

Asset Management Web Application

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ABSTRACT

The management of the technical assets is a challenging task and optimizing their usage is critical. To ensure the effective utilization of assets, it is very important to make the effective decision regarding assets throughout its lifecycle and an effective decision based on the fact that how is the asset's information managed throughout its lifecycle.

The objective of this paper is to develop an application "Asset Management" which effectively manage the asset-information and help decision makers to make effective decisions regarding assets.

For this purpose, first we propose to identify the asset information requirements and second is technologies needed to gather such information.

The finding of this paper would help in selecting asset management web application to provide information about assets in real world applications so that decision makers can make effective decisions and make effective utilization of assets

INTRODUCTION

In most of organisations, physical assets are the foundation for success and future growth. Therefore, the effective management of these assets is essential to the overall success of such organisations. Management of asset information plays important role in the optimized use of asset throughout its lifecycle. Optimized use of assets determines the growth rate of the organisation.

In this era of globalization, Companies must maximize every conceivable advantage to keep pace with their competitors. Industries are therefore under increasing pressure to reduce costs, meet performance and production targets, comply with regulatory requirements, and maximize return on assets. Those with vision are looking for opportunities to reduce the cost of maintaining their assets, improve the performance and extend

the life of those assets, speed up information and decision making, and gain competitive advantage throughout the asset life cycle. This has recently put a strong emphasis on to the area of Asset Management (AM).

NXTGEN Datacentre and Cloud Technology Private Limited is an emerging leader in data centre and cloud-based services that help powering businesses to grow by cutting through complexity and saving on cost.

NXTGEN's offerings include:

On-premise data centres (OPDC™ plug and play fully integrated datacentre, configured individually for all-size companies).

Enterprise Cloud Services™ (available as public, hybrid, and private cloud).

NXTGEN is launching India's first built-for-cloud data centre, their high density data centre facility (HDDC™) in Bangalore.

So it is one of the organisation in which assets play important role for deciding future growth rate. NXTGEN deals with two types of assets: IT assets and non-IT assets.

Asset management web application will provide the user friendly environment for both employee and customer in accessing required information related to asset. The web app provides facilities to manage asset-information, purchasing and billing information of the assets by implementing effective frontend and backend in the application.

Keywords: Asset, Asset Management, Asset Management Life Cycle

Definition 1 (Asset):

An asset is defined as any physical core, acquired elements of significant value to the organisation, which provides and requests services for this organisation”.

Definition 2 (Asset management):

Asset management is the process of organising, planning and controlling the acquisition, use, care, refurbishment, and/or disposal of physical assets to optimise their service delivery potential and to minimise the related risks and costs over their entire life through the use of intangible assets such as knowledge based decision-making applications and business processes.

Definition 3 (Asset management life cycle):

Management of assets throughout their lifecycle is process-oriented. When one consider the complete “cradle -to-grave” life of a typical asset, its lifecycle can be divided into three inter-dependent processes.

Beginning of Life (BOL): which involves the design and creation (manufacture) of the asset;

Middle-of-Life (MOL): when the asset moves into the usage stage, when it provides its intended

service to its user, and requests services from the user in the form of maintenance, upgrade, etc.;

End-of-Life (EOL): when the asset is eventually retired from its operation.

NXTGEN Cloud Enterprise basically work for middle and end part of asset life cycle. NXTGEN provides services like OPDC (on premises data centre), HDDC (high density data centre) and ECS (Enterprise cloud services).NXTGEN purchase the assets and build VMs and sale these VMs to customer as Enterprise cloud services. Sometimes customer demands for racks their desire dimension, NXTGEN provides OPDC services to such customers in less time. This service is self-contained, and efficient. NXTGEN provides co-location, dedicated hosting to customer in HDDC services.

Backend of the Asset Management Web App contain MYSQL Database having three tables: master_table, purchase_order_details, and billing_order. Master_table is managed by IT/NON-IT employee and Head of IT Department. Purchase_order_details is managed by Accountant, Customer and Admin. Billing_order is managed by Accountant and Admin.

System Requirements:

Software requirements:
Hardware requirements:

Front End: JDK 1.8.0_0.5
RAM: 4GB

Back End: MYSQL Server 5.1

OS: LINUX/WINDOWS

BASIC MODEL IMPLEMENTATION

The basic model of Asset Management Web Application is Model-View-Controller (MVC) architecture. MVC Architecture is basic model for interactive web applications. Model defines the business logic and functions which manipulates the business data. It provides updated information and response to query. View represents the application and forward query response to controller.

Controller accepts and check the user request and controls business request to fulfil these request.

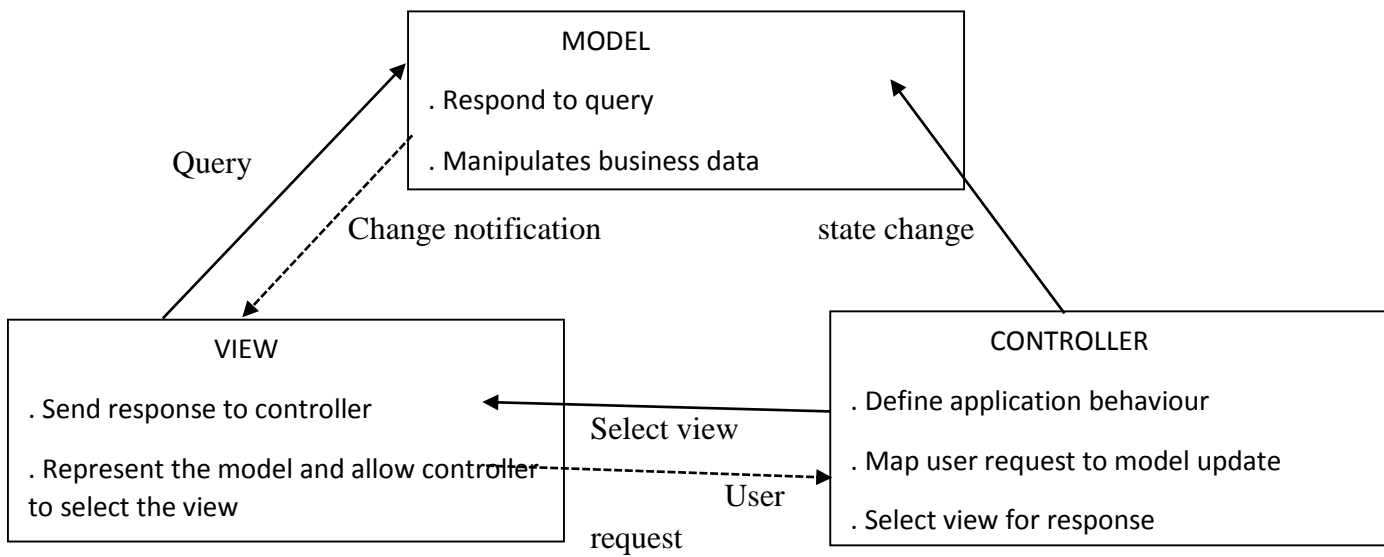


Figure 1. MVC Architectur

Asset Management Web Application provides separate login/registration for employee, customer, accountant and admin. Login application is MVC based implementation.

Example:

login.jsp: take userid and password as input as input, code is:

```
<form method="post" action="nxtgenlogin.jsp">
User Name <input type="text"
name="user_name" value="" /> Password
<input type="password" name="password"
value="" /> <input type="submit" value="Login"
/> <input type="reset" value="Reset" /> Yet Not
Registered!!
<a href="nxtgenreg.jsp">RegisterHere</a></for
m>
```

LoginController.jsp: Controller part of the login application which accept or reject the user request, code is:

```
<%@ page import = "java.sql.*, java.io.*,
java.util.*" %>
```

```
<% String userid = request.getParameter
("user_name"); String pwd =
request.getParameter("password"); Driver
driver= new com.mysql.jdbc.Driver();
DriverManager.registerDriver(driver);
Connection con =
DriverManager.getConnection("jdbc:mysql://loca
lhost:3306/assetmanagementdb?zeroDateBe
havior=convertToNull", "root", "amrita2use");
Statement st = con.createStatement(); ResultSet
rs; rs = st.executeQuery("select * from
Employee_Details where user_name=" + userid
+ " and password=" + pwd + ""); if (rs.next())
{ session.setAttribute("user_name", userid);
out.println("welcome " + userid);
out.println("<a href='nxtgenlogout.jsp'>Log
out</a>");
response.sendRedirect("nxtgenloginsuccess.jsp");
} else { out.println("Invalid password <a
href='index.jsp'>try again</a>");

} %>
```

Loginsuccess.jsp: This page is displaying for successful login, code is:

```
Welcome <%=session.getAttribute  
("user_name") %>
```

Error.jsp: This page is displaying for unsuccessful login, code is:

```
<% if ((session.getAttribute ("user_name") ==  
null) || (session.getAttribute ("user_name") ==  
"")) {%> You are not logged in<br/> <a  
href="login.jsp">Please Login</a>
```

Thus MVC based applications are well controlled web based applications.

In three tier architecture, the web application have three main tiers: Presentation Tier, Business Tier and Integration Tier. Presentation Tier includes view layer and control layer used to interact with client. Business Tier deals with business logics and accessing data from Database. Integration Tier contains database like things.

ENTITY RELATIONSHIP DIAGRAM

Entity Relationship diagram is a data model that recognizes the real world as consisting of basic

objects called entities and relationships among objects.

Keywords: Entity Set, Relationship Set, Attributes

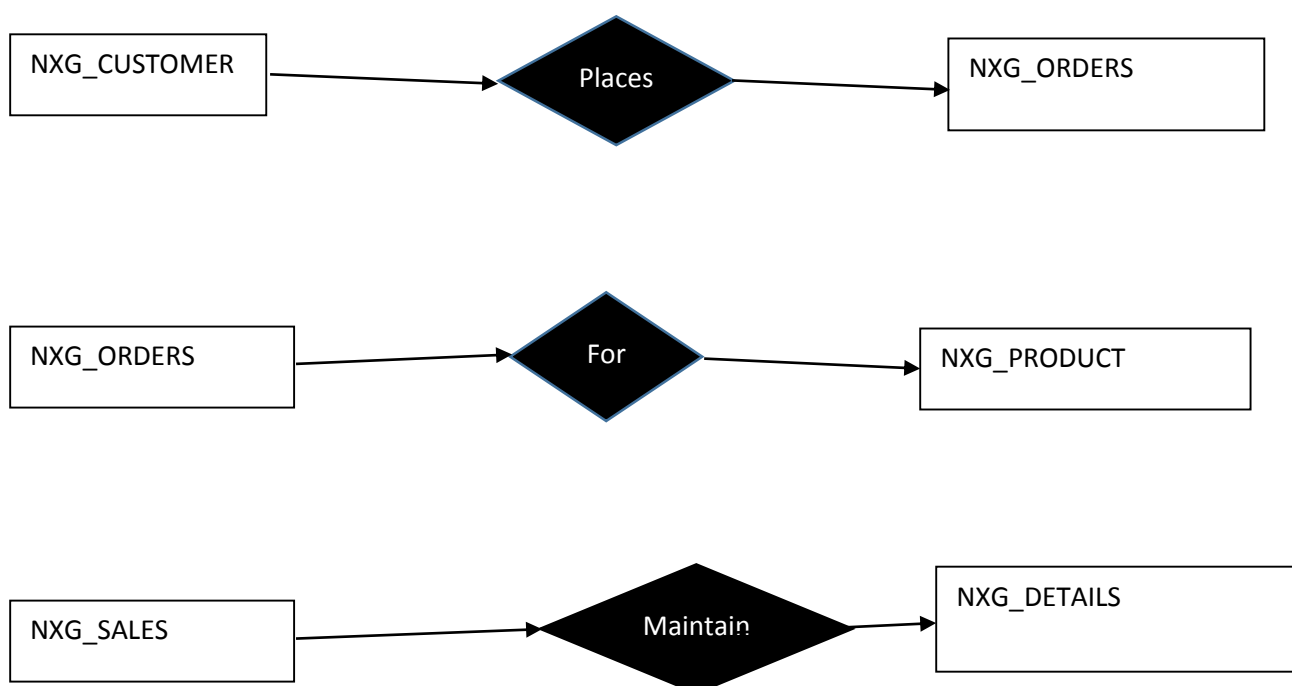
An entity is a “thing” or “object” in the real world that is distinguishable from all other objects. Each entity has some set of properties defined by attributes. Example employee is an entity and its properties like employee name, DOB, employee id, age, department etc. are attributes of entity employee which defines properties of the entity.

An Entity Set is a set of entities of the same type that share the same properties or attributes.

Relationship is an association among entities. For example a relationship can associate customer entity with order entity i.e. a customer can place an order. A Relationship Set is a set of relationships of the same type.

Asset Management Web Application deals with some entities for example NXG_PRODUCT, NXG_ORDERS, NXG_CUSTOMERS, NXG_SALES, and NXG_DETAILS etc.

Relationship among these entities may be defined as follow:



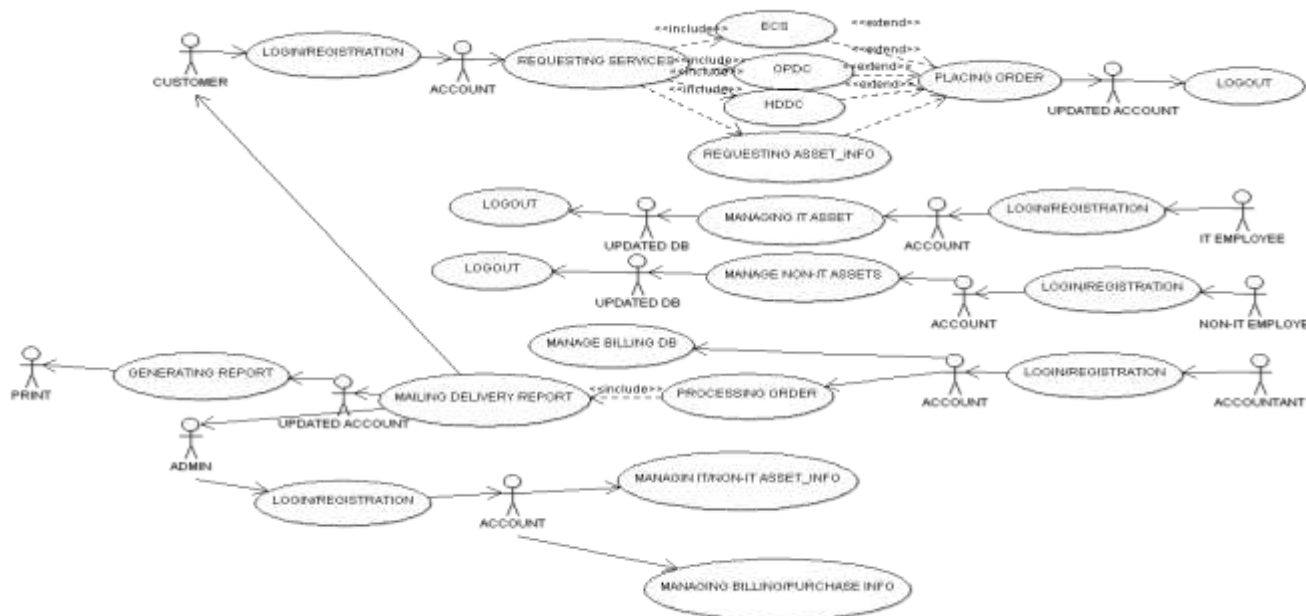
NXG-SALES											
SalesPers_ID	FIRST_NAME	LAST_NAME	REGION	REGION_ID	Phone_Num	email	Manager_ID				
NXG_CUSTOMERS											
CUST_ID	CUSTNAME	ADDRESS1	ADDRESS2	CITY	STATE	COUNTRY_CODE	POSTAL_CODE	email	Phone_Num	YTD_SALES	SalesPers_ID
NXG_ORDERS											
ORDER_ID	CUST_ID	ORDER_DATE	ORDER_SALESMAN	ORDER_POSTED_DATE	DELIVERY_DATE						
NXG_DETAILS											
ORDER_ID	PROD_ID	PROD_QTY	UNIT_PRICE								
NXG_PRODUCT											
PROD_ID	ITEM_DESC	CATEGORY	UNIT_PRICE	CURR_INVENTORY							

USE CASE DIAGRAM

Use case diagram is used to capture the dynamic aspect of the system. Purpose of use case diagram:

- Used to gather requirements of a system.
- Used to get an outside view of a system.
- Identify external and internal factors influencing the system.
- Show the interacting among the requirements are actors.
- The actors can be human user, some internal applications or may be some external applications. So

in a brief when we are planning to draw a use case diagram we should have the following items identified: Functionalities to be represented as a use case, Actors and Relationships among the use cases and actors. Use case diagram of Asset Management Web Application given below defines requirements or functionalities that the Application must provide to its user by oval shape identification. User of the system who initiates the one or more use-cases are actors of the system. In the given use-case Actors are: Account, Customer, IT-Employee, Non-IT Employee, Admin, Print and Accountant. They will initiate the Application



NXTGEN ASSET OPERATIONAL DEFINITION

NXTGEN Asset operational views are of two types:

- a. NxtGen owned assets
- b. Customer owned assets

NxtGen owned assets are assets which are used by NxtGen Employees. Customer owned assets are assets which are used by customers only. Information of both types of assets are managed in Database by NxtGen Employees only. Next level of categorization of assets is in three basic categories:

- a. Internal assets

ASSET NAME	ASSET TYPE	DEPARTMENT-WISE CATEGORIZATION
ACCESS CONTROL	SECURITY SYSTEM (SEC)	IT ASSET
CCTV-DVR	SECURITY SYSTEM (SEC)	IT ASSET
EXTERNAL HDD	COMPUTER SYSTEM (COM)	IT ASSET
FIREWALL	FIREWALL (FEW)	IT ASSET
IP PHONE	NETWORK ELEMENT (NTW)	IT ASSET

- b. Common service assets
- c. Dedicated service assets

This type of categorization depends on the nature of use of the asset. NxtGen assets may be IT assets or NON-IT assets. IT Assets can be managed by IT Employees only in database and NON-IT Assets can be managed by NON-IT Employees only.

WEB APP will provide hence separate user interface for managing IT or NON-IT Assets. Head of the department will be able to insert, update, and delete data of both IT and NON-IT Assets. ASSET NAME, ASSET TYPE and DEPARTMENT-WISE CATEGORIZATION are listed in table given below:

KVM SWITCH	COMPUTER (COM)	SYSTEM	IT ASSET
LCD MONITOR	ELECTRONIC (ELC)	DEVICE	NON-IT ASSET
PC	COMPUTER (COM)	SYSTEM	IT ASSET
PRINTER	COMPUTER (COM)	SYSTEM	IT ASSET
ROUTER	NETWORK (NTW)	ELEMENT	IT ASSET
SERVER	COMPUTER (COM)	SYSTEM	IT ASSET
SWITCH	NETWORK (NTW)	ELEMENT	IT ASSET
UPS	UNINTERRUPTED POWER SUPPLY (UPS)		NON-IT ASSET
VOIP	NETWORK (NTW)	ELEMENT	IT ASSET
LOAD BALANCER	NETWORK (NTW)	ELEMENT	IT ASSET
WIFI	NETWORK (NTW)	ELEMENT	IT ASSET
LAPTOP	COMPUTER (COM)	SYSTEM	IT ASSET
EXTERNAL DVDRW	COMPUTER (COM)	SYSTEM	IT ASSET
WIFI Kbd&Ms	COMPUTER (COM)	SYSTEM	IT ASSET
MUX	ELECTRONIC DEVICE		NON-IT ASSET
EPBX	ELECTRONIC DEVICE		NON-IT ASSET

ASSET ID GENERATION

Asset ID generation is a process in which we give some specific input to an asset input form (HTML

form) in specific way. This form have one submit button which is implemented on clicking and follow the link in the form action attribute. That link will show the output which contain unique asset ID for that asset.

ID	OWNERSHIP	LOCATION	CATEGORY	TYPE	ASSETID
1	N	W	Cm	COM	NWCmCOM1

APPENDING OF DATA FROM EXCEL SHEET TO MYSQL DATABASE

Steps in exporting data from excel sheet to MySQL:

1. Install MySQL Workbench and its one of the utility 'MySQL for Excel'.

NOTE: Installation of 'MySQL for Excel' is possible if and only if Visual Studio is already installed in the system. Otherwise you need to first install Visual Studio then try to install 'MySQL for Excel'.

2. Open the excel sheet containing required data.
3. Select DATA tab in excel sheet.
4. Create Local Connection of Local Instance MySQL56.
5. Once database gets connected, select the required database schema and then select required database table to which you want to append data.
6. Select data from excel sheet then click on the Append command to append data from excel to MySQL database table.
7. On clicking Append command, a new window will open containing two tables. Both tables contain all the columns where mapped columns are in green colour and unmapped columns are in red colour. The columns in red colour are not get append from excel sheet to MySQL Database table.

NOTE: Data type of both MySQL Database table and excel sheet table must be same the only Append command can be executed successfully.

8. On clicking the APPEND command on new window the data get appended from excel sheet to MySQL Database table.

Thus one can transfer the data from excel sheet to MySQL Database table.

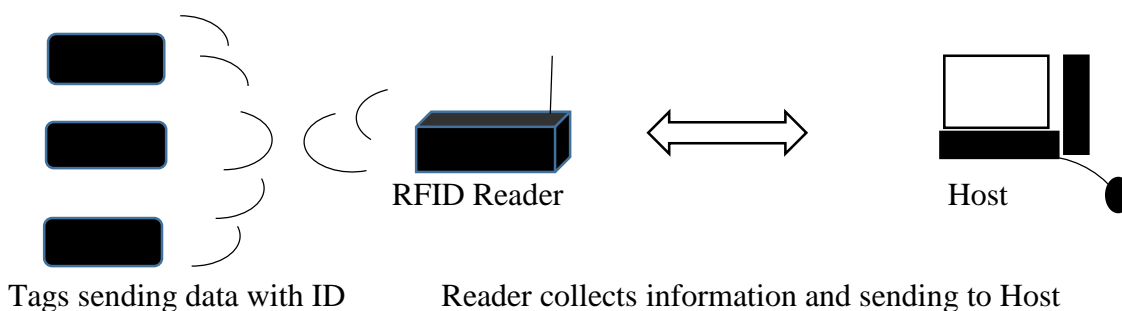
ASSET TRACKING

Asset tracking is a methodology used to track the movement of physical asset. It is done either by scanning barcode tags attached to the asset or by using RFID (Radio Frequency Identifier) tags which broadcast the location of asset in limited transmission range. Barcode reader and RFID Technology belong to the Automatic Identification and Data Capture (AIDC) Technology. This technology automatically identifying the object, collecting data about then and entering that data directly into the system. Data capture technology is used in the situation when information exists on scanned image and electronic files of various format.

Asset Management Web Application will capture the data on barcode and of electronic form by using barcode reader and radio frequency identifier (RFID) respectively.

RFID Technology

RFID Technology access the information easily without delay and any complication. RFID Technology supports real-time access and has long range area coverage reading. RFID is an electronics device consisting of tags, readers and software. RFID system components are shown in figure below:



Tags are transponder that respond to queries from an RFID reader by transmitting a unique identifier. RFID reader is a device which collects information from tags and send to the computer which have software application. RFID software system has two part: application programming interface and application software. API is java based application and it will response for the fetching information collected by the reader, filter that information and send to the end user.

BARCODE Reader

Barcode API will used to decode the barcode image, however it has also facility of encode the image.

Software prerequisites:

- Core.jar, javase.jar
- *BarcodeEngine 1.3L(L for library)*

These two libraries are need to be included in the project's library. Once these get added in project's class path, the API will be ready to read and write the barcode.

CONCLUSION:

This paper provides concept to develop a web application which give user friendly environment to manage the asset and help in maintaining the all asset information, purchase details regarding assets in NxtGen Pvt. Ltd. Both customer and employee will be able to login to their page separately and fetch required information about asset and about its current status.

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