PROJECT MANAGEMENT SYSTEM
A PROJECT REPORT

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Ms. Neelam Rawat
KIET Group of Institution, Ghaziabad

to the
Department of Computer Applications

DR. APJ ABDUL KALAM TECHNICAL UNIVERSITY
(Formerly Uttar Pradesh Technical University) LUCKNOW

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DECLARATION

I hereby declare that the work presented in this report entitled "**Project Management System",** was carried out by me. I have not submitted the matter embodied in this report for the award of any other degree or diploma of any other University or Institute.

I have given due credit to the original authors/sources for all the words, ideas,diagrams,graphics,computerprograms,experiments,results,thatarenotmyoriginalcontribution.Ihave used quotation marks to identify verbatim sentences and given credit to the original authors/sources.

I affirm that no portion of my work is plagiarized, and the experiments and results reported in the report are not manipulated. In the event of a complaint of plagiarism and the manipulation of the experiments and results, I shall be fully responsible and answerable.

Name: Deepali Tyagi
University Roll No: 1900290149039
Branch: MCA

(Candidate Signature):

Dear Deepali Tyagi,

Welcome to Astrea IT Services Pvt Ltd. I am pleased to offer you employment in the position of Software Developer with Astrea.

Astrea is eager to have you as part of our team. We foresee your potential skills as a valuable contribution to our company and clients. Your appointment as Software Developer will commence on July 1st, 2021.

During your internship, you will receive a monthly stipend of Rs 10,000. Your Internship will start from July 1st 2021, and end on December 31st, 2021. After completing your internship, you will start receiving a salary. As a Software Developer, you will be entitled to a monthly starting remuneration of Rs 28000/- (Rupees Twenty eight thousand only). Regular performance review will be conducted to assess your performance and suitability. Your continued employment at Astrea is dependent on your successful completion of the probationary period. Your salary will be revised at regular intervals based upon your performance. You will be entitled to all allowances and benefits whatsoever decided by the management. You shall receive your payment before 5th of every month. Leave and other company policies will be shared with you at the time of joining. These policies are reviewed from time to time by the management of Astrea for your benefit.

After confirmation, the company would be entitled to terminate your services, without assigning any reason, by giving you one month notice in writing, or payment in lieu of such notice. In the event of your desire to leave the company at any time after confirmation, you shall give the company one month's notice, provided that the company may at its sole discretion, waive such notice.

On the day of your joining you are required to submit the following:

1. Relevant copies of Academic /Professional attainments and work experience.
2. Documentary evidence of Date of Birth, No Due Certificate and Relieving letter & TDS certificate from last employer, details of last salary, appointment letter of current employer.
3. Three passport size colored Photographs.

If on verification, at the time of appointment or at a later date it is found that you have furnished wrong information, in such cases your services with the company will be liable to termination.

Your signing this appointment letter confirms your acceptance of the terms and conditions and that you would be joining Astrea on the given date.

I am looking forward to working with you.

Sincerely,

Naveen Gabrani

CEO, Astrea IT Services *Date: May 31st*, 2021

CERTIFICATE

Certified that Deepali Tyagi (1900290149039) has carried out the project work presented in this project report entitled “Project Managment System” for the award of Master of Computer Application from Dr. A.P.J. Abdul Kalam Technical University, Lucknow under my supervision. The report embodies result of original work, and studies are carried out by the student himself and the contents of the report do not form the basis for the award of any other degree to the candidate or to anybody else from this or any other University.

Dr. Ajay Kumar Shrivastava
Professor & Head
Dept. of Computer Applications
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External Examiner

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ABSTRACT

Abstract – The purpose of Project Management System is to automate the existing manual system by the help of computerized equipment's and full-fledged computer software, fulfilling their requirements, so that their valuable data/information can be stored for a longer period with easy accessing and manipulation of the same. The required software and hardware are easily available and easy to work with.

Sales and Inventory System, as described above, can lead to error free, secure, reliable and fast management system. It can assist the user to concentrate on their other activities rather to concentrate on the record keeping. Thus, it will help organization in better utilization of resources. The organization can maintain computerized records without redundant entries. That means that one need not be distracted by information that is not relevant, while being able to reach the information.

The aim is to automate its existing manual system by the help of computerized equipment's and full-fledged computer software, fulfilling their requirements, so that their valuable data/information can be stored for a longer period with easy accessing and manipulation of the same. Basically, the project describes how to manage for good performance and better services for the clients.

ACKNOWLEDGEMENT

Success in life is never attained single headedly. My deepest gratitude goes to my thesis supervisor, **Ms. Neelam Rawat** for his guidance, help and encouragement throughout my research work. Their enlightening ideas, comments, and suggestions. Words are not enough to express my gratitude to **Dr Ajay Kumar Shrivastava, Professor and Head, Department of Computer Applications**, for his insightful comments and administrative help at various occasions.

Fortunately, I have many understanding friends, who have helped me a lot on many critical conditions. Finally, my sincere thanks go to my family members and all those who have directly and indirectly provided me moral support and other kind of help. Without their support, completion of this work would not have been possible in time. They keep my life filled with enjoyment and happiness.

Deepali Tyagi
(1900290149039)

CHAPTER 1

INTRODUCTION

PROJECT MANAGEMENT SYSTEM

Project management is the discipline of initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet the specific success criteria.Hence the management decided to implement a new library management system using SalesForce.com using APEX platform to have an interactive, scalable, flexible, reliable system.Software Project Management Tool deal with the various levels of project development and will account for time used in phase via analysis, design, coding, testing and implementation etc. 1.2 DESCRIPTION: Software Project Management Tool gives the management clear picture of usage of time by projects. By analyzing the results provided by the software.

They might reify the defects in utilizing time and take remedial actions. Software Project Management Tool gives the individual reports of the project, which contains time used for various tasks. In this tool client gives requirements to the BDO and makes an agreement with him. The new project information is entered by the BDO, based on the project information the project manager will take resources from the HR and assign activities to developers who are working under him. Employees fill the time sheet and complete the task assigned to them .these completed tasks are tested and finally the project is submitted the client.

This **project deals with Threemodules –ClientBusiness development officer (BDO)**, **Developer, Human Resource Manager (HR)**, **Project Manager (PM)**.Client deals with checking the status of the project by the client. Only the authenticated client login to the web page and checks in which phase the projectis.**BDO** deals with collecting the requirements from the client and add the client details and project details into the database and also views and updates

the respective details Developer deals with filling the timesheets. Updating and viewing the timesheets and also checking the project status.

HR deals with providing resources to the project manager by checking the employee details like skill anddesignation.HR can also view the status of the project. PM deals with planning the project i.e. dividing the project into different tasks and assigning those tasks to thedevelopers.PM also checks the timesheets of developers. Fills his own timesheet, updates and views the timesheet. **PM** can also check the status of the project.

1.2 Project Scope

To attract doctorate, post doctorate students to roll into the university, management decided to buy periodicals, magazines, books and research related papers and expand library facilities. The current library management system has become obsolete and is not able to provide the necessary data to manage it effectively. It is becoming diffcult for students to block magazines in advance, take more than 2 or 3 books, not able to search either through the title.

- This project will keep track of all the books and library information.
- The software will be able to handle all the necessary information.

Hardware / Software used in the Project

Table 1.1 Hardware

Hardware	**Configuration**
Processor	Intel Pentium G2030 clocked at 3.0 GHz
RAM	4GB DDR4
Monitor	Dell Backlit 21” LED
Modem	Internet Connectivity
Keyboard	Dell Standard 102 Keys & Optical Mouse

Table 1.2 Software

Software	**Configuration**
Operating System	Windows XP /7/8/10
Software	Chrome, Microsoft Edge

Technology Description SALESFORCE

Salesforce.com, Inc. is an American cloud-based software company headquartered in San Francisco, California. It provides customer-relationship management(CRM) service and also sells a complementary suite of enterprise applications focused on customer service, marketing automation, analytics, and application development.

Salesforce is the primary enterprise offering within the Salesforce platform. It provides companies with an interface for case management and tas

management, and a system for automatically routing and escalating important events. The Salesforce customer portal provides customers the ability to track their own cases, includes a social networking plug-inthat enables the user to join the conversation about their company on social networking Web sites, provides analytical tools and other services including email alert, Google search, and access to customers' entitlement and contracts

Service Nature of Salesforce:

Salesforce as SaaS (Software as a Service): There is no need for installation, setup or downloads but you just have to log in and start using the software apps across the cloud. Isn't it more convenient and amazing? The answer is a big "YES" when using Salesforce CRM for your business.

Salesforce as PaaS (Platform as a service): Here, there is no need for a separate platform, but you can use code created by other developers to deploy apps. Obviously, you have to customize it as per your business needs, but it saves a lot of time and money as demanded by business today.

Salesforce as IaaS (Infrastructure as a service): Here, there is no need for installing any hardware or software program, but data and apps are stored securely on the cloud. Even you don't have to take the backup, but the cloud will take care

Salesforce Architecture

Figure 1

What is Cloud Computing?

Cloud computing is all about using a remote server, to store, manage, and process data, instead of a local server/ personal computer.

What is CRM?

CRM (Customer Relationship Management) is a kind of software that stores customer contact information like name, address, age, phone number. It also keeps tracks of customer activity like website visits, numbers of outgoing and incoming phone calls, email, and more.

What is Salesforce?

Salesforce is a cloud-based Customer Relationship Management (CRM) software for managing customer relationships and integration with other systems. This SaaS tool helps to create custom solutions for marketing, sales, services and ecommerce as per business requirements. Salesforce has now expanded from just CRM to offer multiple products.

History of Salesforce

- It was founded in March 1999 by ex-Oracle employee Marc Benioff, Frank Dominguez, and Parker Harris
- In June 2004, the company's IPO was listed on the New York Stock Exchange under the stock symbol CRM and raised US$110 million.
- In October 2014, Salesforce announced the development of its Customer Success Platform to merge all the Salesforce's services like sales, service, marketing, analytics, etc.
- In 2017, Sales force launched a Facebook Analytics tool.
- In 2018, Sales force partnered with Apple for improving apps for businesses.
- Salesforce.com translated its services into 16 different languages. It currently has 82,400 regular customers and over 2,100,000 subscribers.

Why Salesforce? Key Benefits

Here, are prime reasons for using Salesforce CRM:

- It is a complete feature-rich solution for marketing, sales, service, partner management, and community management.
- Salesforce data is stored in the cloud so your team can use it from anywhere in the world with the help of an Internet connection.
- It caters to the needs of small as well as medium to large organizations.
- Salesforce works on a pay as you go, model so there are no overhead costs.
- Increase customer loyalty, retention, and satisfaction
- Accelerates sales productivity
- Salesforce can easily integrate with 3rd party apps.
- Increase the growth of your business
- Continuous optimization of campaigns can be done based on the market response and closure interaction with channel partners.

The architecture of Salesforce can be divided into various components described as follows:

Trusted multitenant Cloud

In this component, multiple instances of one or more application operate separately in a shared environment. The instances are known as tenants which separate from each other. Although, there are physically remain in the same hardware. It is called trusted as it offers a high level of security.

Scalable Metadata Platform

This component helps you to customizations. It also allows you to increase the amount of data or concurrent user instances.

Enterprise Ecosystem

The enterprise Ecosystem of Salesforce is quite big as many partners contribute by creating and maintaining in this platform.

APIs

Salesforce offers a powerful suite of APIs to develop the Mobile App.

CRM and Related Functionality

Salesforce includes all features of CRM and also offers features for the creation of apps

Service Nature of Salesforce

- **Salesforce as SaaS (Software as a Service):** No installations, setup or download required. Just Log in and use software across the Cloud.
- **Salesforce as PaaS (Platform as a service):** In this kind of software service, no separate platform is required. You can use the developer's code to create and deploy applications.
- **Salesforce as laaS (Infrastructure as a service):** No hardware or software installations needed as your data and applications are stored securely on the Salesforce cloud.

Features of Salesforce

- **Marketing and sales lead**: Helps you to measure customer engagement by tracking email activities and convert them to customers.
- **Contact management**: With the help of this feature you can pull your customer's data like activity history, frequent contacts, customer communications, etc.
- **Opportunities and quotes**: Helps vendor to create opportunity and quote.
- **Build and run innovative apps:** You can build, scale and manage apps
- **Analytics:** It allows you to access the data, create dashboards and perform analysis
- **Email integration:** It provides integrations devoted to customer service, support and customer experience
- **Communities for sales:**- Online community software that enables companies to connect customers, partners and employees with each other

- **Salesforce Engine:** This feature focuses on making personalized contact with a customer for various campaigns designed by the marketing team
- **Sales Collaboration:** This feature helps you to address customer queries and feedback
- **Sales Performance Management:** It offers a metric-based goal setting and helps you to get feedback & rewards for the sales team.
- **Lead Management:** This feature helps you to tracks the leads that are in progress
- **Territory Management:** This feature allows you to create multiple territory models. You can also preview them before rollout, and helps you to optimize and balance territories
- **Partnership management:** This feature allows you to build communities with partners and help them to share objectives, goals, and activities
- **Workflow and Approvals:** The interface provides simple drag and drops option
- **Files Sync and Share:** This feature provide the sales team the power to share various files and update them instantly
- **Reports and Dashboards:** Dashboards and reporting feature offers a real-time picture of the business at a glance
- **Sales Forecasting:** This feature allows you are getting a real time view of the forecast of a sales team

APEX

Apex is a proprietary programming language provided by the Force.com platform to developers similar to Java and C#. It is a strongly typed, object-oriented, case-insensitive programming language, following a dot-notation and curly-brackets syntax. Apex can be used to execute programmed functions during most processes on the Force.com platform including custom buttons and links, event handlers on record insertion, update, or deletion, via scheduling, or via the custom controllers of Visual force pages.

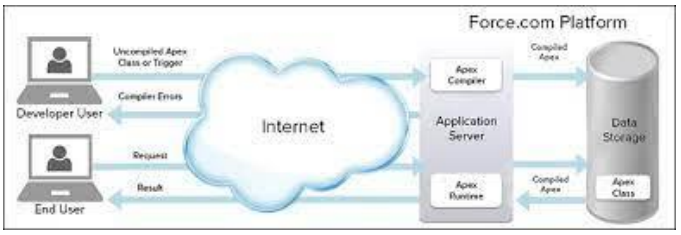

Figure 2

Apex is a proprietary language developed by the Salesforce.com. As per the official definition, Apex is a strongly typed, object-oriented programming language that allows developers to execute the flow and transaction control statements on the Force.com platform server in conjunction with calls to the Force.com API.

It has a Java-like syntax and acts like database stored procedures. It enables the developers to add business logic to most system events, including button clicks, related record updates, and Visualforce **pages. Apex** code can be initiated by Web service requests and from triggers on objects. Apex is included in Performance Edition, Unlimited Edition, Enterprise Edition, and Developer Edition.

Features of Apex as a Language

Let us now discuss the features of Apex as a Language −

Integrated

Apex has built in support for DML operations like INSERT, UPDATE, DELETE and also DML Exception handling. It has support for inline SOQL and SOSL query handling which returns the set of sObject records. We will study the sObject, SOQL, SOSL in detail in future chapters.

Java like syntax and easy to use

Apex is easy to use as it uses the syntax like Java. For example, variable declaration, loop syntax and conditional statements.

Strongly Integrated With Data

Apex is data focused and designed to execute multiple queries and DML statements together. It issues multiple transaction statements on Database.

Strongly Typed

Apex is a strongly typed language. It uses direct reference to schema objects like sObject and any invalid reference quickly fails if it is deleted or if is of wrong data type.

Multitenant Environment

Apex runs in a multitenant environment. Consequently, the Apex runtime engine is designed to guard closely against runaway code, preventing it from monopolizing shared resources. Any code that violates limits fails with easy-to-understand error messages.

Upgrades Automatically

Apex is upgraded as part of Salesforce releases. We don't have to upgrade it manually.

Easy Testing

Apex provides built-in support for unit test creation and execution, including test results that indicate how much code is covered, and which parts of your code can be more efficient.

When Should Developer Choose Apex?

Apex should be used when we are not able to implement the complex business functionality using the pre-built and existing out of the box functionalities. Below are the cases where we need to use apex over Salesforce configuration.

Apex Applications

We can use Apex when we want to −

- Create Web services with integrating other systems.
- Create email services for email blast or email setup.
- Perform complex validation over multiple objects at the same time and also custom validation implementation.
- Create complex business processes that are not supported by existing workflow functionality or flows.
- Create custom transactional logic (logic that occurs over the entire transaction, not just with a single record or object) like using the Database methods for updating the records.
- Perform some logic when a record is modified or modify the related object's record when there is some event which has caused the trigger

Due to the multitenant nature of the platform, the language has strictly imposed governor limitations to guard against any code monopolizing shared resources. Salesforce provides a series of asynchronous processingmethods for Apex to allow developers to produce longer-running and more complex Apex code.

LIGHTNING

Salesforce made public the front end of its platform, called Lightning. This component-based framework is what the Salesforce mobile app is built on. Salesforce built on this framework in 2015 by releasing the Lightning Design System, an HTML style framework with default CSS styling built in. This framework allows customers to build their own components to either use in their internal instances or sell on the AppExchange.

The Salesforce Lightning App Builder is a tool for rapid applicationdevelopment of responsive web interfaces. This interface allows for different screens to be put together based on Lightning components. This can be used as layouts for records or specific applications.

Lightning Experience, released in 2016, is the new redesigned interface in Salesforce for processes enhancement. Since then all the apps available on AppExchange need to be Lightning and those built on Classic have to migrate to Lightning as Classic is not to be updated any more by Salesforce. The platform offers an option for developers to employ migration techniques to enable the new user interface and switch to Lightning.
Lightning includes the Lightning Component Framework and some exciting tools for developers. Lightning makes it easier to build responsive applications for any device.

Lightning includes these technologies:

- Lightning components accelerate development and app performance. Develop custom components that other developers and admins can use as reusable building blocks to customize Lightning Experience and the Salesforce mobile app.
- Lightning App Builder empowers admins to build Lightning pages visually, without code, using off-the-shelf and custom-built Lightning components. Make your Lightning components available in the Lightning App Builder so administrators can build custom user interfaces without code.
- Experience Builder empowers admins to build communities visually, without code, using Lightning templates and components. Make your Lightning components available in Experience Builder so administrators can build community pages without code.

Using these technologies, you can seamlessly customize and easily deploy new apps to mobile devices running Salesforce. In fact, the Salesforce mobile app and Salesforce Lightning Experience are built with Lightning component

What are Lightning Web Components?

LWC is a new programming model to develop Salesforce lightning components. It's a UI framework that is built using native HTML and modern JavaScript. It uses core *web component* standards and leverages custom elements, templates, decorators, modules, shadow DOM, and other new language constructs available in ECMAScript 7 and beyond.

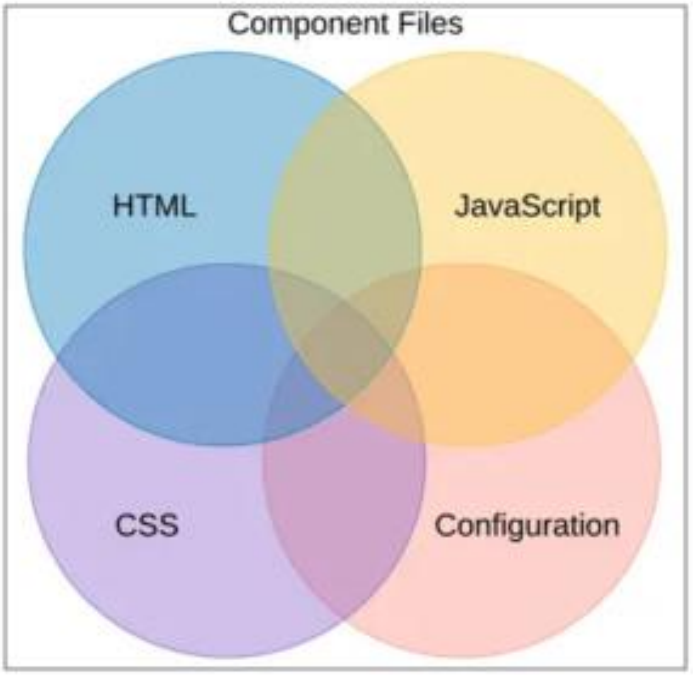

Figure 3

HTML

- Has a root tag <template> which contains your component's HTML.
- When renders, the <template> tag is replaced with <namespace-component-name>.

Figure 4

Javascript

- Import functionality declared in a module eg-lwc(the core module), use the import statement.
- To allow other code to use functionality in a module, use the export statement.
- Lightning Element is custom wrapper of the standard HTML element and we extend it in the component and export.

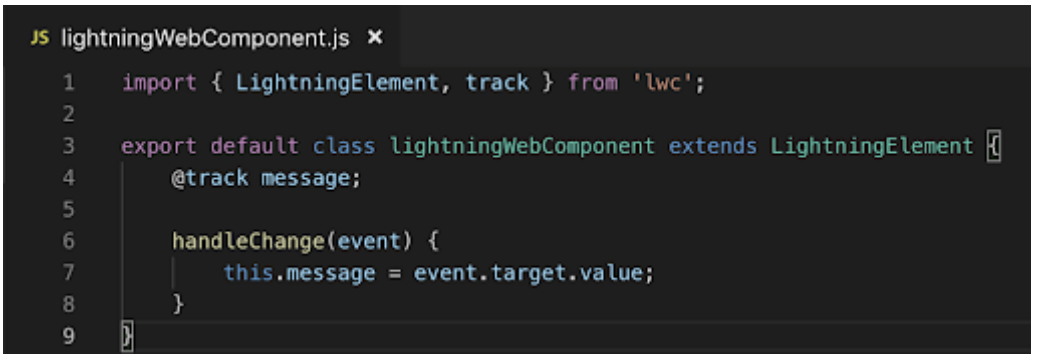

Figure 5

Configuration

XML file that defines the metadata configuration values for the component eg-

- Components Label
- Availability
- Configuration Attributes
- Builder Attributes

Figure 6

CSS

- To style a component.
- The style sheet is applied automatically.

Figure 7

So, the files that we have discussed how would the component build with these look?

Summary

This is the best time to learn and start early with Lightning Web Components, which offer the latest web standards, delivers unprecedented performance and productivity and interoperate seamlessly with existing code.

Example of Lightning Web Components(LWC)

Here is list of some of Lightning Web Component example for developers:

Get Record Id in Lightning Web Component

lightning-record-view-form

JavaScript

JavaScript (often shortened to **JS**) is a lightweight, interpreted, object- oriented language with first-class functions, and is best known as the scripting language for Web pages, but it's used in many non-browser environments as well. It is a prototype-based, multi-paradigm scripting language that is dynamic, and supports object-oriented, imperative, and functional programming styles.

JavaScript runs on the client side of the web, which can be used to design / program how the web pages behave on the occurrence of an event. JavaScript is an easy to learn and also powerful scripting language, widely used for controlling web page behavior.

Contrary to popular misconception, **JavaScript is *not* "Interpreted Java"**. In a nutshell, JavaScript is a dynamic scripting language supporting prototype based object construction. The basic syntax is intentionally similar to both Java and C++ to reduce the number of new concepts required to learn the language. Language constructs, such as if statements, for and while loops, and switch and try ... catch blocks function the same as in these languages (or nearlyso).

JavaScript can function as both a procedural and an object oriented language. Objects are created programmatically in JavaScript, by attaching methods and properties to otherwise empty objects **at run time**, as opposed to the syntactic class definitions common in compiled languages like C++ and Java. Once an object has been constructed it can be used as a blueprint (or prototype) for creating similar objects.

JavaScript's dynamic capabilities include runtime object construction, variable parameter lists, function variables, dynamic script creation (via eval), object introspection (via for ... in), and source code recovery (JavaScript programs can decompile function bodies back into their source text).

What is JavaScript ?

JavaScript is a dynamic computer programming language. It is lightweight and most commonly used as a part of web pages, whose implementations allow client-side script to interact with the user and make dynamic pages. It is an interpreted programming language with object-oriented capabilities.

JavaScript was first known as **LiveScript,** but Netscape changed its name to JavaScript, possibly because of the excitement being generated by Java. JavaScript made its first appearance in Netscape 2.0 in 1995 with the name **LiveScript**. The general-purpose core of the language has been embedded in Netscape, Internet Explorer, and other web browsers.

The ECMA-262 Specification defined a standard version of the core JavaScript language.

- JavaScript is a lightweight, interpreted programming language.
- Designed for creating network-centric applications.
- Complementary to and integrated with Java.
- Complementary to and integrated with HTML.
- Open and cross-platform

Client-Side JavaScript

Client-side JavaScript is the most common form of the language. The script should be included in or referenced by an HTML document for the code to be interpreted by the browser.

It means that a web page need not be a static HTML, but can include programs that interact with the user, control the browser, and dynamically create HTML content.

The JavaScript client-side mechanism provides many advantages over traditional CGI server-side scripts. For example, you might use JavaScript to check if the user has entered a valid e-mail address in a form field.

The JavaScript code is executed when the user submits the form, and only if all the entries are valid, they would be submitted to the Web Server.

JavaScript can be used to trap user-initiated events such as button clicks, link navigation, and other actions that the user initiates explicitly or implicitly.

Advantages of JavaScript

The merits of using JavaScript are −

- **Less server interaction** − You can validate user input before sending the page off to the server. This saves server traffic, which means less load on your server.
- **Immediate feedback to the visitors** − They don't have to wait for a page reload to see if they have forgotten to enter something.
- **Increased interactivity** − You can create interfaces that react when the user hovers over them with a mouse or activates them via the keyboard.
- **Richer interfaces** − You can use JavaScript to include such items as drag-and-drop components and sliders to give a Rich Interface to your site visitors.
-

Limitations of JavaScript

We cannot treat JavaScript as a full-fledged programming language. It lacks the following important features −

- Client-side JavaScript does not allow the reading or writing of files. This has been kept for security reason.
- JavaScript cannot be used for networking applications because there is no such support available.
- JavaScript doesn't have any multi-threading or multiprocessor capabilities.

Once again, JavaScript is a lightweight, interpreted programming language that allows you to build interactivity into otherwise static HTML pages.

JavaScript Development Tools

One of major strengths of JavaScript is that it does not require expensive development tools. You can start with a simple text editor such as Notepad. Since it is an interpreted language inside the context of a web browser, you don't even need to buy a compiler.

To make our life simpler, various vendors have come up with very nice JavaScript editing tools. Some of them are listed here −

- **Microsoft FrontPage** − Microsoft has developed a popular HTML editor called FrontPage. FrontPage also provides web developers with a number of JavaScript tools to assist in the creation of interactive websites.
- **Macromedia Dreamweaver MX** − Macromedia Dreamweaver MX is a very popular HTML and JavaScript editor in the professional web development crowd. It provides several handy prebuilt JavaScript components, integrates well with databases, and conforms to new standards such as XHTML and XML.
- **Macromedia HomeSite 5** − HomeSite 5 is a well-liked HTML and JavaScript editor from Macromedia that can be used to manage personal websites effectively.
-

Where is JavaScript **Today** ?

The ECMAScript Edition 5 standard will be the first update to be released in over four years. JavaScript 2.0 conforms to Edition 5 of the ECMAScript standard, and the difference between the two is extremely minor.

The specification for JavaScript 2.0 can be found on the following site: http://www.ecmascript.org/

Today, Netscape's JavaScript and Microsoft's JScript conform to the ECMAScript standard, although both the languages still support the features that are not a part of the standard.

SOQL

SOQL is Salesforce Object Query Language that is highly similar to SQL (Structured Query Language). With the help of SOQL, you can always search the organizational data wisely. It can be combined with APEX, Visualforce, or Force.com IDE too. While writing a query using SOQL, you should use SELECT command and a lot of other conditions too.

The SOQL can be used when you have the basic idea of objects and related data. It can be used to retrieve data from one or multiple objects that are connected together based on requirements. It helps in getting the total count and sort

queries as well. Further, it can be combined with SOSL (Salesforce Object Search Language) to search the organizational data when they are not sure about objects.
SOSL is programmed in such a way to work on the basis of the search index. To improve the performance of searching, you should combine SOQL and SOSL together because searching work is done better by SOSL as compared to the SOQL.

If you've built a custom UI for Salesforce, you can use the Salesforce Object Query Language (SOQL) and Salesforce Object Search Language (SOSL) APIs to search your organization's Salesforce data.

This guide explains when to use SOQL and SOSL and outlines the syntax, clauses, limits, and performance considerations for both languages. It is intended for developers and assumes knowledge and experience working with APIs to interact with data.

Deciding Which to Use

A SOQL query is the equivalent of a `SELECT` SQL statement and searches the org database. SOSL is a programmatic way of performing a text-based search against the search index.

Whether you use SOQL or SOSL depends on whether you know which objects or fields you want to search, plus other considerations.

Use SOQL when you know which objects the data resides in, and you want to:

- Retrieve data from a single object or from multiple objects that are related to one another.
- Count the number of records that meet specified criteria.
- Sort results as part of the query.
- Retrieve data from number, date, or checkbox fields.

Use SOSL when you don't know which object or field the data resides in, and you want to:

- Retrieve data for a specific term that you know exists within a field. Because SOSL can tokenize multiple terms within a field and build a search index from this, SOSL searches are faster and can return more relevant results.
- Retrieve multiple objects and fields efficiently where the objects might or might not be related to one another.
- Retrieve data for a particular division in an organization using the divisions feature.
- Retrieve data that’s in Chinese, Japanese, Korean, or Thai. Morphological tokenization for CJKT terms helps ensure accurate results.

CHAPTER 2

LITERATURE REVIEW

2.1 Increasing resilience by creating an adaptive salesforce

During disruptions such as the COVID-19 pandemic, the resilience of any commercial organization becomes a critical characteristic. This paper examines the flexibility of the sales process—that is, adaptive selling—as an analog to resiliency, and recommends that firms create an adaptive salesforce to increase resilience. By examining the extant research and conducting interviews with sales leaders, the findings of this paper suggest that an adaptive salesforce should focus on three areas of change within team structures. The first is an increase in flexibility and adaptiveness for the functions that the salesforce performs. The second area is an improvement of the adaptiveness of scale in which sales functions can be rapidly in sourced or outsourced. The final area is technology adaptiveness, in which the salesforce adopts the use of technologies that are most relevant to customers. Implications for the firm, sales function, and individual salespeople are also derived.[1]

2.2Regaining control of salesforce

This study develops a theory explaining how an employer can regain control over its salespeople. We posit that two forms of salesforce opportunism – shirking and influence activities – are the key sources of control loss. We theorize that an employer can regain control through a *selective* match of a formal control mechanism with a salesforce opportunistic behavior.

We test our predictions using data from 304 South Korean automobile dealers. We found that greater output control *mitigates* control loss when it is matched with salespeople's shirking,

whereas it *aggravates* control loss when it is matched with salespeople's influence activities. Conversely, greater behavior control *mitigates* control loss when it is matched with salespeople's influence activities, whereas it *aggravates* control loss when it is matched with salespeople's shirking[2]

2.3APEX-MODFLOW: A New integrated model to simulate hydrological processes in watershed systems

APEX (Agricultural Policy/Environmental eXtender) is an oft-used agro ecosystem model but has limited use in groundwater-driven watersheds due to a simplistic representation of groundwater processes. This paper presents the linkage of APEX and the groundwater flow model MODFLOW into a single modeling code. The mapping of recharge, groundwater head, and groundwater-surface water interactions are handled internally via subroutines[3]

2.4 Minor obstructions for apex-pseudo forests

A graph is called a *pseudo forest* if none of its connected components contains more than one cycle. A graph is an *apex-pseudo forest* if it can become a pseudo forest by removing one of its vertices. We identify 33 graphs that form the minor obstruction set of the class of apex-pseudo forests, i.e., the set of all minor-minimal graphs that are not apex-pseudo forests.[4]

2.5 Salesforce management factors for successful new product launch

New innovative products constitute a central source of economic value creation, but in many industries, salesforce management significantly conditions the appropriation of innovative products during their launch. Very little previous research addresses the salesforce management factors that contribute to successful new product launches. This study identifies and examines a set of salesforce management factors that contribute to successful new product launches by drawing on previous studies related to new product launches and salesforce management.

The multivariate analysis in this study uses data covering new product launches in the Swedish pharmaceutical industry. This study unearths a complex and unique complementarity pattern of factors resting upon the duality of a highly dynamic marketplace and sales representatives with an innovative personality type, which are complementary with other specific factors such as training, management control, and reward system[5]

2.6 SQL

Recently, attention has been focused on spatial databases, which combine conventional and spatially related data, such as geographic information systems, CAD/CAM, or VLSI. A language has been developed to query such spatial databases. It recognizes the significantly different requirements of spatial data handling and overcomes the inherent problems of the application of conventional database query languages. The spatial query language has been designed as a minimal extension to the interrogative part of SQL and distinguishes from previously designed SQL extensions by: the preservation of SQL concepts; the high-level treatment of spatial objects; and the incorporation of spatial operations and relationships. It consists of two components, a query language to describe what information to retrieve and a presentation language to specify how to display query results. Users can ask standard SQL queries to retrieve nonspatial data based on nonspatial constraints[6]

2.7 Preference SQL — Design, Implementation, Experiences

When searching for items to be purchased over the Internet, customer wishes and preferences are becoming increasingly important. Current search engines can hardly cope adequately with fuzzy predicates defined by complex preferences. The biggest problem of search engines implemented with standard SQL is that SQL does not directly understand the notion of preferences

. Preference SQL extends SQL by a preference model based on strict partial orders, where preference queries behave like soft selection constraints. Several built-in base preference types and the powerful Pareto operator, combined with the adherence to declarative SQL programming style, guarantees great programming productivity.

The Preference SQL optimizer does an efficient rewriting into standard SQL, including a high-level implementation of the skyline operator for Pareto-optimal sets. This pre-processor approach enables seamless application integration, making Preference SQL available on all major SQL platforms. Several commercial Business-to-Customer (B2C) portals are powered by Preference SQL[7]

2.8Salesforce automation systems: an exploratory examination of organizational factors associated with effective implementation and salesforce productivity

Given the current information-rich competitive environment, firms must seek ways to utilize technology and information to improve firm productivity. Salesforce automation (SFA) systems are one approach to increased productivity due to their ability to gather and synthesize a wealth of customer and competitor information. Experts suggest, however, a majority of SFA system adoptions fail due to implementation failures. Recognizing the implication of a failed implementation, a conceptual model of SFA implementation effectiveness and firm productivity is

The model proposes that an “enabling” climate and shared values that are congruent with the SFA innovation are necessary for successful implementation. To provide insight into the organizational factors needed to effectively implement SFA innovations, interviews were conducted and rank-order data was collected from sales professionals. Results suggest that an appropriate implementation climate includes sufficient training, encouragement, facilitative leadership, and organizational support. Shared values that are necessary include a customer orientation, adaptive cultural norms, information-sharing norms, entrepreneurial values, and trust among organizational members. Results further indicate that an effective implementation may lead to enhanced productivity through better account prospecting, development, and buyer profiling.

2.9 A Clickable APEX Probe for Proximity-Dependent Proteomic Profiling in Yeast

The engineered ascorbate peroxidase (APEX) is a powerful tool for the proximity-dependent labeling of proteins and RNAs in live cells. Although widely use in mammalian cells, APEX applications in microorganisms have been hampered by the poor labeling efficiency of its biotin-phenol (BP) substrate. In this study, we sought to address this challenge by designing and screening a panel of alkyne-functionalized substrates. Our best probe, Alk-Ph, substantially improves APEX-labeling efficiency in intact yeast cells, as it is more cell wall-permeant than BP.

Through a combination of protein-centric and peptide-centric chemo proteomic experiments, we have identified 165 proteins with a specificity of 94% in the yeast mitochondrial matrix. In addition, we have demonstrated that Alk-Ph is useful for proximity-dependent RNA labeling in yeast, thus expanding the scope of APEX-seq. We envision that this improved APEX-labeling strategy would set the stage for the large-scale mapping of spatial proteome and transcriptome in yeast.

2.10 Proactive behavior and industrial salesforce performance

Proactive behavior has been indirectly linked to effective selling, an assertion underpinned by a logic, which states that in a world of high competition and choice, the passive, reactive seller is unlikely to do as well as his or her more proactive counterpart. Yet, little direct empirical evidence exists to substantiate this link. In this paper, we address this knowledge gap by describing a study that assesses the effect of proactive behavior on the performance of an industrial sales force.

The paper explores the issue of salesperson performance and the construct of proactive behavior (or proactiveness). Using the Proactive Personality (PP) Scale to measure proactiveness and the line manager's subjective evaluation to indicate salesperson performance, it was found that a small but significant relationship exists. The results are discussed, with areas for future research delineated and implications for practitioners explored.

2.11Project management education and training in the USA

Education and training within the USA in the project management field is described. This is intended to: improve understanding and acceptance of project management principles and practices; develop specific planning and control skills, including the use of particular computer software packages; and improve the success rate for project planning and execution. Training and education has traditionally been directed toward project managers and the specialists in project planning and control whose jobs are to support the project manager and the project team. In recent years, more recognition has been given to the need for training functional contributors to the projects as well, and even senior managers who are the owners or sponsors of projects, and this paper describes the various avenues available for training.

Create the following Custom Objects

PMT Error Log– is a project document where all issues that are negatively affecting the project are recorded and tracked.

Data Type	Field Label	Other Values	Remarks
Text	Error Message		Text(255)
Date	Date of arrival		– Mandatory – Can't be greater than today.
Picklist	Type		
Name	Pmt Error log Name		Name of theError(Mandatory)
Text	Method Name		Text(255)
Text Area(Long)	Description	32,000	Visible 3 lines

PMT Error Log– is a project document where all issues that are negatively affecting the project are recorded and tracked.

Data Type	Field Label	Other Values	Remarks
Text	Error Message		Text(255)
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Picklist	Type		
Name	Pmt Error log Name		Name of theError(Mandatory)
Text	Method Name		Text(255)
Text Area(Long)	Description	32,000	Visible 3 lines

Pmt Program- It show all the recent project added with shows Project Name, Project Manager and Project Status

Data Type	Field Label	Other Values	Remarks
Picklist	Program Health		8
Text	Program Name	Length:50	Member's Name – Mandatory
Lookup	Owner Id		Lookup Relationship
Formula	Program Owner		Text

PMT Resource Allocation: Resource Allocation Is the process of assigning and scheduling Availbale resource in the most effective and economical way possible

Data Type	Field Label	Other Values	Remarks
Picklist	Role		
Formula(Text)	User Department		Text
Formula(Text)	User Name		Text
Formula(Text)	User Id		
Formula(Text)	Resource Name		

PMT Error Log — is a project document where all issues that are negatively affecting the project are recorded and tracked.

On clicking PMT Program it shows Program Name,Owner Id,Program Health,Program Owner
Pmt Resource Allocation Shows User Id,Resource Name,User Department,Role

Both are required fields.

Once the record is saved, need to show the project on the saved screen.
It show all the recent project added with shows Project Name, Project Manager and Project Status

Sprint define team work complete the set amount of work

Backlogs Object It shows a list of tasks required to support larger strategic plan

Log Effort check how an issue log helps a project manager in effectively dealing with issues that occur in pmp

Whenever Book is returned – the borrowed_books counter in Member table to be reduced by1.

Features :-

1 .Projects are often carried out by a team of people who have been assembled for that specific purpose. The activities of this team may be coordinated by a project manager. Project teams may consist of people from different backgroundand different parts of the organisation. In some cases project teams may consist of people from different organisations. Project teams may be inter-disciplinary groups and are likely to

2 lie outside the normal organisation hierarchies. The project team will be responsible for delivery of the project

3 end product to some sponsor within or outside the organisation. The full benefit of any project will not become available until the project as been completed

Feasibility study is made to see if the project on completion will serve the purpose of the organization for the amount of work, effort and the time that spend on it. Feasibility study lets the developer foresee the future of the project and the usefulness. A feasibility study of a system proposal is according to its workability, which is the impact on the organization, ability to meet their user needs and effective use of resources. Thus, when a new application is proposed it normally goes through a feasibility study before it is approved for development.

The document provides the feasibility of the project that is being designed and lists various areas that were considered very carefully during the feasibility study of this project such as Technical, Economic and Operational feasibilities.

Technical Feasibility

The system must be evaluated from the technical point of view first. The assessment of this feasibility must be based on an outline design of the system requirement in the terms of input, output, programs and procedures. Having identified an outline system, the investigation must go on to suggest the type of equipment, required method developing the system, of running the system once it has been designed.

Technical issues raised during the investigation are:

Does the existing technology sufficient for the suggested one? Can the system expand if developed?

The project should be developed such that the necessary functions and performance are achieved within the constraints. The project is developed within latest technology. Through the technology may become obsolete after some period of time, due to the fact that never version of same software supports older versions, the system may still be used. So, there are minimal constraints involved with this project. The system has been developed using Java the project is technically feasible for development.

Operational Feasibility

Proposed projects are beneficial only if they can be turned out into information system. That will meet the organization's operating requirements. Operational feasibility aspects of the project are to be taken as an important part of the project implementation. Some of the important issues raised are to test the operational feasibility of a project includes the following:

 Is there sufficient support for the management from the users?

Will the system be used and work properly if it is being developed and implemented?

Will there be any resistance from the user that will undermine the possible application benefits?

This system is targeted to be in accordance with the above-mentioned issues. Beforehand, the management issues and user requirements have been taken into consideration. So, there is no question of resistance from the users that can undermine the possible application benefits.

Economic Feasibility

The developing system must be justified by cost and benefit. Criteria to ensure that effort is concentrated on project, which will give best, return at the earliest. One of the factors, which affect the development of a new system, is the cost it would require.

The following are some of the important financial questions asked during preliminary investigation:

The costs conduct a full system investigation. The cost of the hardware and software.

The benefits in the form of reduced costs or fewer costly errors.

Since the system is developed as part of project work, there is no manual cost to spend for the proposed system. Also, all the resources are already available, it gives an indication of the system is economically possible for development.

Behavioral Feasibility

An estimate should be made of how strong a reaction the user staff is likely to have towards the development of a computerized system. It is common knowledge that computer installation have something to do with Turnover, Transfers and changes in employee Job Status. Normal human psychology of human beings indicate that people are resistant to change and computers are known to facilitate change. Any project formulations should consider this factor also. Before the development of the Project titled "Delhi Metro", the need to study the feasibility of the successful execution of the project was felt and thus the following factors are considered for a Feasibility Study.

Need Analysis.

Provide the users information pertaining to the preceding requirement.

CHAPTER 3

DATABASE MANAGEMENT

A Database in Salesforce is defined as the organized collection of objects where each object contains some information. Data is stored in the form of database tables for people, things, contacts, etc that are important for any project in the future. Each database has a set of certain rows and columns where information is stored in the form of fields and records. It helps produce database systems

That meet the requirements of the users

Have high performance.

One such important concept in Oracle is the Salesforce database class. Database classes can specify either you want to continue the execution or not if some error is encountered. You can also add one Boolean parameter to the Salesforce database class to make it more functional. The same task can be completed using DML statements but you are not free to keep a check on query execution.

Another important concept is the Salesforce database architecture. It has the multi-tenancy architecture where clouds are used to share resources reliably and securely. The multitenant Salesforce database architecture has a huge impact on application delivery and the infrastructure. In simple words, we can say that Salesforce database architecture is highly similar to the architecture of relational database systems.

3.1 Schema Builder

Fig 3.1 Shows the relationship between Custom Objects.

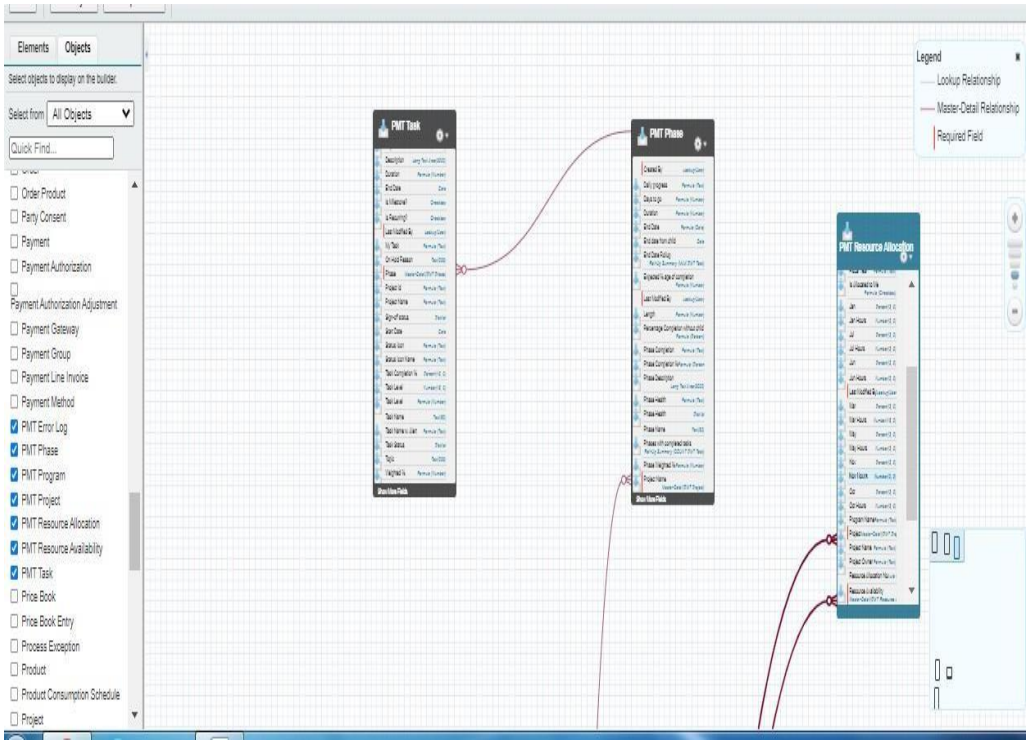


Figure 8

Flow Graphs

Zero Level DFD

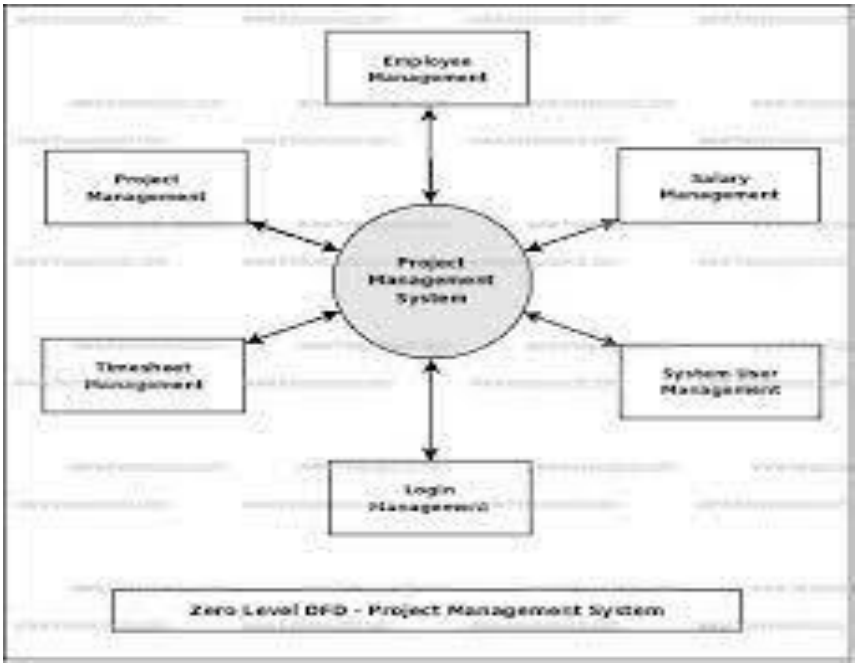


Figure 9

One Level DFD

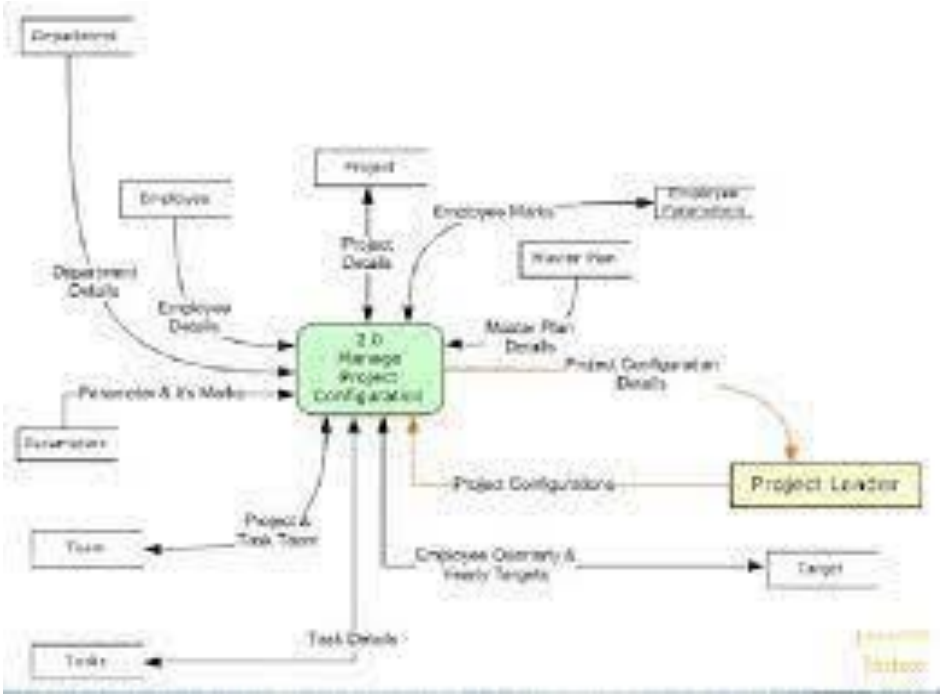
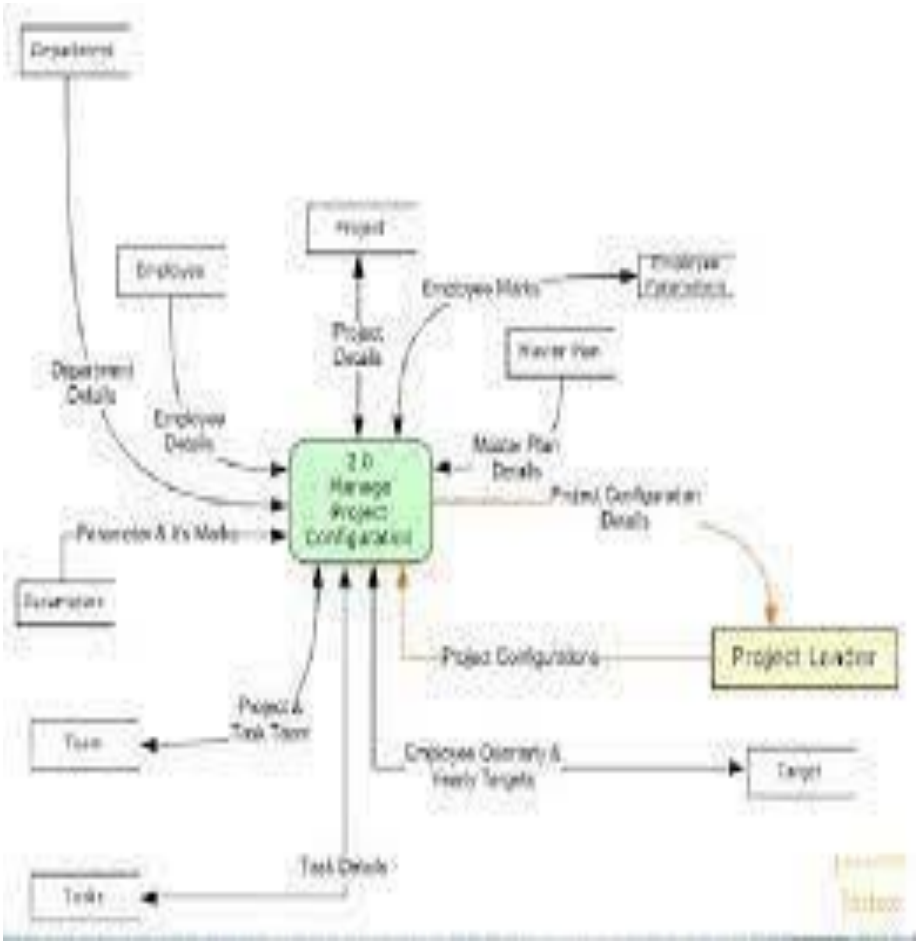


Figure 10

Two Level DFD



Project Management System ER Diagram

Project Management System is an information system that will manage the processes and transactions involved in monitoring and recording the updates of a project. The said project can be implemented in an offline settings but in most cases this is implemented in a live server or it simply means an online system.

The first step in the development of the Project Management System is to prepare the ER diagram that will serve as the basis later on in the creation of the actual database.

We will create and explain the process of making the entity relationship diagram of project management system.

Let's start from the symbols used in the ER Diagram.

Entity is represented by the rectangle shape. The entity will be our database table of Project Management system

Attribute is represented by the oval shape. This will be the columns or fields of each table in the Project Management System.

Relationship is represented by diamond shape. This will determine the relationships among entities. This is usually in a form of primary key to foreign key connection.

We will follow the 3 basic rules in creating the ER Diagram.

1. Identify all the entities.
2. Identify the relationship between entities and
3. Add meaningful attributes to our entities.

Step 1. In the Project Management System we have the following entities

- Company
- Project
- Project Category
- Project Member Assignment

- Project Member
- Project Manager
- Project Updates

We will follow the 3 basic rules in creating the ER Diagram.

1. Identify all the entities.
2. Identify the relationship between entities and
3. Add meaningful attributes to our entities.

- **Step 2**. After we have specified our entities, it is time now to connect or establish a relationship among the entities. company has 1 or more projects to be managed (1 to many relationship).
- the project belongs to a specific type or category (1 to 1 relationship).
- the project can be managed by multiple project managers, it depends of the scope of the project, but to be more flexible the relationship will be set to (1 to many relationship).
- The project will be assigned to several members (1 to many relationship).
- The project member can be assigned to several tasks (1 to many relationship).
- The project member posts an updates (1 to many relationship).
- The project will receive an updates (1 to many relationship).

Step 3. The last part of the ERD process is to add attributes to our entities.

Company Entity has the following attributes:

- Company ID – primary key represented with underline
- Name
- Email
- Logo
- Information
- Website
- Contact information

- Username
- Password

Project Entity has the following attributes:

- Project ID – primary key represented with underline
- Company ID – foreign key
- Category ID – foreign key
- Manager ID – foreign key
- Name
- Description
- Code
- Banner
- Start Date
- End Date
- Remarks

Project Category Entity has the following attributes:

- Category ID – primary key represented with underline
- Name
- Description

- Project Member Assignment Entity has the following attributes: Project Details ID – primary key represented with underline
- Project ID – foreign key
- Project Member ID – foreign key

Project Member Entity has the following attributes:

- Project Member ID – primary key represented with underline
- Code
- Name
- Contact
- Email
- Username

- Password
- Status

Project Manager Entity has the following attributes:

- Project Manager ID – primary key represented with underline
- Code
- Name
- Email
- Contact
- Username
- Password
- Status

Project Update Entity has the following attributes:

- Update ID – primary key represented with underline
- Code
- Date of Update
- Description of Update
- Project ID
- Member ID

Note: all attributes with underline represents the primary key of the entity or table.

The next step is to convert the plan designed on ER Diagram into the actual database, please search for the Project Management System article which was already posted.

Contact us on our facebook page for the softcopy of the Project Management System.

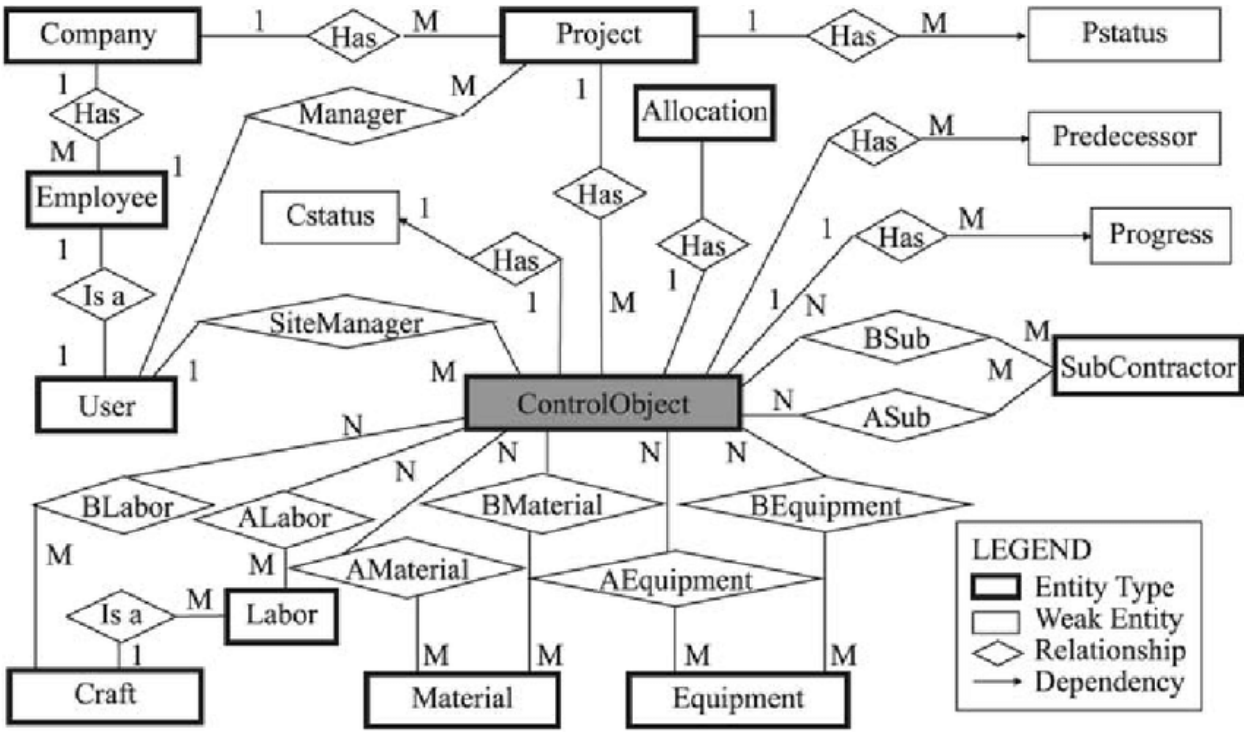

Company
Has
Project
Has
Pstatus
Has
Manager
Allocation
Has
Predecessor
Employee
Cstatus
Has
Has
Has
Progress
Is a
SiteManager
BSub
SubContractor
User
ControlObject
ASub
BLabor
ALabor
BMaterial
BEquipment
AMaterial
AEquipment
Is a
Labor
Craft
Material
Equipment
LEGEND
Entity Type
Weak Entity
Relationship
Dependency

Figure 11

CHAPTER 4

OBJECT INTERFACES

4.1 project Object

Fig. 4.1 It show all the recent project added with shows Project Name, Project Manager and Project Status

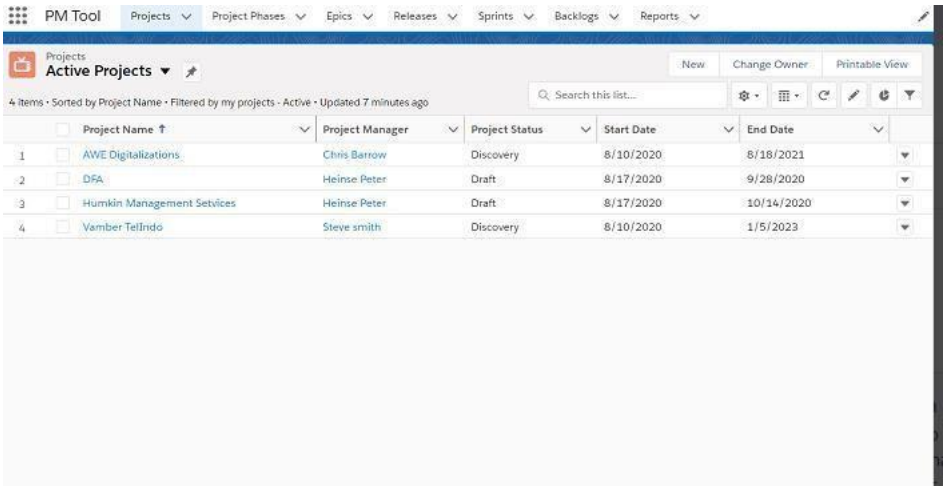


Figure 12

Fig. 4.1 Project Object Shows Project Added

Fig. 4.1.1. In this snapshot we can see to CHANGE Architectural Changes and which

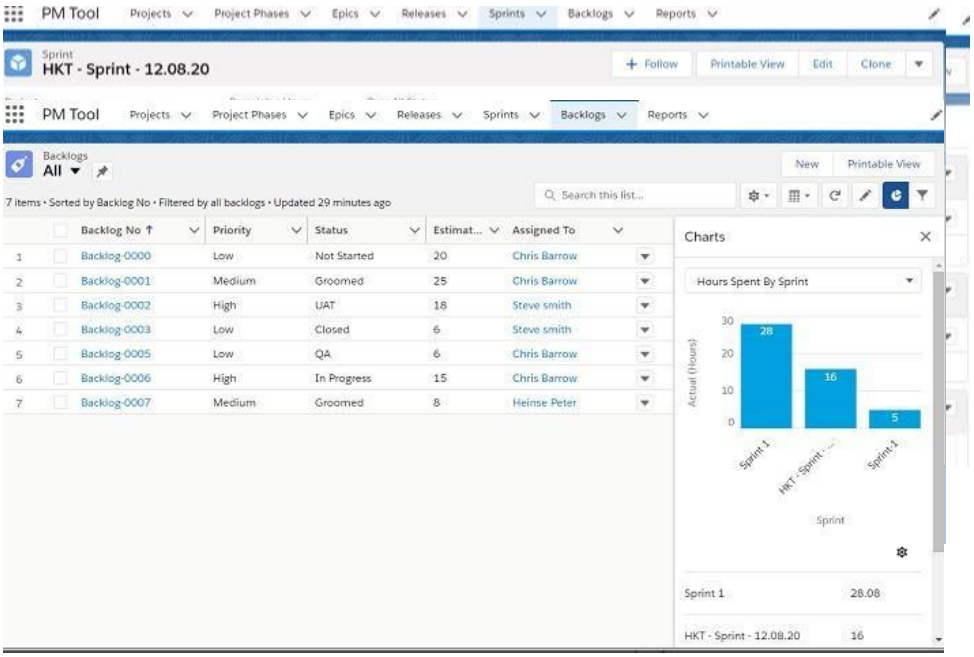


Figure 13

Figure 4.1.1. Architectural Interface

Fig. 4.1.3. Sprint define team work complete the set amount of work

Fig 4.2. Backlogs object

It shows a list of tasks required to support larger strategic plan

CHAPTER 5

Extend Salesforce with Clicks, Not Code

Ready to go beyond the basics of Salesforce administration? Want to customize your org, push its boundaries, and enhance its functionality? You can do that and so much more without writing a single line of code. All you need is your mouse and a sense of adventure. Enhance your objects, data, and fields, customize your org's look and feel, augment your business processes, create websites, and even create apps—all using point-and-click tools.

The Force.com platform provides an enormous amount of functionality and flexibility, all of which is driven by underlying metadata. Force.com metadata is a collection of attributes that describe most components of data and applications that operate on the platform. Metadata describes the data structures in your environment, the declarative functionality implemented on the platform—even the applications you build on theplatform.

To understand the power and reach of metadata, simply access a data record held in Force.com. When you access the record in your Force.com environment, the platform uses metadata to understand the structure of the record, the user interfaces defined for the record, the applications that use the user interface, even the security on that data andapplication.

5.1 App SetupMenu

The App Setup menu is where you will spend the most time as a developer. These menus provide access to pages that let you create and configure Force.com components andservices.

Once you create a custom object, you can edit the definition of the object via the Custom Object page.

The Custom Object page provides links for adding custom fields, validations to enforce data integrity rules, database triggers, and custom buttons or links to the object's page layouts. You can also modify the attributes of standard fields, buttons, links or layouts for both the page and search dialogs, as well as add new page layouts or assign record types.

As an example, when you add a new field to a custom object, a wizard walks you through a number of steps, including:

Selecting a fieldtype.

Giving the field a label, name, help text, a default value, and potentially other attributes, such as the length of the field or whether a value is required.

Assigning security settings to the field.

Adding the field to existing page layouts.

Depending on the type of field in focus, the wizard may include other pages for other relevant meta data attributes.

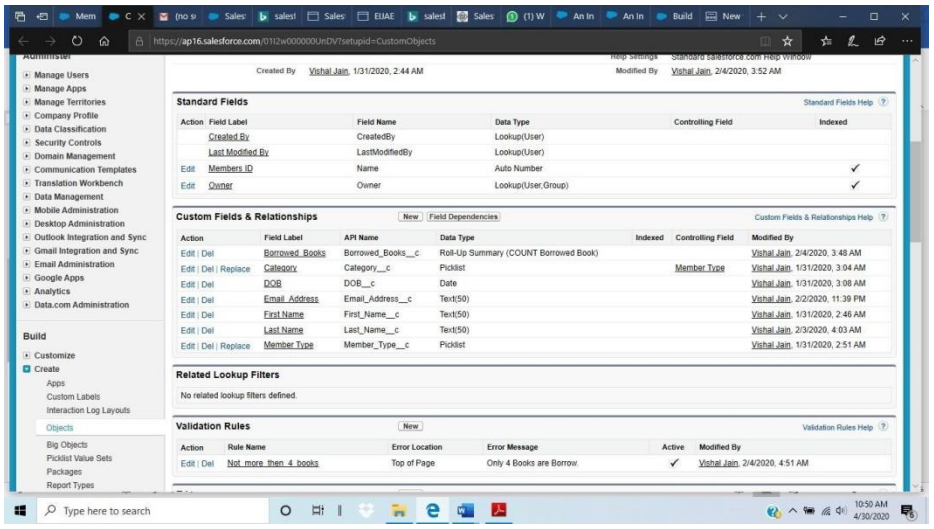


Fig 5.1

CHAPTER 6

TESTING

SalesForce testing requires the use of complex **test** methodologies as most of the features in **SalesForce** are built-in features that are customizable. When an issue is observed, the tester needs to make sure that he is **testing** the code that has been customized rather than **testing** the built-in **salesforce** functionality

SalesForce is built on a platform development language named as APEX. The language provides built-in unit test cases for developers to test their own code. The standard rule of SalesForce requires a developer to achieve 75% of code coverage with unit test cases.
From a tester's perspective, we should always aim for 100% code coverage within each test cycle.
Salesforce Testing Process

The salesforce testing process would be the same as that of testing a normal web-based application. However, a tester needs to have a clear perspective of the customizable features that are being built so that during the testing process, a tester can focus on those features alone rather than the built-in Salesforce features.
Testing of Salesforce applications requires a production like an environment called **SandBox.** Developers and testers need to use the Sandbox environment for each of their purposes.
Once the code is deployed in a Sandbox environment and approved to be ready for release, the code would be moved into production from the Sandbox environment. It is assumed that the tester has the basic knowledge of all the terms used in Salesforce before proceeding with testing.

Salesforce Testing Tips

Salesforce testing must include the following features:

Testing must include UI testing, functional testing, regression testing, integration testing, system testing and system integrationtesting.

Automation testing can also be enforced on SalesForce using tools like HP Unified Functional Testing (UFT) and Selenium.

A tester needs to be cautious during UI testing as most of the web pages on the Salesforce platform are Visual Force pages. The dynamic nature of visual force pages need to be paid special attention as all the elements of a webpage may not be loaded at one go.

Testers need to create functional flows including positive and negative flows to cover the entire functionality of an application.

Workflows using various user roles must be constructed andtested .

Test cases need to be documented using a test management tool like HP ALM.

Test Data needs to be prepared for validating the reports functionality.

Roles and Responsibilities of a Salesforce Tester

Testers involved in SalesForce are often referred to as **'Quality Engineers'** as opposed to **'Quality Assurance'** people as SalesForce testing requires the testers to build complex test frameworks, understanding the functionality of an application in depth and the ability to work with the developers and project stakeholders.

Please note that some of the default functionalities provided by SalesForce cannot be removed, although your organization may not use them. Testers need to ignore the default functionality and focus on the customized functionality built by theorganization.

Given below are some of the major roles and responsibilities of a Salesforce tester.

A tester needs to have clear communication with the development team, to understand the customizable features that are being built into SalesForce.

The tester needs to coordinate with the business whenever required as the requirement document for Salesforce is usually complex to understand and requires a lot of effort to be understandable by the testers.

The tester needs to make sure that the code coverage does not go below 75% as per the standard Salesforcerule.

The tester needs to conduct role-based testing to ensure the consistency of data with various user roles.

The tester needs to perform compatibility testing of the third-party applications integrated with SalesForce if any.

A tester needs to be familiar with load testing tools such as JMeter to validate the complex flows that produce inconsistent results In Salesforce.

A tester needs to be familiar with multiple application flows.

SalesForce Exploratory Testing

Exploratory Testing in Salesforce would involve the following best practices:

Testing should involve validating the consistency of data across multiple screens.

UI Testing must involve documented test cases as per the requirement document.

Testing should involve negative test flows, such as deleting the default data generated and validating the behaviour of an application.

Testing should involve user input validation on the form fields.

Cross browser compatibility testing needs to be performed to ensure if the rendering of data is correct across multiple browsers.

Testing must include Maximum length validation for each of the editable input fields along with the invalid data validation.

Testing must also include error message validation when invalid data is passed onto the applications.

Amount field validation on banking applications using Boundary Value Analysis technique needs to be performed with proper diligence.

Reports and dashboard testing need to be paid special attention to various test data parameters.
Testing should include the entire application flow, along with individual functional flows.
Multiple permutations and combinations of functional flows can be tested for positive and negative testing.
API testing for integrated third-party applications needs to be performed.
Identify the default Salesforce functionalities that come in the way of customized features and coordinate with the developers.

SalesForce Test Automation

Automated functional testing of SalesForce is a challenging one as most of the web pages are dynamic in nature on the SalesForce platform. Hence, SalesForce demands automation testers to build robust automation framework to sustain in the future. Also, there can be frequent updates to the applications as they are on cloud applications.
Test Automation on Salesforce can be achieved using any of the following tools:
Selenium web driver
HP Unified Functional Testing(UFT)
Test Frameworks, such as Cucumber
Provar

Salesforce Load Testing

Load testing involves testing the behavior of an application under varying loads. SalesForce.com is a highly scalable platform built for handling a large number of users. Salesforce.com is tested by the platform developers themselves for performance bottlenecks.
However, load testing becomes essential when a newly introduced piece of code yields performance bottlenecks that have to be addressed. Load Testing

on Salesforce platform can be performed using performance testing tools such as HP Load Runner and Apache JMeter.

Salesforce Security Testing

Security testing on the Salesforce platform is usually done by SalesForce development team. Before placing a request for a security test, it is best to review the 'Application and Network Vulnerability Assessment Summaries' provided by Salesforce.

After reviewing the summary, if a security test is still required, then a Security Assessment Test can be scheduled with the Salesforce team.

CHAPTER 7

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