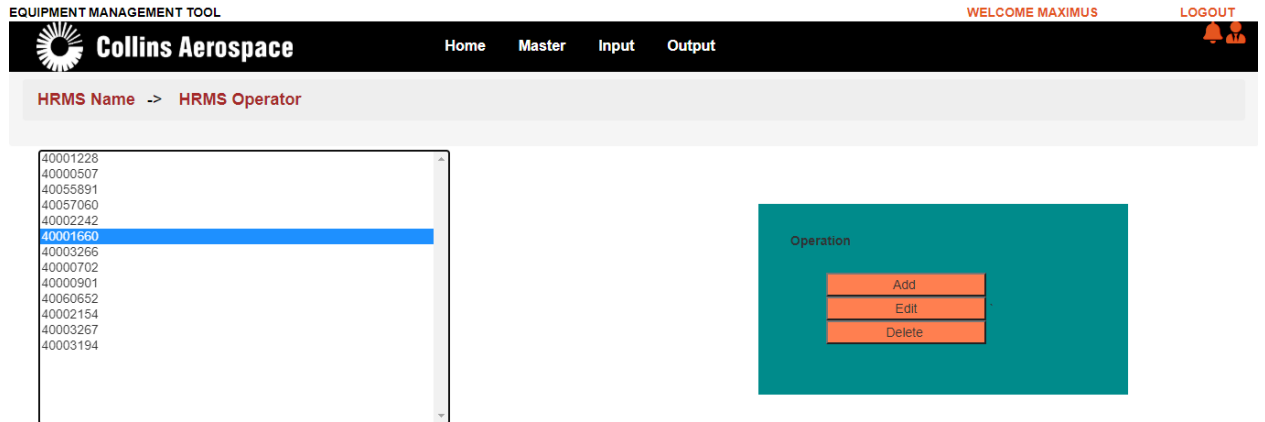


Fig. Selection of HRMS Page

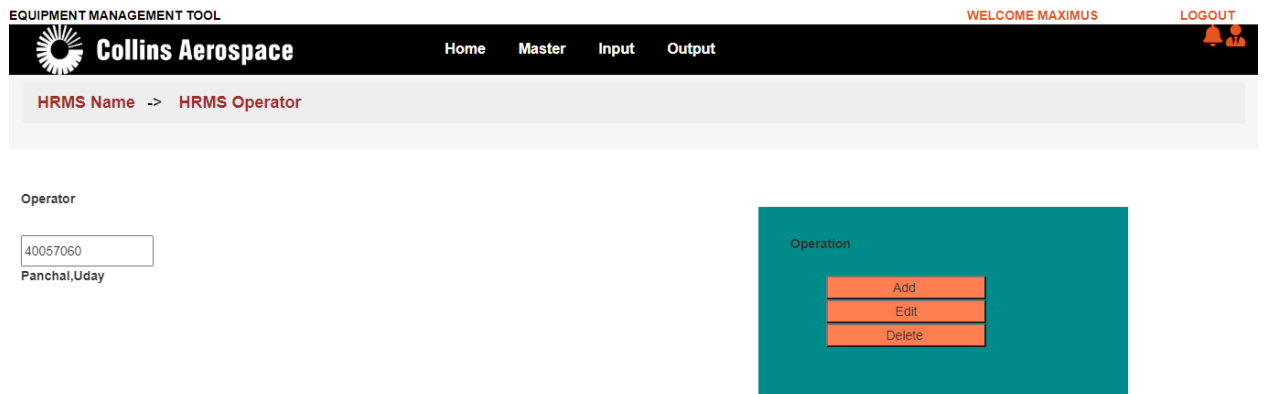



Fig. Add, Edit and Delete of Operator Page

ISSUING FOCUL & CUSTOMER

1. Home Page

1.1 Request

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4
Requested

2
Issued

1
Due Return


Requested

<input type="checkbox"/> Request No	Equipment ID	Equipment Desc	Req Date	Req From	Req To	Req Buy
<input type="checkbox"/> 32121327	32121327	AC Power Supply 3	12 Jun 2020	15 Jun 2020	20 Jun 20120	Divya.Shree
<input checked="" type="checkbox"/> 43443241	43443241	Thermal Chamber GEC-TC-01	16 Jun 2020	15 Jun 2020	03 Jul 2020	ram.prasad
<input checked="" type="checkbox"/> 32121435	32121327	Air retention test rig GEC/007/Nil Charge	10 Jun 2020	23 Jun 2020	03 Aug 2020	Lavanya.Ramegowda
<input checked="" type="checkbox"/> 32121987	32121987	Radiant heat test rig GEC/006	15 Jun 2020	16 Jun 2020	13 Jul 2020	Pavan.Kalyan

Fig. Requested Equipment details Page

1.2 Issued

EQUIPMENT MANAGEMENT TOOL WELCOME MAXIMUS [LOGOUT](#)

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4
Requested

2
Issued

1
Due Return

Issued

<input type="checkbox"/> Request No	Equipment ID	Equipment Desc	Req Date	Req From	Req To	Req Buy
<input checked="" type="checkbox"/> 43443241	43443241	DC Power Supply GEC-PSD-02	2 Jun 2020	22 Jun 2020	22 Jul 2020	Vidhya.Nagendra
<input checked="" type="checkbox"/> 32121327	32121327	Current Probe GEC/LIG/CP/01	03 Jan 2020	04 Jan 2020	03 Jul 2020	Dinakar.Swamy

Fig. Issued Equipment Details Page

1.3 Due Return

EQUIPMENT MANAGEMENT TOOL WELCOME MAXIMUS [LOGOUT](#)

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4
Requested

2
Issued

1
Due Return

[Search](#)

Due Return

Request No	Equipment ID	Equipment Desc	Req Date	Req From	Req To	Req Buy
87621327	87621327	Conditioning Chamber GEC/025	21 May 2019	23 May 2020	10 Jun 2020	venkat.tadala

Fig. Due Return Equipment Details Page

2. Equipment Request

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[Search](#)




Step 1: Search equipment > Step 2: Select equipment > Step 3: Check Availability > Step 4: Cart List > Step 5: Place the request

Step 1

Plant <input type="text" value="GEC-Site-1"/>	Area <input type="text" value="Site-1 FF"/>	PO No. <input type="text" value="25684953"/>
Bond No. <input type="text" value="658745213"/>	Identification Tag. <input type="text" value="Power Supply"/>	Supplier <input type="text" value="Hari"/>
MMD No. <input type="text" value="654879654"/>	Service Status <input type="text" value="Active"/>	Description <input type="text" value="Power Supply"/>
Import Type <input type="text" value="STPI"/>	Purchase Type <input type="text" value="Asset transfer"/>	Category <input type="text" value="MMD"/>
Equipment Owner <input type="text" value="Utcain\Hari.Krishna"/>	Asset OwnerShip <input type="text" value="GEC-AVIONICS"/>	

Fig. Search equipment Page

EQUIPMENT MANAGEMENT TOOL WELCOME MAXIMUS [LOGOUT](#)

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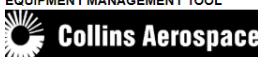


Step 1: Search equipment > **Step 2: Select equipment** > Step 3: Check Availability > Step 4: Cart List > Step 5: Place the request

Step 2

Identification Tag	Equipment Description	Service status	Make	Model	Calibration due	Operating Range	Current User	Area	Department	Cell	Unit
Power Supply	Power AC Supply	Active	AC supply	MD-87654	65874596	Range-2	Divya.Shree	Site-1 FF	AVIONICS	Cell-4	5

Fig. Equipment selection Page

EQUIPMENT MANAGEMENT TOOL WELCOME MAXIMUS [LOGOUT](#)

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Step 1: Search equipment > Step 2: Select equipment > **Step 3: Check Availability** > Step 4: Cart List > Step 5: Place the request

Step 3

From: To:

Available ■ Booked ■ PM/Calibration Planned

Equipment Name: Power AC Supply

Fig. Equipment Availability Check Page

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Step 1: Search equipment > Step 2: Select equipment > Step 3: Check Availability > **Step 4: Cart List** > Step 5: Place the request

Step 4

	Identification Tag	Equipment Description	Service status	Make	Model	Calibration due	Operating Range	Current User	Area	Department	Cell	Unit
Power Supply	Power AC Supply	Active	AC supply	MD-87654	65874596	Range-2	Divya.Shree	Site-1 FF	AVIONICS	Cell-4	5	

[Previous](#)
[Save & Continue](#)

Fig. Equipment Cart List

EQUIPMENT MANAGEMENT TOOL WELCOME MAXIMUS [LOGOUT](#)

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[Search](#)

Step 1: Search equipment > Step 2: Select equipment > Step 3: Check Availability > Step 4: Cart List > **Step 5: Place the request**

Step 5

Requestor Name

SBU

GEC Network

Comments

Date

Project Name

From Date

Project ID




To Date

[Previous](#)
[Book](#)

Fig. Place request for Equipment Page

3. Equipment Search

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Search for the Equipment [Advanced Search](#)




Category Asset Ownership

Category	Bond No.	Location Main Cell	Equipment Make	Equipment Model	Identification Tag	MMD No.	Service Status	Equipment Description	Range/Capacity of the equipment	Calibration due date	Asset ownership	Calendar
MMO	25487632	Cell-5	587462154	MD-548721	Power AC Supply	658456947	Active	Power Supply	Range-5	23/06/2020	Utcaini Hari Kirshna	June 2020

Fig. Search Equipment Page

4. Contact Team

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Sampath, Prabu- 70095(Prabu.Sampath@utas.utc.com)

Panchal, Uday -70123(Uday.Panchal@utas.utc.com)

Harikrishnan.KG-80185(Harikrishnan.KarukayilGopalakrishnan@utas.utc.com)

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Fig. Contact Us Page

CHAPTER-7

SOFTWARE OR QUALITY TESTING

Quality testing is a process to identify if the output of developed software is able to meet the Expected outputs from the user requirements. This whole process involves the execution of the entire software.

Software testing helps identify the defect, missed requirements in the actual requirements of a software system. Testing can be done by manually or automatically.

The program is being performed by using several test cases and using these test cases the output for the program is evaluated to verify if the applications are worked, according to user requirements. Software testing process is the important activity exhibits the final analysis and design, code generation.

Software testing can be divided in 2 classes:

- Clear Box Testing
- Behavioral Testing

Clear Box Testing

This kind of software quality is used to check the internal process of an application as it expected form. In this testing a tester should have a programming knowledge.

Behavioral Testing

This type of software testing is also known as behavioral testing, in which tests the Functionalities of the software. It can be applied to different levels of the software in order to ensure the correctness of the system.

1.1 TESTING STAGES

The testing stages are:

- 1. Component Testing**
- 2. Beta Testing**

1.2 Component Testing

In This kind of testing process each module/ units will test to ensure whether they are working as expected. Unit testing can be done by the developer while programming the each module.

1.3 Beta Testing

This testing is a output of the Program Testing ,In beta quality real users of software will test system to make sure it works well as requirements are stated. User acceptance is the final and crucial software product procedures must appear earlier than newly advanced software is release to market.

1.4 Test Protocol

Test protocol represents the range, resource, schedule of testing the activity. It identifies the features to be tested and assigning will do what task, how dependent the tester is, the environment in which test is going to be done, what are the design process is used for entry and exit criteria. And risk involved in contingency planning.

1.5 Test Data

Test data is used for the evaluations of the test cases to ensure the quality of the software system.

1.6 Test cases

Test case is a condition that checks or verifies final outcome of software with the expected outcome which determines software is validated, verified and bug free. It contains Test case Id, Description, Actual outcome, Expected outcome and Status which prescribes whether the actual outcome is same as expected outcome, it states pass or fail.

1.7 Test Report

It is a final output of testing process. It shows the numbers of test cases are passed and numbers of test cases are failed.

SIGN UP/SIGN IN TEST CASES

ID	Description	Steps to be followed	Expected Output	Actual Output	Status
TC1	Login as admin	Enter Url and go to login page enter the LDAP id of admin an password	Redirects to the page of admin	Redirected to the page of admin	Pass
TC2	Login As Asset owner	Enter Url and then go to the login page and enter the LDAP ID and the password given.	Redirects to issuing home page	Redirected to issuing home page	Pass
TC3	Login as user	Enter Url, it redirect to login page, after that enter LDAP ID and PASSWORD	Redirects to the user home page and enable user request equipment	Successfully logged in and Redirected to user home page	Pass
TC4	Login With invalid LDAP id / Password	Enter Url, it shows login page, then enter valid credentials.	Displays Invalid LDAP id and Password.	Displays Invalid LDAP id and Password.	Pass

ADMIN OPERATION TEST CASES

ID	Description	Steps to be followed	Expected Output	Actual Output	Status
TC5	Generate Report	In Admin Page click on generate report Button and select month/year.	Displays the Message as “Report generated successfully”	“Report generated successfully” message is displayed	Pass
TC6	Generate Invoice	In Admin Page click on generate Invoice Button and select month/year.	Displays the Message as “Invoice Generated Successfully”	“Invoice Generated Successfully” message is displayed	Pass
TC7	Update or Edit the Existing Equipment	In Admin Page click on Equipment management then select update Equipment.	Displays the Message as “Equipment updated successfully”	“Equipment updated successfully” message is displayed	Pass
TC8	Delete the Equipment	In Admin Page click on Equipment management then select Delete Equipment	Displays the Message as “Equipment Deleted successfully	“Equipment Deleted successfully” message is Displayed	Pass
TC9	Add New Equipment	In Admin Page click on Equipment management then select ADD Equipment	Displays the Message as “ successfully Equipment added”	“ successfully Equipment added” message is displayed	Pass

USER OPERATION TEST CASES

ID	Description	Steps to be followed	Expected Output	Actual Output	Status
TC10	Request Equipment	In User Home page search equipment and click on Request equipment button.	Displays the Message as “Equipment Requested successfully”	“Equipment Requested successfully” message is displayed	Pass
TC11	Return Equipment	In User Home page search equipment and click on Return equipment button.	Displays the Message as “Equipment Returned successfully”	“Equipment Returned successfully” message is displayed	Pass

ISSUING FOCUL OPERATION TEST CASES

ID	Description	Steps to be followed	Expected Output	Actual Output	Status
TC12	See Equipment Details	In Issuing Focul Home page search equipment and click on equipment .	Displays the Message as “Equipment details”	“Equipment Details Displayed successfully” message is displayed	Pass
TC13	Approve Request/ Return	In Issuing Focul Home page click on mail and approve the request / return of the Equipment	Displays the Message as “Request/Return Approved successfully	“Request/Return Approved successfully” message is displayed	Pass

CHAPTER-8

CONCLUSION

Equipment management tool is a important management tool which is very useful in getting the accurate results of right quality and right quantity of the equipment.

EMT Tool ensures the supply of the equipment on right time to the customer by having the good material management and control.

Corporate companies should maintain the good asset system and in order to maintain the assets the EMT tool is required.

Using EMT Tool we can manage the all the equipment in the organization easily and can keep track of the assets. IN this tool we can also generate the reports based on month wise / yearly.

For the use of assets the user can pay the money which will be calculated based on the utilization of the equipment which will helps the organization to improve in asset management financially. Users can easily request and return the equipment easily no need of travel investments which helps to time saving.

CHAPTER-9

FUTURE ENHANCEMENT

Equipment Management Tool is web Based Application for maintain of the different Equipment in the organization. Equipment Management Tool is developed through Collins Aerospace to provide their functionality to the user in easy way. This is helped to the IT team of Organization stake holders in order to maintain their equipment stocks in IT store.

These are the following future enhancements:

- In Equipment Management Option to download all the attachments in the database of that particular equipment.
- Payment for the equipment utilization is improved.
- In PM Collaboration if Empid is not working then the employee request is removed from the PM collaboration.
- In Report generation Issues with closed report Auto time month.
- Should have the option to download based on the SBU (Asset Ownership) remove Project ID from the tool.
- Categorization of the equipment as direct effort equipment with sample limit for each equipment- like billed equipment.

APPENDIX A

BIBLIOGRAPHY

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- <https://dotnet.microsoft.com/>