UNIVERSITY OF DAR ES SALAAM

COLLEGE OF INFORMATION AND COMMUNICATION TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PROGRESS REPORT

PROJECT TITLE: DESIGN AND IMPLEMENTATION OF JOB PORTAL WITH AUTOMATED INTERVIEW.

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SIGNATURE: **……**

DATE: **26th January 2017**

STATEMENT OF OWNERSHIP

I declare that this report and the work described in it is my own work, with any contributions from others expressly acknowledged and cited.

I declare the work in this report was carried out in accordance with regulations of University of Dar-es-salaam and has not been presented to any other University for examination in either Tanzania or Overseas. Any views expressed in this report are those of the author and in no way represent those of the University of Dar-es-salaam.

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DATE: …….

ACKNOWLEDGEMENT

First and foremost, I would like to thank GOD for giving me health and protection throughout the entire semester.

Secondly I would also like to thank my supervisor Dr. KALINDA who has invested her full effort in guiding me in achieving the goal. I have to appreciate the guidance given by other supervisor as well as the panels especially thanks to their comment and advices.

Third, I would like to recognize contributions from staff and students of Department of Computer Science and Engineering of the University of Dar es Salaam for their support.

Furthermore I would also like to acknowledge with much appreciation the crucial role of the staff of PSRS, who gave the permission to use all required equipment and the necessary materials to complete this task.

LIST OF ACRONYMS AND ABBREVIATIONS

API	:	Application program interface
CoICT	:	College of Information and Communications Technology
HTML	:	Hypertext Markup Language
MVC	:	Model–view–controller
PHP	:	Hypertext Preprocessor
PSRS	:	Public Service Recruitment Secretariat
SQL	:	Structured Query Language
SRS	:	Software Requirement Specification
UML	:	Unified Modelling Language

ABSTRACT

Technology is dynamic; it evolves to adapt to the needs of the world. With the advent of the Internet, it is possible to perform online job search with automated interview. The World Wide Web has made it possible to integrate services that were done by different organizations on different platforms to single solution platforms.

This project aims to develop a system that will integrate the job portal system with interview so as to overcome difficulties that pertain the overall process of job recruitment. The methodology that has been used include the use of waterfall as a software development model. Primary data was collected from PSRS system through open ended interview. Secondary data was obtained from the internet, newspaper and so on.

Scheduling job applicants for their interviews is a crucial component of the hiring process. Whether done by a company's in house human resources department, through an outsourced service or recruiting company, or assigned to hiring coordinators, the task of scheduling and managing interview dates and times—as well as candidate information—can be tedious and time-consuming, especially if these interviews are scheduled over the phone, in-person. And based on recent survey results from the National Association for Business Economics that projects payrolls will rise an average of 170,000 employees per month in 2012, the need for efficient interview-scheduling methods will become increasingly vital as the economy continues to improve.

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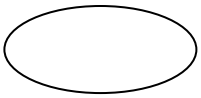
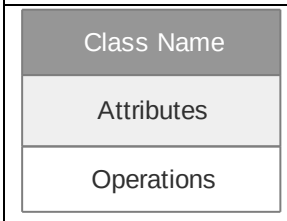
LIST OF SYMBOLS

Symbol	Name
	Use case
	association
	actor
	Aggregation
	class
	Generalization

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CHAPTER ONE: INTRODUCTION

1.1 Background

Job seeking is an important step towards employment process. With developing county such as Tanzania the importance of employment is of great magnitude especially considering its economy. Job seekers tend to use various ways so as to obtain the information about a particular job post. Such ways include media such as Television, newspaper, radio and so on. But with growing use of information communication technology more methods of recruiting individual have appeared. Such method include the use of web technology to advertise jobs. They are known as job portal.

Job portal is a web based site that brings together diverse source of employment information so as individual seeking job can apply for one. Job portal are important as they centralize all job posts on a single system for easy use. Also through technology we can push much further and integrate automated interview system so as interviews can be performed seamlessly.

Automated interview is an online recruitment method conducted using computer-mediated communication (CMC) such as instant messaging, email, or video. Online interviews are separated into synchronous online interviews, for example via online chat which happen in real time online and asynchronous online interviews.

Recently in Tanzania there have been application of job portal technology but most systems have not integrated the interviewing process in this system. It is because our interviewers still use the face to face method of interviewing individuals. Face to face interview is common in Tanzania as most people have not yet been exposed to the internet or do not have technology required to access effectively this growing community of the internet.

With this system developed the process cost of the interview process will have decreased exponentially and individual shall be exposed to the online community so as to ease their entire life.

1.2 Problem Statement

With manual methods of searching for a job and interviewing an individual our community is faced with inefficient ways of recruiting individuals with variety of needed skills and yet maintain equality through the whole process. The inefficiency include employers are faced with additional cost of advertising job post in different media, payment for venues so as interview can be performed. By the other side of the coin job seekers also need additional cost for transport so as they can reach venue where they can perform the interview, they need to have access to communication media such as television or newspaper so they can be aware of the job post. Media such as television do not provide detail information about job post.

But with Information and communication technology we can be able to automate the process and save all cost as described above.

1.3 Project Objectives

1.3.1 General Objective

The Objective of this project is to design and develop job search portal integrated with automated interview system that will allow individual who search for a job with required specification to perform a preset interview by an employer.

1.3.2 Specific Objective

The following are specific objective of the project.

i. To capture and analyze system requirement.
ii. To design and implement a module that will allow to post and view jobs.
iii. To design and implement interviewing module.
iv. To integrate module and perform system testing of all system modules.

1.4 Significance of the project

i. Job seekers can access system at any time for reference.
ii. Employers will be able to target a specific people in the community.
iii. Carry out interviews with a very geographically dispersed population.

iv. Provide savings in costs to the job seekers and employers.

v. Record data quickly and accurately.

1.5 Project Scope

The system to be developed will focus on developing a web based system with modules that will allow posting and viewing jobs, interviewing an individual and alerting an individual via email. The system will use video interview using a computer web come and provide an alternative method of interview if needed by an interviewer.

CHAPTER TWO: LITERATURE REVIEW

2.1 Over View of Related System

2.1.1 PSRS web system

Public Service Recruitment Secretariat (PSRS) is a Tanzanian government system that post various job posts on the Internet. The system provides various functionality such as job searching through various filters, registration, and SMS subscription. It provides users with interview tips but the system does not interview individuals online. The applicants that meet a certain job requirement have to go to a specific location so as they can be interviewed.

2.1.2 SONRU

SONRU is trusted global leader and pioneer of automated video interviewing for screening candidates, simplifies the recruiting process for recruiters and their candidates. Is system allows company to set their interview in terms of closed ended form and the candidate who answers the question is video interviewed via a web cam.

Every question when appear the web cam starts recoding after a predefined wait time. When then time expires the window automatically closes and it saves the interview session to the data base. The interview then can view each question with respective answer in terms of video.

2.2 Overview of proposed system

Job portal with automated interview is an integrated system that allows employers so post jobs and set predefined interviews so as job seekers can search and perform interviews on the web. The overall system will be implemented based on the following tools:

a) MYSQL database

MySQL databases are relational. A relational database stores data in separate tables rather than putting all the data in one big storeroom. The database structures are organized into physical files optimized for speed. The logical model, with objects such as databases, tables, views, rows, and columns, offers a flexible programming environment. You set up rules

governing the relationships between different data fields, such as one-to-one, one-to-many, unique, required or optional, and "pointers" between different tables. The database enforces these rules, so that with a well-designed database, your application never sees inconsistent, duplicate, orphan, out-of-date, or missing data.

b) PHP using Code Igniter Framework

Code Igniter is a toolkit for people who build web applications using PHP. Its goal is to enable you to develop projects much faster than you could if you were writing code from scratch, by providing a rich set of libraries for commonly needed tasks, as well as a simple interface and logical structure to access these libraries. Code Igniter lets you creatively focus on your project by minimizing the amount of code needed for a given task. Code Igniter is based on the Model-View-Controller development pattern. Figure 2.1 show how the MVC works

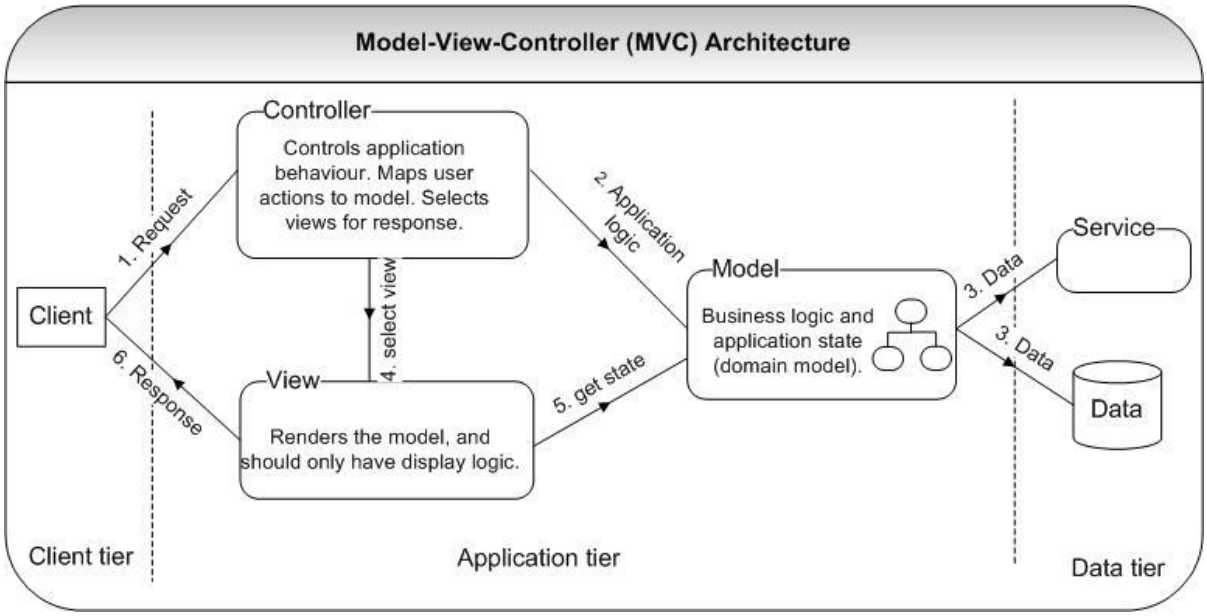


Figure 2.1 MVC Diagram

c) Java script using JQuery Framework

jQuery is a fast, small, and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event handling, animation, and Ajax much simpler with an easy-to-use API that works across a multitude of browsers. With a combination of versatility and extensibility

CHAPTER THREE: METHODOLODY

3.1 Literature Review

For Successful completion of this project literature review on several subjects is required as pointed out below for this project.

a) Object Oriented (OO) System Design with UML
b) Database Design and Implementation with MYSQL, to store all useful data
c) Backend system development with PHP using Code Igniter Framework
d) Front end system development with Java script using JQuery Framework

3.2 Design Approach

This project will use Waterfall software development model. The Waterfall model provides a framework for planning top – down systems development .The development flows down a number of successive activity stages the stages in the waterfall model overlap and feed information to each other .During design, problems with requirements are identified; during coding, design problems are found and so on. The development process is not a simple linear model but involves a sequence of iterations of the development activities.

With waterfall model the following are the task that are going to be done for successful completion of the project:-

a) Feasibility Study

The first phase is the feasibility study. The purpose of this phase is to produce a feasibility study document that evaluates the costs and benefits of the proposed application. To do so, it is first necessary to analyze the problem, at least at a global level. Obviously, the more we understand the problem, the better we can identify alternative solutions, their costs, and their potential benefits to the user.

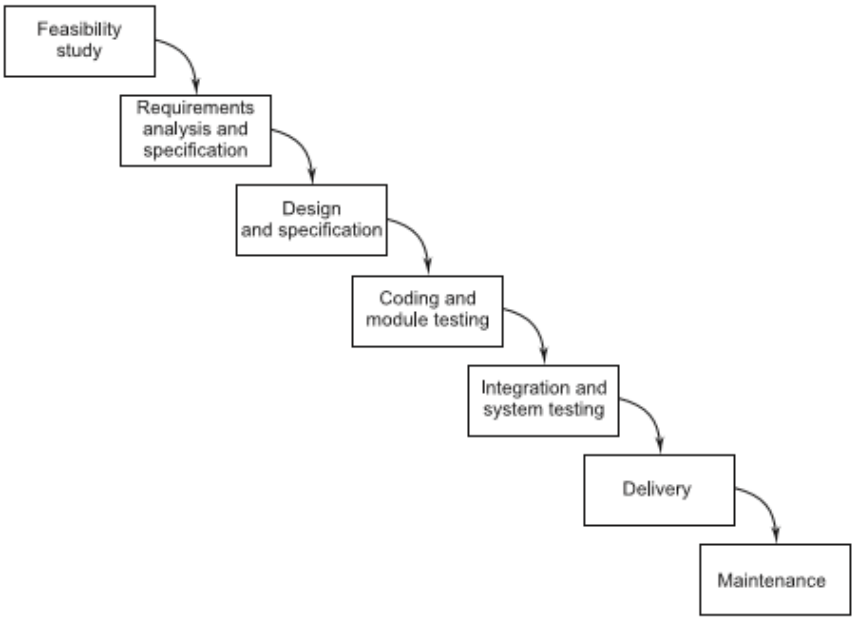


Figure 3.1: Waterfall model

b) Requirement Analysis and Specification

This phase exactly tells the requirements and needs of the project. This is a very important and critical phase in the waterfall model. The requirements describe the "what" of a system, not the "how." The requirement are going to be gathered using methods listed in the data collection section.

c) Design and Specification.

The goal of the design phase is to transform the requirements specified in the SRS document into a structure that is suitable for implementation in some programming language. Here the UML diagrams such as conceptual model are going to be used so as do obtain design specification.

d) Coding and Module Testing.

Coding and module testing is the phase in which we actually write programs using a programming language. Here HTML will be used to develop to give the structure of the whole system, backend development shall use PHP to provide the required functionality,

Front end functionality such as form validation shall use JavaScript and MYSQL database shall be used for storing system data.

e) Integration and System Testing

During the integration and system testing phase, the modules are integrated in a planned manner. Such model include posting module, interviewing module and user notification module.

3.3 Data collection

Data collection was done through two ways which include primary data collection and secondary data collection. Primary data was obtained by visiting and interviewing stake holders of the PSRD system. Also primary data was obtained through observation of the whole job recruitment and interview process. Secondary data was obtained through books, internet and newspapers.

CHAPTER FOUR: REQUIREMENT CAPTURE AND ANALYSIS

4.1 Requirements Capture

System requirements are the tasks which the proposed system is expected to perform; they can also be termed as System functions. System requirements can further be categorized into two namely functional requirements and non-functional requirements.

4.1.1 Functional Requirements

Functional requirements are tasks or processes which a system must perform for the user or for the system itself so as to attain specific desired system functionality. The function requirement are described in the Table 4.1.

Table 4.1: Functional Requirements for the system

Ref#	Function	Category
R1.1	The system should allow Management of Job Seeker and Employer Profiles	Evident
R1.2	The system should allow admin to Add New Services, Related to Employers or Job Seekers	Evident
R1.3	The system should allow message interaction between actors	Evident
R1.4	The system should allow search job seeker information	Evident
R1.5	The System should allow posting of jobs	Evident
R1.6	System should allow editing of user profile	Evident
R1.7	The system should allow passwords reset by automated email.	Evident
R1.8	The system should provide information on how much time left on each job posting and how long left on CV access	Evident
R1.9	The system should allow employer to set up interview	Evident

Ref#	Function	Category
R1.10	The system should allow user registration.	Evident
R1.11	The system should allow employers to view submitted interview	
R1.12	The system should allow uploading and downloading of CV	Evident
R1.13	The system should allow search and application for a job	Evident
R1.14	The system should allow job seekers to view Application History from profile.	Evident
R1.15	The system should automatically calculate the remaining time for job post and interviews	Hidden
R1.16	The system should allow interviewing of job seekers	Evident
R1.17	The system should store its data into a database	Hidden

4.1.2 Non-Functional Requirements

Non-functional requirements are the system constraints from which the operating of the system can be analyzed. The non-functional requirements are show in Table 4.2

Table 4.2: System Attributes

Ref#	Attribute	Constraint
RN1	Fault-tolerance	The system should be able to recover from failure
RN2	User friendliness	The system should meet user needs and should be easy to learn and use.
RN3	Reliability	The system should perform the desired functions in a required period of time under stated condition.
RN4	Security	The system should have high security by creating of access level.

Ref#	Attribute	Constraint
RN5	Extensibility	The system can be upgraded by addition of functionalities and capabilities
RN6	Maintainability	The system should be such that future maintenance and enhancements times and efforts are reduced.

4.2 Requirement Analysis

Requirement analysis is the detailed study of various operations performed by a system and their relationships within and the outside the system. Modeling of the system was done using UML. Requirement analysis phase consists of identification of use cases, use case description, use case diagrams and a system conceptual diagram.(must reference table)

4.2.1 Use Cases Identification

The use cases are identified in Table 4.3

Table 4.3: Identification of use cases

Actor	Actor Description	Use cases
Job Seeker	A person who is actively looking for employment. Job seeker interacts with system by logging in and search for job post. They also perform an online interview.	Post cv, apply job, search job, perform interview, login, view profile info, update profile, register, send mail
Employer	A person or business that employs one or more people, especially for wages or salary. They interact with the system by posting jobs and interviewing job seekers.	Update profile, register, search job seeker info, post job, login ,view profile, set interview, view interview, download cv, send mail,
Administrator	A system administrator (sysadmin) is a	Manage accounts, add

	person who supports a multiuser computing environment and ensures continuous, optimal performance of IT services and support systems.	services, provide roles, login, view profile, send mail, edit job info

4.2.2 Use case Description

Table 4.4 through Table 4.10 Show the use cases description of few selected use cases of the system.

Table 4.4: Register description

Field	Description
Use Case	Register
Actors	Employee, Job Seekers
Short description	A use case allows users to register to the system
Pre-condition	
Post-condition	A user is ready to access the system online services.
Main Flow	1. The user select Registration service center 2. The user select register an account 3. The system provide the member with the "Online register form". 4. User fills the form with the appropriate details. 5. User submits the duly filled form. 6. System validates the form and successively updates database fields to allow access to online service.
Alternative Flow(s)	Unfilled field/invalid data 1. System validation of the submitted form fails due to unfilled form field(s) or invalid data. 2. System ask the member to re-fill the form (the unfilled fields or fields with invalid data) 3. Go back to Main Flow 5.
Exception Flow(s)	If a member cancels the registration process, a member does not get

	registered for online services and use case ends.

Table 4.5: Update Profile description

Field	Description
Use Case	Update Profile
Actors	Employee, Job Seekers
Short description	A use case allows users to change various profile information including user name, password etc.
Pre-condition	The user must be registered The user must be logged in
Post-condition	User profile information is updated
Main Flow	1. The system present the user with an editable view of present details (personal info, password, username) 2. A user then edits the editable fields 3. A member submits the updated details to the system. 4. The system validates the details provided 5. The system saves the new details and present the updated details to the member in a read-only view
Alternative Flow(s)	Unfilled field/invalid data 1. System validation of the submitted form fails due to unfilled form field(s) or invalid data. 2. System ask the member to re-fill the form (the unfilled fields or fields with invalid data) 3. Go back to Main Flow 3.
Exception Flow(s)	If a member cancels the update process, a members details does not get updated and use case ends.

Table 4.6: View Profile description

Field	Description
Use Case	View Profile
Actors	Employer, Job Seekers
Short description	A use case allow registered user to view their personal information
Pre-condition	The user must be registered The user must be logged in.
Post-condition	A user is presented with his/her information.
Main Flow	1. System fetch information depending on the logged in user id. 2. System displays profile info to the user.
Alternative Flow(s)	
Exception Flow(s)	

Table 4.7: Post Job description

Field	Description
Use Case	Post Job
Actors	Employer
Short description	A use case allows the employers to post job
Pre-condition	The user must be registered The user must be logged in.
Post-condition	A user is presented with his/her information.
Main Flow	1. The system present the employer with a form with all necessary job detail required. 2. An employer then insert all the information as required. 3. An employer submits the form to the system. 4. The system validates the details provided 5. The system saves the new job post the publish it.
Alternative Flow(s)	1. If the employer selects the interview button 2. The employer sets interview question

	3. The employer sets the interview time limit in seconds 4. Go back to Main Flow 3
Exception Flow(s)	If an employer cancels the posting process, a job post does not get published and use case ends.

Table 4.8: Perform Interview description

Field	Description
Use Case	Perform Interview
Actors	Job Seeker
Short description	A use case allow the job seeker to perform inline interview.
Pre-condition	The user must be registered The user must be logged in. Must have requirement as specified by the Employer. Must have working video camera
Post-condition	The interview is automatically uploaded to the employer account
Main Flow	1. The system presents the user with series of questions while recording 2. The user answers the questions 3. The system analyses the videos recorded
Alternative Flow(s)	
Exception Flow(s)	

Table 4.9: Apply Job description

Field	Description
Use Case	Apply Job
Actors	Job Seeker
Short description	A use case allow registered user to apply for job depending on their

	qualification
Pre-condition	The user must be registered The user must be logged in.
Post-condition	An application form is submitted to the employer's database.
Main Flow	1. Employee is presented with different job on screen. 2. The employee will be presented with a text area to type his application latter 3. The employee will also require to upload all necessary documentation. 4. The employee submits the form.
Alternative Flow(s)	
Exception Flow(s)	

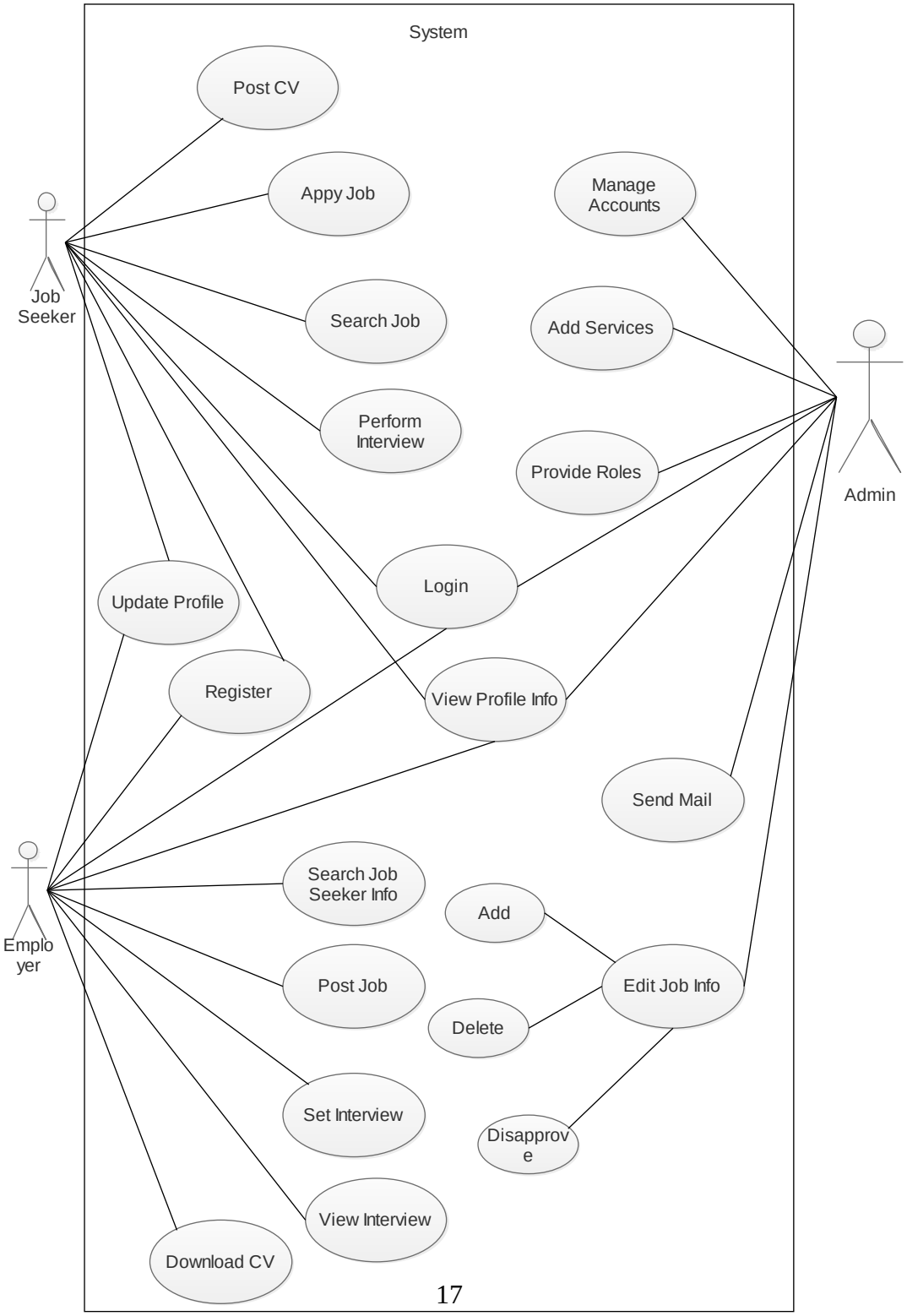
Table 4.10: Set interview description

Field	Description
Use Case	Set interview
Actors	Employer
Short description	A use case allow an employer to set interview question.
Pre-condition	• The user must be registered • The user must be logged in.
Post-condition	
Main Flow	1. An employer is presented with a form that requires to set question and maximum amount of time used by the employee to answer the question. 2. The employer fills the form. 3. The employer submits the form.
Alternative Flow(s)	
Exception Flow(s)	

4.2.3 Use case Diagram of the system

Figure 4.1 represents the interaction between selected actor and the system use cases

Figure 4.1: Use Case Diagram for the system



4.2.4 Conceptual Diagram

Figure 4.2 show various concepts and their relationships.

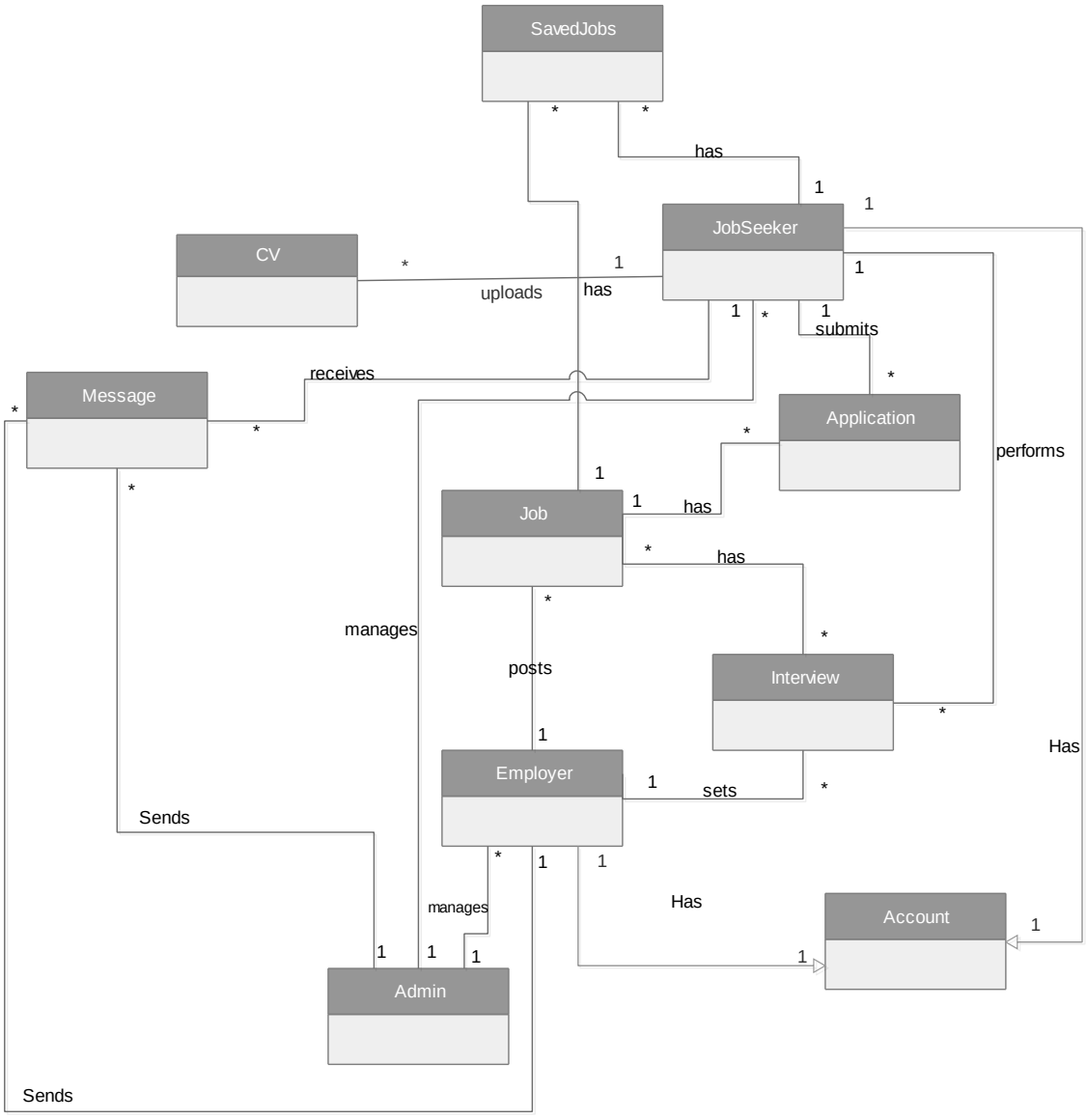


Figure 4.2: Conceptual Diagram

4.2.5 System Sequence Diagram

System sequence diagrams depict the interaction between the system and any user involved with the system. They show different events initiated by user and their corresponding system

response. Figure 4.1 through 4.3 show the system sequence diagram of most important use cases

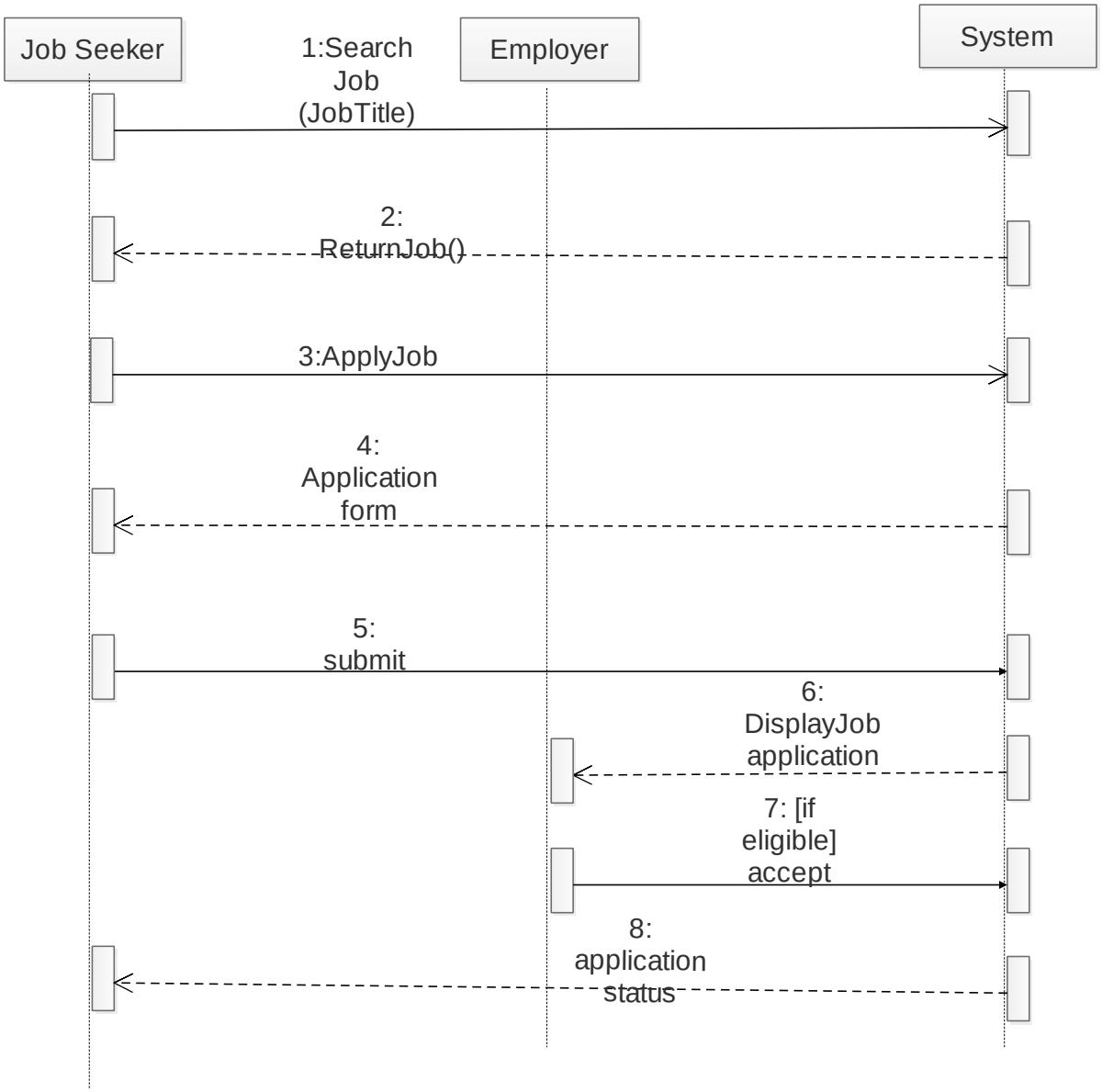


Figure 4.1: Sequence diagram for Job application

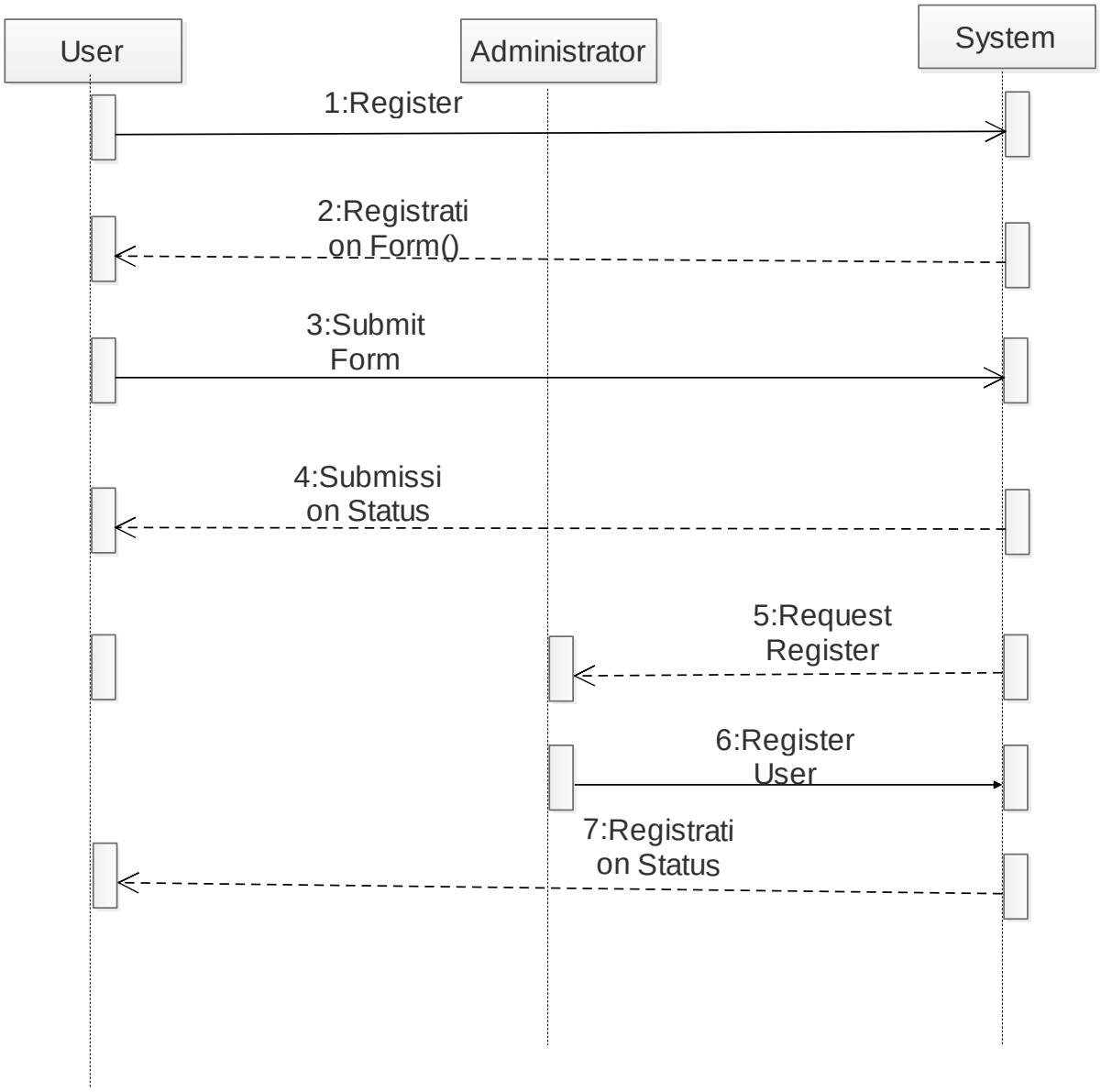


Figure 4.2: Sequence diagram for registration

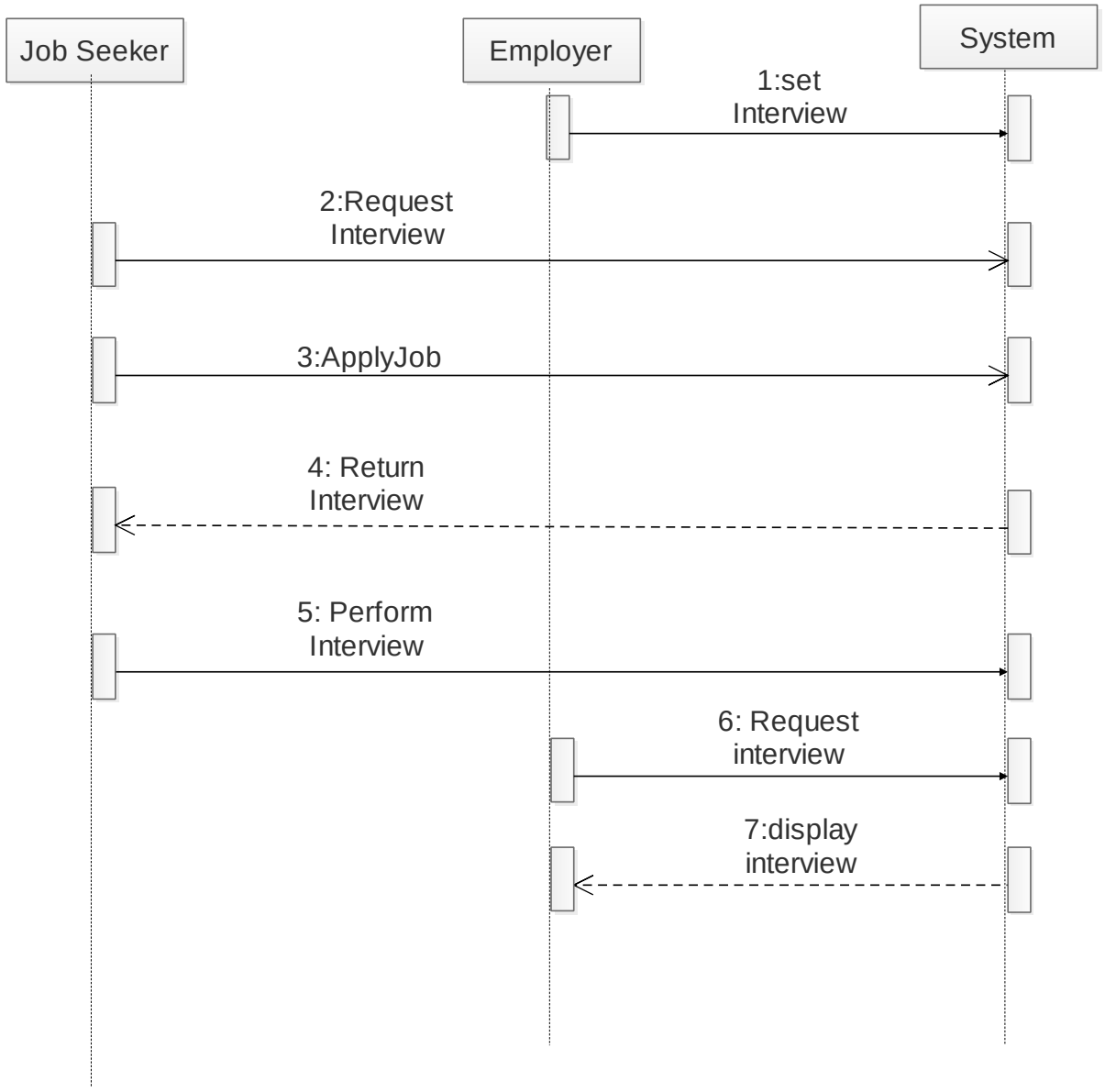


Figure 4.3: Sequence diagram for Job Interview

CHAPTER FIVE: SYSTEM DESIGN

5.1 Design Class Diagram

Design Class Diagram is the description of the classes on an Object Oriented System, their fields, methods and relationship between the classes that interact or inherit from each other. Figure 5.1 shows the Design Class diagram of the system.

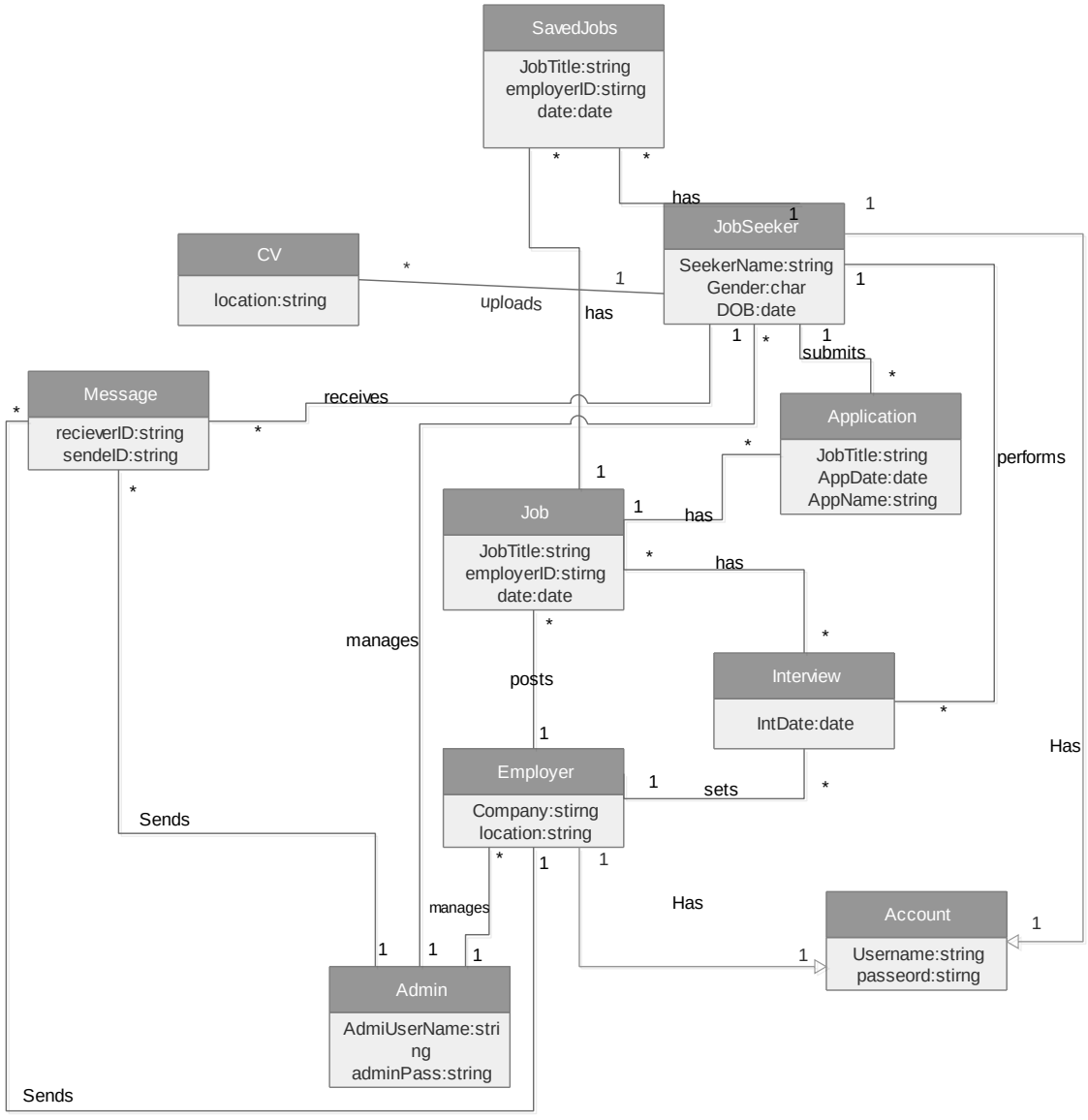


Figure 5.1: Design Class Diagram for System

5.2 Database Design

Database design is the description of various parts of the design of the database system. Figure 5.2 shows the data base table relation of the system.

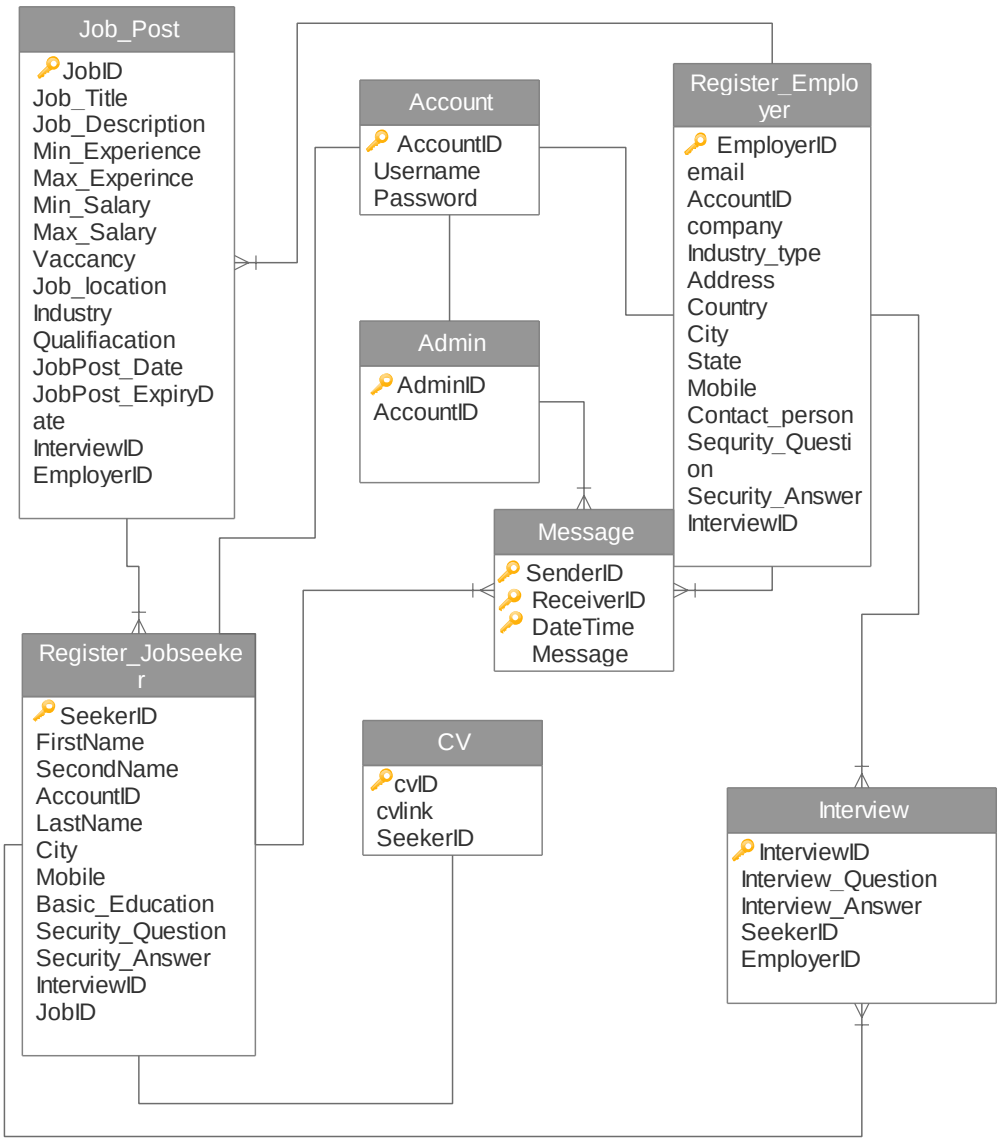


Figure 5.2: Database Design Diagram of System

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Work Done so Far

The following is what has been done so far;

i. Literature review on different technologies and resources
ii. Data collection
iii. Project cost analysis
iv. Progress report preparation
v. Requirement capture and analysis
vi. System Design

6.2 Work to be Done in Semester Two

During semester two the work will start with refining the database and start of the implementation of the modules.

6.3 Budget

For completion of the project, Table 6.1 shows the estimated budget that will be incurred.

Table 6.1: Set interview description

NO	MATERIALS	UNITS	UNIT COST	COST (T/SH).
1	Internet Surfing	42 days	15,000	63,000/=
2	Report Printing	200 pages	100	20,000/=
3	Report Binding	4 reports	3500	14,000/=
4	Transport expenses	1 person	48,000	30,000/=
5	Communication	1 person	30,000	30,000/=
6	Overheads			43,000/=
	TOTAL			**200,000/=**

6.4 Time Schedule

Time schedule for the work done is shown in Table 6.2.

Table 6.2: Time Schedule

S/N	ACTIVITY	WEEKS (SEMISTER 1)																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Project Tittle Verification																	
2	Meeting with the supervisor																	
3	Requirement Gathering and specification																	
5	Literature review																	
6	Submitting progressive report																	
7	Oral progressive presentation																	
8	Design of the System																	
9	Submission of the project report for review																	
10	Submission of final report																	
11	CS 498 oral presentation																	

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