



District, Tamil
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R.M.D. ENGINEERING COLLEGE

(An Autonomous Institution)

**R.S.M Nagar, Kavaraipettai, Gummidoondi Taluk, Thiruvallur
Nadu- 601206**

Anna University, Chennai / Approved by AICTE, New
Delhi/Accredited by NAAC

9001:2015 Certified Institution / All the Eligible UG Programs are
accredited by NBA, New Delhi

DEPARTMENT OF INFORMATION TECHNOLOGY

INTERNSHIP

PUBLIC EMPLOYMENT CENTER

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20IT401 SOFTWARE ENGINEERING

LABORATORY OBJECTIVES:

- ☐ ☒ To understand the software engineering methodologies for project development.
- ☐ ☒ To gain knowledge about open source tools for Computer Aided Software Engineering.
- ☐ ☒ To develop an efficient software using case tools.

SOFTWARE REQUIRED:

Open source Tools: Star UML / UML Graph / Top cased

Prepare the following documents for each experiment and develop the software using software engineering methodology.

1. Problem Analysis and Project Planning -Thorough study of the problem – Identify Project scope, Objectives and Infrastructure.

2. Software Requirement Analysis - Describe the individual Phases/modules of the project and Identify deliverables.

3. Data Modelling - Use work products – data dictionary, use case diagrams and activity diagrams, build and test class diagrams, sequence diagrams and add interface to classdiagrams.

4. Software Development and Debugging – implement the design by coding

5. Software Testing - Prepare test plan, perform validation testing, coverage analysis, memory leaks, develop test case hierarchy, Site check and site monitor.

INDEX

SL.NO	NAME OF THE EXPERIMENT
	LIBRARY MANAGEMENT SYSTEM
1	Problem Analysis 1(a)Problem Statement
	1(b)Project Planning
2	Software Requirement Analysis
3	Modeling 3(a)Design 3(b)Data Dictionary
4	Implementation
5	Testing - Test Cases
6	Documentation

Ex.No 1(a)**PROBLEM ANALYSIS****Problem Statement**

A public employment center (PEC) is an agency that provides employment services to job seekers and employers. The problem statement for a PEC could be as follows:

Many individuals in our community are facing challenges in finding suitable employment opportunities, while many employers are struggling to find qualified candidates to fill their job vacancies. This mismatch between job seekers and employers is a critical issue that needs to be addressed. A public employment center can play a vital role in bridging this gap by providing a range of services to job seekers and employers, such as job matching, training and skill development, career counseling, and labor market information. The problem statement for a PEC is to design and implement an effective employment service system that can efficiently connect job seekers with suitable job opportunities, provide employers with a pool of qualified candidates, and enhance the overall employability of the workforce. This requires identifying the needs and preferences of job seekers and employers, understanding the current labor market trends and challenges, and leveraging technology and partnerships to deliver effective and efficient employment services. The ultimate goal is to promote economic growth, reduce unemployment and underemployment, and improve the quality of life for individuals and families in our community.

Analysis

A public employment center (PEC) is a government agency that provides employment services to job seekers and employers. The analysis of a PEC would typically cover the following aspects:

1. Services provided: A PEC provides a range of services to job seekers and employers, such as job matching, training and skill development, career counseling, and labor market information. The effectiveness of these services in meeting the needs of job seekers and employers is a key aspect of the analysis.
2. Target population: A PEC serves a diverse range of job seekers, including unemployed individuals, underemployed individuals, and those seeking career changes. The analysis should consider the demographics of the population served by the PEC, such as age, education level, and employment history, and identify any gaps or unmet needs.

3. Funding and resources: A PEC typically relies on government funding to operate. The analysis should evaluate the adequacy of funding and resources allocated to the PEC to deliver effective employment services and identify any areas where additional resources may be needed.
4. Partnerships and collaborations: A PEC may collaborate with other organizations, such as community colleges, non-profit organizations, and workforce development boards, to deliver employment services. The analysis should assess the effectiveness of these partnerships and collaborations in meeting the needs of job seekers and employers.
5. Performance metrics: The effectiveness of a PEC can be measured by various performance metrics, such as the number of job placements, the average time to find a job, and the rate of job retention. The analysis should evaluate the performance of the PEC against these metrics and identify any areas where improvement is needed.

Feasibility study

Technical feasibility

The Public Employment Center runs with a minimum system resources:

- Web server(Tomcat Apache)
- PYTHON
- JAVA
- PHP
- HTML

Above said system resources are available as open source. Hence it is feasible to develop PEC in this environment.

Operational feasibility

As the system has HTML based GUI no special skill set is required for working with the system, hence it is operationally feasible.

Economic feasibility

As the PEC requires minimum system resources, hence it is economically feasible.

Ex.No 1(b)

PROJECT PLANNING

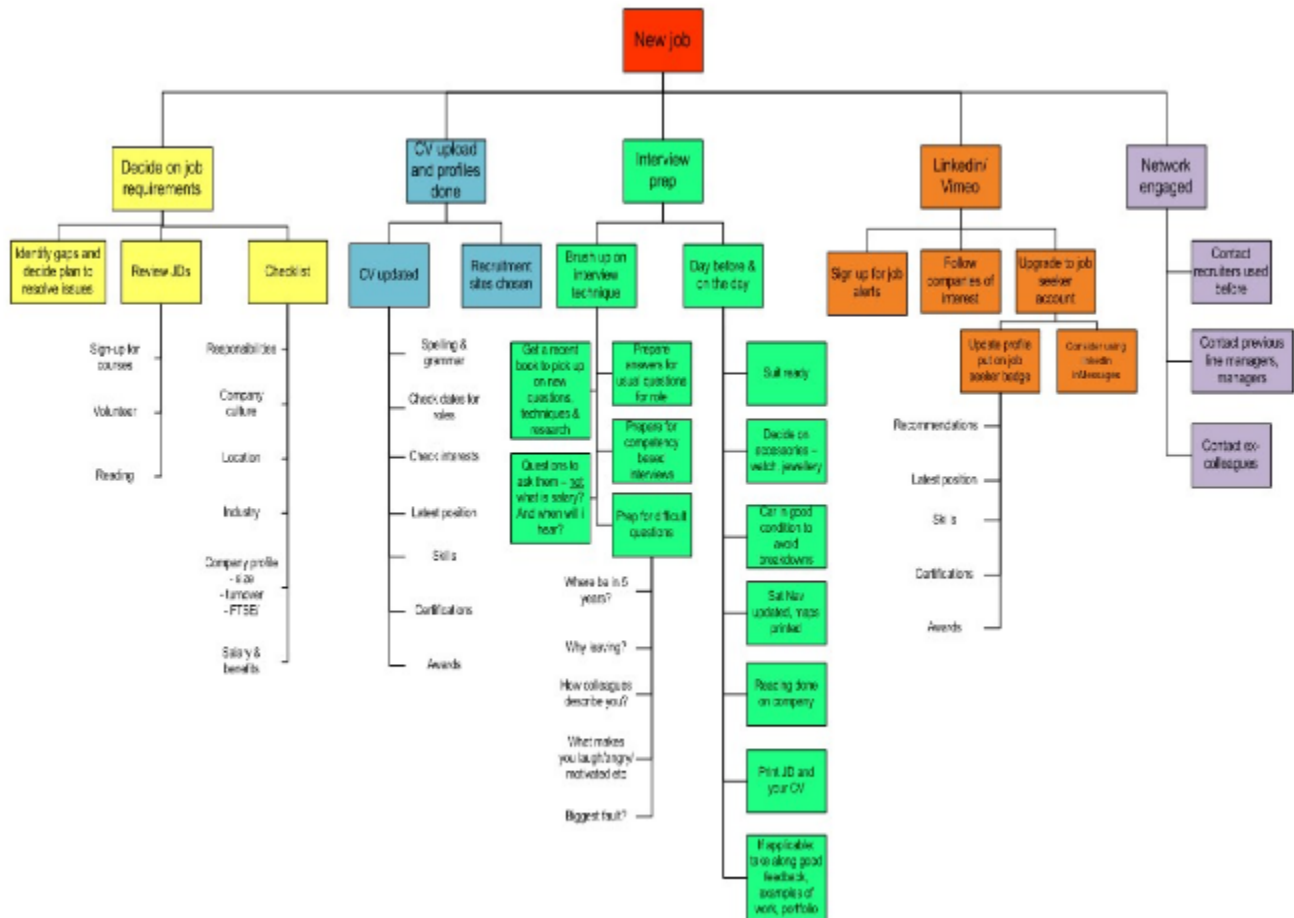
1. 1. Overview

The specific services and resources offered by a PEC may vary depending on the country or region. In many countries, PECs are part of the national labor administration system and work closely with other agencies such as social security, immigration, and education. PECs typically offer job placement services for individuals seeking employment, including assistance with resume writing, job search strategies, and interview preparation. Some PECs also offer specialized services for specific populations, such as youth, veterans, or people with disabilities.

2. 2. Goals and Scope

- 1.Promoting equal opportunities.
2. Supporting employers.
3. Facilitating labor market information.
4. Strengthening social protection.
5. providing job search assistance.

Work Breakdown Structure



Schedule and Milestones

Milestones	Description	Milestone Criteria	Planned week
M0	Problem Analysis		1 st week
		Problem statement, Analysis, Feasibility Study	

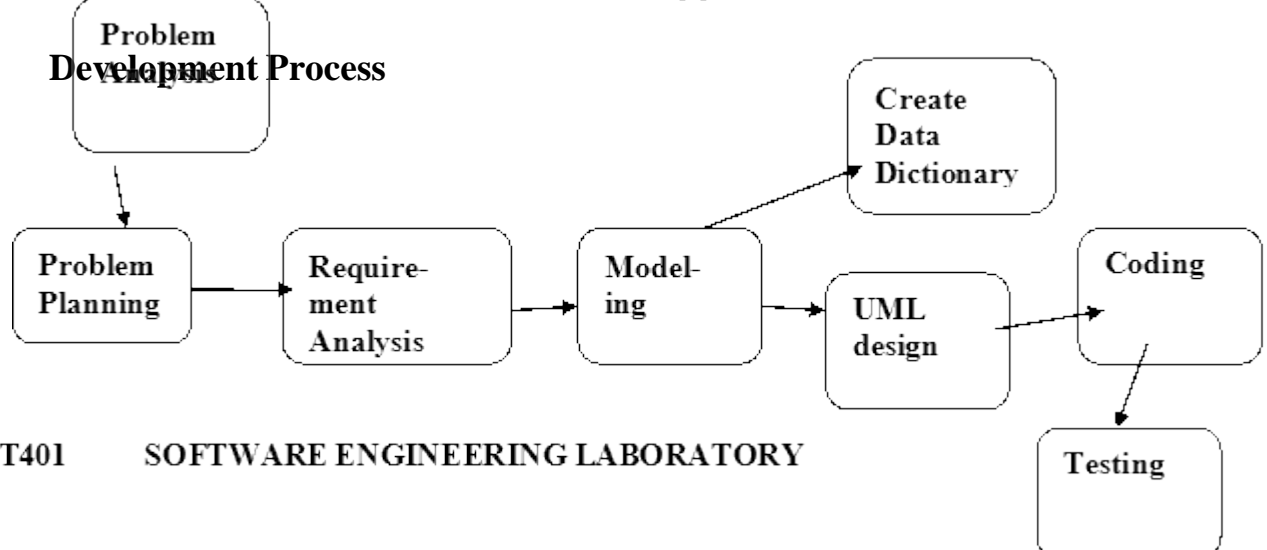
M1	Project Planning		2 nd week
		Scope and concept described	
M2	Requirement Analysis		2 nd and 3 rd week
		Draft SRS, Design Specification, Test Plan, Requirement Analysis (Final)	
M3	Study of UML Notations		3 rd week
		Architecture reviewed and stable	
M4	Modeling		4 th week
		Software Design, Data Dictionary	

Milestones	Description	Milestone Criteria	Planned week
M5	Implementation		5 th week
		Coding of functionality, Debugging, System TestPlan.	
M6	Testing		6 th week
		Database & System Integration, AcceptanceTesting	
M7	Documentation		7 th week
		User Manual	

Budget

Category	Budget for Period in kUS\$					
	M0-M1	M1-M2	M2-M3	M3-M4	M4-M5	M5-M6
Human Resources (internal)						
Human Resources (external)						
Purchases (COTS)						
Equipment						
Premises						
Tools						
Travel costs						
Training						
Review activities						
Other						
Total	1	1	2	5	2	1
Total cumulated	1	2	4	9	11	12

For a detailed list of costs of all resources see <document> [x].



Risk Management

1. Funding and budget risks:
 - Risk: Insufficient funding may lead to a shortage of staff, resources, or services.
2. Staffing risks:
 - Risk: High turnover, lack of qualified staff, or staff burnout may affect the quality and continuity of PEC services.
3. Technology risks:
 - Risk: Technical failures, cybersecurity breaches, or data loss may compromise PEC operations and confidentiality.
4. Service delivery risks:
 - Risk: Inadequate or inconsistent service delivery may result in low client satisfaction or negative feedback.
5. Legal and regulatory risks:
 - Risk: Non-compliance with labor laws, data protection regulations, or other legal requirements may lead to fines, penalties, or reputational damage.
6. External risks:
 - Risk: External factors such as economic downturns, natural disasters, or political instability may affect PEC operations and sustainability.

Delivery Plan

Ident.	Deliverable	Planned Date	Receiver
D1	Analysis and Feasibility Report	1 st week	Client
D2	Project Plan	2 nd week	Client
D3	SRS	3 rd week	Client
D4	Design	4 th week	Client
D5	Test Plan	5 th week	Client
D6	Code	6 th week	Client
D7	Test Report	6 th week	Client

Ex.No.2**SOFTWARE REQUIREMENT ANALYSIS****Software Requirement
Specification (SRS)****1. Introduction**

This chapter asks how the Public Employment Service (PES) can assess the impact of its labour market programmes and use this information to manage them better. In general terms, PES institutions and data systems need to allow identification of the “output” of labour market programmes, in terms of reducing unemployment and increasing employment and earnings, and use this information to replace less effective programmes with more effective ones. The chapter sets out preconditions for successful market-driven provision of publicly-financed employment services. These preconditions are often also relevant, although they may be relaxed or adapted in some respects, for the performance management of public services. Section 1 surveys historical evidence that impact evaluation can be a driving force in the management of the PES and the results it obtains. Section 2 sets out some general principles for performance management. Section 3 considers i) quasi-market arrangements where the government defines output measures and financing conditions for the delivery of public employment services by competing independent organizations, and ii) the application of performance management principles within a more traditional PES organization.

Purpose of the requirements document

1. Job search assistance: PECs help job seekers search and apply for job openings, create resumes and cover letters, and prepare for job interviews. 2. Vocational training: PECs may offer training programs to help job seekers acquire new skills or upgrade their existing skills to meet current job market demands. 3. Career counseling: PECs provide guidance and support to job seekers to help them identify their strengths, interests, and career goals. 4. Employer services: PECs work with employers to post job openings, screen and refer candidates, and provide customized training and workforce development services. 5. Labor market information: PECs provide up-to-date information on labor market trends, job demand, and job outlook to job seekers, employers, and policy makers. PECs play an important role in reducing unemployment, improving workforce development, and promoting economic growth and development. By providing employment-related services to job seekers and employers, PECs help to strengthen the workforce and contribute to a healthy and vibrant economy.

Scope of the product

One of the primary scope of a PEC is to help job seekers find suitable employment. PECs provide job search assistance, career counseling, skills assessment, and vocational training to help job seekers enhance their employability. PECs aim to promote equal opportunities for all job seekers, including those from disadvantaged backgrounds such as youth, veterans, and

people with disabilities. They work to eliminate discrimination and provide equal access to job opportunities. PECs provide support to employers by helping them find qualified job candidates, offering recruitment and selection services, and providing training on employment-related topics. PECs collect and analyze labor market information to identify job trends, skills in demand, and other relevant data that can inform job seekers and employers. This information can help job seekers make informed career choices and employers make strategic hiring decisions. PECs play a role in promoting social protection for workers by ensuring compliance with labor laws and providing unemployment benefits and other forms of social assistance.

Definitions, acronyms and abbreviations

PHP- Hypertext
Preprocessor
SQL- Structured
Query Language
GUI- Graphical
User Interface
PEC – Public Employment Center

References

- (i) (i) Reference provided by the Prof.Bibhudatta Sahoo.
- (ii) (ii) Aigner, D.J. and Chu, S. F. (1968). Estimating the Industry Production Function. American Economic Review, 58: 826-839.

1.5. Overview of the remainder of the document

The SRS will provide a detailed description of the Public employment center. This document will provide the outline of the requirements, overview of the characteristics and constraints of the system.

Section 2 of this document provides the General description such as Product perspective, Product functions and the characteristics of the user's of this product. Section 3 describes the Specific requirements which cover the functional, non-functional and interface requirements. This is obviously the most substantial part of the document but because of the wide variability in organizational practice, it is not appropriate to define a standard structure for this section. The requirements may document external interfaces, describe system functionality and performance, specify logical database requirements, design constraints, emergent system properties and quality characteristics.

2. 2.

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Product functions

This function allows users to manage employee information, including their personal details, job information, and performance data.

Function allows users to track and manage employee time and attendance, including tracking hours worked, leave requests, and absences. This function allows users to manage employee compensation, including calculating payroll, processing taxes, and generating pay stubs. This allows users to manage employee benefits, including health insurance, retirement plans, and other employee perks. function allows users to manage employee performance, including setting goals, conducting performance evaluations, and tracking progress over time. This function allows users to manage employee training and development, including identifying training needs, scheduling training sessions, and tracking completion. This function allows users to generate reports and analytics based on employee data, including performance reports, compensation reports, and demographic reports. This function allows users to manage system security and access control, including user authentication, authorization, and permissions management.

User characteristics

HR managers are the primary users of the employee management system. They are responsible for managing employee data and ensuring compliance with employment laws and regulations. HR managers need access to all features of the system and require a high level of system administration privileges. Supervisors are responsible for managing their team's performance, attendance, and scheduling. They need access to features such as time and attendance management, performance management, and scheduling. Employees need access to their own personal data and information, such as their payroll, benefits, and time and attendance records. They may also need access to training and development resources and performance feedback.

General constraints

Public employment centers are subject to federal, state, and local laws and regulations. These laws govern the operation of the center, the services it can offer, and the data it collects and shares. Public employment centers are often funded by government agencies, which means their budgets may be subject to constraints and limitations. This can impact the services they are able to provide and the resources they have available to offer job

seekers. Public employment centers are often located in specific regions or areas, which can limit their reach and ability to serve job seekers who live outside those areas. Public employment centers may be limited in the number of staff they can hire and employ due to budgetary constraints. This can impact their ability to provide personalized services to job seekers and may result in longer wait times for appointments or assistance. Public employment centers may face constraints when it comes to technology, such as outdated hardware or software, limited internet access, or insufficient training for staff on how to use technology to deliver services to job seekers.

Assumptions and dependencies

- • The users have sufficient knowledge of computers.
- • The users know the English language, as the user interface will be provided in English
- • The product can access the college student database

3. 3. Specific requiremen ts Functional Requiremen ts

This section describes in detail all the functional requirements.

(It shows what the system can do)

- Login
- Adding Employee Information Details
- Updating Time and Attendance Details
- Deleting Payroll Details
- Training and Development
- Generating Reports
- Viewing/Searching for Details.

Non- Functional Requirements

Usability

- The system is user friendly and self-explanatory.

Reliability

The system has to be very reliable due to the importance of data and the damages incorrect or incomplete data can do.

Availability

The system is available 100% for the user and is used 24 hrs a day and 365 days a year. The system shall be operational 24 hours a day and 7 days a week.

Mean Time Between Failures (MTBF)

The system will be developed in such a way that it *may* fail once in a year.

Mean Time to Repair (MTTR)

Even if the system fails, the system will be recovered back up within an hour or less.

Accuracy

The accuracy of the system is limited by the accuracy of the speed at which the employees of the library and users of the library use the system.

Maximum Bugs or Defect Rate

Not specified.

Access Reliability

The system shall provide 100% access reliability.

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The system shall respond to the member in not less than two seconds from the time of the request
submittal. The system shall be allowed to take more time when doing large processing jobs.

The requirements may document external interfaces, describe system functionality and performance, specify logical database requirements, design constraints, emergent system properties and quality characteristics.

Hardware and software requirements

Hardware Interfaces

☐ Processor:

☐ Pentium or

Higher.

RAM:

312MB or

Higher.

3.3.2. Software Interfaces

☐ Operating System: Unix, Linux,

☐ Mac, Windows etc.

☐ Development tool: PHP

Hypertext Preprocessor Data Base:

MySQL

3.4 External Interfaces

User Interfaces

The user-interface of the system shall be designed as shown in the user-interface prototypes.

6. 6. Appendices

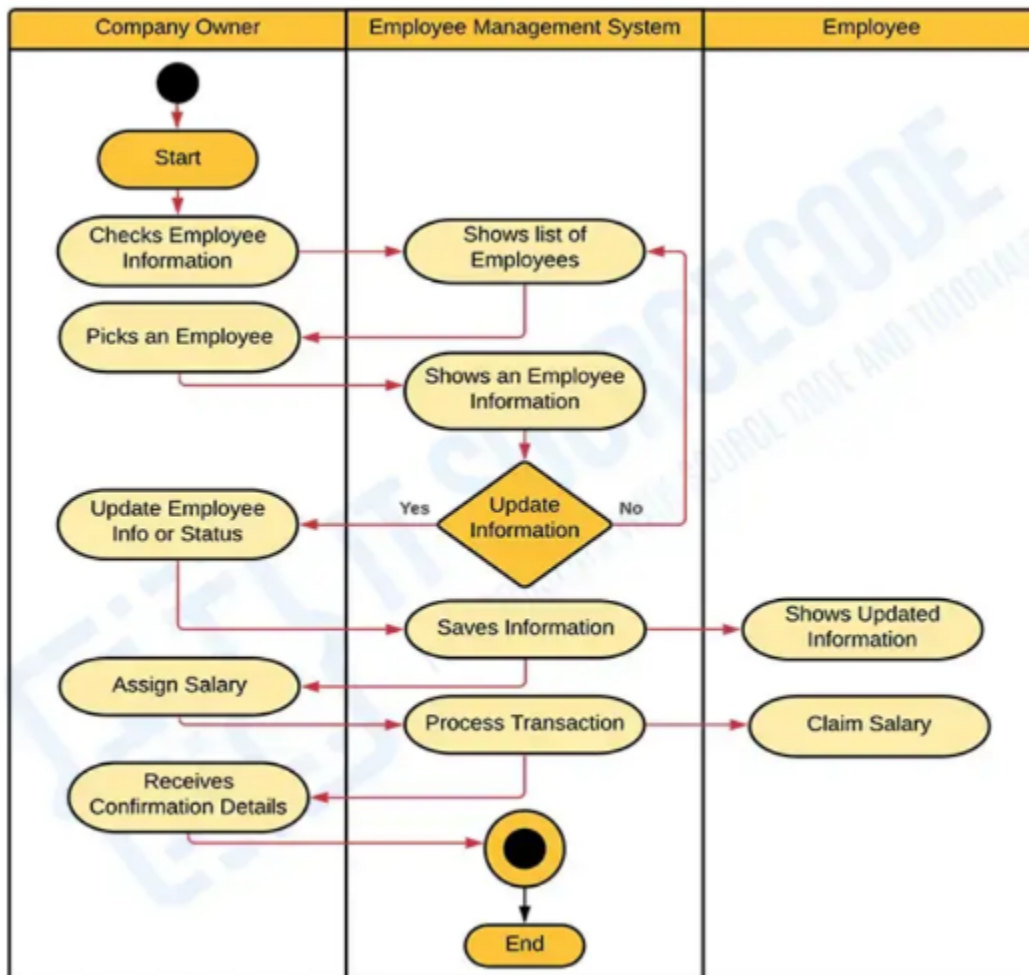
7. Index

Result: Thus the Software Requirement Specification Document for Library Management System has been completed.

Ex.No. 3**MODELING****(i) Design model –UML diagrams****Use case diagram****Step 1:start ARGO UML->Create-> Use Case Diagram**

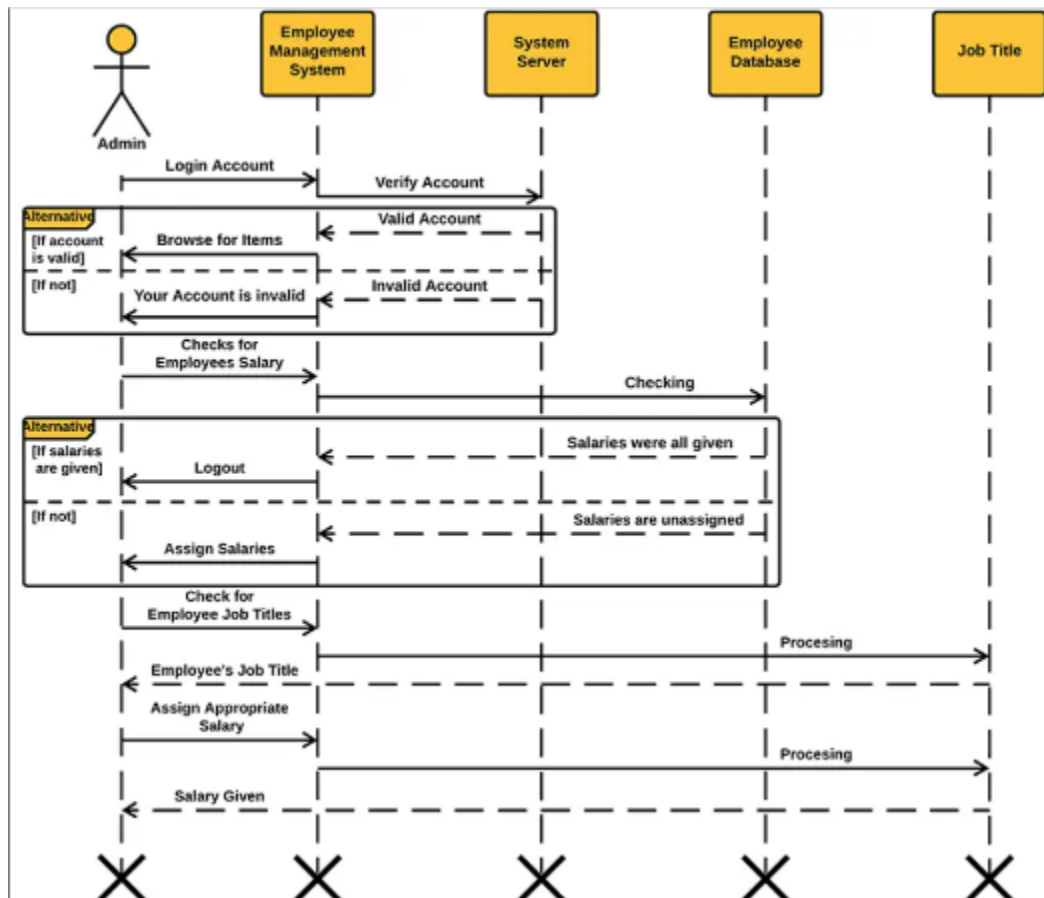
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Activity Diagram for Public Employment Center

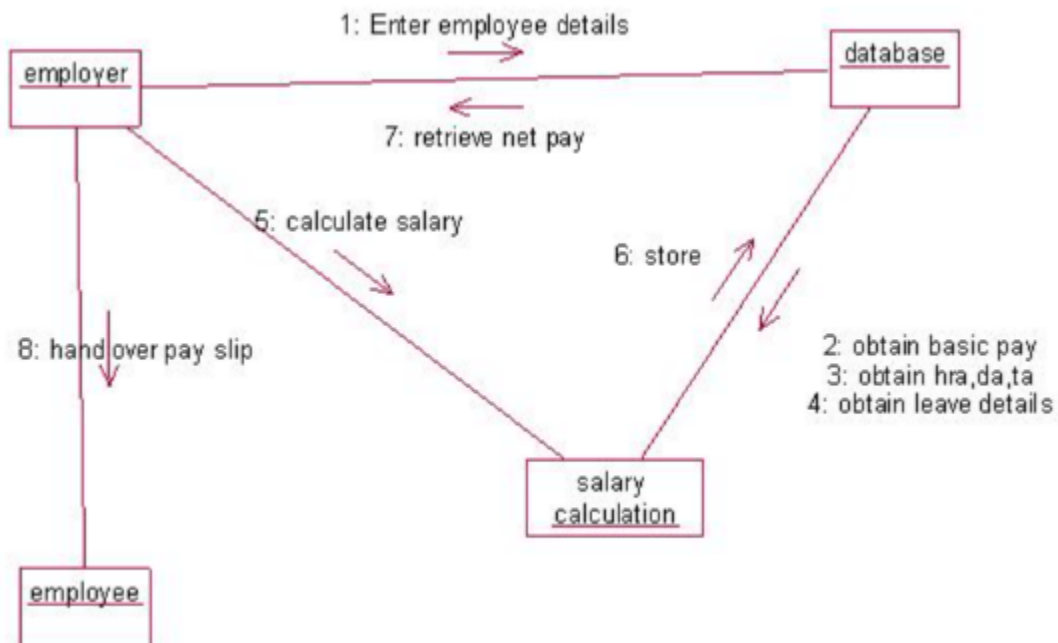


ACTIVITY DIAGRAM

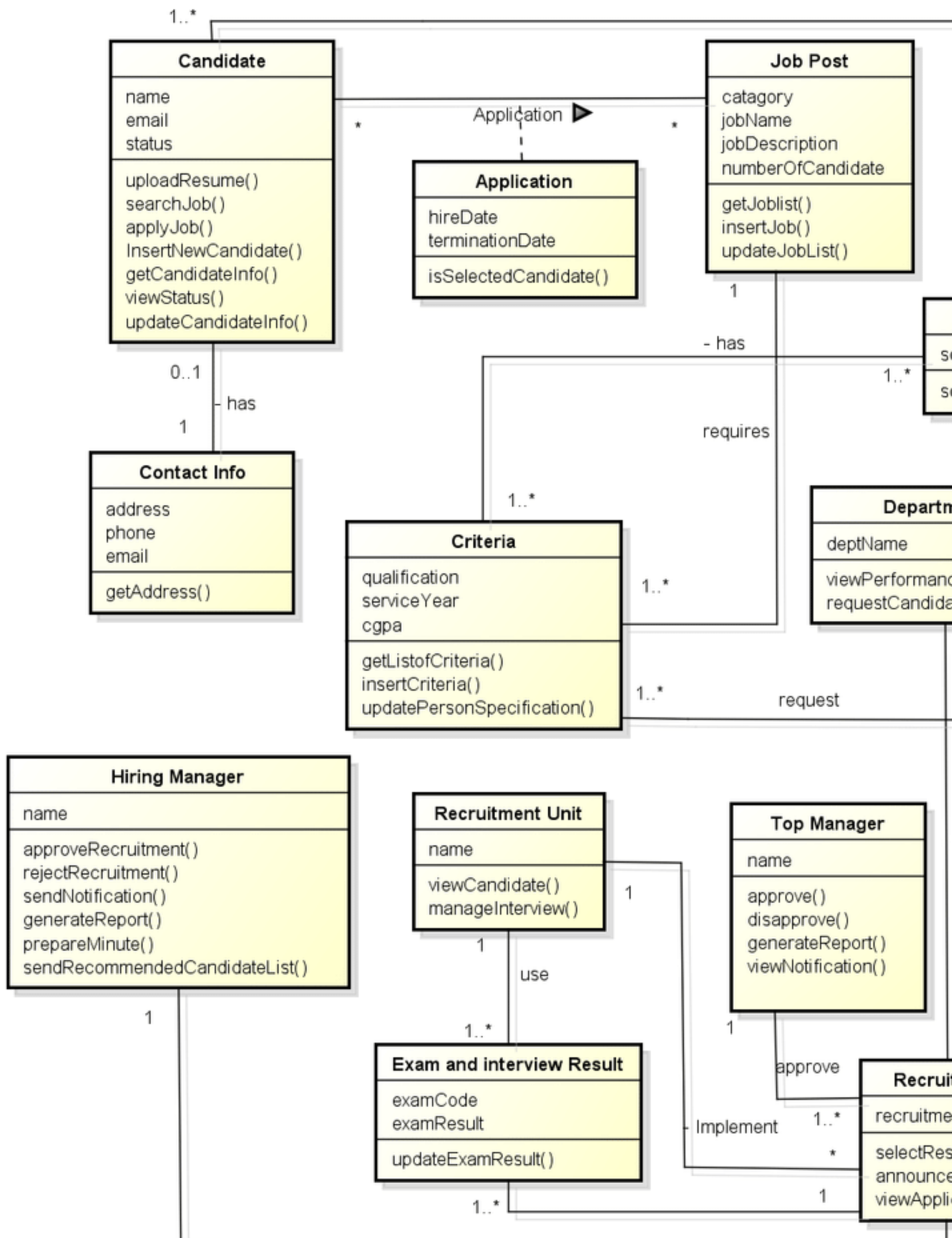
Sequence diagram for Public Employment center



Collaboration diagram for Public Employment Center



Class Diagram



Ex.No.3 (b) DATA DICTIONARY**Employees:**

Field name	Data Type	Size	Description	Example
Employee ID	Integer	10	Unique identifier for the employee	1001
First Name	String	50	First name of the employee	John
Last Name	String	50	Last name of the employee	Doe
Hire Date	Date	N/A	Date the employee was hired	2022-01-01

User Details

Field Name	Data Type	Example	Description	Supplementary Data	
				Data Type	Size
1	User ID	2001	Unique identifier for the user	Integer	10
2	Username	john	User's login username	String	50
3	Password	*****	User's login password	String	50
4	Employee ID	1001	Employee ID associated with the user	Integer	10
5	User Type	Admin	Type of user	String	10

LOGIN

```

<!DOCTYPE html>
<html>
<head>
  <title>Login form</title>
  <link rel="stylesheet" type="text/css" href="style.css">
</head>
<body>

  <div class="form-container">
    <form action="" method="post">
      <h3>Login now</h3>
      <?php
        if(isset($error)){
          foreach($error as $error){
            echo '<span class="error-msg">'.$error.'</span>';
          };
        };
      ?>
      <input type="text" name="name" required placeholder="enter your name"><br><br>
      <input type="password" name="password" required placeholder="enter your
password"><br><br>
      <input type="submit" name="submit" value="Login now" class="form-btn">
      <p>Don't have an account?<a href="register_form.html">register now
</a>
</p>
</form>
</div>

</body>
</html>

```

OUTPUT

Ex.No 5**TESTING****Test cases:**

Name	Requirement	Description	Input	Expeted o/p	Actual o/p
Login	Username & password shouldbe entered	Used to verify if actor is the authorized person ornot	User,name,password	Valid msg	Valid msg
Login	Username & password shouldbe entered	Used to verify if actor is the authorized person ornot	User,name,password	InValid msg	InValid msg
Modify user	user details should be entered	User's login username	Name, User ID, email id	Valid msg	Valid msg
Salary	Salary details	Used to enter the salary details	User ID, Salary Slip	Valid msg	Valid msg