NOTE KEEPER

A Project Report Submitted
In Partial Fulfillment of the Requirements
for the Degree of

MASTER OF COMPUTER APPLICATION

by

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Under the Supervision of

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KIET Group of Institutions, Ghaziabad

to the

FACULTY OF MCA

DR. APJ ABDUL KALAM TECHNICAL UNIVERSITY
(Formerly Uttar Pradesh Technical University) LUCKNOW
August 2021

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INTERNSHIP COMPLETION CERTIFICATE

To whom it may concern,

It is to certify that Mr. Aman Garg (Student of MCA Six Semester from Krishna Institute of Engineering & Technology, Ghaziabad) has completed a three-month internship with DIGISCREEN MEDIA SOLUTION, from 10th April till 10th July 2021.

He worked under the direct supervision of the IT Manager and got the opportunity to work on Android project "Note Keeper". Along with his other duties, he was responsible for managing the timelines of the projects he was working on. His manager is pleased with his timely highlighting and managing of any delays, which could have affected the project completions.

He is a fast learner, and he learned our operations system and organizational culture quickly. With his eagerness to learn, he developed various skills while working with us.

This letter is only for the reference for Krishna Institute of Engineering & Technology, Ghaziabad. Any details about Project cannot be disclose by Aman Garg as it is confedential.

We wish him the best of luck for all his future endeavors.

Yours Sincerely,

For DIGISCREEN MEDIA SOLUTION

Corporate Head

For DIGISCREEN MEDIA
Partner

Authorised Signature

CERTIFICATE

Certified that **Aman Garg (1900290149011**) has carried out the project work presented in this project report entitled "**Note keeper**" for the award of Master of Computer Application from Dr. A.P.J. Abdul Kalam Technical University, Lucknow under the supervision of **Dr. Sangeeta Arora**. 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.

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Professor & Head

Department of Computer Applications

KIET Group of Institutions, Ghaziabad

Date:

NOTE KEEPER

AMAN GARG

ABSTRACT

Library management is a sub-discipline of institutional management that focuses on specific issues faced by libraries and library management professionals. Library management encompasses normal managerial tasks, as well as intellectual freedom and fundraising responsibilities. Issues faced in library management frequently overlap with those faced in managing non-profit organizations.

Note keeper is a project which aims in developing a computerized system to maintain all the daily work of library. This project has many features which are generally not available in normal Note keeper

Note keeper is designed & developed for a receipt and issuance of books in the along with the student's details. The books received in the **library** are entered in Books Entry form and the new student is entered in the student entry form.

ACKNOWLEDGEMENT

Success in life is never attained single handedly. My deepest gratitude goes to my thesis supervisor, **Ms. Dr Sangeeta Arora**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 Srivastava, 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 wouldnot have been possible in time. They keep my life filled with enjoyment and happiness.

Aman Garg

1900290149011

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INTRODUCTION

1.1. Project Description

One of the universities which is growing fast has many students and faculty members. 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 difficult for students to block magazines in advance, take more than 2 or 3 books, not able to search either through the title. 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.

- The main aim of this project is to design the application using Cloud computing applications branch out well beyond CRM. Salesforce.com customers are building more apps and building better apps.
- The objective of the Library Management System is to handle the entire activity of a library.
- The software keeps track of all the information about the books and their complete details.
- Data are store on cloud where all the information will be stored safely and access anywhere, anytime by authorize person.

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 difficult 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.

Salesforce.com, Inc. is an American cloud-based software company headquartered in San Francisco, California.It provides customer-relationshipmanagement(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 task

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 ofSalesforce:

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 businesses 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

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.

1.3. 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

1.3.1. Technology Description

SALESFORCE

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3. **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 of it automatically.

1.3.1.1 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 Visualforce pages.

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

1.3.1.2 LIGHTNING

Salesforce made public the frontend 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 application developmentof 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.

1.3.1.3JavaScript

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, suchas if statements, for and while loops, and switch and try ... catch blocks function the same as in these languages (or nearly so).

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).

1.3.1.4. 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.

CHAPTER 2

LITERATURE REVIEW

2.1 SENTIMENT ANALYSIS

Sentiment Analysis is a challenging research problem especially on social media. Users can freely express their views, opinions and feelings on different trending events, topics, etc. via social media posts. These posts need to be analysed to know what sentiment is conveyed through these posts. Sentiment Analysis, also referred as emotion AI, involves analyzing views from the written text so as to understand and gauge human emotions. The social media allows world-wide users to connect and interact with each other and express the opinions on general topics. Social Sentiment Analysis can be used to improve customer service and marketing and also serves as a measure of social media performance. In recent years, the impact of social media websites on daily life has become so considerable that even information on large and small incidents or disasters is gathered via social media sites. The automated extraction of sentiment from these posts and classifying them into different polarities–positive, negative or neutral–has received extensive attention from researchers during the past decade.Twitter is one of the popular social media and boasts of a respectful 255 million active

monthly users. Some of the challenges in analysing tweets are: use of informal language, short forms, abbreviations, heavy use of emoticons and slangs. Twitter, also known as microblogging, has limited size of tweets that makes it difficult to compute the polarity.[4]

Theoretical frameworks in psychology map the relationships between emotions and sentiments. In this paper, we study the role of such mapping for computational emotion detection from text (e.g., social media) with an aim to understand the usefulness of an emotion-rich corpus of documents (e.g., tweets) to learn polarity lexicons for sentiment analysis.[15]

The idea of drawing on social media sentiment for satisfaction monitoring aligns well with the broader move towards smart destinations and real-time information processing. Thus, this paper aims to examine whether the electronic word of mouth originating from Twitter posts offers a useful source for assessing destination sentiment. [1]

2.2 TWITTER AND COVID19 TWEETS

Twitter is a social media platform with more than 500 million users worldwide. It has become a tool for spreading the news, discussing ideas and comments on world events. Twitter is also an important source of health-related information, given the amount of news, opinions and information that is shared by both citizens and official sources. It is a challenge identifying interesting and useful content from large text-streams in different languages, few works have explored languages other than English. It is important to understand public reactions, information dissemination and consensus building in all major forms, including social media in different countries. [11]

Undoubtedly, coronavirus (COVID-19) has caused one of the biggest challenges of all times. The ongoing COVID-19 pandemic has caused more than 150 million infected cases and one million deaths globally as of May 5, 2021. Understanding the sentiment of people expressed in their social media comments can help in monitoring, controlling, and ultimately eradicating the disease. This is a sensitive matter as the threat of infectious disease significantly affects the way people think and behave in various ways. [13]

2.3 BIG DATA

Big Data is the dataset with 3 V's that are Volume, Variety and Velocity and difficult to store and process using traditional database management systems. Big Data Analytics is the way of processing the large amount of data. Hadoop is a popular open-source software which is very useful in analyzing the larger data. Hadoop provides several tools for this purpose like Hive, Pig, Hbase, Cassandra etc. [16]

Advances in information technology and its widespread growth in several areas of business, engineering, medical, and scientific studies are resulting in information/data explosion. Knowledge discovery and decision-making from such rapidly growing voluminous data are a challenging task in terms of data organization and processing, which is an emerging trend known as *big data computing*, a new paradigm that combines large-scale compute, new data-intensive techniques, and mathematical models to build data analytics. Big data computing demands a huge storage and computing for data curation and processing that could be delivered from on-premise or clouds infrastructures.[6]

With the development of Internet of Things (IoT), 5 G, and cloud computing technologies, the amount of data from manufacturing systems has been

increasing rapidly. With massive industrial data, achievements beyond expectations have been made in the product design, manufacturing, and maintain process. [12]Many research works deal with big data platforms looking forward to data science and analytics. These are complex and usually distributed environments, composed of several systems and tools. As expected, there is a need for a closer look at performance issues.[14]

2.4 HADOOP

Hadoop is Java based programming framework for distributed storage and processing of large data sets on commodity hardware. It is developed by Apache Software Foundation as open source framework. Hadoop basically has two main components. First one is Hadoop Distributed File System (HDFS) for distributed storage and second part is MapReduce for distributed processing. HDFS is a file system which builds on the existing file system. MapReduce is a programming model which is used for processing and generating large data sets with a parallel, distributed algorithm on a cluster. A MapReduce job generally splits the input data set into independent blocks which are processed by the map tasks in a completely parallel manner. First step is mapping of data set in MapReduce architecture. The framework sorts the outputs of the mapping process, which are then input to the second step is reduce task. Input and the output of the job are stored in a file-system. [3]

In Hadoop, users retain control over how data are being processed by writing their own algorithms in the Map and Reduce interfaces provided. Other issues that require addressing when dealing with parallel executions, such as failure detection, recovery and synchronization between tasks, are handled automatically by the Hadoop framework. In conjunction, the underlying file

system supporting the Hadoop framework, the Hadoop Distributed File System, HDFS 2 provides the framework with features such as file distribution balancing and file redundancy. The replicated files not only provide data redundancy in the event where one of the nodes fails, it also helps Reduce data transfer when performing workload balancing. In cases where the nodes are busy, new tasks can be assigned to other nodes which hold the corresponding block's replicated copy, for processing. [5]

2.5 HDFS

HDFS faces several issues when it comes to handling a large number of small files. These issues are well addressed by archive systems, which combine small files into larger ones. They use index files to hold relevant information for retrieving a small file content from the big archive file. However, existing archive-based solutions require significant overheads when retrieving a file content since additional processing and I/Os are needed to acquire the retrieval information before accessing the actual file content, therefore, deteriorating the access efficiency.[9]

2.6 MAPREDUCE

MapReduce is an established computing paradigm for processing massive data, in which the input data is viewed as records of key-value pairs. In such a two-phase computation, a first-phase *map* task processes a portion of the data records to generate or update the key-value pairs; these key-value pairs are then

shuffled and supplied to the second-phase *reduce* tasks, each processes a portion of them, typically with the same key, to produce the final output. [10]

Over the last decade, several advancements have happened in distributed and parallel computing. A lot of data is generated daily from various sources, and this speedy data proliferation led to the development of many more frameworks that are efficient to handle such huge data e.g. - Microsoft Dryad, Apache Hadoop, etc. Apache Hadoop is an open-source application of Google MapReduce and is getting a lot of attention from various researchers. Proper scheduling of jobs needs to be done for better performance. [2]

[7] analyze the performance impact of JobTracker failure in Hadoop. A JobTracker failure is a serious problem that affects the overall job processing performance.

2.7 APACHE HIVE

SQL-on-Hadoop engines such as Hive provide a declarative interface for processing large-scale data over computing frameworks such as Hadoop.The increasing need to process analytical queries over large-scale semi-structured data has led to the development of SQL-on-Hadoop engines. These systems evaluate SQL-like queries over data stored in distributed file systems such as the Hadoop Distributed File System (HDFS) . Hive was the first SQL-on-Hadoop system to provide an SQL-like query language, namely HiveQL, and can use MapReduce or Tez as its underlying framework for executing queries. [8]

DATA REQUIREMENTS

For the analysis purpose we needed a large amount of data as we are using Hadoop which is a tool for analysing Big Data. We found twitter dataset on Kaggle Website. This data set contains 13 columns. All the entries and Tweet's text in data set are related to Covid19 situation. Kaggle.com is a website that provides dataset for free for its users. Thus,I got dataset for free of cost.

CHAPTER 4

DESIGN

4.1 0-LEVEL DATA FLOW DIAGRAM

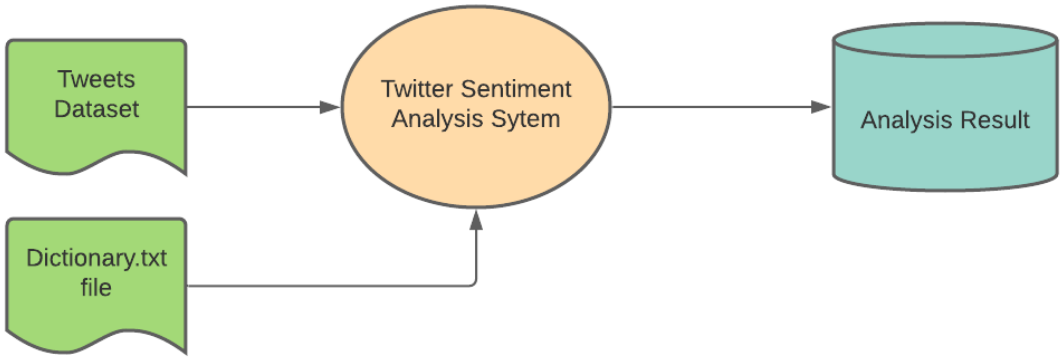

Fig. 4.1 0-LEVEL DFD

4.2 1-LEVEL DATA FLOW DIAGRAM

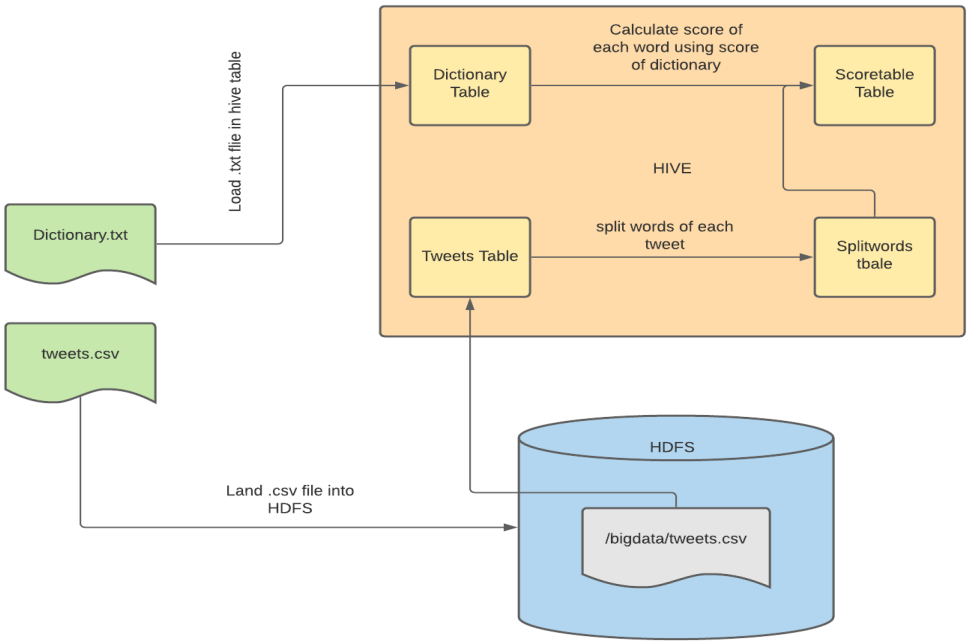

Fig. 4.2 1-LEVEL DFD

4.3 DATA DICTIONARY

4.3.1 Tables Used

- Covtweets Table stores the actual dataset and it contains all the fields that has been specified in .csv file.

Considerations for the Library Management System:

Some of the requirements are:

1. Tohavelistofdifferenttypesofbooksandhavethecapabilitytosearcheithert hroughtitleor author or bookname.
2. Track all the pending requests for books and get the status of thebook.
3. Take the requests from students and faculty members and prioritize in buyingbooks.
4. GivepropersecurityaccessestoLibrariansothatpendingrequestsarenotedi tedanddeleted byeveryone.
5. Inform library member when the book requestedarrives.
6. Include Reports to generate defaulters list, money collected everymonth.

2.1 Create the following CustomObjects

2.1.1 Books – This object holds all the information related to abook.

Data Type	Field Label	Other Values	Remarks
Text	Book_ID		Generated – Format B-{00000}
Date	Date of arrival		Date on which Library got it – Mandatory – Can't be greater than today.
Text	Author	Length:50	Mandatory
Picklist	Type	Magazines Periodicals Books WhitePapers	
Name	Text		Name of the book (Mandatory)
Currency or Number	Price of the book		In Dollar terms (Mandatory) and make sure that it is greater than Zero
Text Area(Long)	Description	32,000	Visible 3 lines

2.1.2 Members – This object holds all the information related to a libraryMember.

Data Type	Field Label	Other Values	Remarks
Text	First Name	Length:50	Member's First Name – Mandatory
Text	Last Name	Length:50	Member's Last Name – Mandatory
Dependent picklist	Member Type	Student or faculty	Mandatory
Dependent picklist	Category		Beginner, Sophomore, Junior, Senior for students

			Computer Science, Mechanical, Electronics for faculty
Date	DOB		
Number	Borrowed_Books		Total number of books borrowed
Text	Email_Address		Should take the email address
Text	Member_ ID		Generated – Format M-{00000}

2.1.3 BorrowedBooks: This has one to many relationships between Library Member and books. Contains the data of books borrowed by the librarymember.

Data Type	Field Label	Other Values	Remarks
Text	Book_ID		Foreign Key from the BOOKS table (Books_ID).
Text	Member_ID		Foreign Key from the MEMBERs table (Member_ID)
Date	Borrowed Date		Borrowed Date can't be changed once the record is created
Date	Return Date		Borrowed Date + 15. Once borrowed date is created, can't be changed
Date	Actual Returned Date		Actual Return Date can't be less than Borrowed Date

1.On Books, Members screen – on the related Borrowed Books screen need to showMember who borrowed the book (Member First Name) and also the BOOKID and theAuthor of the book.

2. On clicking BOOKS tab, please show BOOKID, Author, Book Name. On borrowing book screen, show which book one is borrowing like book name and the author, who is borrowing. Two look up fields to be created on that screen.

3. On clicking Members tab, please show Member First Name, Last Name.

4. Both are required fields.

5. Once the record is saved, need to show the author of the book on the saved screen.

6. In the look up screen show both BOOK_ID, AUTHOR and DESCRIPTION of the book.

7. Increment Member.Borrowed_Books for that member by 1 whenever Borrowed Book new record is created.

8. Member can't borrow more than 4 books.

9. Arrange the fields in two column fashion from top down in the same sequence.

10.Whenever Book is returned – the borrowed_books counter in Member table to be reduced by 1.

11. Book date arrived can't be changed once the record is created.

12.Try to create a time trigger which should create a task or send an email whenever a record is created and whose due date in case of task should be Borrowed Date + 10.

13.Book Author name can't be changed once the book is borrowed.

14. Combination of MemberID and BOOKID should be unique in Borrowed Book table.

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.

2.2. 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.

2.3. Operational Feasibility

Proposed projects are beneficial only if they can be turned out into information system. That will meet theorganization'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 intoconsideration. So, there is no question of resistance from the users that can undermine the possible application benefits.

2.4. 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.

2.4. 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.

1. Need Analysis.
2. 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

1. That meet the requirements of the users
2. 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.

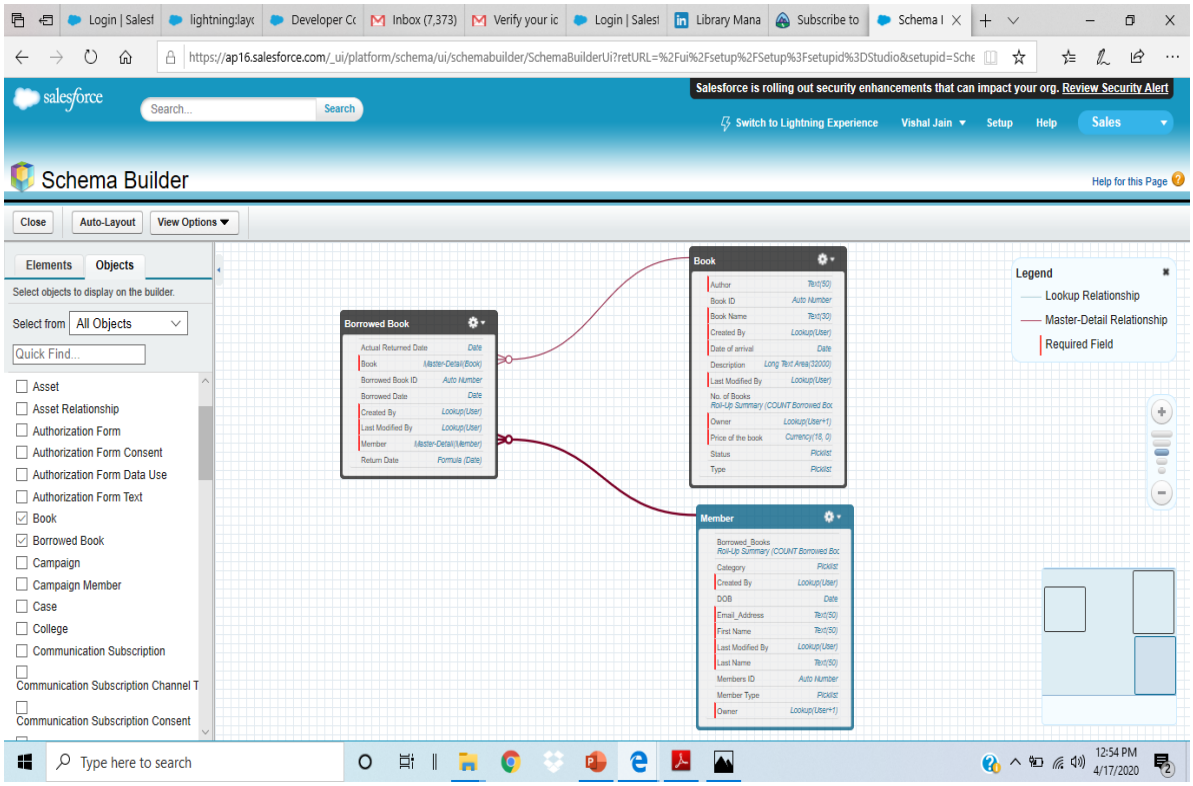

Fig. 3.1

3.2. Flow Graphs

3.2.1 Zero Level DFD

Fig. 3.2.1 Zero Level DFD

3.2.2 One Level DFD

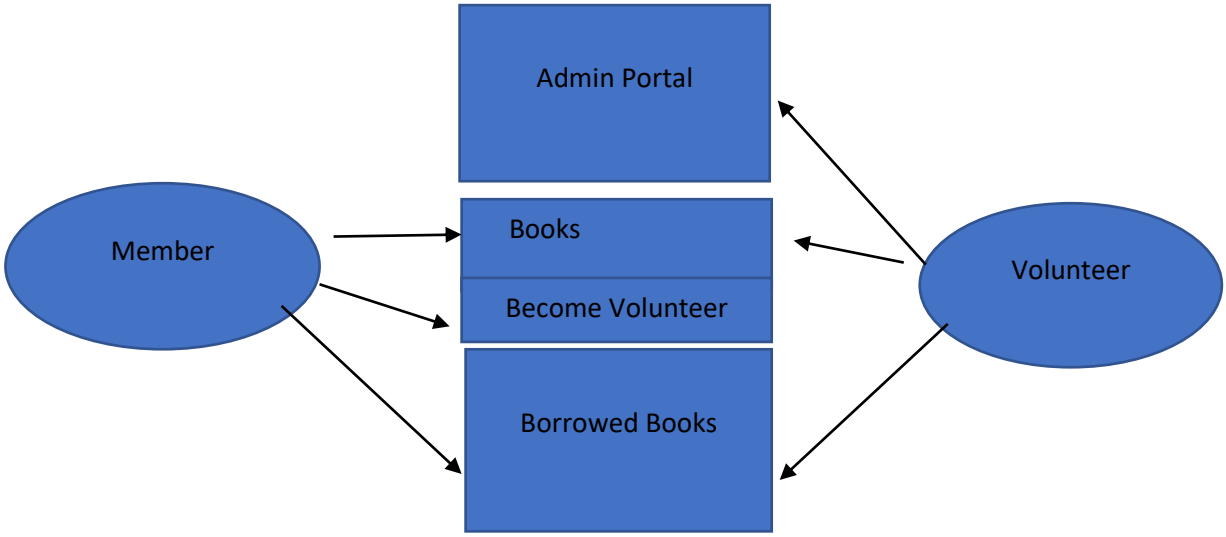

Fig. 3.2.2 One Level DFD

3.2.3 Two Level DFD

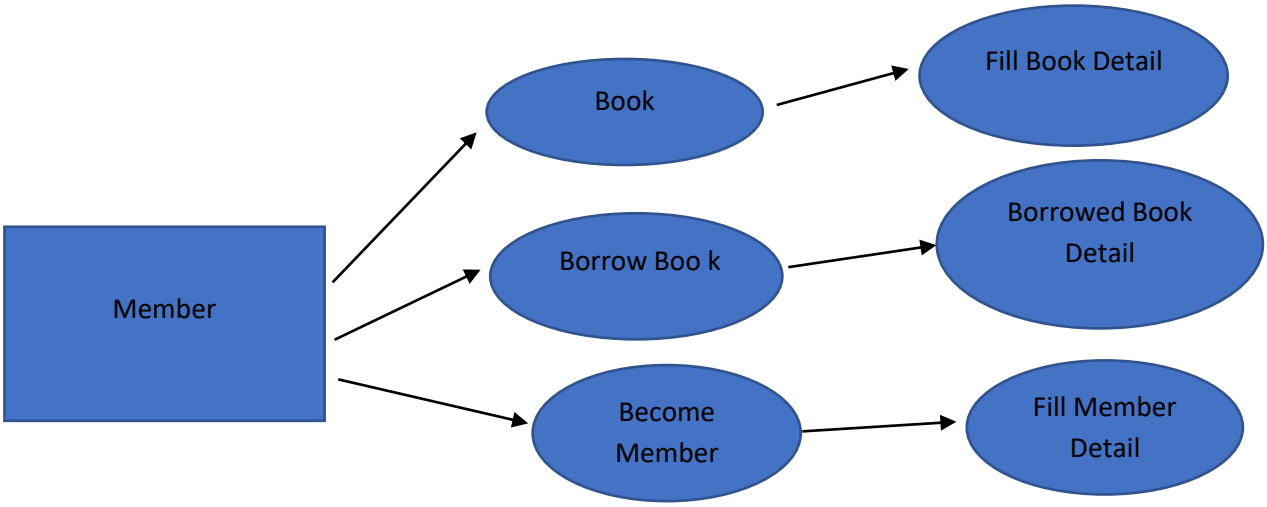

Fig. 3.2.3 Two Level DFD

CHAPTER 4

OBJECT INTERFACES

4.1. Book Object

Fig. 4.1 It show all the recent book added with shows Book Id, Book Name and Author name.

Fig. 4.1.1. In this snapshot we can see to add New Book and which type of book it is and price of it.

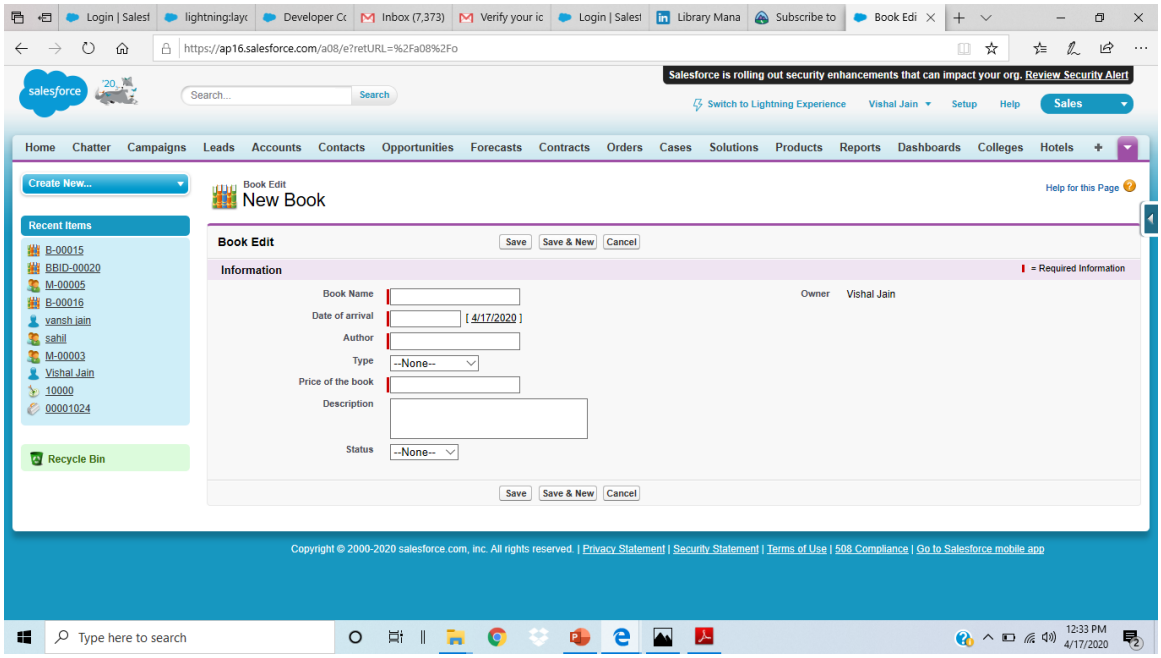

Figure 4.1.1.Adding New Book Interface

Fig. 4.1.3. This shows the book detail like how many books, book Id, number of Books etc. and show Book are Borrow by who's borrower.

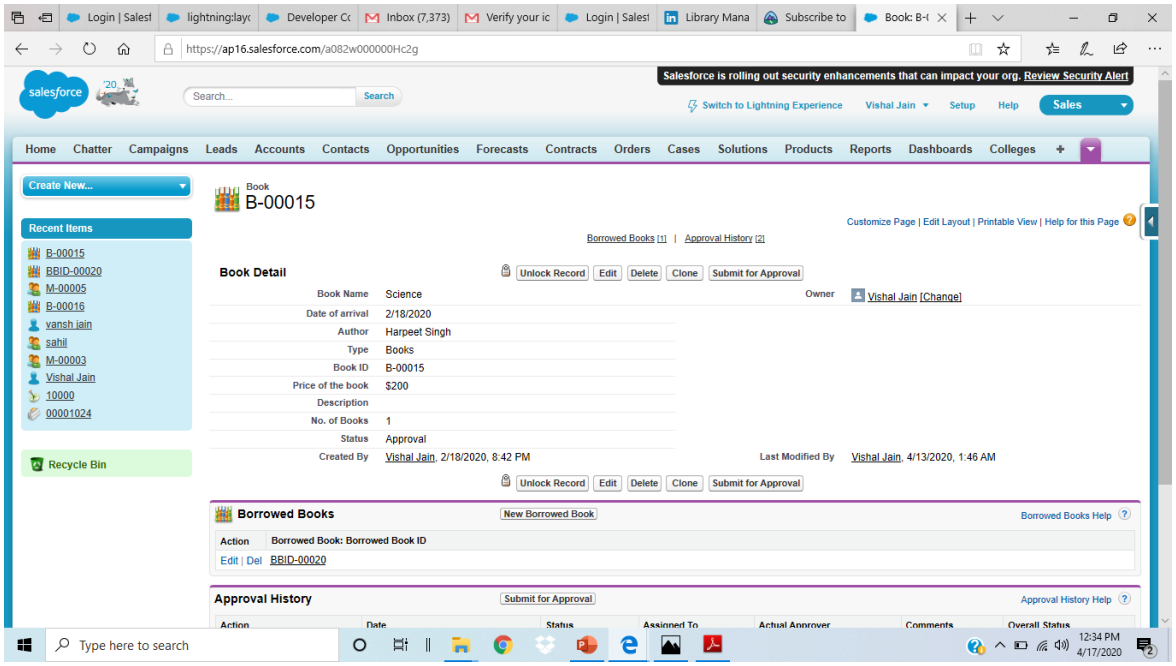

Fig. 4.1.3Book Detail

Fig 4.2.Member object

It shows all the recent member with member Id, First name, last name and member type.

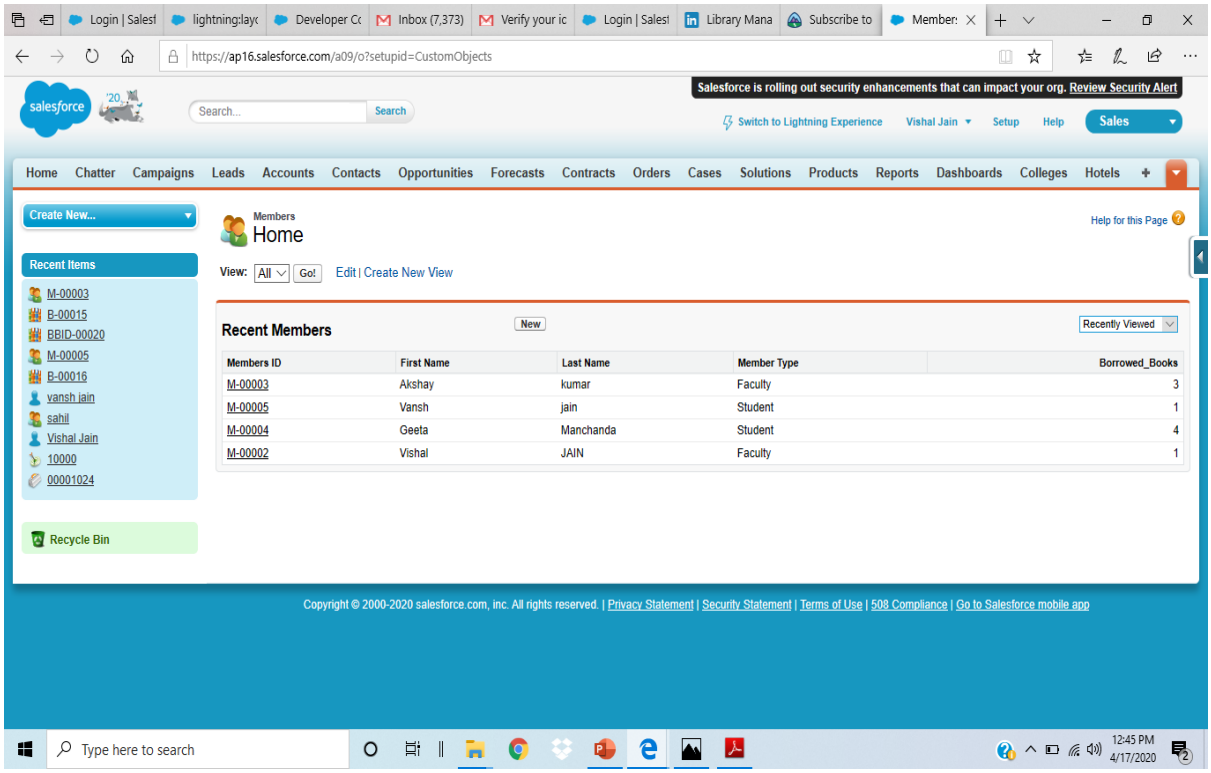

Fig. 4.2. Recent Member

Fig 4.2.1. In this figure new member are added by filled their Details in respective fields,

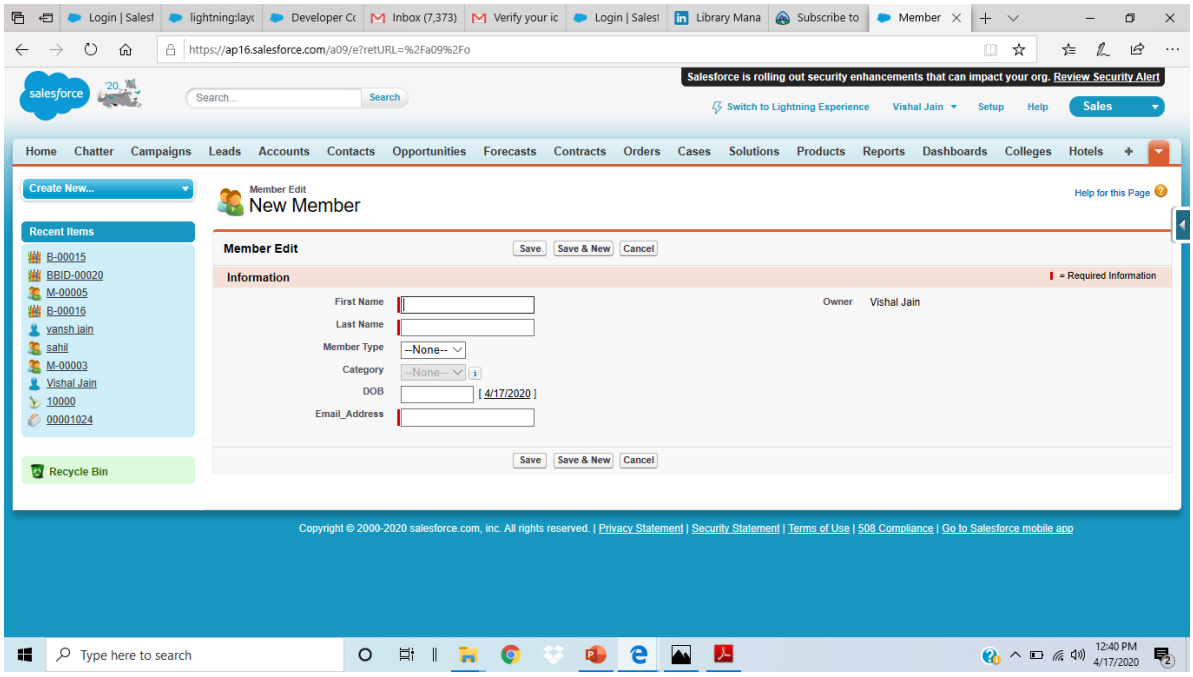

Fig. 4.2.1 Add Member

Fig. 4.3 BORROWED OBJECT

This object shows when person wants to borrow a book firstly it became a member then it can borrow a book by choose by Lookup view which contain by Book id , member id .

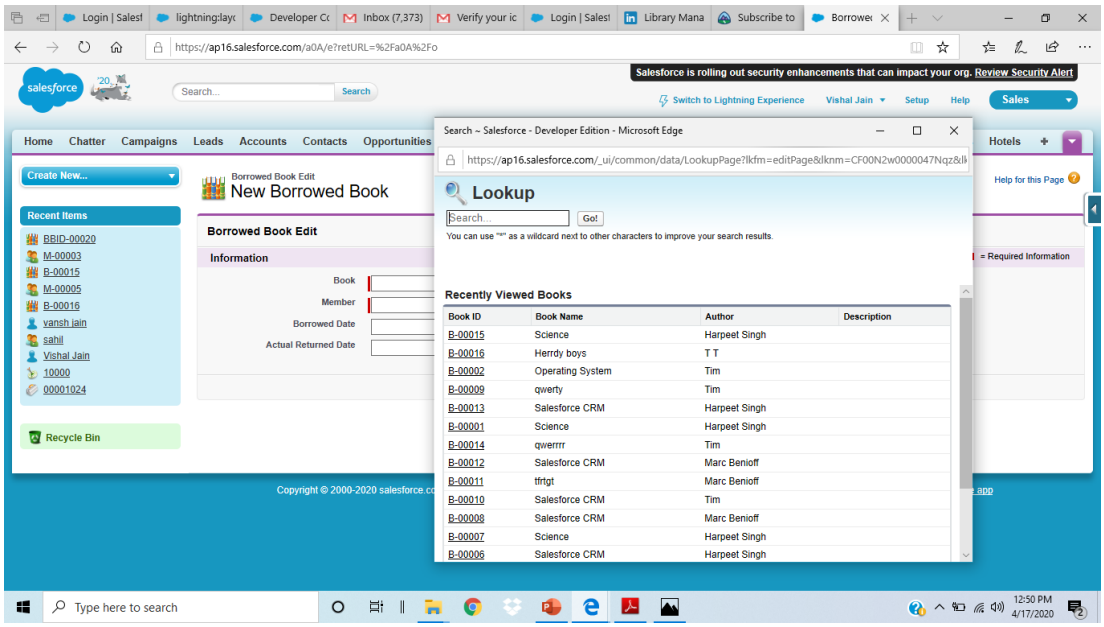

Fig. 4.3 Add Borrowed Member

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 the platform.

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 and application.

5.1 App Setup Menu

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 and services.

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 field type.
- 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 metadata attributes.

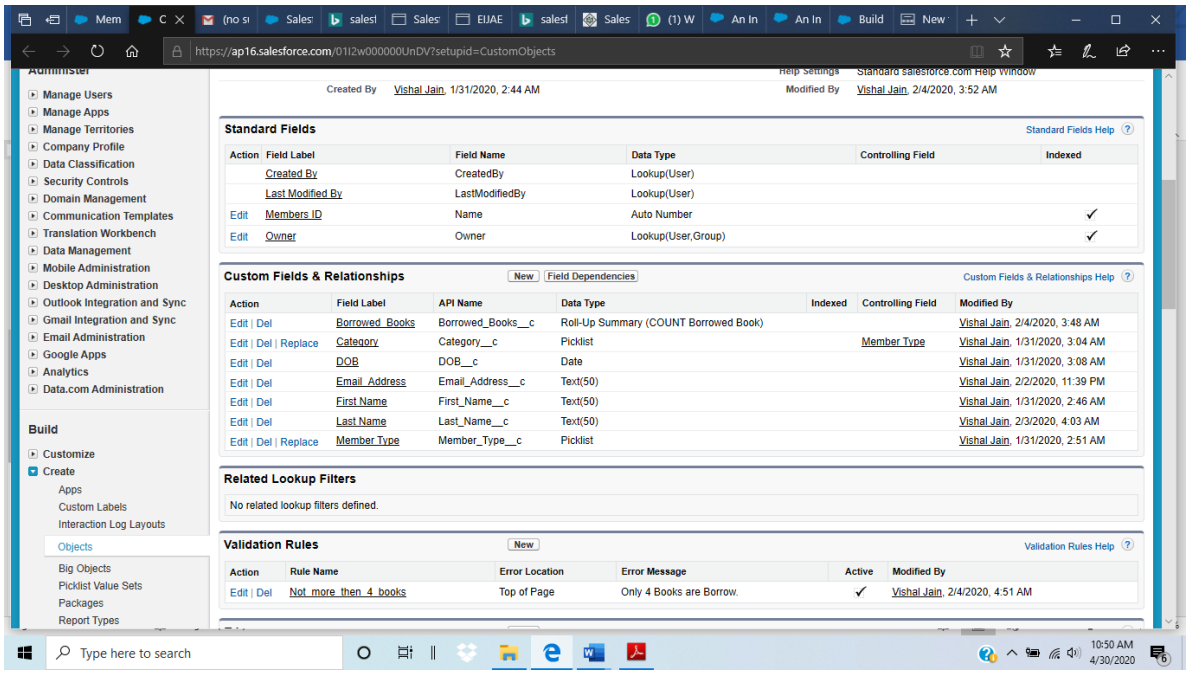

Fig 5.1

CHAPTER 6

TESTING

SalesForcetesting 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 integration testing.
- 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 and tested.
- 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 the organization.

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 Salesforce rule.
- 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.

6.1 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.

6.2 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

6.3 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 LoadRunner and Apache JMeter.

6.4 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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