Institute Application

A Project Report Submitted

in Partial Fulfilment of the Requirements

for the Degree of

MASTER of COMPUTER APPLICATION

by

NAMAN KUMAR

(Enrollment no. 1802914008)

Under the Supervision of

Dr. Sangeeta Arora

KIET Group of Institutions, Ghaziabad

to the

Department of Computer Applications

Dr. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY

LUCKNOW

(Formerly Uttar Pradesh Technical University, Lucknow)

August 2021

DECLARATION

I hereby declare that the work presented in this report entitled “**Institute Application** ", was carried out by me. Ihave not submitted the matter embodied in this report for the award of any other degree or diploma of anyother Institute or Institute.

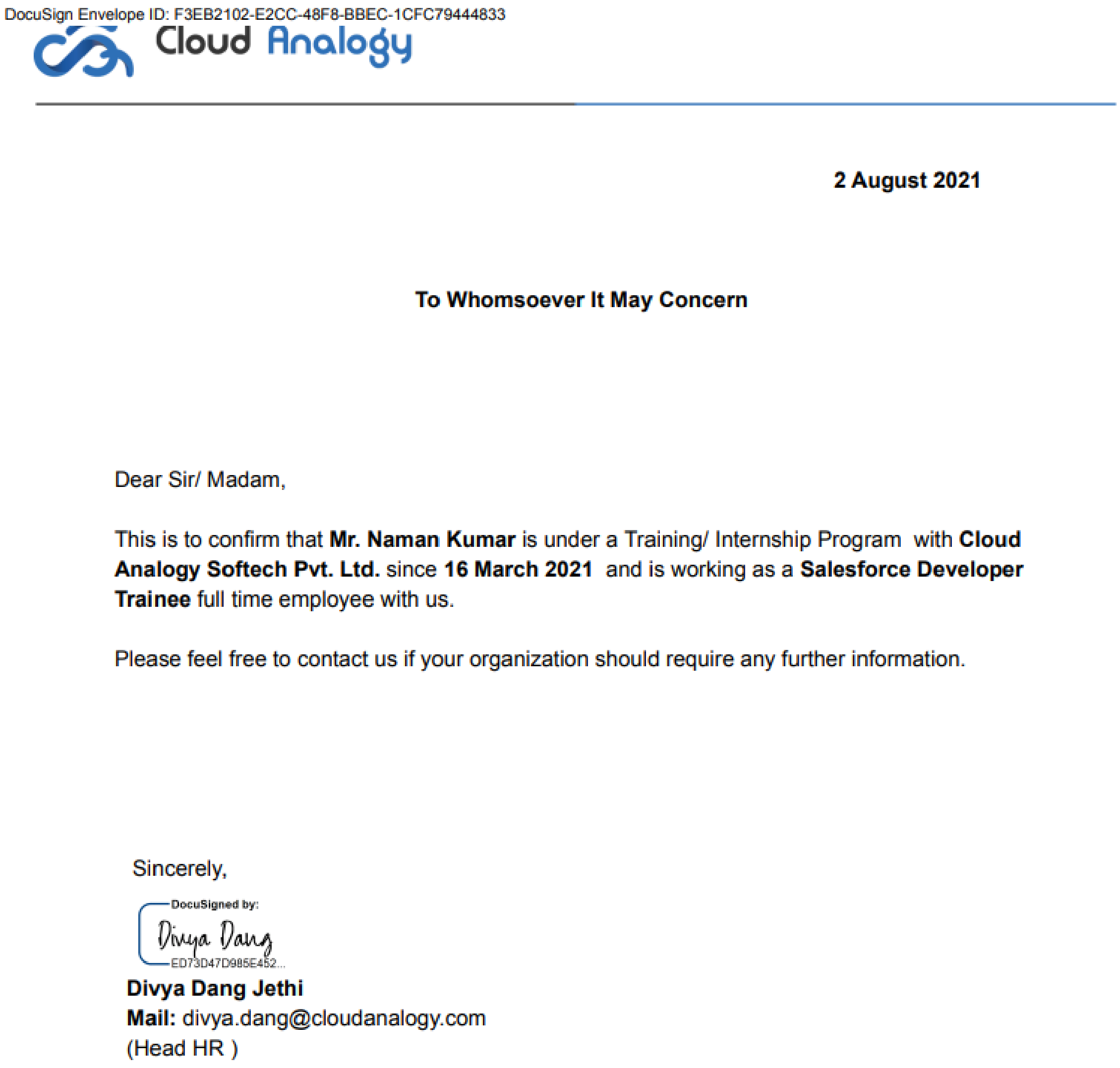
I have given due credit to the original authors/sources for all the words, ideas, diagrams, graphics, computer programs, experiments, results, that are not my original contribution. I have used quotationmarks to identify verbatim sentences and given credit to the original authors/sources.

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	: Naman Kumar
Enroll. No.	: 1802914008
Branch	: Master of Computer Application

(Naman Kumar)

TRAINING CERTIFICATE



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Cloud Analogy

2 August 2021

To Whomsoever It May Concern

Dear Sir/ Madam,

This is to confirm that **Mr. Naman Kumar** is under a Training/ Internship Program with **Cloud Analogy Softech Pvt. Ltd.** since **16 March 2021** and is working as a **Salesforce Developer Trainee** full time employee with us.

Please feel free to contact us if your organization should require any further information.

Sincerely,

DocuSigned by:
Divya Dang
ED73D47D985E452...

Divya Dang Jethi
Mail: divya.dang@cloudanalogy.com
(Head HR)

CERTIFICATE

Certified that **Naman Kumar (1802914008)** has carried out the project work having “**Institute Application**” for the award of **Master of Computer Application** from Dr. A.P.J. Abdul Kalam Technical University (AKTU) (formerly UPTU), Lucknow under my supervision. The project report embodies original work, andstudies are carried out by the student himself / herself and the contents of the project 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 Institute/Institution.

This is to certify that the above statement made by the candidate is correct to the best of myknowledge.

Dr. Sangeeta Arora **External Examiner**
Associate Professor
Dept. of Computer Applications
KIET Group of Institutions, Ghaziabad

Dr. Ajay Kumar Shrivastava
Professor & Head,
Department of Computer Applications
KIET Group of Institutions, Ghaziabad

Date:

Institute Application

NAMAN KUMAR

ABSTRACT

"Institute Application " is a Salesforce application which is based on cloud computing. These days we are using databases in which coding is required to enter the data. But this time we have an application which can do our work simpler and easier i.e. Salesforce. This application is used to storea huge amount of data properly and consistently.

The objective of this application is to show that how a normal person who doesn't even know programming can use this application easily, it is flexible like data can be deleted enter or updated easily. A software project means a lot of experience. I learned a lot through this project. This project has sharpened our concept cloud computing.

This concept of cloud computing has now become a great role to play in today's technical world. Thesetechnologies will definitely take database systems far away.

Through this project I learnt so many things can be manage through this application like sales, marketing, commercials and many more things. The only drawback of Salesforce is that it is expensive butto do great work we have to use good technology as today data security is the best and the most essential thing and Salesforce contains that all. things which I also learnt make Data Flow Diagram, State Event Diagram and Activity Diagram with help of our project Mentors.

ACKNOWLEDGEMENTS

Success in life is never attained single handedly. My deepest gratitude goes to my thesis supervisor, **Dr. Sangeeta Arora** for her 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 in manycritical 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.

Naman Kumar

(1802914008)

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CHAPTER 1

INTRODUCTION

1.1 Project Details:

"**Institute Application**" is taking a concept from "**Cloud Computing**" and Salesforce was founded by **"Marc Benioff"**.

As the Salesforce is cloud computing Application consists of a large, waist-level cabinet with number of clouds in it. Each cloud contains different objects through which we can access the data. Oncethe application start, we can enter the particular amount of data which we need to put in the application for sure, the individual can directly add the data to the particular objects and fields thereby adding the student's data. This do not require much time only we have to filled and enter all the data related to particular student.

This application will be developed for PC's, we can access it from anywhere and even from the phone easily using the salesforce application.

1.2 Purpose:

Salesforce provides you with the fastest path from Idea to App. You can concentrate on building your app using Salesforce tools, rather than building the infrastructure and tools yourself. This can save you years of time and millions of dollars.

Salesforce customers generally say that it's unique for three major reasons:

Fast – Traditional CRM software can take more than a year to deploy, compare that to months or evenweeks with Salesforce.

Easy – Salesforce wins in the easy to use category hands down. You can spend more time putting it to useand less time figuring it out

Effective – Because it is easy to use and can be customized to meet business needs, customers findSalesforce very effective.

Salesforce is in the cloud, so your team can use it from anywhere with access to the internet. Ifyou are a business that is rapidly changing or you are a seasoned company that's been around for years, yourbusiness is probably changing too. Salesforce is completely scalable to your growth.

Salesforce seamlessly integrates with 3rd party apps. If you want to integrate Salesforce with Gmail you can do it, if you want to integrate it with your accounting software you can do that too. On the other hand, integration is tough with other CRMs. Salesforce is affordable, especially if you consider its vastvariety of capabilities. Even startups and small businesses can use Salesforce.

1.3 Identification of Need :

User need identification and analysis are concerned with what user needs rather than what he/she wants. Not until the problem has been identified, defined, and evaluated should the analyst think about solutions and whether the problem is worth working. This step intended to help the user and analyst understand the real problem rather than its symptoms. The user or the analyst may identify the need for a candidate system or for enhancement in the existing system.

An analyst is responsible for performing following tasks:

- Studied strength and weakness of the current system.
- Determined "what" must be done to solve the problem.
- Prepared a functional specifications document.

These modules are developed with the aim of reducing time, reducing manpower so that everything can be easily maintained and. The volume of work and complexity are increasing year by year. This system reduces complexity and time. Also provide availability 24*7.

1.4 Problem Statement

In the existing system all the work is done manually. This is chance of committing errors and it will take more time to perform or checkout any information. There are so many limitations in the existing system. So the existing system should be atomized. If the system is carried over manually, for everything it take more time. So it is difficult to take immediate decisions.

- In the traditional system, if you wish to analyze any record you have to turn pages many time.
- Existing systems are time consuming as it requires too much planning and so much human involvement.
- As it involves much human involvement, the cost of the system automatically gets increased.
- Existing systems require paper use, which isn’t good for the environment.
- With too much human involvement, there are high chances of risk as well.
- There is too much of paper work too, which makes the tasks in the existing system, very tedious.

1.6 Hardware / Software used in Project

1.6.1 Hardware Requirement

Hardware	Configuration
Processor	Intel(R)core(TM)i5-7200UCPU @2.50GHz
Ram	4GB
Monitor	Normal

Table 1.1

1.6.2 Software Requirement

Software	Configuration
Operating System	Windows10
Language	Apex

Table 1.2

1.7 Scope:

Students can use their device (laptop, mobile, desktop) or you can provide your lab. We set up a branded solution for you (Software as a Service) and maintain every upgrade of the platform,right from hardware to software.

Our flagship product is built from scratch for engineering institutes with one objective – make students successful. Whether it is a campus job or higher education, we enablestudents and teachers to be successful by capturing, measuring, and analyzing the right data.

Engineering Students are at the core of the platform. We not only assess but also arepart of the journey to accomplish the mission. Whether it is about finding a campus job or preparing for higher education, we enable you for success.

Students can learn from industry experts who are mentors on our platform (many ofthem are your college alumni). Take timely suggestions, join webinars and learn from their experiences. It is a virtual, ongoing, unstructured learning under supervised guidance that prepares you for the job ahead.

1.8 Project Schedule

The objective of software project planning is to provide a framework that enables the manager to make reasonable estimates of resources, costs and schedule. These estimates are made within a limited time frame at the beginning of a software project and should be updated regularly as the project progresses. In addition, estimates should attempts to define “best case” and “worst case” scenarios so that project outcomes can be bounded.

The first activity in software project planning is the determination of software scope. Function and performance allocated to software during system engineering should be assessed to establish a project scope that is ambiguous and understandable at Presidency and technical levels. Software scope describes function, performance, constraints, interfaces and reliability.

During early stages of project planning, a microscopic schedule is developed. This type of schedule identifies all major software engineering activities and the product functions to which they are applied. As the project gets under way, each entry on the macroscopic Schedule is refined into detailed schedule. Here specific software tasks are identified and scheduled.

Scheduling has following principles:

1. Compartmentalization: the project must be compartmentalized into a number of manageable activities and tasks.
2. Interdependency: the interdependencies of each compartmentalized activity or tasks must be determined.
3. Time allocation: each task to be scheduled must be allocated some number of work units.
4. Effort validation: every project has a defined number of staff members.
5. Defined responsibilities: every task that is scheduled should be assigned to a specific team member.
6. Defined outcomes: every task that is scheduled should have a defined outcome.

1.8.1 Pert chart

Program evaluation and review technique (pert) is a project scheduling method that is applied to software development.

Pert provide quantitative tool that allow the software planner to-Determine the critical path-the chain of tasks that determines the duration of the project; Establish “most likely” time estimates for individual tasks by applying statistical models; and

Calculate “boundary times” that defines a time “window” for a particular task.

Pert chart (program evolution review technique) for project-

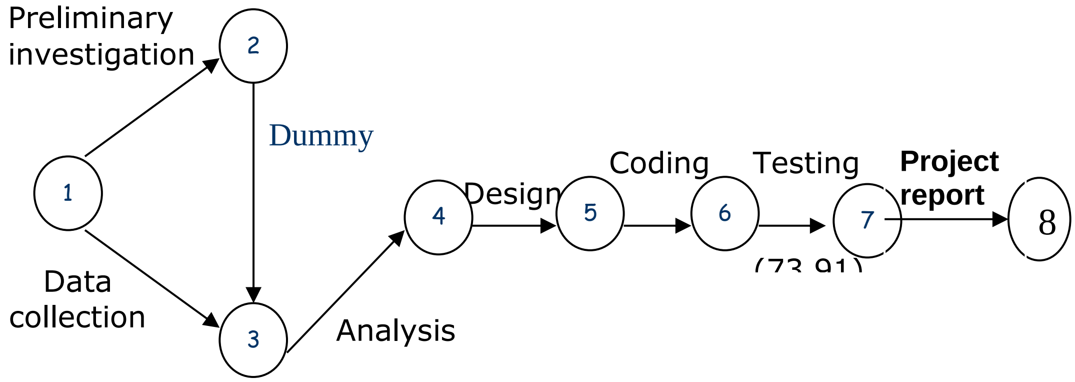


Fig 1.1 Pert Chart

1.8.2 Gantt Chart

When creating a project schedule, the planner begins with a set of tasks (the work breakdown structure). If automated tools are used, the work breakdown is input as a task network. Effort, duration and start dates are input are each task network. As a consequence of this input, a timeline chart also called a Gantt chart is generated. A timeline chart is developed for entire project.

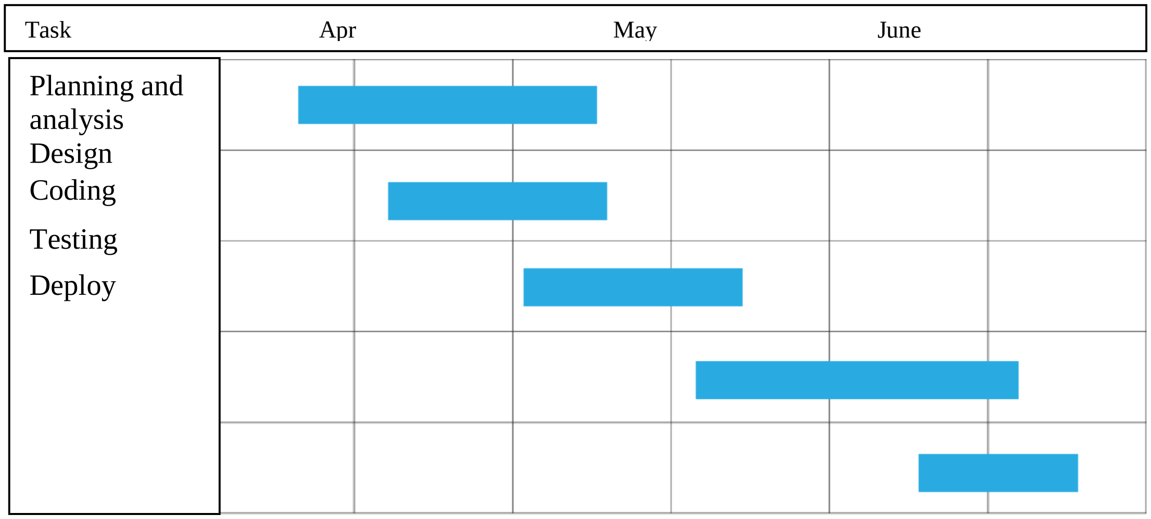


Fig 1.2 Gannt chart for project

Here horizontal bars indicate the duration of each task.

CHAPTER 2

CLOUD COMPUTING

2.1 About:

Cloud computing relies on software for distributed batch and stream processing, as well as distributed storage. This chapter focuses on an oft-ignored angle of assuredness: performance assuredness. A significant pain point today is the inability to support reconfiguration operations, such as changing of the shard key in a shared storage/database system, or scaling up (or down) of the number of virtual machines (VMs) being used in a stream or batch processing system. We discuss new techniques to support such reconfiguration operations in an online manner, whereby the system does not need to be shut down and the user/client-perceived behavior is indistinguishable regardless of whether a reconfiguration isoccurring in the background, that is, the performance continues to be assured in spite of ongoing background reconfiguration. Next, we describe how to scale-out and scale-in (increase or decrease) the number of machines/VMs in cloud computing frameworks like distributed stream processing and distributed graph processing systems, again while offering assured performance to the customer in spite ofthe reconfigurations occurring in the background. The ultimate performance assuredness is the ability to support SLAs/SLOs (service-level agreements/objectives) such as deadlines. We present a new real-time scheduler that supports priorities and hard deadlines for Hadoop jobs. We implemented our reconfiguration systems as patches to several popular and open-source cloud computing systems, including MongoDB and Cassandra (storage), Storm (stream processing), LFGraph (graph processing), and Hadoop (batch processing).[1]

Cloud computing has become the industry standard for rapid application deployment, scalable server support, mobile and distributed services, and it provides access to (theoretically) infinite resources. Unfortunately, researchers are still trying to converge towards cross-provider cloud computingframeworks to enable compatibility and seamless resource transition between cloud providers. Moreover, users are restricted to using the provider-specific pre-configured options of resources and services, irrespective of their current needs. At the same time, cloud services are provided as a direct service from the providers to the clients. This creates a segregated cloud market clientele, and non-negotiable pricing

Strategies for the cloud services. In this paper, we propose Jugo, a generic architecture for cloud composition and negotiated service delivery for cloud users. Jugo acts as a match-maker for service specifications from the users with the currently available assets from the cloud providers. The engagementof a middle-man as an opaque cloud service provider will create a better opportunity for cloud users to find cheaper deals, price-matching, and flexible resource specifications, with increased revenue and higherresource utilization for the cloud service providers.[2]

Many enterprises in industries start using Cloud Computing for their IT infrastructure services. This adoption of Cloud Computing is a part of the enterprise transformation which is the migration from a legacy IT environment to Cloud Computing. On the other hand, one of major targets is an industry solution which provides a critical business service to their end customers. This paper proposesIndustry Cloud which is the enhanced design of Cloud Computing for industry solutions. It efficiently supports industry solutions for enterprise business requirements. The paper describes Industry Cloud witha requirement analysis of industry solutions, those adopted functions, and three use case scenarios in the electronics and retail industry. The contribution of the paper is the analysis of industry wide requirements,the definition of Industry Cloud with a common function among industry solutions and the usage with usecase scenarios.[3]

The complexity of Cloud infrastructures is increasing every year, requiring new concepts and tools to face off topics such as process configuration and reconfiguration, automatic scaling,elastic computing and healthiness control. This paper presents a Smart Cloud solution based on a Knowledge Base, KB, with the aim of modeling cloud resources, Service Level Agreements and their evolution, while enabling the reasoning on cloud structures and implementing strategies of efficient smartcloud management and intelligence. The solution proposed is composed of Smart Cloud Engine, SCE, theKnowledge Base, KB, and the Supervisor and Monitoring module for data acquisition. It can be easily integrated with any cloud configuration manager, cloud orchestra or, and monitoring tool, since the connections with these tools are performed by using REST calls and XML files. [4]

Current Cloud Computing is primarily based on proprietary data centers, where hundreds of thousands of dedicated servers are setup to host the cloud services. In addition to the huge number of dedicated servers deployed in data centers, there are billions of underutilized Personal Computers (PCs), usually used only for a few hours per day, owned by individuals and organizations worldwide. The vast untapped compute and storage capacities of the underutilized PCs can be consolidated as alternative cloud fabrics to provision broad cloud services, primarily infrastructure as a service. This approach, thus referred to as "no data center" approach, complements the data center based cloud provision model. In this paper, we present our opportunistic Cloud Computing system, called cu Cloud, that runs on scavenged resources of underutilized PCs within an organization/community. Our system demonstrates that the "no data center" solution indeed works. Besides proving our concept, model,and philosophy, our experimental results are highly encouraging. [5]

Whatever one public cloud, private cloud or a mixed cloud, the users lack of effective security quantifiable evaluation methods to grasp the security situation of its own information infrastructure on the whole. This paper provides a quantifiable security evaluation system for different clouds that can be accessed by consistent API. The evaluation system includes security scanning engine, security recovery engine, security quantifiable evaluation model, visual display module and etc. The security evaluation model composes of a set of evaluation elements corresponding different fields, such ascomputing, storage, network, maintenance, application security and etc. Each element is assigned a three tuple on vulnerabilities, score and repair method. The system adopts "One vote vetoed" mechanism for one field to count its score and adds up the summary as the total score, and to create one security view.

We implement the quantifiable evaluation for different cloud users based on our G-Cloud platform. It shows the dynamic security scanning score for one or multiple clouds with visual graphs and guided usersto modify configuration, improve operation and repair vulnerabilities, so as to improve the security of their cloud resources. [6]

To move applications to the cloud is not only a technical decision but also a business-oriented decision, in which both business and technical factors (e.g. transformation effort,

Multi-tenancy and auto-scaling enablement, scalability and extensibility) should be considered. However, existing approaches and tools do not support a consumable business oriented cloud transformation decision to select more suitable transformation solution with the right cloud delivery model, services type,affordable transformation effort and etc. In this paper, we introduce a practical three-step approach and a tool, CTA (Cloud Transformation Advisor) to enable decision makers to identify the most suitable cloud transformation solution to satisfy their business goals based on a well-structured cloud transformation knowledge base. [7]

CHAPTER 3

FEASBILITY STUDY

3.1 Introduction

Feasibility of the system in an important aspect, which is to be considered. The system needs to satisfy the law of economic, which states that the maximum output should be yielded in minimum available resources.

A feasibility analysis evaluates the project’s potential for success; therefore, perceived objectivity is an essential factor in the credibility of the study for potential investors and lending institutions. There are five types of feasibility study—separate areas that a feasibility study examines, described below.

1. **Technical Feasibility**

This assessment focuses on the technical resources available to the organization. It helps organizations determine whether the technical resources meet capacity and whether the technical team is capable of converting the ideas into working systems. Technical feasibility also involves the evaluation of the hardware, software, and other technical requirements of the proposed system. As an exaggerated example, an organization wouldn’t want to try to put Star Trek’s transporters in their building—currently, this project is not technically feasible.

2. **Economic Feasibility**

This assessment typically involves a cost/ benefits analysis of the project, helping organizations determine the viability, cost, and benefits associated with a project before financial resources are allocated. It also serves as an independent project assessment and enhances project credibility—helping decision-makers determine the positive economic benefits to the organization that the proposed project will provide.

3. **Legal Feasibility**

This assessment investigates whether any aspect of the proposed project conflicts with legal requirements like zoning laws, data protection acts or social media laws. Let’s say an organization wants to construct a new office building in a specific location. A feasibility study might reveal the organization’s ideal location isn’t zoned for that type of business. That organization has just saved considerable time and effort by learning that their project was not feasible right from the beginning.

4. **Operational Feasibility**

This assessment involves undertaking a study to analyze and determine whether—and how well—the organization’s needs can be met by completing the project. Operational feasibility studies also examine how a project plan satisfies the requirements identified in the requirements analysis phase of system development.

5. **Scheduling Feasibility**

This assessment is the most important for project success; after all, a project will fail if not completed on time. In scheduling feasibility, an organization estimates how much time the project will take to complete.

When these areas have all been examined, the feasibility analysis helps identify any constraints the proposed project may face, including:

- Internal Project Constraints: Technical, Technology, Budget, Resource, etc.
- Internal Corporate Constraints: Financial, Marketing, Export, etc.
- External Constraints: Logistics, Environment, Laws, and Regulations, etc.

3.2 Main Aspects

There are three aspects of feasibility to be considered namely.

1. Technical
2. Operational
3. Economical

TECHNICAL:

In the technical aspects one may consider the hardware equipment for the installation of the software. The system being centralized will required very little hardware appliances. Hence this helps the system to work smoothly with limited amount of working capitals.

OPERATIONAL:

In the operational aspects may think of the benefits of the workload that many a personal may have to share. This is eased out and the required output may be retrieved in a very short time. Thus there is accuracy in the work on time is also saved there will be very little work that needs to be performed.

ECONOMICAL:

Economical system is definitely feasible because the hardware requirement is less and the operational working for the system requires less number of recruits. This help introduction over-staffing and wastage funds.

We studied on the position to evaluate solution. Most important factors in this study were tending to overlook the confusion inherent in system Development the constraints and the assumed studies. It can be started that it the feasibility study is to serve as a decision document it must answer three key questions.

1. Is there a new and better way to do the job that will benefit the user?
2. What are the costs and savings of the alternatives?
3. What is recommended?

On these questions it can be explained that feasibility study of the system includes following different angles.

3.2.1 Technical feasibility:

This centers on the existing computer system (hardware, software etc.) and to what extent it can support the proposed additional equipment .in this stage of study, we have collected information about technical tools available by which I could decide my system design as the technical requirements.

3.2.2 Operational Feasibility:

In this stage of study we have checked the staff availability. I concentrate on knowledge of end users that are going to use the system. This is also called as behavioral feasibility in which I have studied on following aspects; people are inherently resistant to change, and computers have been known to facilitate change .An estimate has been made to how strong a reaction the user staff is having toward the development of a computerized system. It is common knowledge that computer installations have something to do with turnover. I had explained that there is need to educate and train the staff on new ways of conducting business.

3.2.3 Economical feasibility:

Economical analysis is the most frequently used method for evaluating the effectiveness of candidate system. More commonly known as cost\benefit analysis, the procedure is to determine the benefits and savings that benefits outweigh costs. The decision was to design and implement system because it is for having chanced to be approved. This is an on going effort that improves the accuracy at each phase of the system life cycle.

In developing cost estimates for a system I need to consider several cost elements. Among these is hardware personal facility. Operating and supply costs.

3.3 Benefits

Benefits of conducting a feasibility study:

- Improves project teams' focus
- Identifies new opportunities
- Provides valuable information for a "go/no-go" decision
- Narrows the business alternatives
- Identifies a valid reason to undertake the project
- Enhances the success rate by evaluating multiple parameters
- Aids decision-making on the project
- Identifies reasons not to proceed

3.4 System Requirement Specification

Any system can be designed after specifies the requirement of the user about that system. For this first of all gathered information from user by the preliminary investigation which is starting investigation about user requirement.

The data that the analysts collect during preliminary investigation are gathered through the various preliminary methods.

Documents Reviewing Organization

The analysts conducting the investigation first learn the organization involved in, or affected by the project. Analysts can get some details by examining organization charts and studying written operating procedures.

Collected data is usually of the current operating procedure:

- The information relating to clients, projects and students and the relationship between them was held manually.
- Managing of follow-ups was through manual forms.
- Complaints require another tedious work to maintain and solve.
- Payments details had to be maintained differently.

Gathering Information by Asking Questions

Interviewing is the most commonly used techniques in analysis. It is always necessary first to approach someone and ask them what their problems are, and later to discuss with them the result of your analysis.

Questionnaires

Questionnaires provide an alternative to interviews for finding out information about a system. Questionnaires are made up of questions about information sought by analyst. The questionnaire is then sent to the user, and the analyst analyzes the replies.

Electronic Data Gathering

Electronic communication systems are increasingly being used to gather information. Thus it is possible to use electronic mail to broadcast a question to a number of users in an organization to obtain their viewpoint on a particular issue.

In my project, with the help of Marg software solutions, I have send questionnaire through electronic mail to twenty employees of the company and retrieved the information regarding the problem faced by existing system.

Interviews

Interview allows the analysts to learn more about the nature of the project request and reason of submitting it. Interviews should provide details that further explain the project and show whether assistance is merited economically, operationally or technically.

One of the most important points about interviewing is that what question you need to ask.

It is often convenient to make a distinction between three kinds of question that is

- Open questions
- Closed question
- Probes

Open questions are general question that establish a person's view point on a particular subject.

Closed questions are specific and usually require a specific answer.

Probes are question that follow up an earlier answer.

CHAPTER 4

DESIGNs

4.1 Introduction

System is created to solve problems. One can think of the systems approach as an organized way of dealing with a problem. In this dynamic world, the subject system analysis and design, mainly deals with the software development activities.

Since a new system is to be developed, the one most important phases of software development life cycle is system requirement gathering and analysis. Analysis is a detailed study of various operations performed by a system and their relationship within and outside the system. Using the following steps it becomes easy to draw the exact boundary of the new system under consideration.

All procedures, requirements must be analyzed and documented in the form of detailed DFDs, logical data structure and miniature specifications.

System analyses also include sub-dividing of complex process involving the entire system, identification of data store and manual processes.

4.2 System Design

System design is the process of planning a new system or to replace the existing system. Simply, system design is like the blueprint for building, it specifies all the features that are to be in the finished product.

System design phase follows system analysis phase. Design is concerned with identifying functions, data streams among those functions, maintaining a record of the design decisions and providing a blueprint the implementation phase.

Design is the bridge between system analysis and system implementation. Some of the essential fundamental concepts involved in the design of application software are:

- Abstraction
- Modularity
- Verification

Abstraction is used to construct solutions to problem without having to take account of the intricate details of the various component sub problems. Abstraction allows system designer to make step-wise refinement, which at each stage of the design may hide, unnecessary details associated with representation or implementation from the surrounding environment.

Modularity is concerned with decomposing of main module into well-defined manageable units with well-defined interfaces among the units. This enhances design clarity, which in turn eases implementation, Debugging, Testing, Documenting and Maintenance of the software product. Modularity viewed in this sense is a vital tool in the construction of large software projects.

Verification is fundamental concept in software design. A design is verifiable if it can be demonstrated that the design will result in implementation that satisfies the customer's requirements. Verification is of two types namely.

- Verification that the software requirements analysis satisfies the customer's needs.
- Verification that the design satisfies the requirement analysis.

Some of the important factors of quality that are to be considered in the design of application software are:

Reliability:

The software should behave strictly according to the original specification and should function smoothly under normal conditions.

Extensibility:

The software should be capable of adapting easily to changes in the specification.

Reusability:

The software should be developed using a modular approach, which permits modules to be reused by other application, if possible.

The System Design briefly describes the concept of system design and it contains four sections. The first section briefly describes the features that the system is going to provide to the user and the outputs that the proposed system is going to offer.

The second section namely Logical Design describes the Data Flow Diagrams, which show clearly the data movements, the processes and the data sources, and sinks, E-R diagrams which represent the overall logical design of the database, and high-level process structure of the system.

Preliminary Design:

Preliminary design is basically concerned with deriving an overall picture of the system. Deriving entire system into modules and sub-modules while keeping Cohesion and Coupling factors in mind. Tools, which assist in preliminary design process, are Data Flow Diagrams.

Code design:

The purpose of code is to facilitate the identification and retrieval for items of information. A code is an ordered collection of symbols designed to provide unique identification of an entity or attribute. To achieve unique identification there must be only one place where the identified entity or the attribute can be entered in the code; conversely there must be a place in the code for everything that is to be identified. This mutually exclusive feature must be built into any coding system.

The codes for this system are designed with two features in mind. Optimum human oriented use and machine efficiency they are also operable i.e., they are adequate for present and anticipate data processing both for machine and human use.

Input /Output design

Is a part of overall system design, which requires very careful attention. The main objectives of input design are:

- To produce a cost-effective method of input.
- To achieve the highest possible level of accuracy.
- To ensure that the input is acceptable to and understood by the user staff.

Outputs from computer systems are required primarily to communicate the results of processing to users. They are also to provide a permanent hard copy of these results for later consultation.

The various types of outputs are required by this system are given below:

- External outputs, whose destination is outside the concern and which require special attention because they, project the image of the concern.
- Internal outputs, whose destination is within the concern and which require careful design because they are the user's main interface within the computer.
- Operation outputs, whose use is purely within the computer department, E.g., program listings, usage statistics etc,

4.3 SDLC

Software Development Life Cycle (SDLC) is a framework that defines the steps involved in the development of software at each phase. It covers the detailed plan for building, deploying and maintaining the software.

SDLC defines the complete cycle of development i.e. all the tasks involved in planning, creating, testing, and deploying a Software Product.

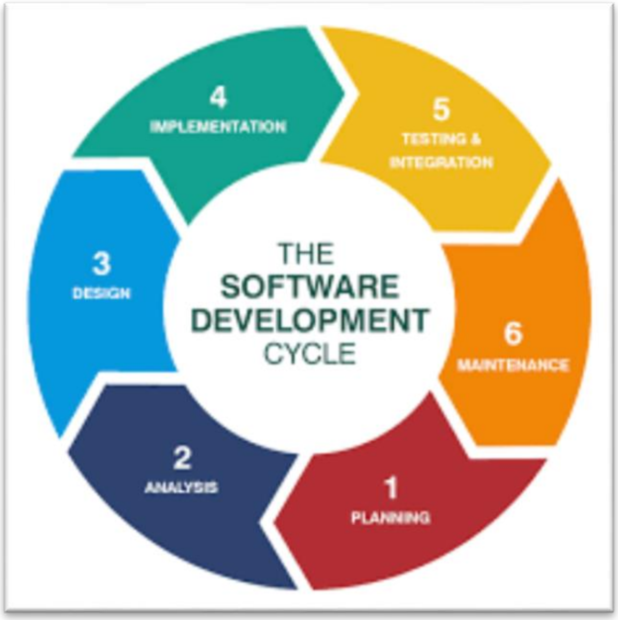


Fig 4.1 The planning step

4.3.1 SDLC Phases

Given below are the various phases:

- Requirement gathering and analysis
- Design
- Implementation or coding
- Testing
- Deployment
- Maintenance

Requirement Gathering and Analysis

During this phase, all the relevant information is collected from the customer to develop a product as per their expectation. Any ambiguities must be resolved in this phase only.

Business analyst and Project Manager set up a meeting with the customer to gather all the information like what the customer wants to build, who will be the end-user, what is the purpose of the product. Before building a product a core understanding or knowledge of the product is very important.

Once the requirement gathering is done, an analysis is done to check the feasibility of the development of a product. In case of any ambiguity, a call is set up for further discussion. Once the requirement is clearly understood, the SRS (Software Requirement Specification) document is created. This document should be thoroughly understood by the developers and also should be reviewed by the customer for future reference.

Design

In this phase, the requirement gathered in the SRS document is used as an input and software architecture that is used for implementing system development is derived.

Implementation or Coding

Implementation/Coding starts once the developer gets the Design document. The Software design is translated into source code. All the components of the software are implemented in this phase.

Testing

Testing starts once the coding is complete and the modules are released for testing. In this phase, the developed software is tested thoroughly and any defects found are assigned to developers to get them fixed.

Deployment

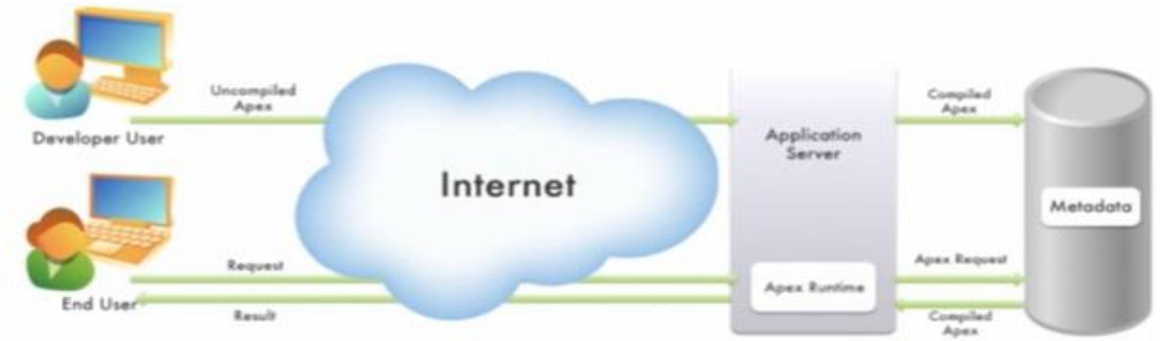
Once the product is tested, it is deployed in the production environment or first UAT (User Acceptance testing) is done depending on the customer expectation.

Maintenance

After the deployment of a product on the production environment, maintenance of the product i.e. if any issue comes up and needs to be fixed or any enhancement is to be done is taken care by the developers.

4.4 DFD

DFD is the abbreviation for **Data Flow Diagram**. The flow of data of a system or a process is represented by DFD. It also gives insight into the inputs and outputs of each entity and the process itself. DFD does not have control flow and no loops or decision rules are present. Specific operations depending on the type of data can be explained by a flowchart. Data Flow Diagram can be represented in several ways.



.Fig 4.2 Apex Working

Level 0 DFD :

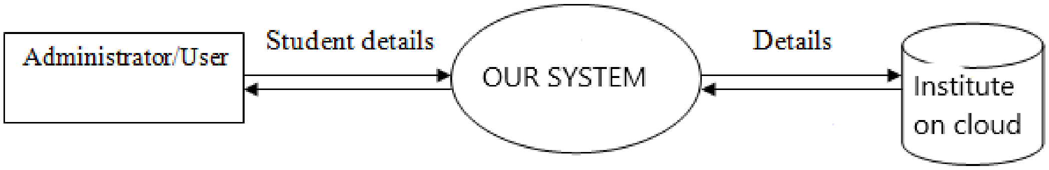


Fig 4.3 Context level

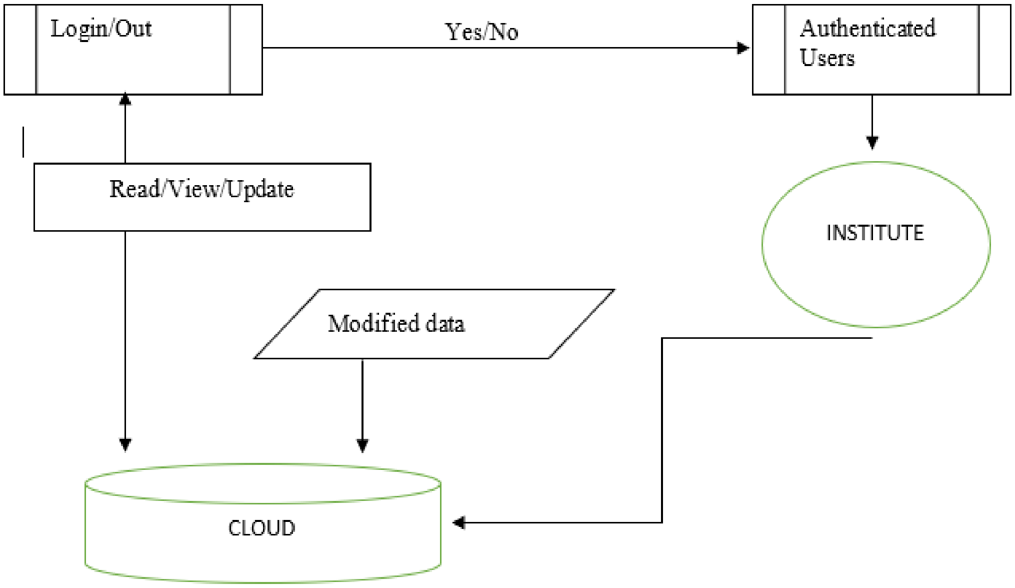


Fig 4.4 DFD 1 Level

4.5 UML use case diagram

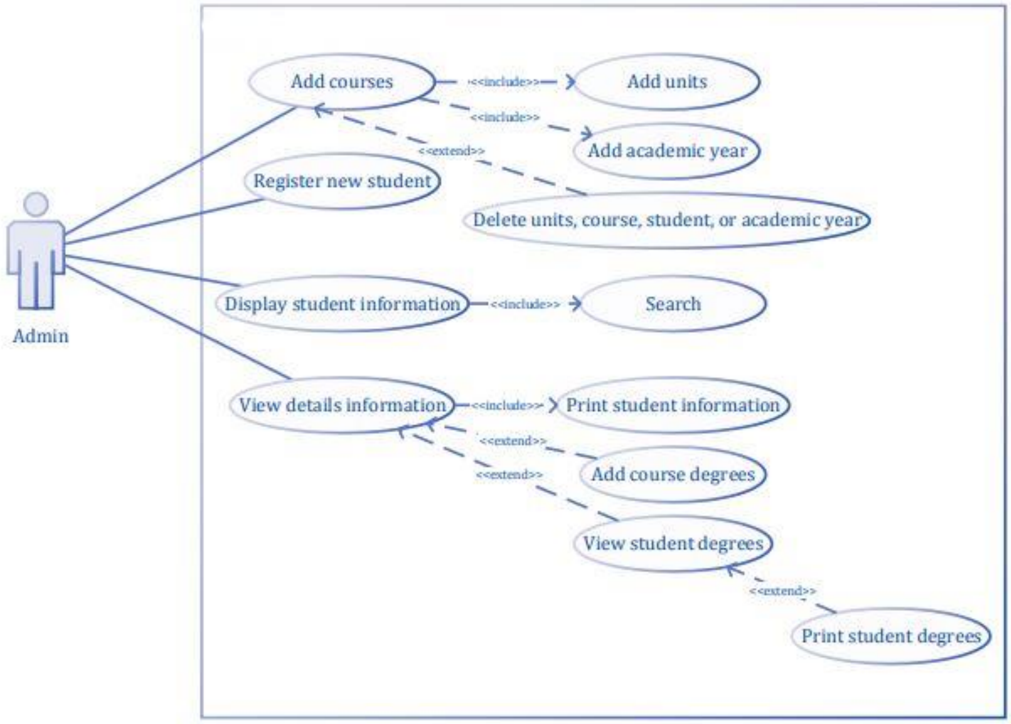


Fig 4.5 Uml use case

4.6 ER Diagram

An Entity–relationship model (ER model) describes the structure of a database with the help of a diagram, which is known as Entity Relationship Diagram (ER Diagram). An ER model is a design or blueprint of a database that can later be implemented as a database. The main components of E-R model are: entity set and relationship set.

An ER diagram has three main components:

1. Entity
2. Attribute
3. Relationship

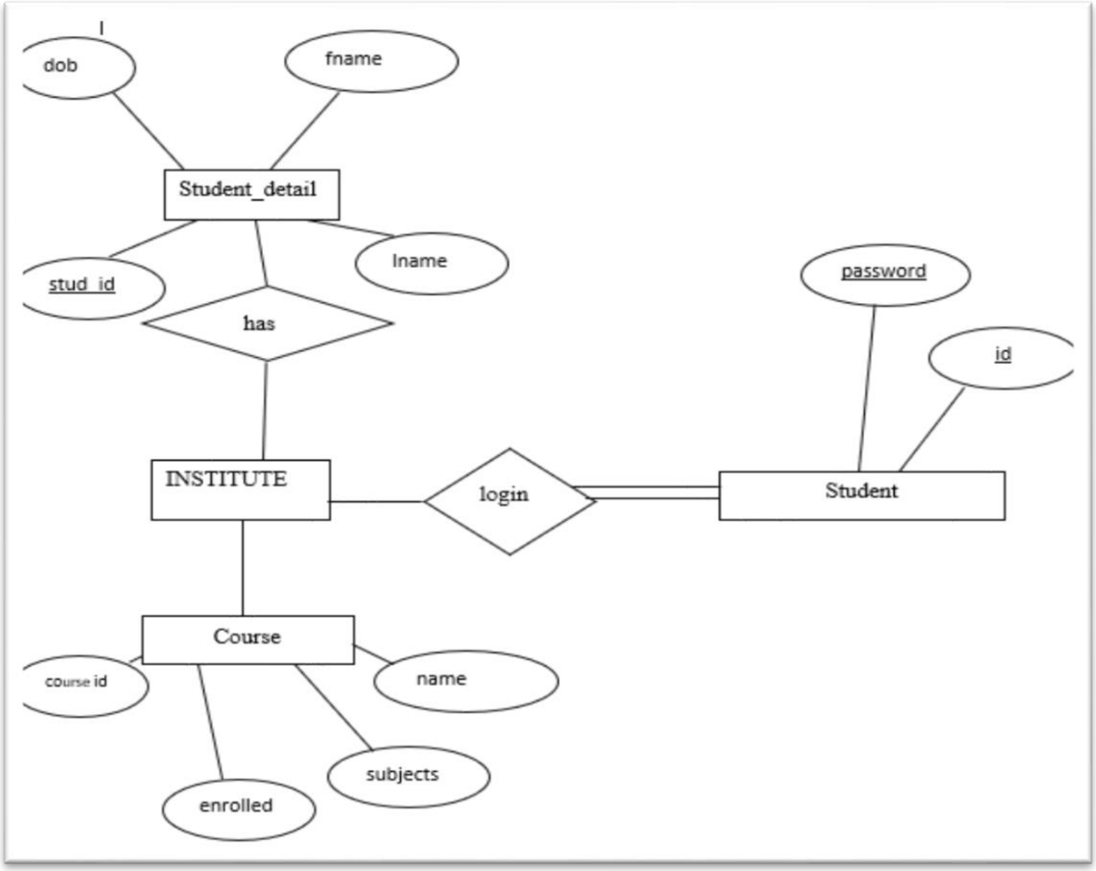


Fig 4.6 ER diagram of system

4.7.1 ER- Diagram Notations

ER- Diagram is a visual representation of data that describe how data is related to each other.

- **Rectangles:** This symbol represent entity types
- **Ellipses :** Symbol represent attributes
- **Diamonds:** This symbol represents relationship types
- **Lines:** It links attributes to entity types and entity types with other relationship types
- **Primary key:** attributes are underlined
- **Double Ellipses:** Represent multi-valued attributes

CHAPTER 5

SALESFORCE

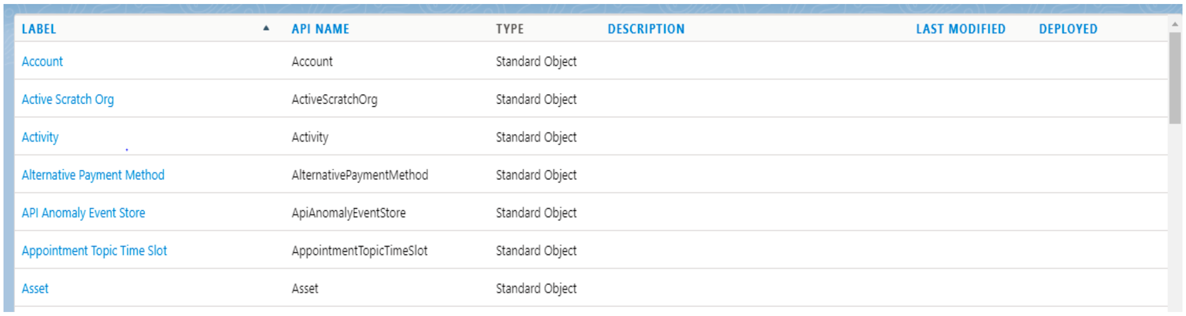
The Salesforce Platform stores data in relational tables. The records in these tables containdata for the structure of the platform itself as well as user created data. For example, the data about the configuration and settings of an account are already in-built as a relational table. But you can also create your own tables to store data specific to your business like the 'dispatch schedule' for a week assuming you are a courier company.

These relational tables are roughly referred to as API Objects or only objects in Salesforce. There are three kinds of Salesforce objects.

- Standard Objects − The objects already created for you by the Salesforce platform.
- Custom Objects − These are the objects created by you based on your business processes.
- External Objects − The objects which you create map to the data stored outside your organization.

5.1 Standard Objects

These are the objects which already exist in the Salesforce platform to manage the configurations and settings of the environment. Once you log in to the salesforce platform, you can see the available objects.

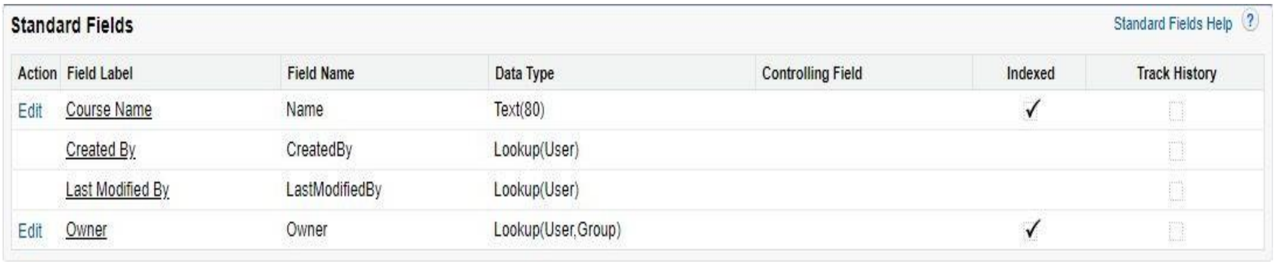


LABEL ▲	API NAME	TYPE	DESCRIPTION	LAST MODIFIED	DEPLOYED
Account	Account	Standard Object			
Active Scratch Org	ActiveScratchOrg	Standard Object			
Activity	Activity	Standard Object			
Alternative Payment Method	AlternativePaymentMethod	Standard Object			
API Anomaly Event Store	ApiAnomalyEventStore	Standard Object			
Appointment Topic Time Slot	AppointmentTopicTimeSlot	Standard Object			
Asset	Asset	Standard Object			

Table 5.1 Standard Object Table

5.2 Standard Fields

These are the some fields which is already exists in the standard objects. When you click the standard object than you can see the standard fields.



Standard Fields

Action	Field Label	Field Name	Data Type	Controlling Field	Indexed	Track History
Edit	Course Name	Name	Text(80)		✓	□
	Created By	CreatedBy	Lookup(User)			□
	Last Modified By	LastModifiedBy	Lookup(User)			□
Edit	Owner	Owner	Lookup(User,Group)		✓	□

Table 5.2 Standard Field table

3.3 Important Standard Objects

In this section, we will discuss the important standard objects in Salesforce. The following table listsdown the objects –

ObjectName	Meaning	Usage
Account	Represents anindividual account, which is an organization or personinvolved in the business like customers, competitors, partners, etc.	Use this object to query and manageaccounts in your organization.
Account History	Represents the history of changes to the values in the fields of an account.	Use this object to identify changesto an account.
Case	Represents a case,which is a customer issue or problem.	Use the case object to manage casesfor your organization.
Contact	Represents a contact, which is an individual associated with anaccount.	This object is used to manage individuals who are associated with an Account in the organization.

ser	Represents a userin the organization.	This object is used to query information about users and also helps to provide and modify the information concerning the users.
Asset	Represents anitem of commercial value, such as a product sold by the company or a competitor thata customer has purchased and installed.	This object is used to track assets previously sold into customer accounts. With asset tracking, a client application can quickly determine which products were previously sold or are currently installed at a specific account.
Domain	Read-only objectthat represents a custom Webaddress assigned to a site in your organization.	This read-only object is used to object to query the domains that are associatedwith each website in your organization.

Table 5.3 Standard Objects

As IT technology advanced, a new style of innovation emerged, in which a leading innovation company invites end-users to its open software service platform. With respect to this type of innovation,a lot of innovation studies were performed to understand the structure of the interaction among users and the platform provider from the perspective of network science. By concentrating only on the internal mechanisms among agents, the previous studies miss to consider innovation through collective intelligence. A platform provider plays an important role in the innovation. In this research, we investigate the structure of a service network with empirical data gathered from Salesforce.com App Exchange and discuss the role of a platform provider in innovation through collective intelligence. Our results suggest that the platform provider led the innovation in the initial period and, then, third party developers became gradually innovation leaders. Our findings are expected to re-orient the research focus from internal mechanisms to the role of platform providers. [8]

With the appearance of distributed computing, associations are hoping to move their Customer Relationship Management (CRM) applications from an On-Premise environment or we can say local servers to an On-Demand environment that is on cloud server. On-Premise environment is when association has the framework and programming inside their system. In On-Demand environment, an outsider has the base and programming and charges the relationship in light of its participation. Salesforce is the principle On-Demand CRM thing. [9]

The advantages of cloud while supporting real-time service systems using the Salesforce platform. We build here a service management platform for the Polish Billiards and Snooker Association (PBSA), based on a real-time system located in a cloud. It allows PBSA managers to accomplish tasks in this system on-demand. And, it is deployed as a private cloud to grant an access only to the employees from the snooker organization. [10]

In a recent scenario, IT industries are growing with the help of proper Utilization of available resources. The IT giants like Microsoft, Infosys, IBM, Oracle, & TCS are switching from theirs on premises IT setups to the cloud. Cloud computing is replacing the traditional model in which software applications installed on on premise hardware, from desktop computers to server rooms, depending on the size of the business. The proposed work is about the cloud platform which is going to change all the traditional views of software, application, and product development Technologies. Salesforce.com is one of the best cloudproviders available in the recent scenario. There are number of reasons why IT industries are switching to theCloud. And there are number of reasons why Industries have to think to adopt Salesforce.com cloud. The proposed work is about to focus on important and common features of salsforce.com. These features are common for any developer to learn and use in to software, application and product development in salesforce.com. The goal of this proposed work is to show the available resources in the salesforce.com which are still new for the developers. This an approach to make people familiar with the salesforce.com cloud provider. [11]

Summary form only given as follows. The strongest predictors of new product success is understanding market requirements early in the new product development (NPD) process. A direct salesforce is one of the best sources of new product ideas and market information, although not fully leveraged in many firms. A recent study of 248 salespeople in nineteen high-tech firms indicates wide variation in NPDinvolvement across and within a firm's salesforce. The study revealed that at the organization level, the lengthof the NPD cycle was associated with salesforce-initiated and NPD-headquarters initiated activities. In particular, the longer a firm's NPD cycle for product improvements, the lower the involvement the salesforce has in headquarters initiated involvement activities. A significant relationship exists between a firm's new product cycle time and the level of involvement in salesforce-initiated NPD predevelopment activities. At thesalesperson level, several factors affect involvement in NPD activities. Most significant was the relationship between salesperson involvement and the distance between a salesperson's location and the NPD office site. The study shows that organizations can affect the degree of involvement that their salesforce or individual salespeople have in early phases of NPD. [12]

Motivation is important because it determines and individual's effort toward performing a task andit leads to an optimistic and challenging attitude at work place. Incentive motivation is concerned with the way goals influence behavior. Incentive is the promise or stimulus for greater action. Incentives are something that is given in addition to wages. It means additional remuneration or benefit to an employee in recognition of achievement or better work. Organizations in emerging markets are more likely to give group rewards and generally do not encourage risk taking as much as developed economies. Money motivates employees to some extent but there are other powerful sources of motivation such as interesting andchallenging tasks and assignments, praise, good interpersonal relations etc. This paper analyzes incentives plan structure of sales people in Croatia. Advantages and disadvantages of different compensation plans and benefits for salespeople are discussed. [13]

Modern business decision models are often very complicated due to a deluge of information. Evaluation and diagnostics of such decision models is extremely challenging due to many factors, including the complexity and volume of data. In addition, since there is no ideal data sample to construct a control group for comparison studies, performance evaluation and diagnostics of business actions can easily be distorted by selection bias. In this paper, we design a framework to analyze this sample bias issue under a practical business scenario. In particular, we focus on: a) identification of the key factors which drive selection bias during the business decision; b) evaluation of the performance of business actions with consideration of the identified selection bias. We evaluate baseline analytics tools on the worldwide sales-force data of a large global corporation and clearly demonstrate that the selection bias issue makes the usual evaluation very unstable and not trustable. However, by removing such detected sample bias, our framework can generate reasonable diagnostics results across different dimensions. The implemented analysis tool was applied to a worldwide business opportunity dataset of a multinational Fortune 500corporation; the analytics results clearly show the significance of such a bias detection-based evaluation framework for sales-force optimization. [14]

Estimating generalizable relationships between actions and results from historical samples, especially when there is a level of noise or randomness in that signal, is an important problem to address before making decisions on actions to take. Many business analytics problems require the optimal assignmentof limited resources to actions and activities to maximize some result or objective such as profit. We presenta novel approach to solving this class of analytics problems by modeling the relationship between resource effort and expected return as a dose-response signal and formulating its causal estimation as one of kernel regression. The estimated expected value and variance of the result are then used to optimize resource allocation so as to maximize expected response while minimizing the risk around response subject tobusiness constraints. We apply this approach to the task of optimally assigning salespeople to enterprise clients using real-world data, and show that profit can be substantially increased with fewer salespeople and reduced risk. [15]

CHAPTER 6

CREATE OBJECTS, VALIDATIONS AND TRIGGERS

6.1 Creating a Salesforce Custom Object

- First, follow this path: Setup > Build > Create > Objects > on the screen, click on the new customobject button > enter label name, plural label, and object name > enter record name as a data type.
- To create a record name, first, consider the two data types:
- Text
- Auto-number

You also have some optional features while creating objects:

- Allow reports: If you tick off this checkbox, then only these objects will be available to makereports.
- Allow activities: If you tick off this checkbox, then you are able to make activities on this object.
- Track field history: When you tick off this checkbox, then you can merely track fields. You cantrack up to 20 fields for a single object.

Now, you have the following deployment modes:

- In development: If you opt for this, then this object will remain in the development mode. It willnot be present for deployment.
- Deployed: When you opt for this, the object will be available for deployment.

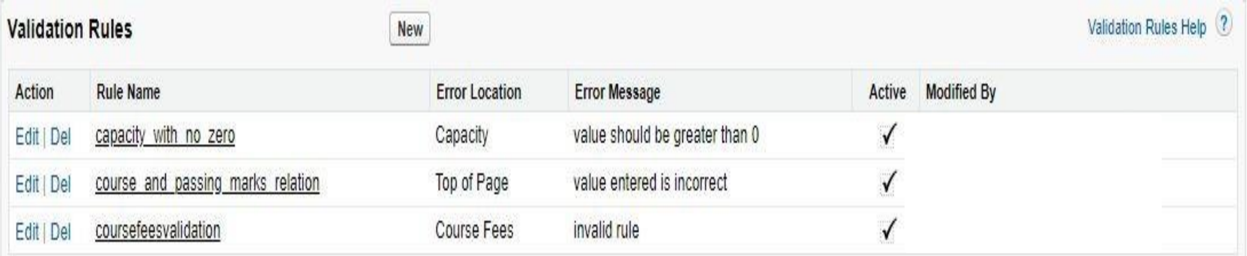
The following options are available only when you are creating a custom object for the first time:

- Add notes and attachments related list
- Launch a new custom tab wizard after saving this custom objectAfter completing all these settings, press the Save button.

If you do not select ‘Launch new custom tab wizard’ from the object creation page, then the object wouldbe saved without the tab appearance. In such a case, first, you need to make a tab for this object. On the other hand, if you select this option, the object would be saved, along with a tab would be created, whichwill be visible to you.

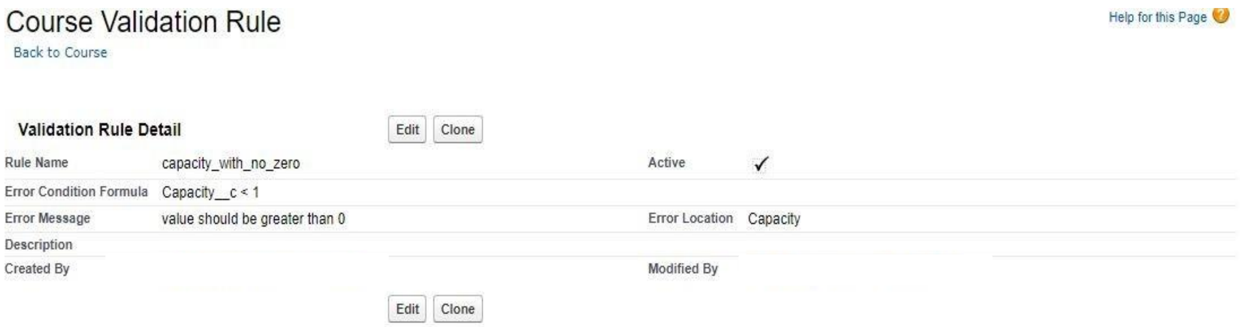
6.2 Creating a Validation Rule

- From Setup, go to Object Manager and click Account
- In the left sidebar, click Validation Rules.
- Click New.
- Enter the following properties for your validation rule
- Rule Name: Account_Number_8_Characters
- Error Condition Formula:
- LEN(Account Number) != 8
- Error Message: Account number must be 8 characters long.
- To check your formula for errors, click Check Syntax.
- Click Save to finish.



Action	Rule Name	Error Location	Error Message	Active	Modified By
Edit | Del	capacity_with_no_zero	Capacity	value should be greater than 0	✓	
Edit | Del	course_and_passing_marks_relation	Top of Page	value entered is incorrect	✓	
Edit | Del	coursefeesvalidation	Course Fees	invalid rule	✓	

Fig 6.1 Validation Rule



Course Validation Rule

Back to Course

Help for this Page

Validation Rule Detail Edit Clone

Rule Name	capacity_with_no_zero	Active	✓
Error Condition Formula	Capacity__c < 1		
Error Message	value should be greater than 0	Error Location	Capacity
Description			
Created By		Modified By	

Edit Clone

Fig 6.2 Course Validation Rule

6.2 Apex Triggers

The following steps show the different types of triggers you can use.

- From Setup, select Customize and then click the object that you want to add the trigger to.
- Click Triggers and then click New.
- To define your trigger, enter Apex code similar to this sample code.
- Replace [ObjectName] with the name of the object that you are adding the trigger to.
- Replace [NameOfCustomSetting] with the integration name you created on the EinsteinDiscovery Integration information page.

6.2.1 Apex trigger for single object with no data transformation

```
trigger SetDealPrediction on [ObjectName] (after insert, after update) {if(System.isFuture())

  return; if(ed_insights.CheckRecursive.runOnce()) {

  // custom Settings' name

  String CONFIG_NAME = '[NameOfCustomSetting]';
ed_insights.TriggerHandler.insertUpdateHandle(CONFIG_NAME);
}
}
```

6.2.2Apex trigger with data transformation:

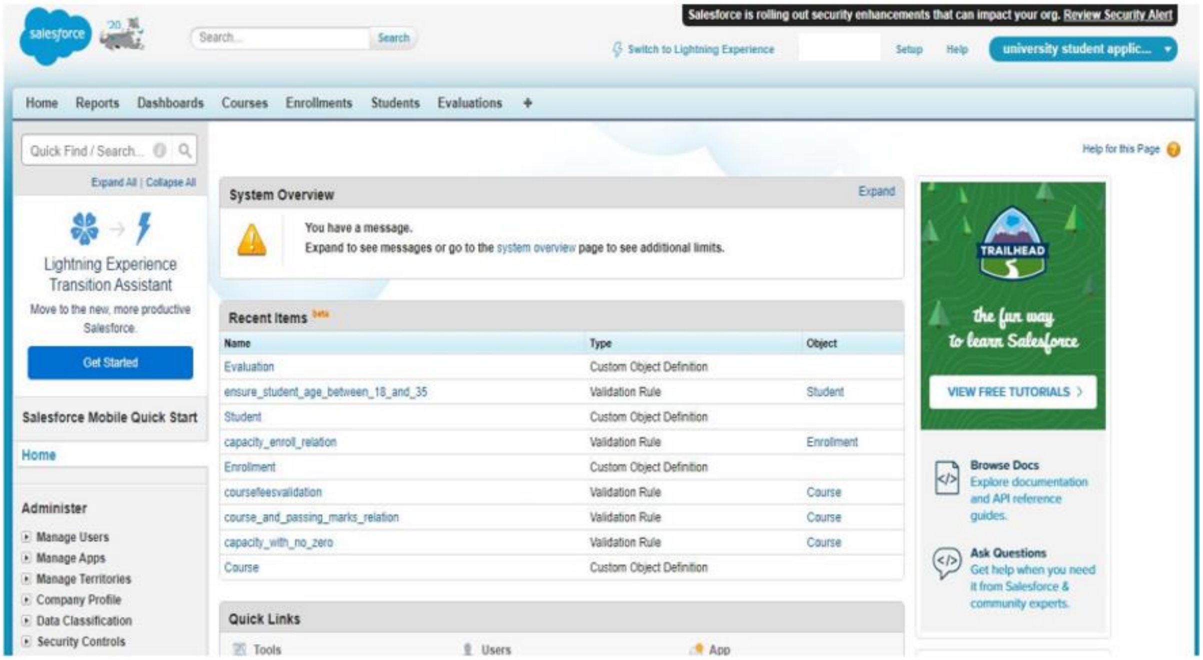
```
trigger SetDealPrediction on [ObjectName] (after insert, after update)
{
if(System.isFuture()) return;

List<Map<String, String>> fieldValues = new List<Map<String, String>>();

// Iterate through all records that are supposed to be processed by this trigger
// Only need to populate the fields that are NOT mapped to the object.
// Fields mapped to the object are automatically queried via the recordID

for ([objectName] o: Trigger.new) {

// the field-value Map to be passed to the setPredition() method Map<String, String>
fieldStringMap = new Map<String, String>();

fieldStringMap.put('Id', o.Id); //Must Have this or scoring will fail
fieldStringMap.put('<model field 1>',<value 1>); fieldStringMap.put('<model field
2>',<value 2>); fieldValues.add(fieldStringMap);
}
// make sure there are fieldValues populated; otherwise, skip thisif(fieldValues.size()>0)

{

                    ed_insights.TriggerHandler.insertUpdateHandleForFieldValues(CONFIG_NAME,JSON.serialize(fieldValues));

}
```

CHAPTER 7

OUTPUT SCREEN

7.1 Screenshots of Modules:

Application main page that shows all the menu related to application in one place. Its having the menu bar along with dashboard to show the count of the active and deactivate students and also shows the course related things like course wise students no


salesforce
Search...
Search
Switch to Lightning Experience
Setup
Help
university student applic...
Home
Reports
Dashboards
Courses
Enrollments
Students
Evaluations
+
Quick Find / Search...
Expand All | Collapse All
Lightning Experience Transition Assistant
Move to the new, more productive Salesforce.
Get Started
Salesforce Mobile Quick Start
Home
Administer
Manage Users
Manage Apps
Manage Territories
Company Profile
Data Classification
Security Controls
Help for this Page
Expand
TRAILHEAD
the fun way to learn Salesforce
VIEW FREE TUTORIALS
Browse Docs
Explore documentation and API reference guides.
Ask Questions
Get help when you need it from Salesforce & community experts.
Quick Links
Tools
Users
App

Salesforce is rolling out security enhancements that can impact your org. Review Security Alert

System Overview

You have a message.
Expand to see messages or go to the system overview page to see additional limits.

Recent Items beta

Name	Type	Object
Evaluation	Custom Object Definition	
ensure_student_age_between_18_and_35	Validation Rule	Student
Student	Custom Object Definition	
capacity_enroll_relation	Validation Rule	Enrollment
Enrollment	Custom Object Definition	
coursefeesvalidation	Validation Rule	Course
course_and_passing_marks_relation	Validation Rule	Course
capacity_with_no_zero	Validation Rule	Course
Course	Custom Object Definition	

Fig 7.1 Showing home page

7.2 Courses Object:

User can create the courses and add the course related information to show on the web page and add the several other information like the Available seats and the studies materials, fees, qualification marks and passing marks.

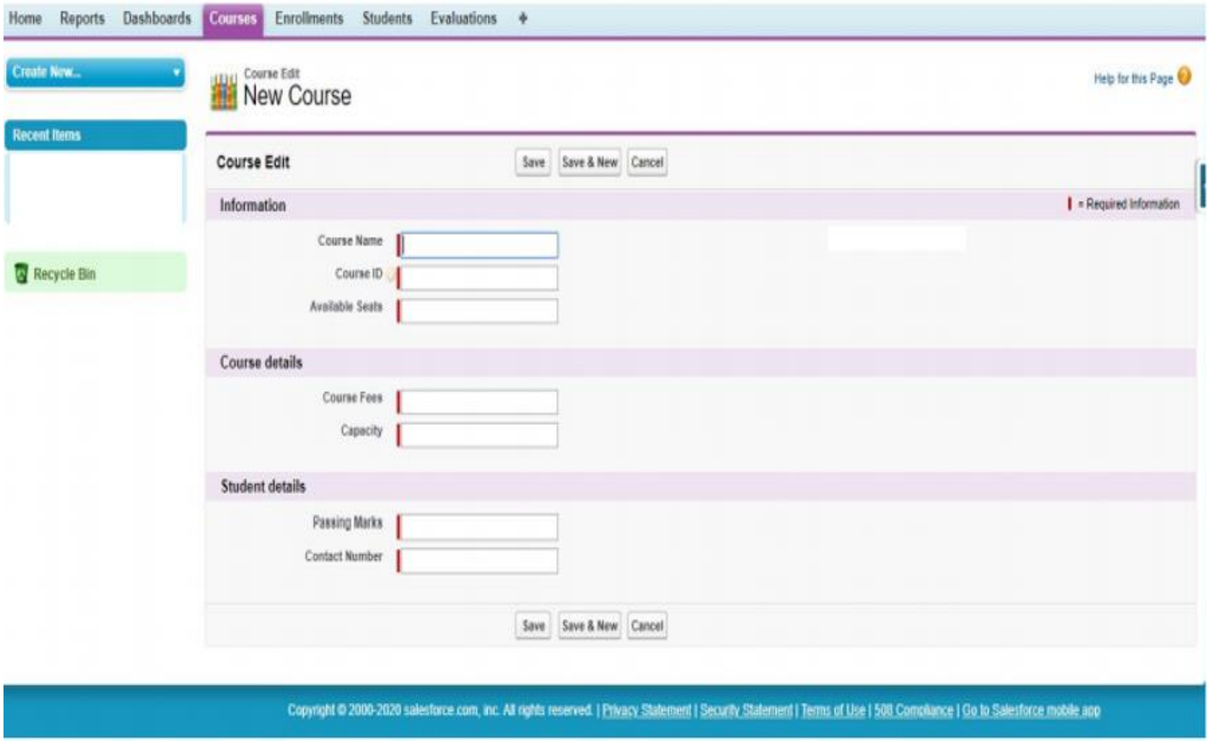


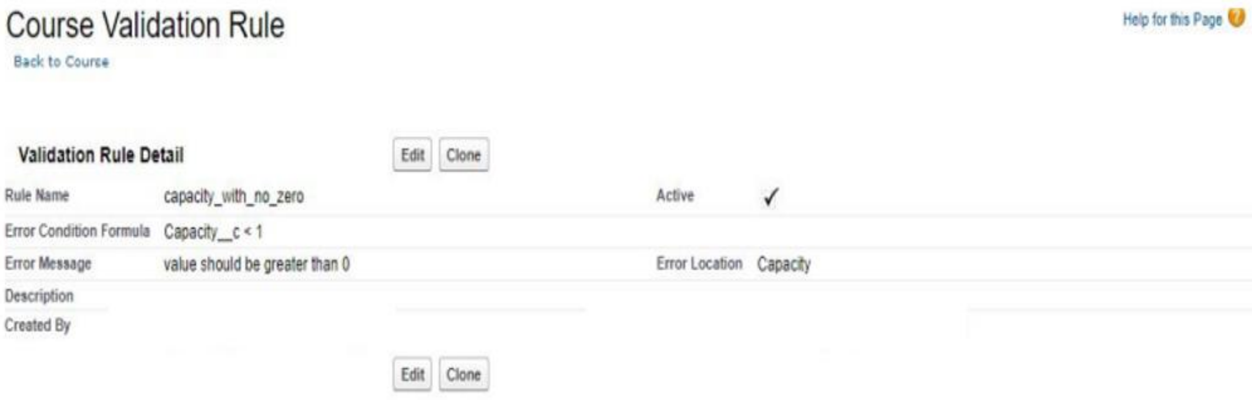
Fig 7.2 Showing Course Object

7.3 Validations on Course Object:

On adding the courses to the page we also create some validation related rules for the data verifications.

a) Check that course id should be greater than zero.

b) User can’t click on save button until course name blank.



Course Validation Rule

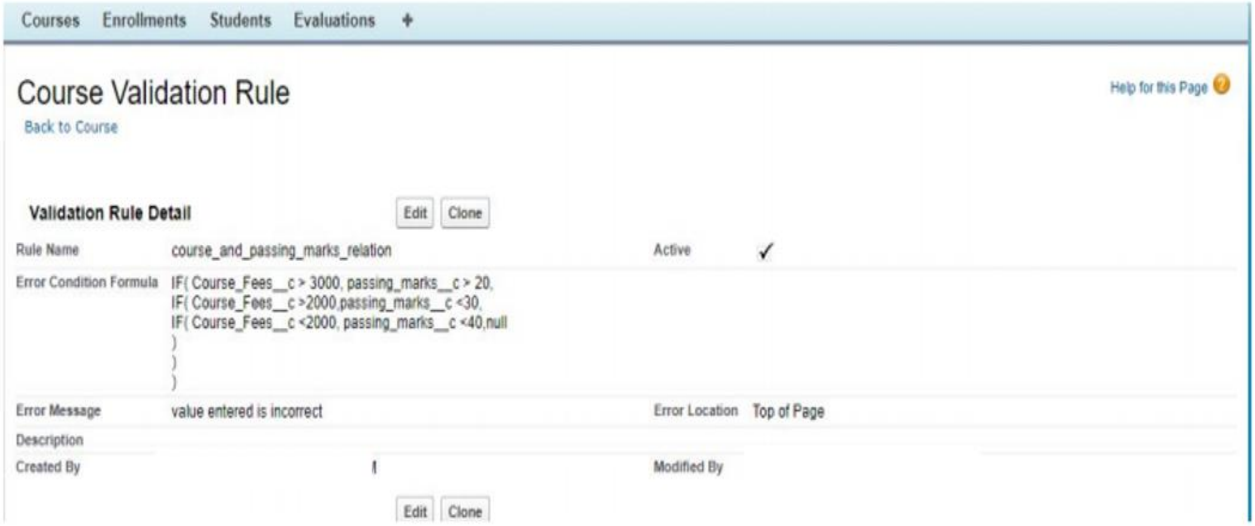
Validation Rule Detail

Rule Name	capacity_with_no_zero	Active	✓
Error Condition Formula	Capacity__c < 1		
Error Message	value should be greater than 0	Error Location	Capacity
Description			
Created By			

Fig 7.3 Validations

We have also put the barriers on the fees structures and the passing marks for the cousers creation like

a) If course fees greter than 3000 then the passing marks should be greater then 20.
b) If course fees less than 2000 then the passing marks should be less then 30.
c) If course fees greter than 2000 then the passing marks should be greater then 40.



Course Validation Rule

Validation Rule Detail

Rule Name	course_and_passing_marks_relation	Active	✓

Error Condition Formula	IF(Course_Fees__c > 3000, passing_marks__c > 20,
	IF(Course_Fees__c >2000,passing_marks__c <30,
	IF(Course_Fees__c <2000, passing_marks__c <40,null
	)
	)
	)		

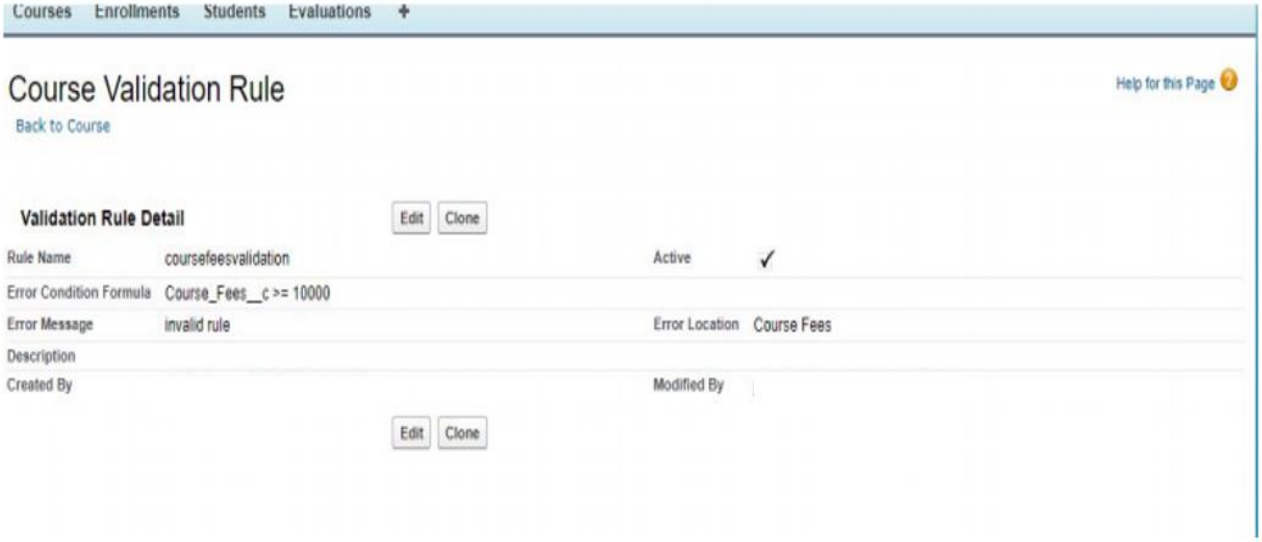
Error Message	value entered is incorrect	Error Location	Top of Page
Description			
Created By		Modified By	

Fig 7.4 Validations on Course Fees Object

We have also put the barriers on the fees structures for the cousers creation like

a) Course fees should be grater than 0

b) Course fees should be interger value



Course Validation Rule

Validation Rule Detail

Rule Name	coursefeesvalidation	Active	✓
Error Condition Formula	Course_Fees__c >= 10000		
Error Message	invalid rule	Error Location	Course Fees
Description			
Created By		Modified By	

Fig 7.5 Validations on Course Fees Object

7.4 Enrollment Object:

Students mapping with the courses and fees.

This page use to save or update the students enroll courses and the fees which charge from the user. This page is use full when student not confuse in the courses selection on the enrollment time or any students who eligible for the special discounts on the courses fees

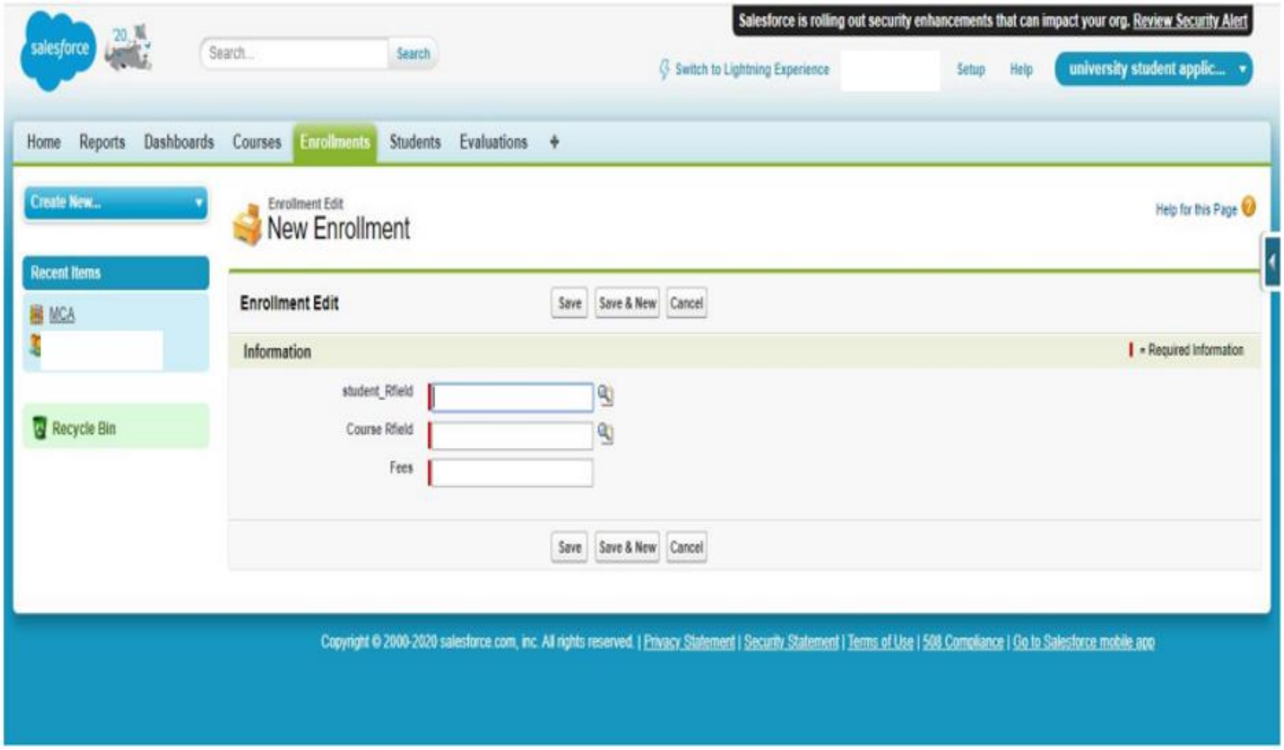

salesforce
Search...
Search
Salesforce is rolling out security enhancements that can impact your org. Review Security Alert
Switch to Lightning Experience
Setup
Help
university student applic...
Home
Reports
Dashboards
Courses
Enrollments
Students
Evaluations
+
Create New...
Recent Items
MCA
Recycle Bin
Enrollment Edit
New Enrollment
Help for this Page
Enrollment Edit
Save
Save & New
Cancel
Information
= Required Information
student_Rfield
Course Rfield
Fees
Save
Save & New
Cancel
Copyright © 2000-2020 salesforce.com, inc. All rights reserved. | Privacy Statement | Security Statement | Terms of Use | 508 Compliance | Go to Salesforce mobile app

Fig 7.6 Showing all the Fields of Enrollment Object

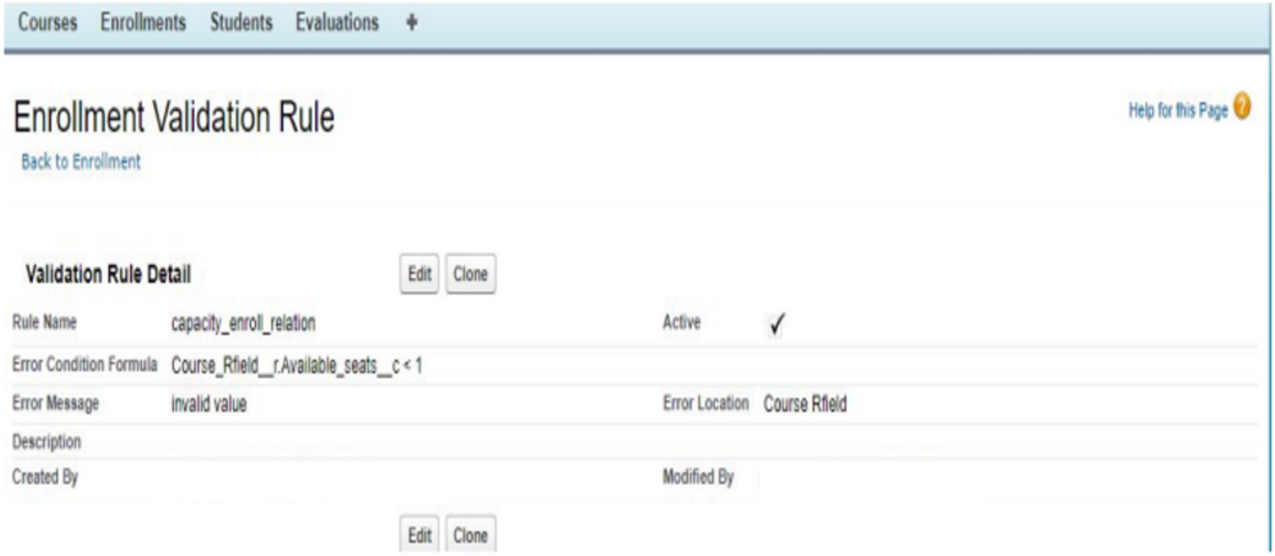
7.5 Validation on Enrollment Object

Validation rules related to the enrollments are \

a) For allow students to enroll in courses related available seats should be greater than 0.

b) Seats only shows in the integer format.

c) Once course seats full then students are not able to select that courses.



Enrollment Validation Rule

Back to Enrollment

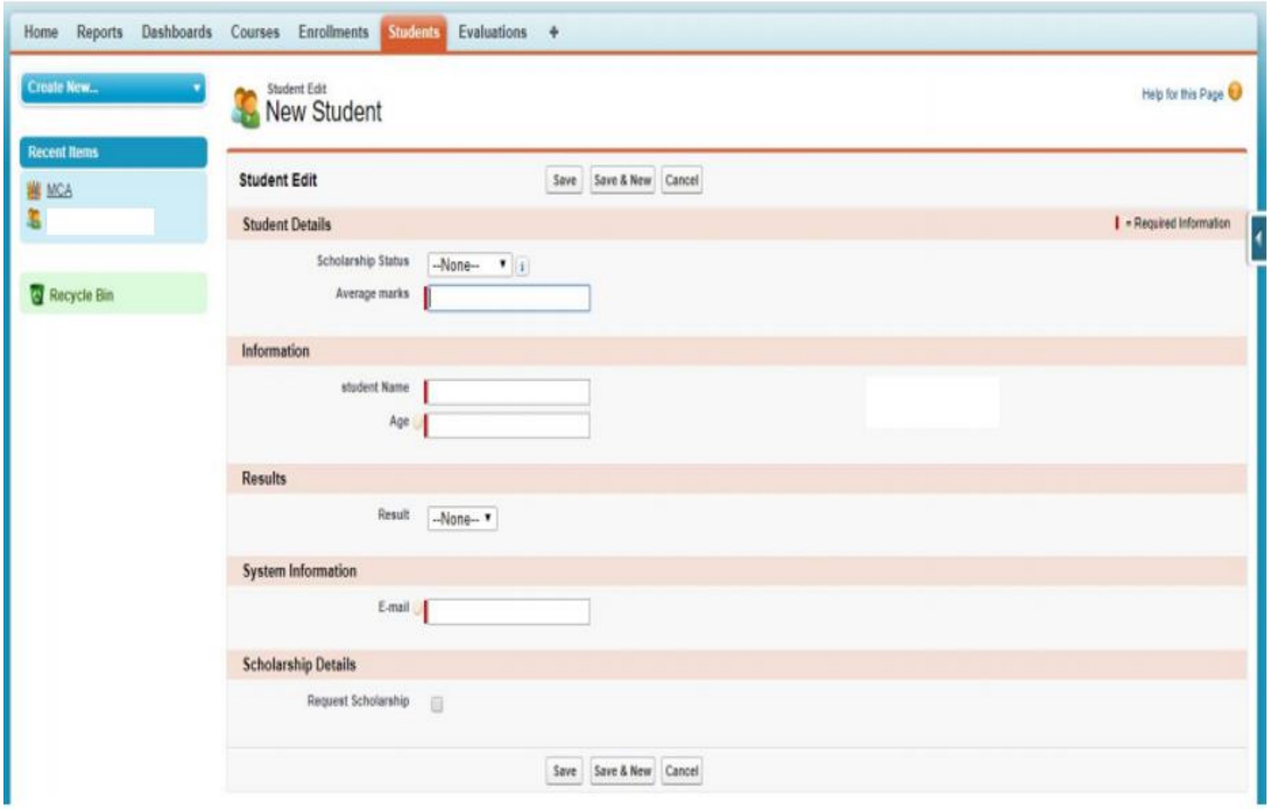
Validation Rule Detail

Rule Name	capacity_enroll_relation	Active	✓
Error Condition Formula	Course_Rfield__r.Available_seats__c < 1		
Error Message	invalid value	Error Location	Course Rfield
Description			
Created By		Modified By	

Fig 7.7 Showing Validations and Master Detailed Relationships

7.6 Students Object

In this custom object student can be enter his/her details. This object is store the students data.



Student Edit

Student Details

Scholarship Status --None--

Average marks

Information

student Name

Age

Results

Result --None--

System Information

E-mail

Scholarship Details

Request Scholarship □

Fig 7.8 Showing all the Fields of Students Object

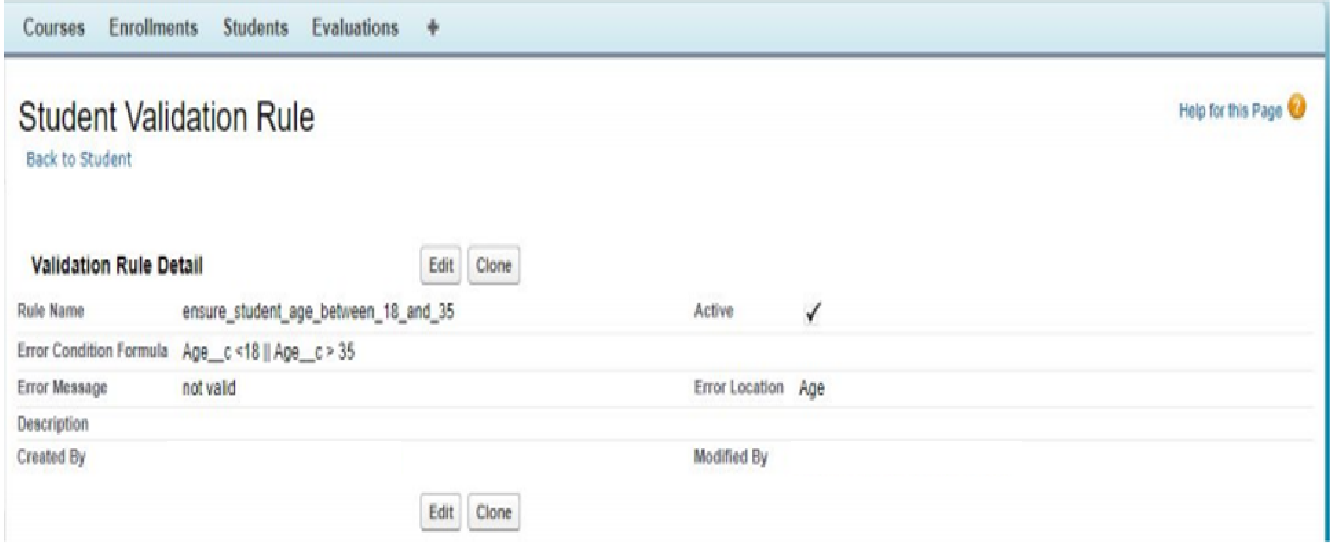
7.7 Validations on Students Object

On the students enrollments we have put the validation like

a) Student age should be greater than 18.

b) Student age should be less than 35.

c) Age should be Integer datatype.



Student Validation Rule

Validation Rule Detail

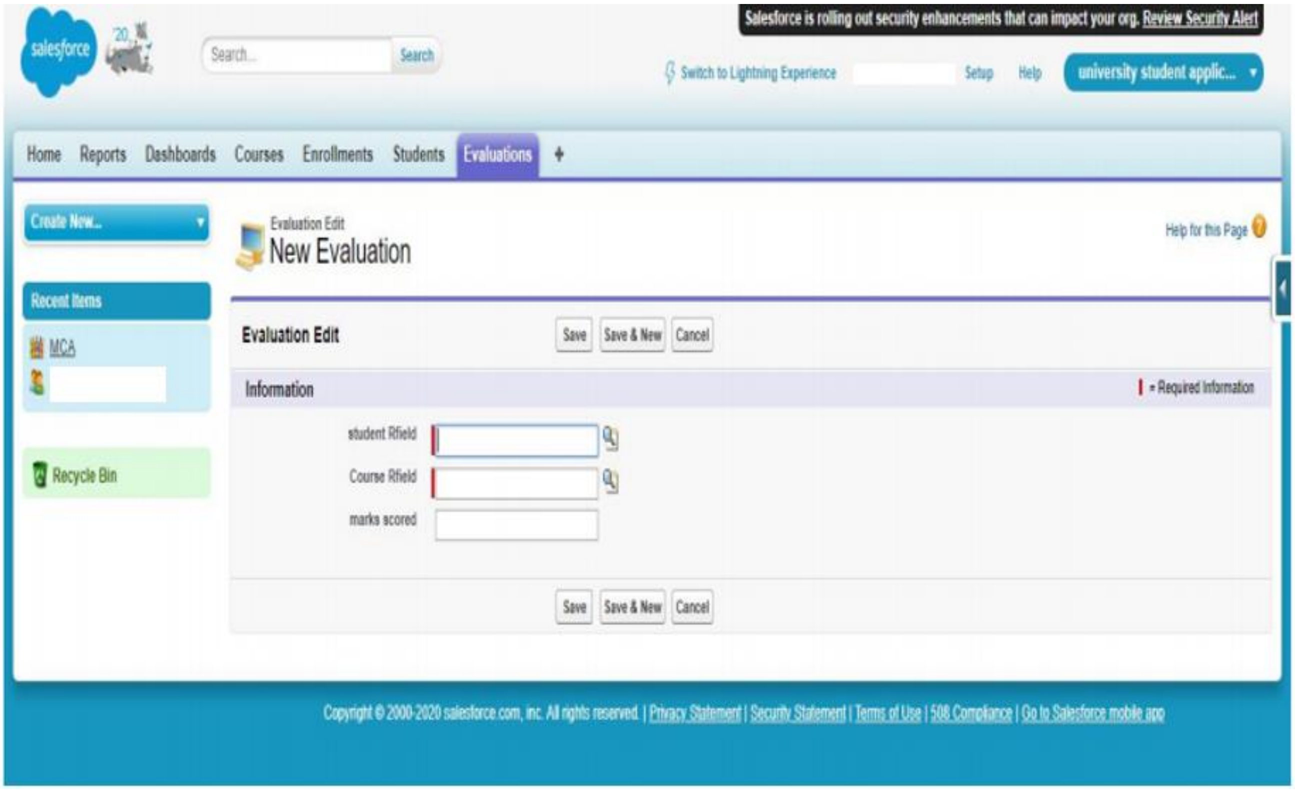
Rule Name	ensure_student_age_between_18_and_35	Active	✓
Error Condition Formula	Age__c <18 || Age__c > 35		
Error Message	not valid	Error Location	Age
Description			
Created By		Modified By	

Fig 7.9 Showing Validations on Students Object

7.8 Evaluation Object

This page is use as the results page and user can find out the result by the student id or course name.

Once user give the required field to the page then its shows the marks score by the student’s and also shows the status.


salesforce
Search...
Search
Salesforce is rolling out security enhancements that can impact your org. Review Security Alert
Switch to Lightning Experience
Setup
Help
university student applic...
Home
Reports
Dashboards
Courses
Enrollments
Students
Evaluations
+
Create New...
Recent Items
MCA
Recycle Bin
Help for this Page
Save
Save & New
Cancel
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Evaluation Edit

New Evaluation

Evaluation Edit

Information

| = Required Information

student Rfield

Course Rfield

marks scored

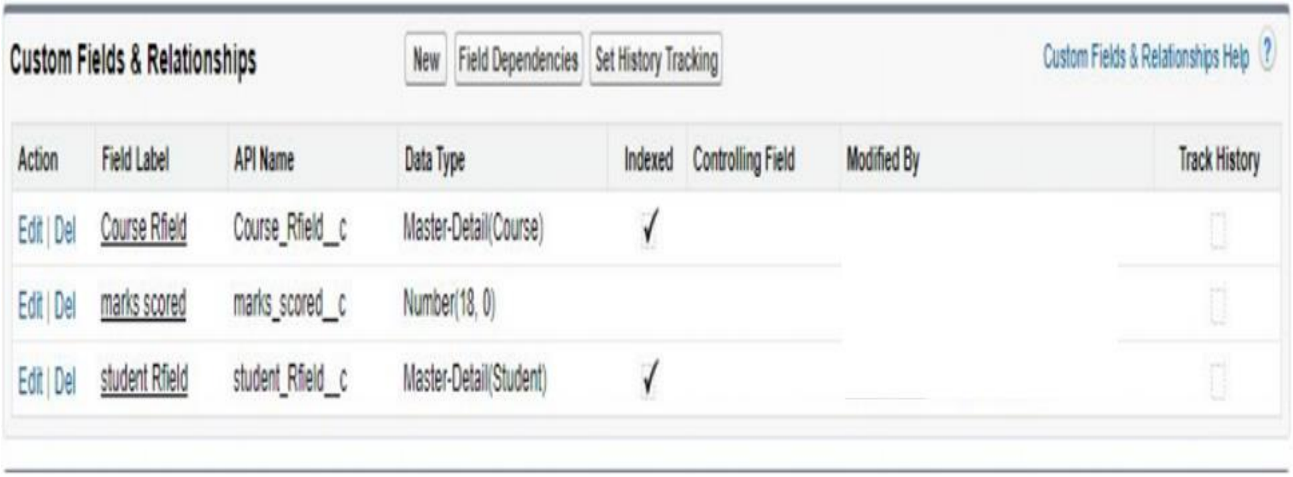
Fig 7.10 Showing Evaluation Object

7.9 Relationships between Objects

Below screen showing the relationship between the pages and the table of the application

a) Courses id (which is integer in the datatype) has the relation between the student and the marks table.

b) Student's id (which is integer in the datatype) has the dependency with the course id.



Custom Fields & Relationships
New
Field Dependencies
Set History Tracking
Custom Fields & Relationships Help
?

Action	Field Label	API Name	Data Type	Indexed	Controlling Field	Modified By	Track History
Edit | Del	Course Rfield	Course_Rfield__c	Master-Detail(Course)	✓			□
Edit | Del	marks scored	marks_scored__c	Number(18, 0)				□
Edit | Del	student Rfield	student_Rfield__c	Master-Detail(Student)	✓			□

7.11 Showing Mater-Detailed Relationships between Objects

CHAPTER 8

TESTING

8.1 INTRODUCTION

Testing is the integral part of any System Development Life Cycle. Insufficient and interesting applications tend to crash and result in loss of economic and manpower investment besides user's dissatisfaction and downfall of reputation.

"Software Testing can be looked upon as one among many processes an organization performs, and that provides the last opportunity to correct any flaws in the developed system. Software Testing includes selecting test data that have more probability of giving errors." The first step in System testing is to develop the plan for all aspects of system .Complements, Correctness, Reliability and Maintainability.

Software is to be tested for the best quality assurance, an assurance that the system meets the specification and requirement for its intended use and performance.

System Testing is the most useful practical process of executing the program with the implicit intention of finding errors that makes the program fail.

8.2 Types of Testing

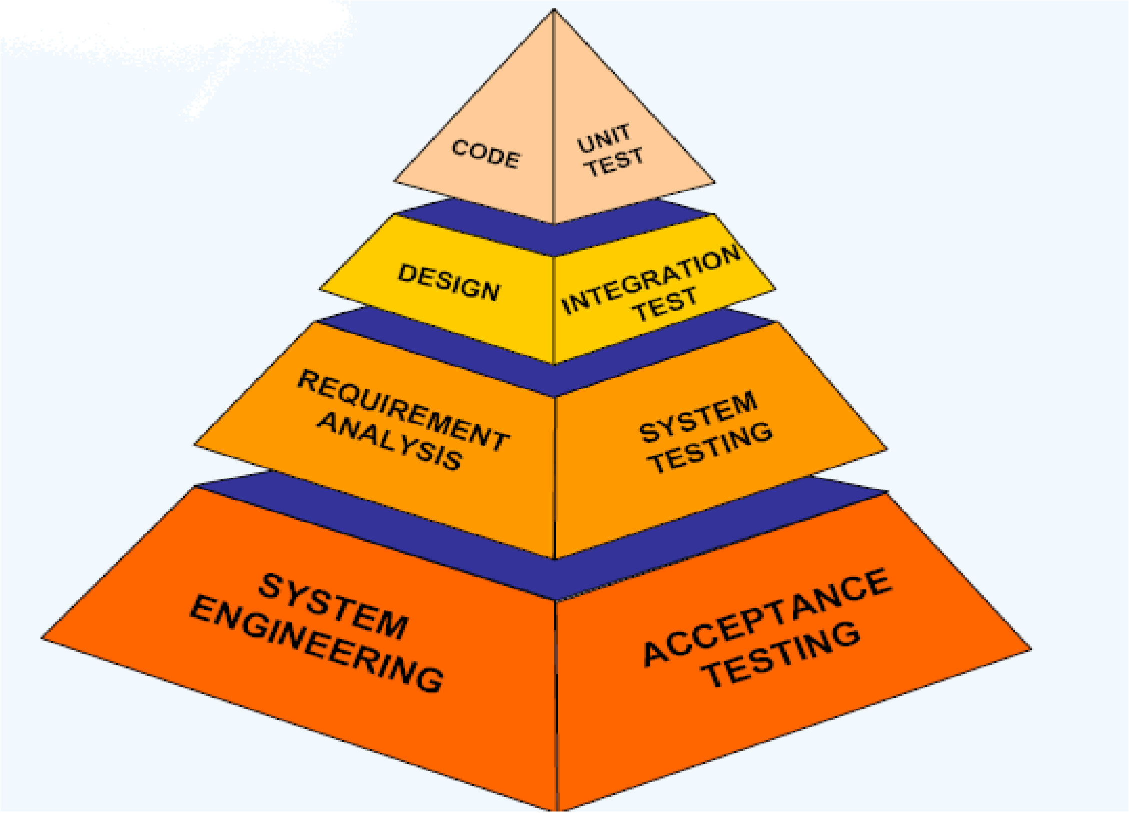


Fig 8.1 Testing Pyramid

Black Box (Functional) Testing:

Testing against specification of system or components. Study it by examining its inputs and related outputs. Key is to devise inputs that have a higher likelihood of causing outputs that reveal the presence of defects. Use experience and knowledge of the domain to identify such test cases. Failing this, a systematic approach may be necessary. Equivalence partitioning is where the input to a program falls into a number of classes, e.g. positive numbers vs. negative numbers. This type of test case design method focuses on the functional requirements of the software, ignoring the control structure of the program. Black box testing attempts to find errors in the following categories:

- Incorrect or missing functions.
- Interface errors.
- Errors in data structures or external database access.
- Performance errors.
- Initialization and termination errors.

White Box (Structural) Testing:

Testing based on knowledge of structure of components (e.g. by looking at source code). Advantage is that structure of code can be used to find out how many test cases need to be performed. Knowledge of the algorithm (examination of the code) can be used to identify the equivalence partitions. Path testing is where the tester aims to exercise every independent execution path through the component. All conditional statements tested for both true and false cases. If a unit has no control statements, there will be up to 2n possible paths through it. Static tools may be used 34to make this easier in programs that have a complex branching structure. Tools support. Dynamic program analyzers instrument a program with additional code. Typically this will count how many times each statement is executed. At the end print out a report showing which statements have and have not been executed. Problems with flow graph derived testing:

- Data complexity could not be taken into account.
- We cannot test all paths in combination.
- It is really only possible at unit and module testing stages because beyond that complexity is too high.

Unit Testing:

Unit testing concentrates on each unit of the software as implemented in the code. This is done to check syntax and logical errors in programs. At this stage, the test focuses on each module individually, assuring that it functions properly as a unit. In our case, we used extensive white-box testing at the unit testing stage. A developer and his team typically do the unit testing; the unit testing is done in parallel with coding; it includes testing each function and procedure.

Incremental Integration Testing:

Bottom up approach for testing i.e. continuous testing of an application as new functionality is added; Application functionality and modules should be independent enough to test separately done by programmers or by testers.

Integration Testing:

Testing of integration modules to verify combined functionality after integration .Modules are typically code modules, individual applications, client and server and distributed systems.

Functional Testing:

This type of testing ignores the internal parts and focuses on whether the output is as per requirement or not .Black box type testing geared to functionality requirements of an application.

System Testing:

Entire system is tested as per the requirements. Black box type test that is based on overall requirement specifications covers all combined parts of a system.

8.3 Some Important Observations

8.3.1 System Testing and Validation Results.

System testing was done after the system was duly coded. Individual modules of the system were checked to ensure they are fully functional units before the integrating them. This was done by examining each unit; each script was checked to ensure that it functions as required and that it performed exactly as intended. The success of each individual unit gave us the go ahead to carryout integration testing.

The system was validated using a short questionnaire that was filled by representatives of the users who were let to interact with the system using test data and provided feedback about the system features. This was done to assess if the system met their needs and requirements as regards. It was found out that the system performed in conformance to the then defined user needs and requirements. Results of the validation are shown as percentages of respondents against each requirement.

8.3.2 Testing Test Scenarios

1. Check if the page load time is within the acceptable range.
2. Check the page load on slow connections.
3. Check the response time for any action under a light, normal, moderate, and heavy load conditions.
4. Check the performance of database stored procedures and triggers.
5. Check the database execution time.
6. Check for load testing of the application.
7. Check for the Stress testing of the application.
8. Check CPU and memory usage under peak load conditions.

We have checked for scenarios and find that our system performing well in the circumstances.

CHAPTER 9

CONCLUSION AND FUTURE SCOPE

9.1 Conclusion

In this project we can provide the data of courses about institutions to the user so they can easily find the courses according to their needs, requirements and there financial conditions.

They don’t need to go anywhere to get the details of courses from anyone else from the institutions they can get the data in just a one click.

A software project means a lot of experience. I learned a lot through this project. This project has sharpened our concept cloud computing.

It provides easy methods to manage the load of work easily for the users.

It is much fast and more efficient as the data once entered can be used and accessed easily.

This project has given me an ample opportunity to design, code, test and implements an application. This has helped in putting into practice of various Software Engineering principles concepts like maintaining integrity and consistency of data.

9.2 Future Scope

- The Future scope is to make the system more user friendly and enhanced.
- And we will make Mobile app for our system.
- I will add Helping BOT in the system.
- Online examination module would be introduced to conduct online examination.
- Further, the faculty can upload the videos of their lectures on to this site and students who had missed those classes can view those videos.

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