REPORT OF EMPLOYMENT AGENCY

VIETNAM NATIONAL UNIVERSITY – INTERNATIONAL UNIVERSITY

COMPUTER SCIENCE AND ENGINEERING

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I. Overview

1. Introduction

The cost for recruitment nowadays can be as high as 40.000$ per employee. Beside the training expenses, most of the cost is actually spent in the recruitment processes themselves, for examples advertisement, background checking, interviewing and other HR staff's work. Such processes can consume a great amount of work time also. Thus, we are aiming to create an employment agency to help businesses with their needs of human resources and assist job-seekers at the same time.

2. Goals & Scope

2.1. Project Goals

Our group application has a convenient way for recruiters and applicants to contact each other. Make it easier for applicants to find the job (vice versa). Overall, there are 3 main objectives of our project:

- Help companies find the right person for a job by providing information about applicant's education, work experience and skill sets.
- Provide job candidates details on the firm, which they consider to apply for a position at.
- Reduce cost and time for both human resources management of businesses and job-seekers alike.

2.2. Project Scope

2.2.1. Included

1/ Provide login account for both recruiters and job-seekers.

2/ Login account contains basic information of a person such as Name, Gender, Date of Birth and specific details depend on which type of user.

3/ Job-seekers can edit their profiles, CVs, educations and work experiences.

4/ Recruiters can edit their profiles, job titles and facts about companies for which they work.

5/ Provide search engine to help seekers and recruiters find potential work or applicants.

6/ Recruiters can add, modify and delete their vacancies.

7/ Job-seekers can apply for the jobs they want.

8/ Staffs can review and approve vacancies made by recruiter.

9/ Manager can monitor staff actions.

10/ Manager can create and delete staffs' accounts.

2.2.2. Excluded

1/ No work categories

2/ No skill sets

3. Stakeholders

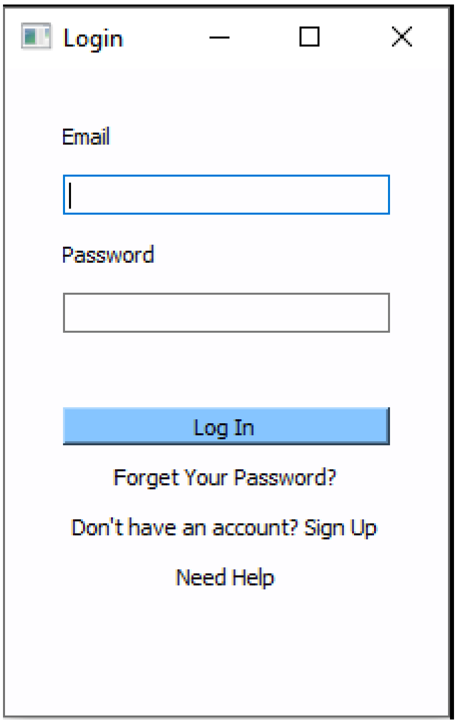
There are various stakeholders of this app. The most user includes recruiters or applicants such as university students, especially those who just graduated or in their last year of university.

4. Software Context

- For applicant: this app will filter out the characteristic of the job that suits the ability or needs of the applicants. it also allows them to upload their cv as well as contact the recruiter for any inquiry related to the job they are looking for.
- For recruiter: this app acts as a form of employment marketplace for the recruiter to post their job description on recruit the ideal candidates that suits their need. It also has a feature for them to organise an online interview with the applicants.

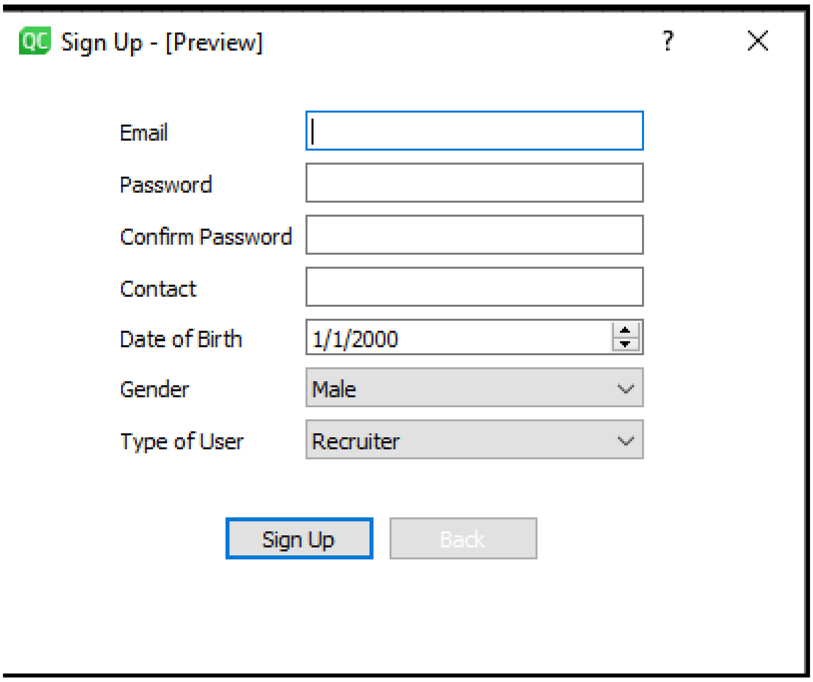
5. System Interface

a. For login interface: The user login to the system

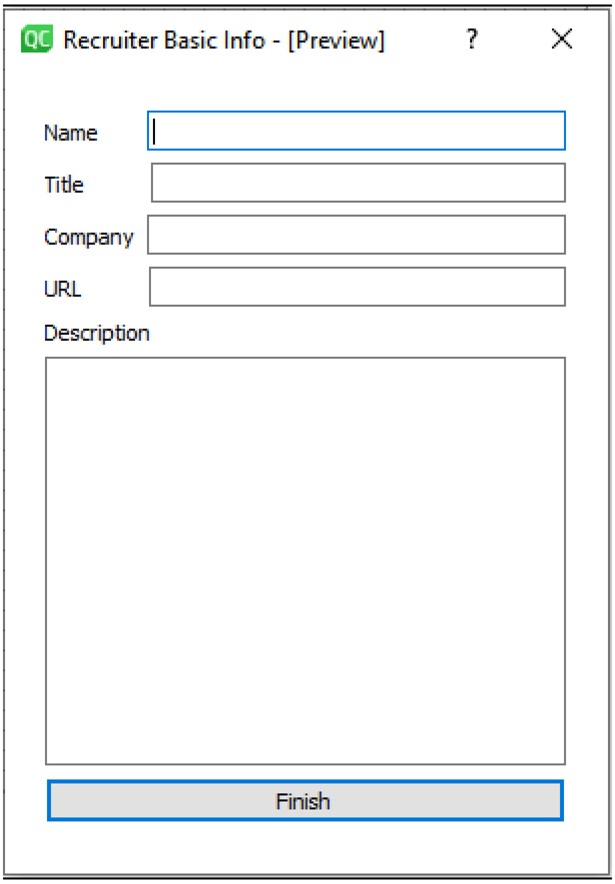


Login
Email
Password
Log In
Forget Your Password?
Don't have an account? Sign Up
Need Help

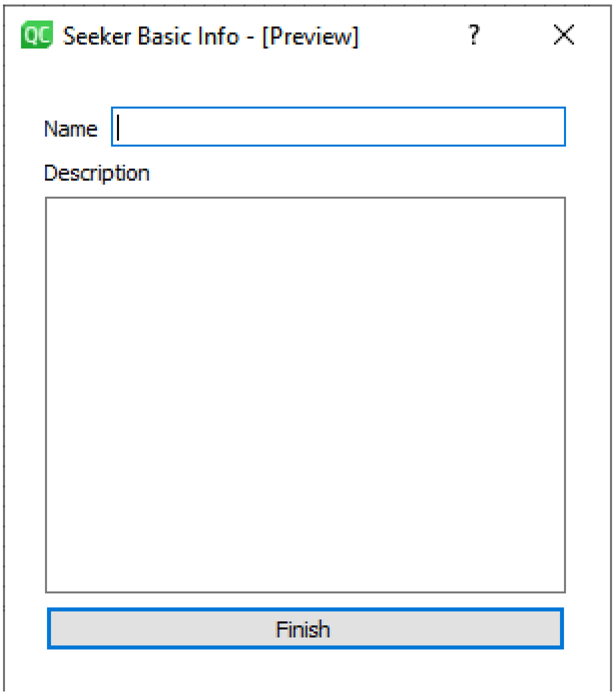
b. For Sign-up If the user don’t have account already

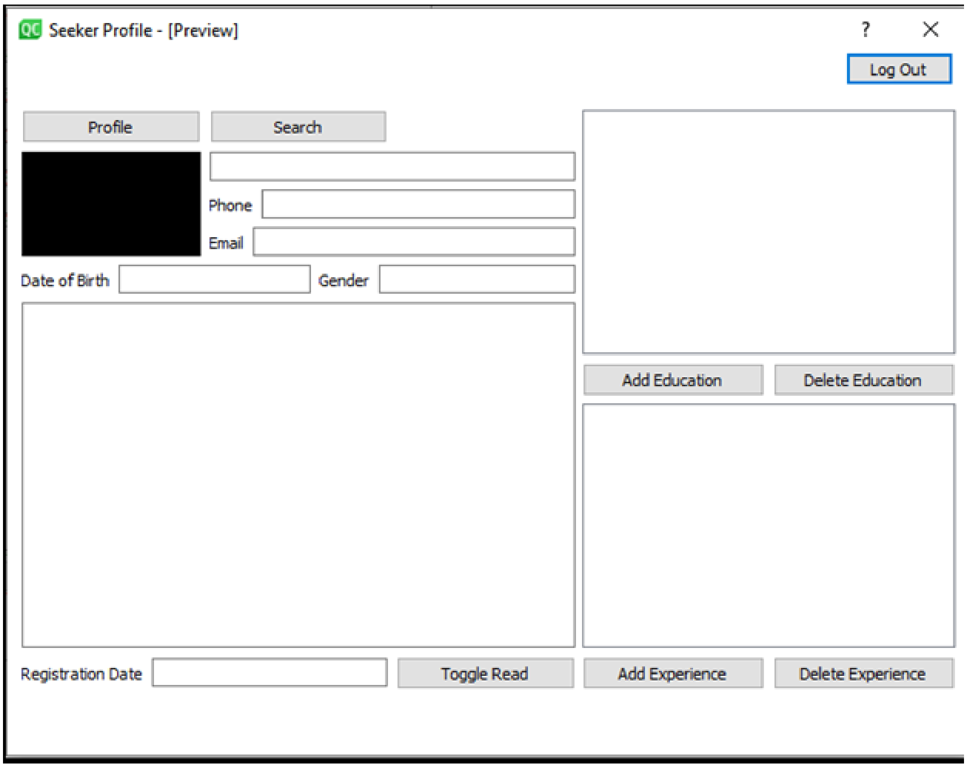


c. For Recruiter Interface: This is where the recruiter sign up their basic information

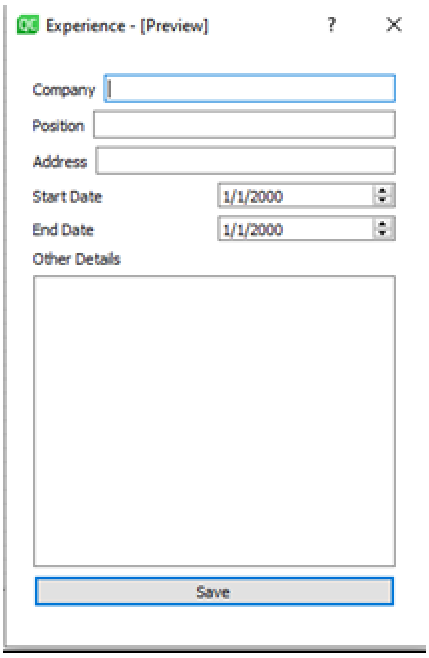


d. Seeker info: help seeker add their information





e. Experience Interface For seeker to show their experiment



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II. Resource Requirements

1. Hardware resource

Equipment	Quantity
Laptop	2
PC	1

2. Software Resource

Application	Description	Quantity
Microsoft Window Pro Single Language Edition	Operating System	5
Microsoft Office 365	Document tool	5
QT	IDE	5
SQLite	Database Server	1
C++/QT	Languages/ Framework	1
Apache Tomcat	Server	1

3. Human Resources

Full name	Position
Chiêm Quốc Hùng	Developer & Tester
Nguyễn Hoàng Lâm	Developer
Nguyễn Thị Thu Xuyên	Project Manager

III. Schedule

1. Work Breakdown Structure

Scope of Work	Description	Person(s) in Charge	Time to Complete	Priority (1: highest 5: lowest)
Requirements Analysis	Analyze user's requirements	Xuyen	1 week	1
Database Design	Visualize data by using ERD	Lam	1 week	1
Database Implementation	Create database & RD in MySQL	Lam + Xuyen		2
Database Testing	Add test data to the database & test queries	Hung + Xuyen	After finishing Database Implementation 3-5 days	5
UI Design	Design screen layouts, transitions buttons, test & image by hand	Hung + Xuyen	Can be done parallel with database design 2-3 days	1
UI Implementation	Code font-end using Qt Creator	Hung + Lam	1 week Can be extended up to 3 days	2
Database Connection	Connect MySQL database to Qt application	Hung	1 week	2
Algorithm Research	Research & optimize algorithm for CRUD operations	Lam	1 week Can be done parallel with database connection	1
Algorithm Implementation	Code C++ for CRUD operation & other functions	Hung + Lam	1 week	2
Program Testing	Test application & fix bugs	All member	1 week	3
Find Product Deployment	Wrap up & write final report	All member	1 week	2
Presentation Preparation	Make slide & practice present	All member	2-3 days	4

Presentation Delivery	Give the best presentation we can	All member	1 day	1

2. Schedule and Milestones (Product backlog for Employment Agency)

ID	As a …	I want to able to …	So that …	Priority
1	job seeker	select a job near my location	can go to work conveniently	2
2	job seeker	search job by career levels	search based in career levels	3
3	job seeker	search job by education levels	search based in education levels	3
4	job seeker	build and update resume	the employer can check	1
5	employer	submit a job vacancy	job seeker can view	1
6	employer	remove a job vacancy	can eliminate expired job	3
7	employer	edit a job vacancy	can change job information	2
8	employer	build & update my information	the job seeker can contact	1
9	staff	send messages to job seeker	suggest suitable job to job seeker	3
10	staff	send messages to employer	remind employer remove expired job	3
11	staff	accept an employer’s registration request	can check if a job suitable or not	2
12	manager	add/ delete staff’s account	manage the staff access	1
13	manager	can monitor staff account	check if staff have made mistake	3

3. Development Process (optional)
4. Development Environment (optional)

Qt Creator is a cross-platform C++, JavaScript and QML integrated development environment which is part of the SDK for the Qt GUI application development framework.[3] It includes a visual debugger and an integrated GUI layout and forms designer. The editor's features include syntax highlighting and autocompletion. Qt Creator uses the C++ compiler from the GNU Compiler

Collection on Linux and FreeBSD. On Windows it can use MinGW or MSVC with the default install and can also use Microsoft Console Debugger when compiled from source code.

5. Measurement Program (optional)

6. Requirement Analysis
   a. Functional requirements

The main function of this app is to find jobs and carer vacancy or to recruit an ideal employee. it works in a way that sorts out jobs by location - from the nearest to the farthest or by education level/qualifications. it also classifies jobs based on career levels, depends on how much experience required. there is a registration and edit personal information section for both recruiter and seeker. besides, the feature that allows both parties to send messages to each other as well as submit, remove, edit an employment-related post is also available.

- and accept an employer's registration request.

- Add/ delete/ view staff's account

   b. Non-functional requirements

- Stability.

- High performance.

- Easy accessibility.

IV. Design and Programming

1. Use cases list and use case diagram.

i. Use cases list

- **Name 1: Send messages to others in the Employment Agency**

Identifier: UCSM

Input:

1. User name
2. Messages content

Output:

Basic course:

Actor: User (Job Seeker, Recruiter, Staff, Staff Manager)	System
Open the message box	• Display the box
Enter receiver name and messages content	
Submit	• Send messages to the receiver

Precondition:

User must enter the Receiver name correctly.

User story: As a job seeker, I want to contact with recruiter. As a recruiter I want to contact with job seeker. As a staff I want to contact with either job seeker or Recruiter. As a staff Manager I want to contact with staff.

- **Name 2: Create staff's account in the Employment Agency**

Identifier: UCCS

Input:

1. Staff's account name
2. Staff's account password

Output:

1. Staff's account

Basic course:

Actor: User (Staff Manager)	System
Open the register page	• Display the register page

Enter name and password	
Submit	• Check staff's account already existence or not • If not create one • Else display error

Precondition: User must enter correct format

User story: The staff can't not create their account. As a staff manager I want to create account for staff so they can use that account to go to work.

- **Name 3: Delete staff's account in the Employment Agency**

Identifier: UCDS

Input:

1. Staff's account name

Output:

Basic course:

Actor: User (Staff Manager)	System
Open the account page	• Display the account page
Enter staff name to delete	
Confirm	• Check staff's account in page • Delete it

Precondition:

User must enter correct staff name.

User story: As a staff manager I want to delete account for staff if their quit the job.

- **Name 4: Accept Recruiter's Registration Requests in the Employment Agency**

Identifier: UCARRR

Input:

1. Recruiter's Registration Requests

Output:

Basic course:

Actor: User (Staff Manager)	System
Open the Request page	• Display the request page
Select accept or not	
Confirm	• If yes display the Registration in the job page • Else delete it

User story: As a Staff I want to view and check request carefully before display the request in my page.

- **<u>Name 5</u>: Update Specific Information**

Identifier: UCUSI

Inputs:

a. Education or Work Experience (if the user is Seeker)
b. Company (if the user is Recruiter)

Outputs:

a. The user's profile page (if successful)
b. An error modal (if fail)

Basic course:

Actor: User (Seeker/ Recruiter)	System
1. Open edit information page	1. Display edit information page
2. Enter information	
3. Submit	1. Check entered information 2. If success, return to profile page 3. Else, display an error

Precondition: None

Post condition:

a. Enter all required fields with correct format.

User story: Users want to add, update their information in the future so that other users can check their information.

- **Name 6: Search Available Vacancies**

Identifier: UCSAV

Inputs:

a. Location
b. Career Level
c. Education Level
d. Job Type

Outputs:

a. List of available vacancies

Basic course:

Actor: User (Seeker)	System
1. Open vacancy search page	1. Display vacancy search page
2. Enter check fields (if needed)	
3. Submit	1. Check entered fields 2. Query for vacancies 3. Return list of vacancies 4. If none, return “No such vacancy”

Precondition: None

Post condition: None

User story: Seekers want to search for available vacancies based on certain attributes if needed, so that they can pick suitable vacancies to apply.

- **Name 7: Search Others’ Information**

Identifier: UCSOI

Inputs:

a. Type of User (Seeker or Recruiter)
b. Keyword

Outputs:

a. List of users’ information

Basic course:

Actor: User (Seeker/ Recruiter)	System
1. Open user search page	1. Display user search page
2. Enter check fields (keyword if needed)	
3. Submit	1. Check entered fields 2. Query for information 3. Return list of users' information 4. If none, return "No such information"

Precondition: None

Post condition: None

User story: Seekers and Recruiters want to search for other users' information, so that they can check others' information and learn more about them.

- **Name 8: Apply for Vacancies**

Identifier: UCAV

Inputs:

a. Message (Introduction)

Outputs:

a. A success modal
b. Or a fail modal

Basic course:

Actor: User (Seeker)	System
1. Check vacancy's information	
2. Enter message for recruiter	
3. Submit	1. Check if the requirements of the vacancy were met 2. If met, send job application to recruiter and return a success modal 3. Else, return a fail modal

Precondition: The career and education levels of the seeker must meet the vacancy's requirements.

Post condition: None

User story: Seekers want to apply for vacancies, so that they have a chance to get job(s).

- **Name 9: Create Vacancies**

Identifier: UCCV

Inputs:

a. Vacancy's Information

Outputs:

a. A success modal
b. Or a fail modal

Basic course:

Actor: User (Recruiter)	System
1. Open create vacancy page	1. Display create vacancy page
2. Enter vacancy's information	
3. Submit	1. Check entered fields 2. If met, return a success modal and get back to profile page 3. Else, return a fail modal

Precondition: None

Post condition: All required fields must be entered with correct format.

User story: Recruiters want to create vacancies, so that seekers can apply for.

- **Name 10: Update Vacancies**

Identifier: UCUV

Inputs:

a. Vacancy's Information

Outputs:

a. A success modal
b. Or a fail modal

Basic course:

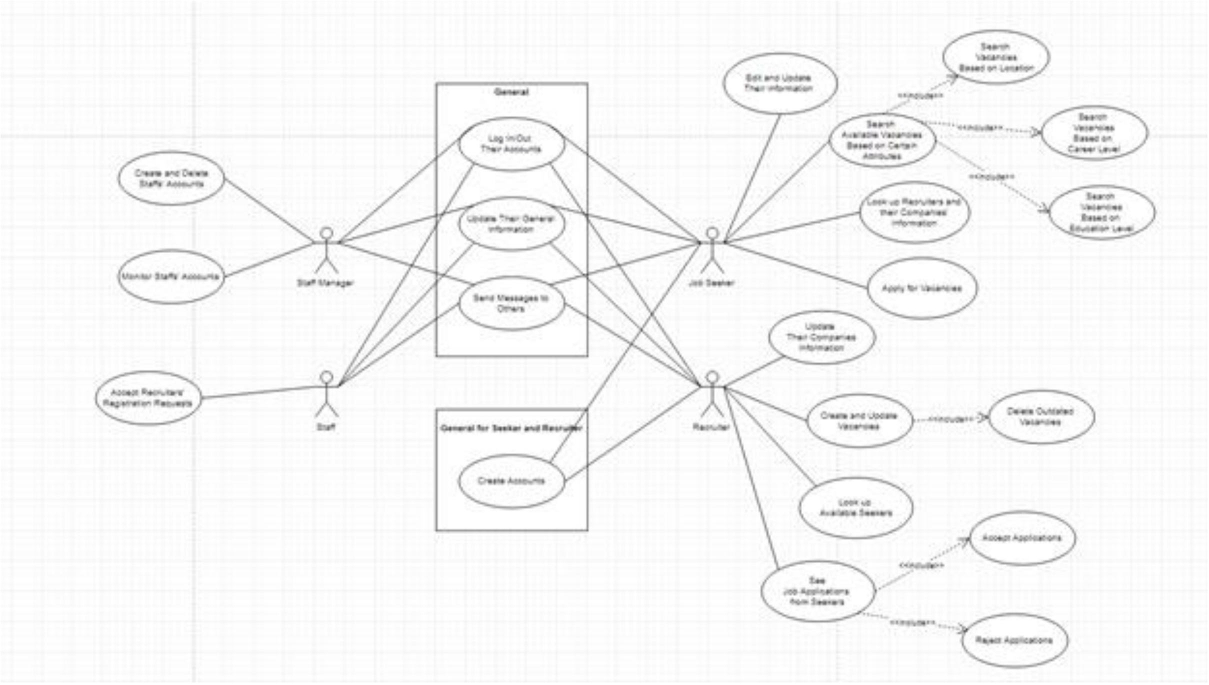
Actor: User (Recruiter)	System
1. Open update vacancy page	1. Display update vacancy page
2. If want to delete, press delete vacancy	2.2. Ask if user really want to delete vacancy 2.3. If yes, delete vacancy, return a success modal and get back to profile page 2.4. Else, stay in the update vacancy page
3. Enter updated information	1. Check updated information 2. If success, return a success modal and get back to profile page 3. Else, return a fail modal

Precondition: None

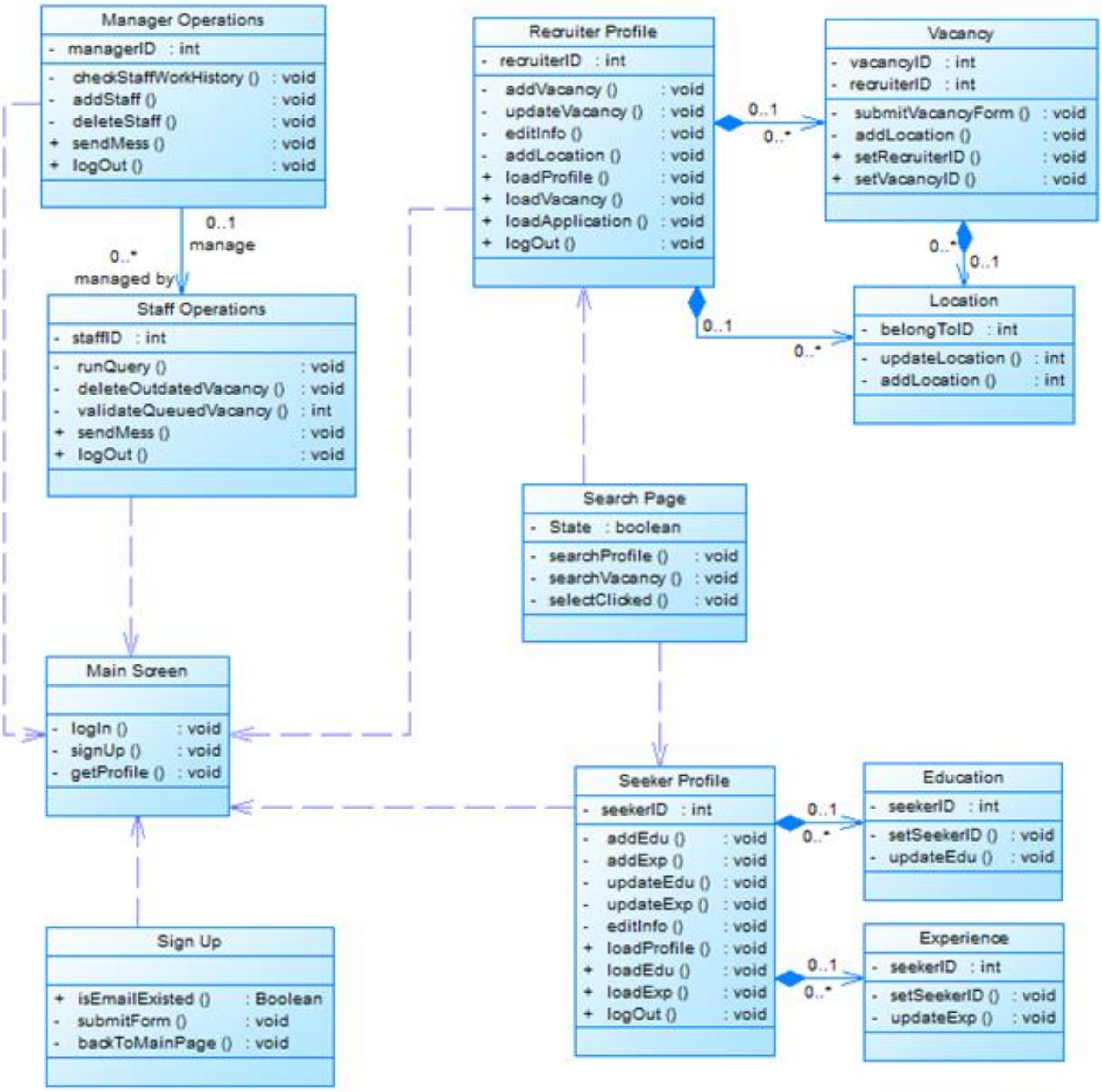
Post condition: All required fields must be entered with correct format.

User story: Recruiters want to update vacancies, so that they can delete outdated/unavailable vacancies.

ii. Use case diagram

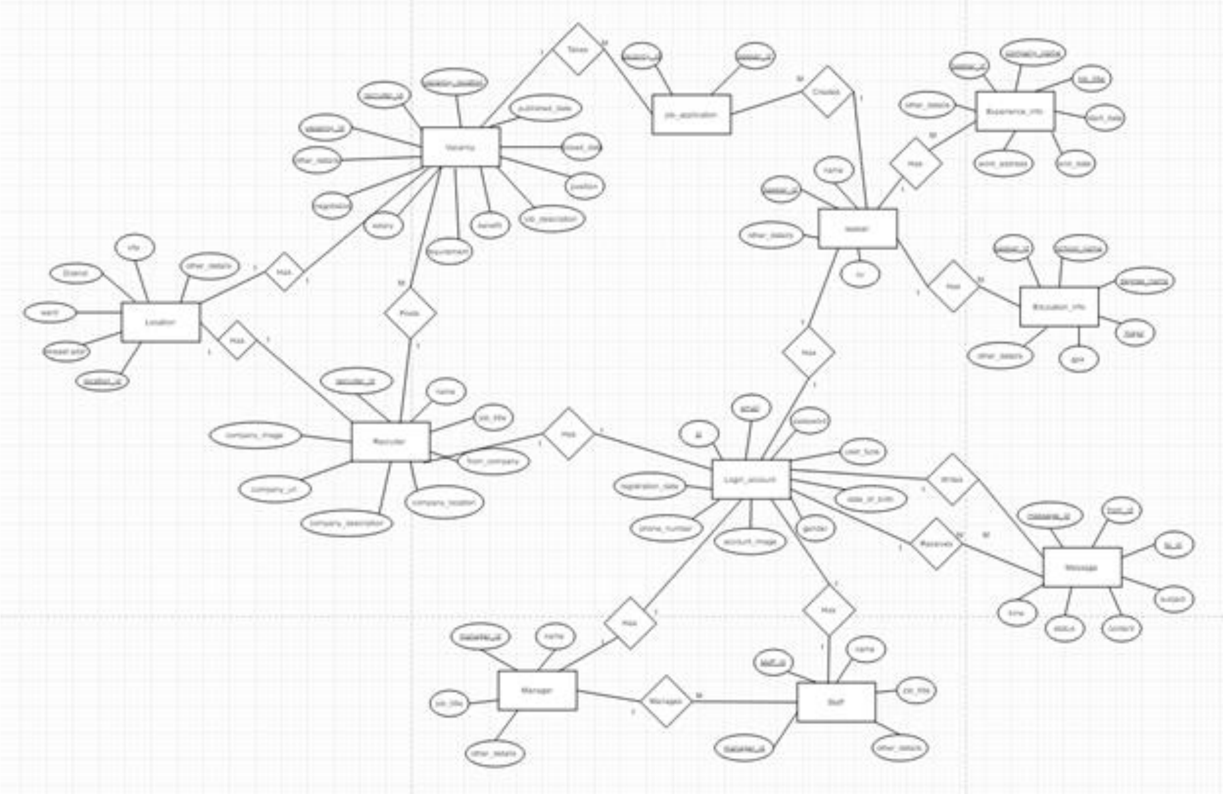

General
Log In/Out Their Accounts
Update Their General Information
Send Messages to Others
General for Seeker and Recruiter
Create Accounts
Create and Delete Staffs' Accounts
Monitor Staffs' Accounts
Staff Manager
Accept Recruiters' Registration Requests
Staff
Edit and Update Their information
Search Available Vacancies Based on Certain Attributes
<<include>>
Search Vacancies Based on Location
Search Vacancies Based on Career Level
Search Vacancies Based on Education Level
Look up Recruiters and their Companies' information
Apply for Vacancies
Job Seeker
Update Their Companies information
Create and Update Vacancies
Delete Outdated Vacancies
Look up Available Seekers
See Job Applications from Seekers
Accept Applications
Reject Applications
Recruiter

2. Class Diagram

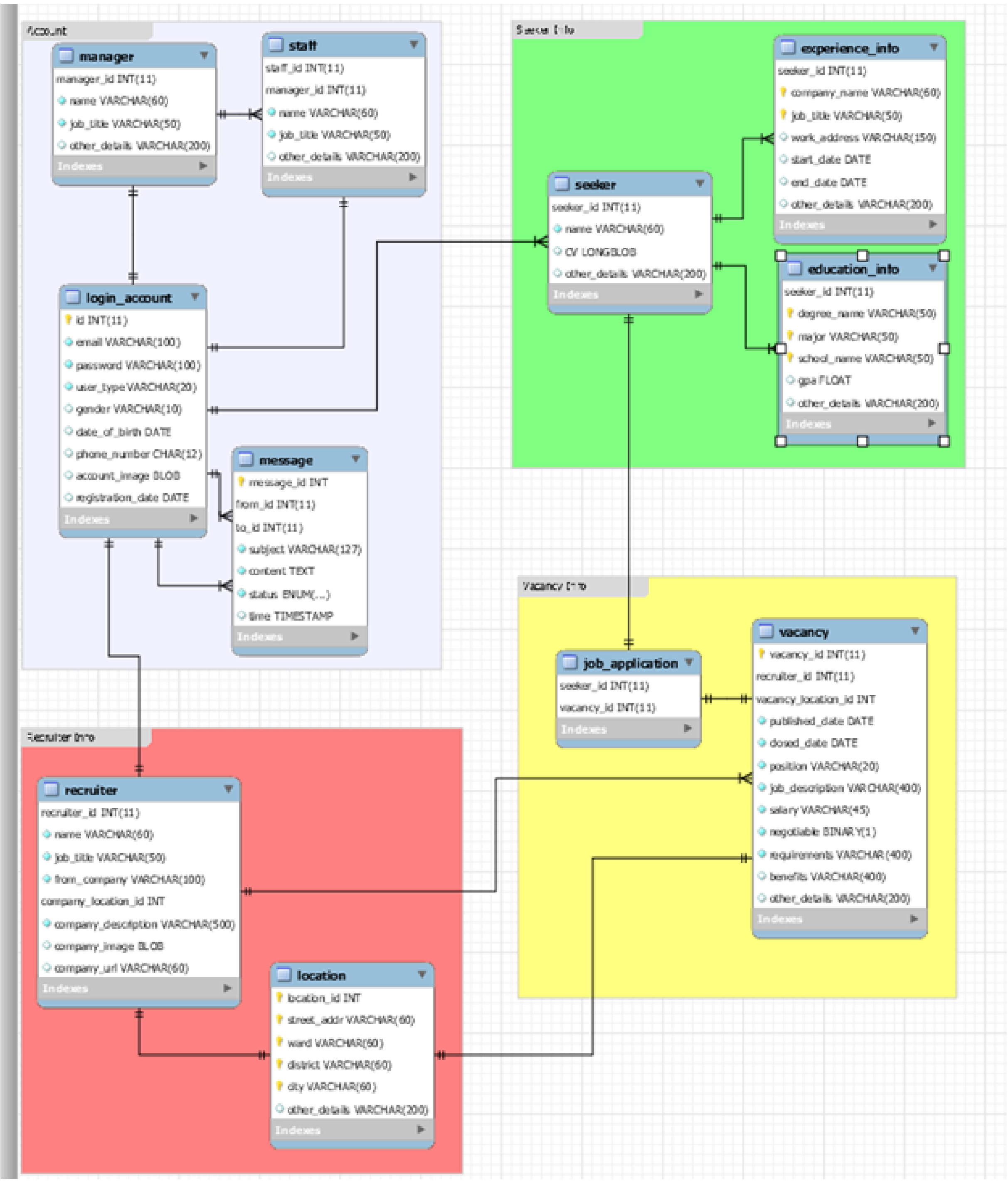


3. ERD and RD

3.1. ERD Diagram



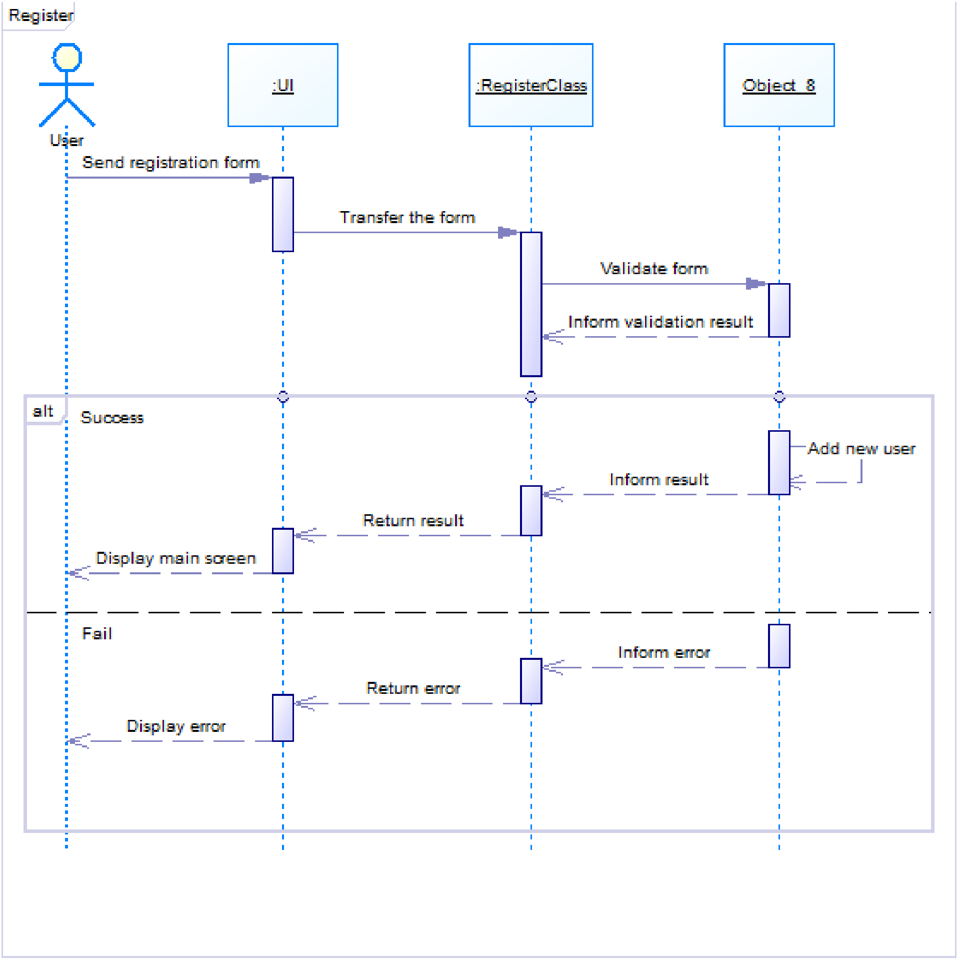
3.2. RD Diagram.

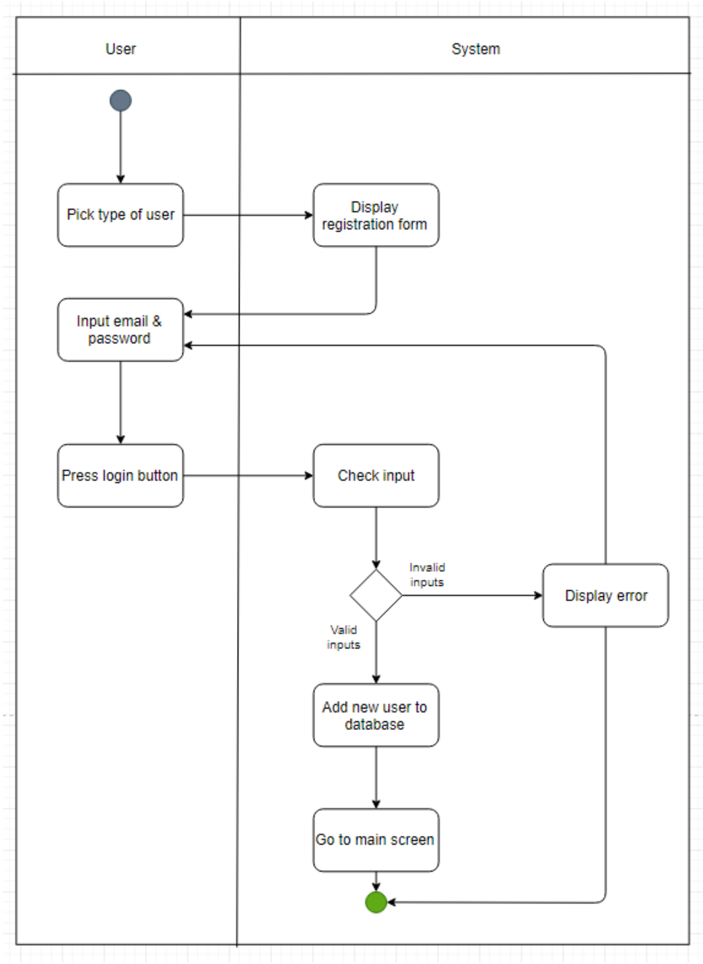


We try to create a SQL database that satisfies the BCNF.

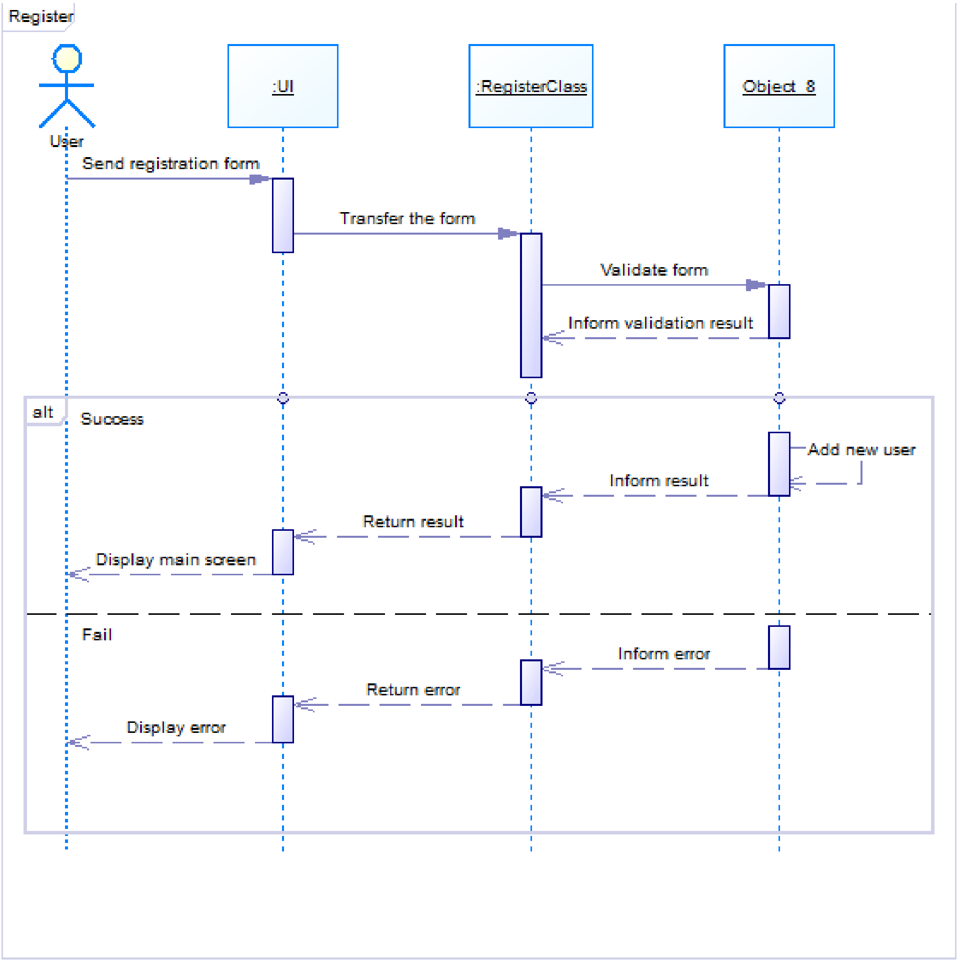
4. Sequence and Activity Diagram

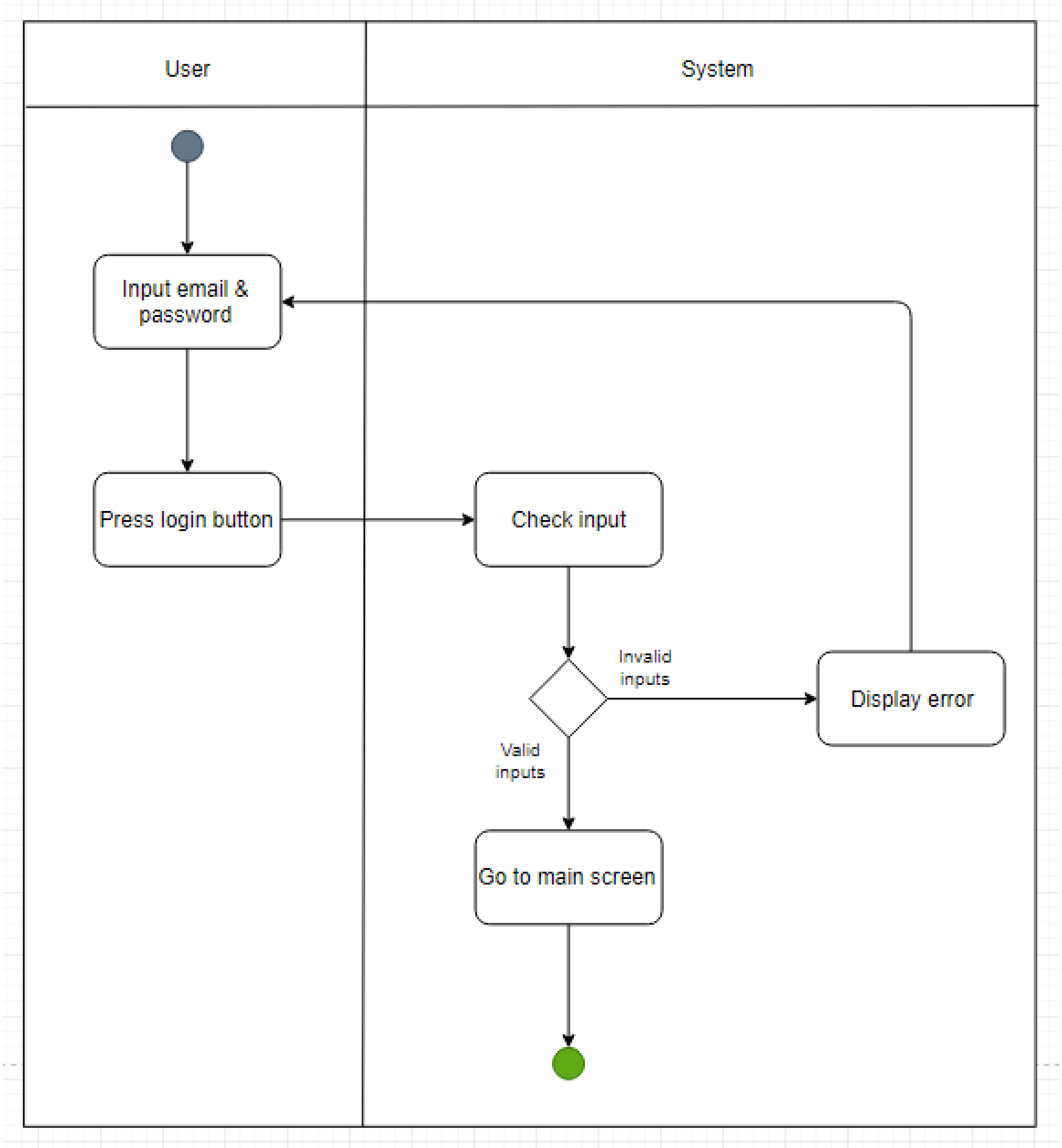
4.1. Register Action



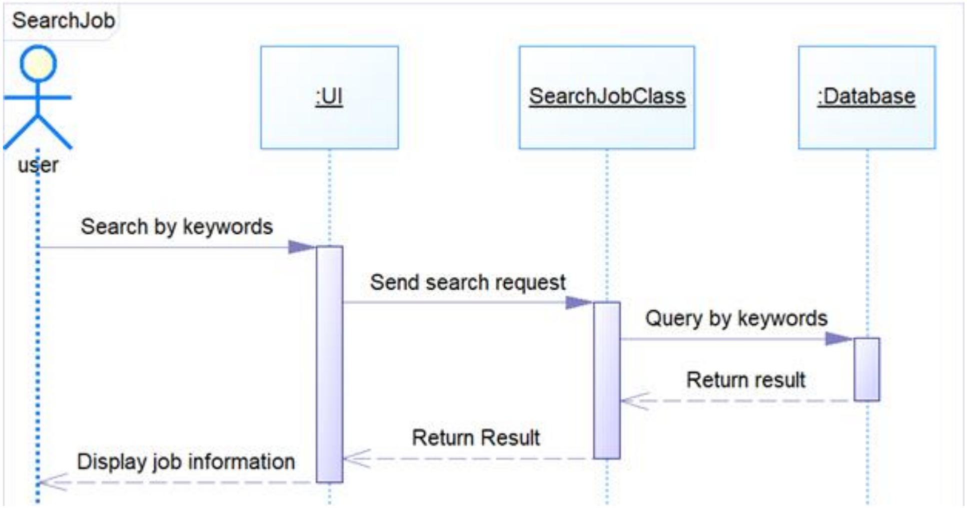

User
System
Pick type of user
Display registration form
Input email & password
Press login button
Check input
Invalid inputs
Display error
Valid inputs
Add new user to database
Go to main screen

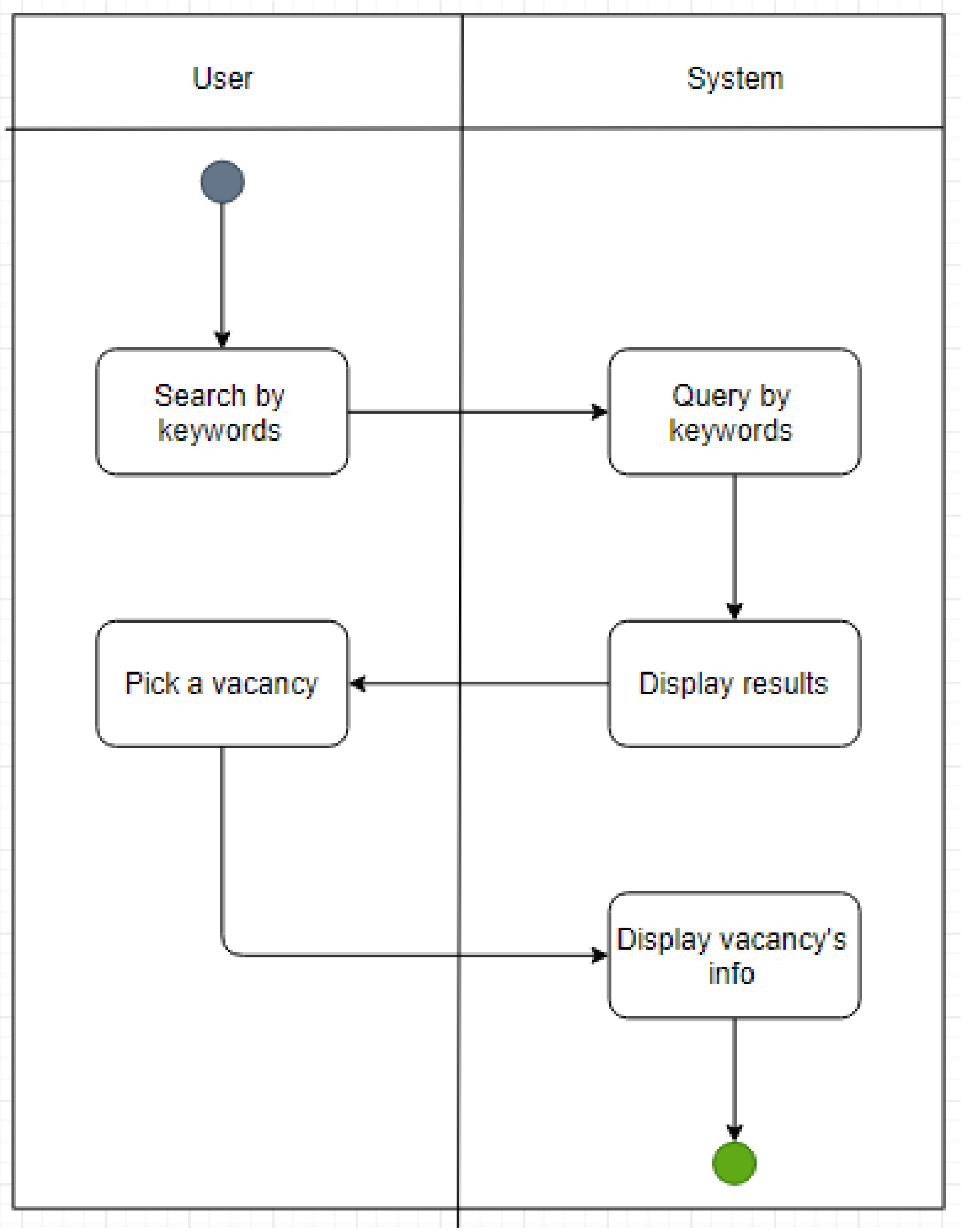
4.2. Login Action



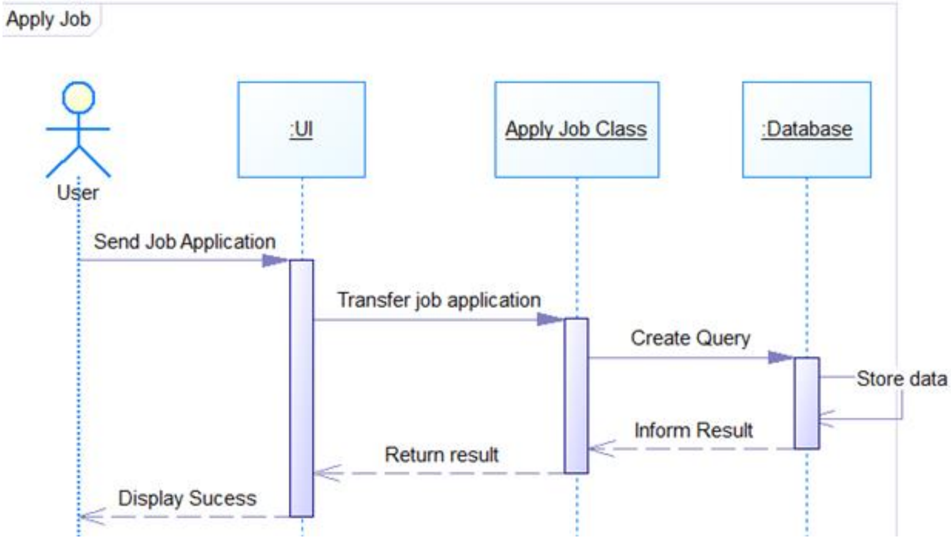

User
System
Input email & password
Press login button
Check input
Invalid inputs
Display error
Valid inputs
Go to main screen

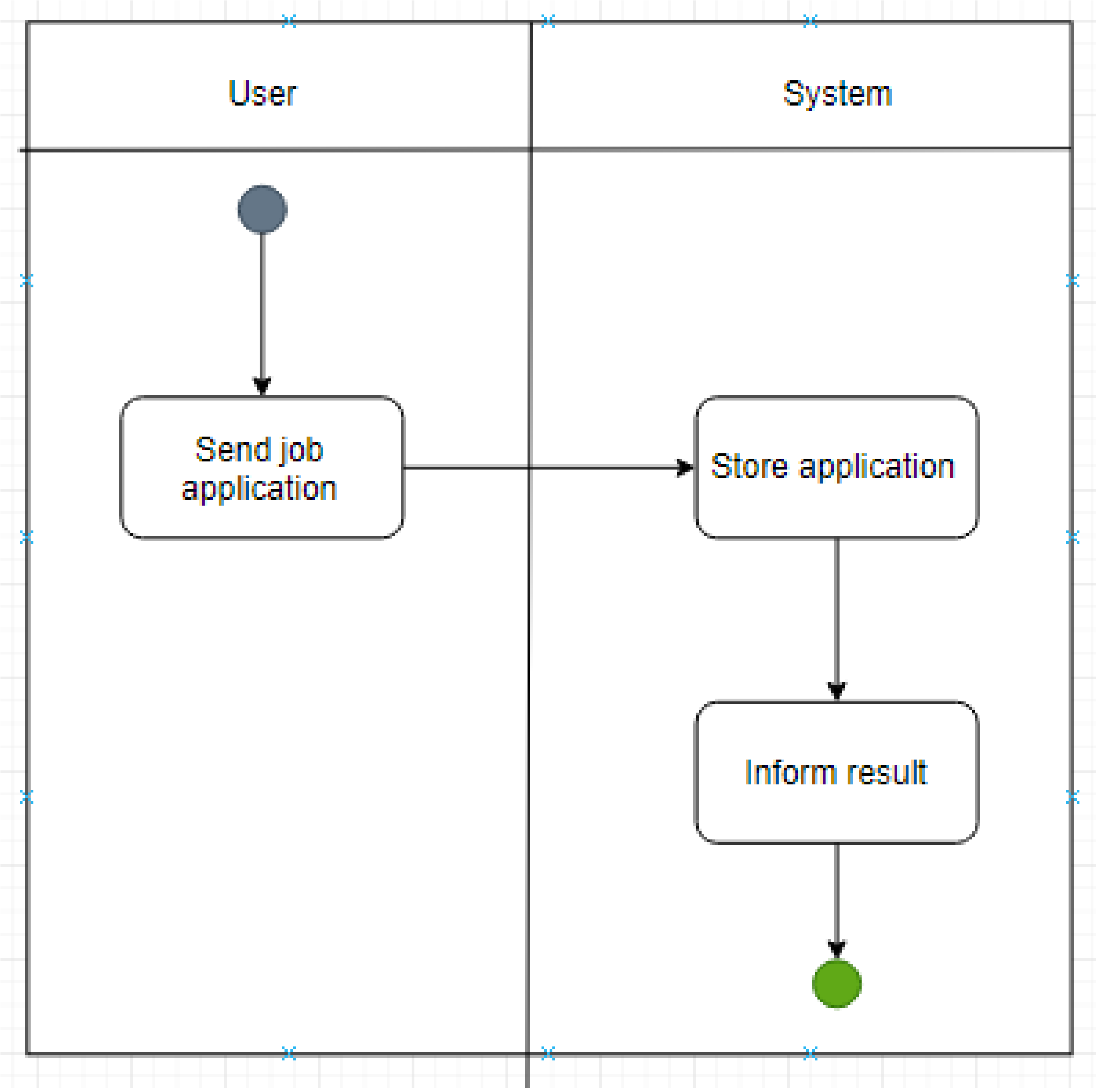
4.3. Search Job



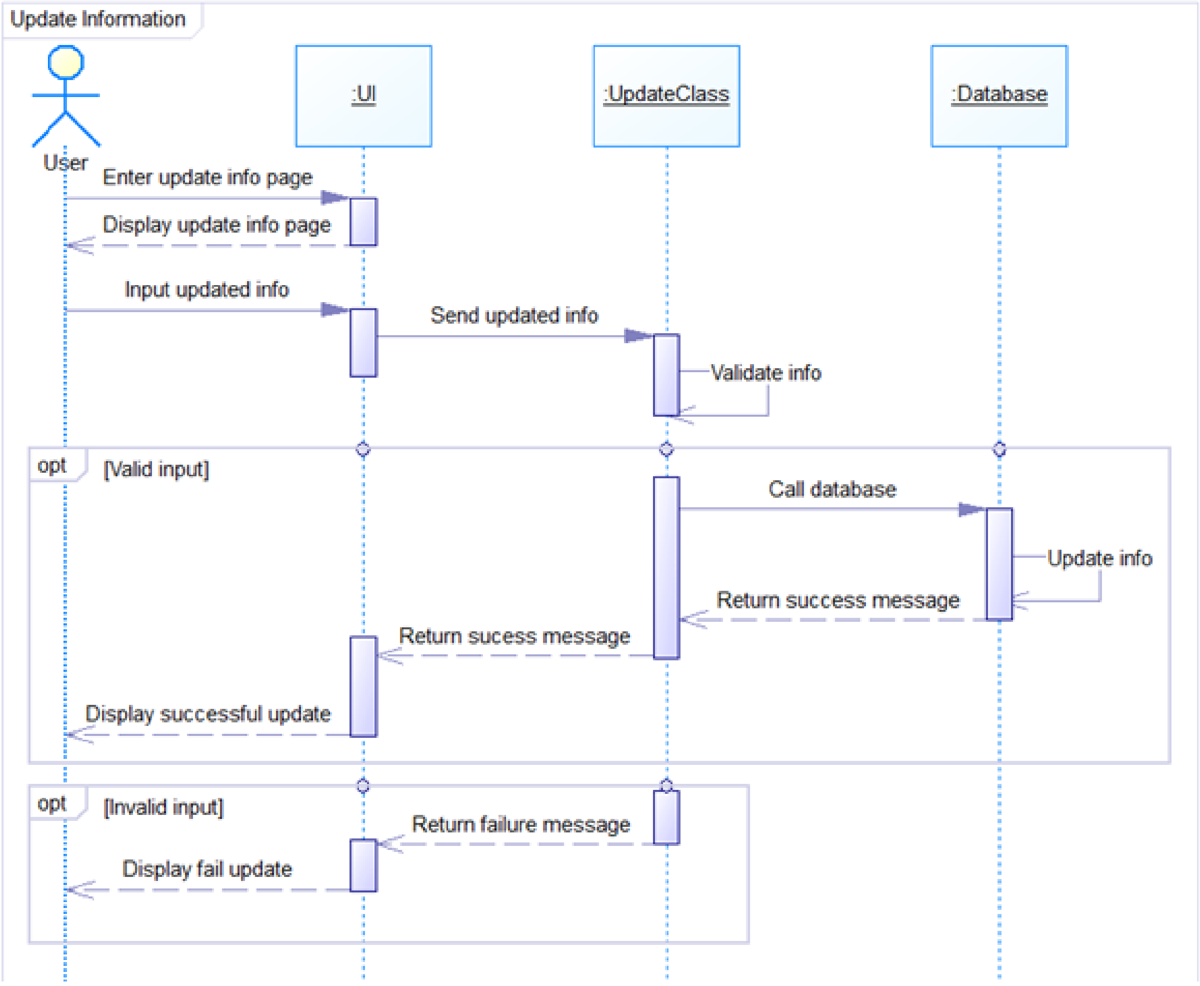

User
System
Search by keywords
Query by keywords
Pick a vacancy
Display results
Display vacancy's info

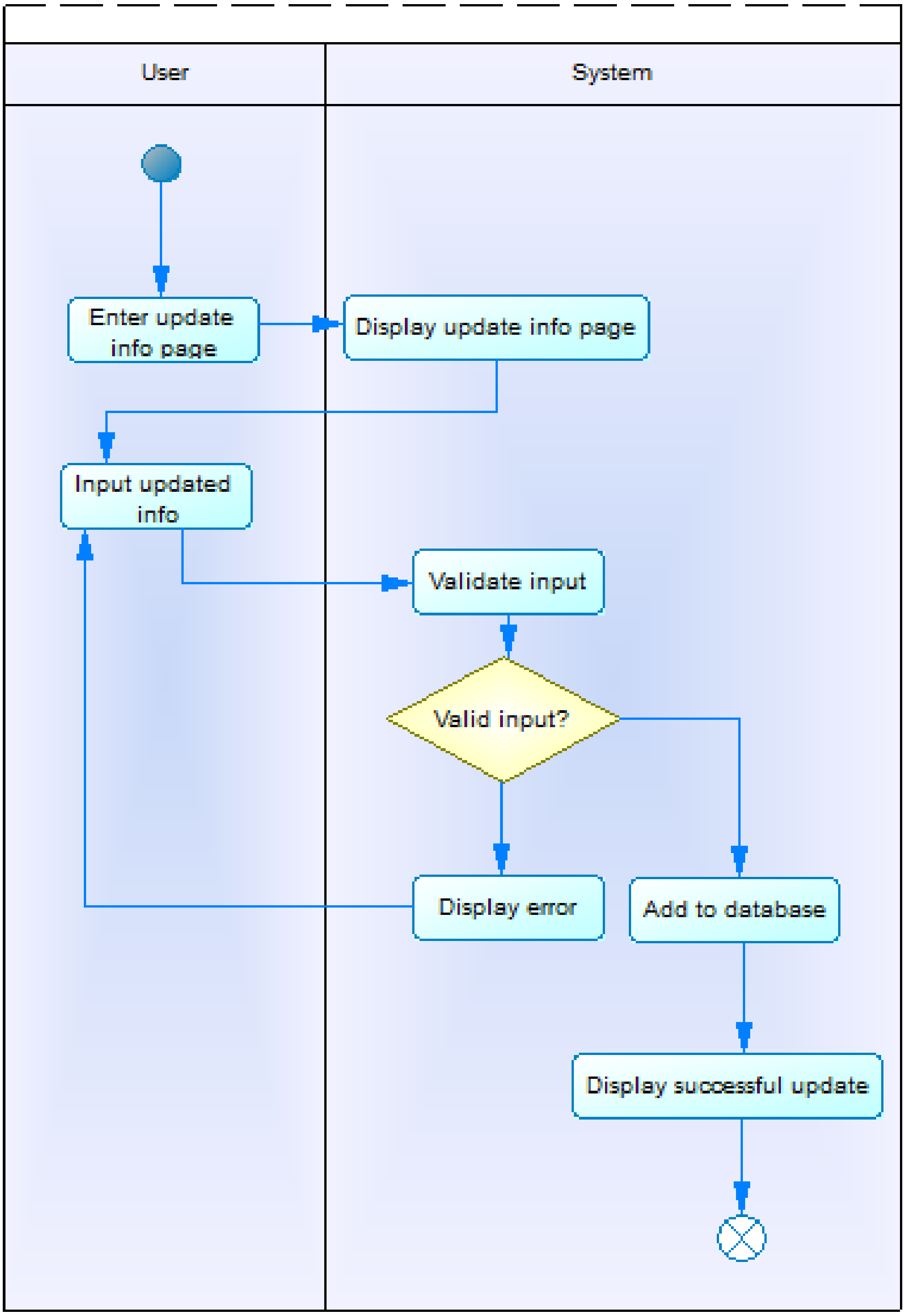
4.4. Apply Job


Apply Job
User
:UI
Apply Job Class
:Database
Send Job Application
Transfer job application
Create Query
Store data
Inform Result
Return result
Display Sucess

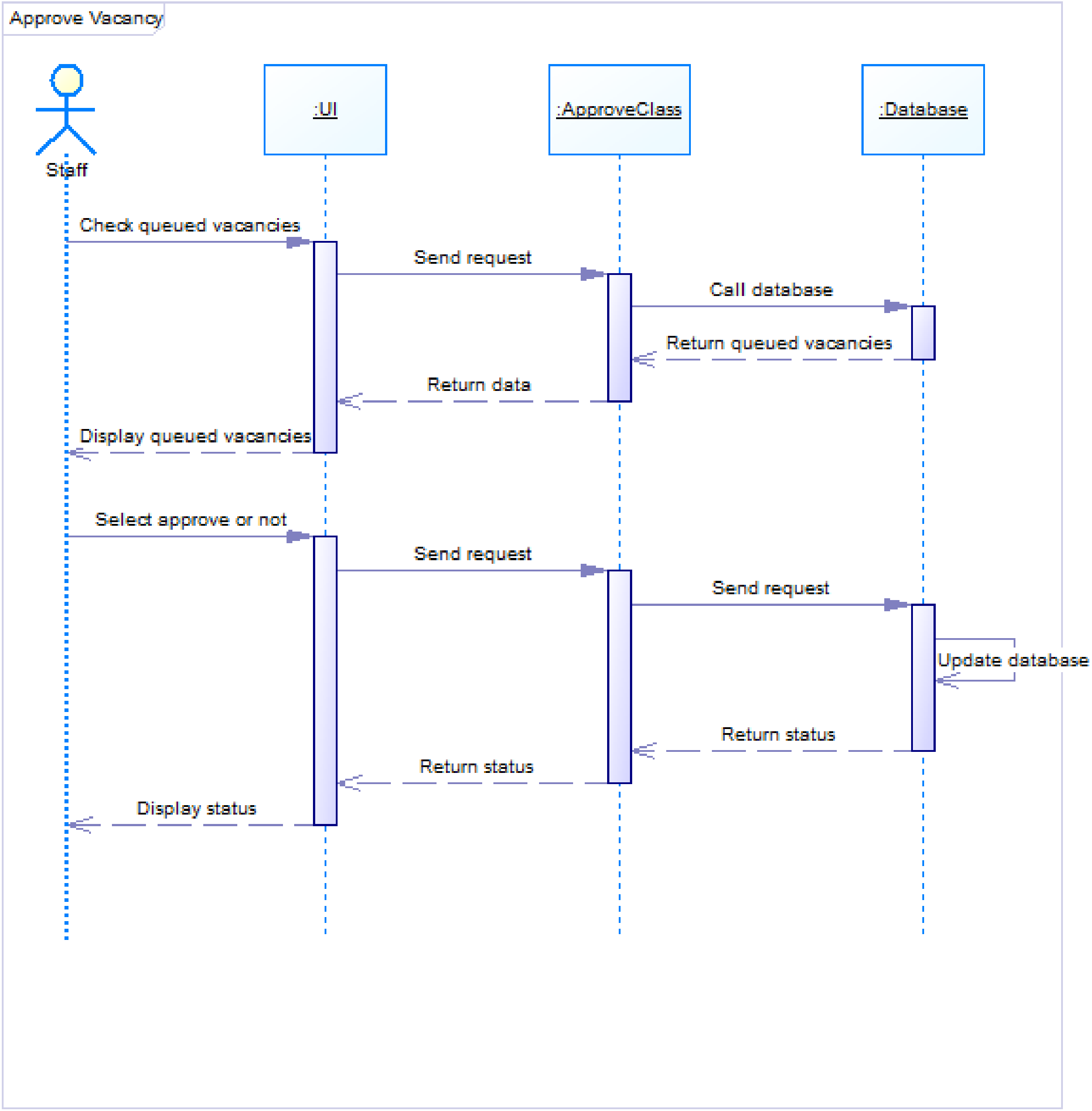

User
System
Send job application
Store application
Inform result

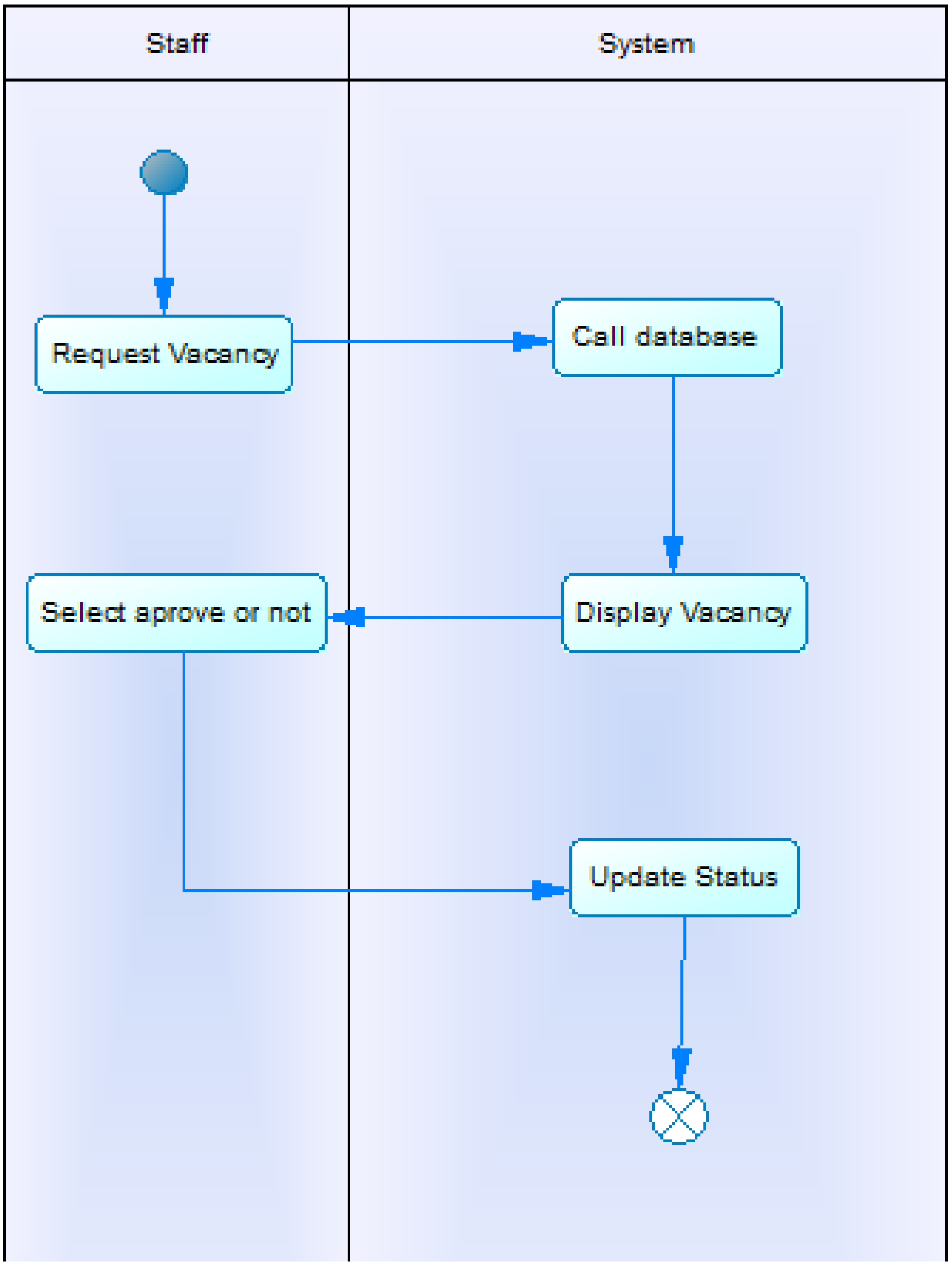
4.5. Update Information



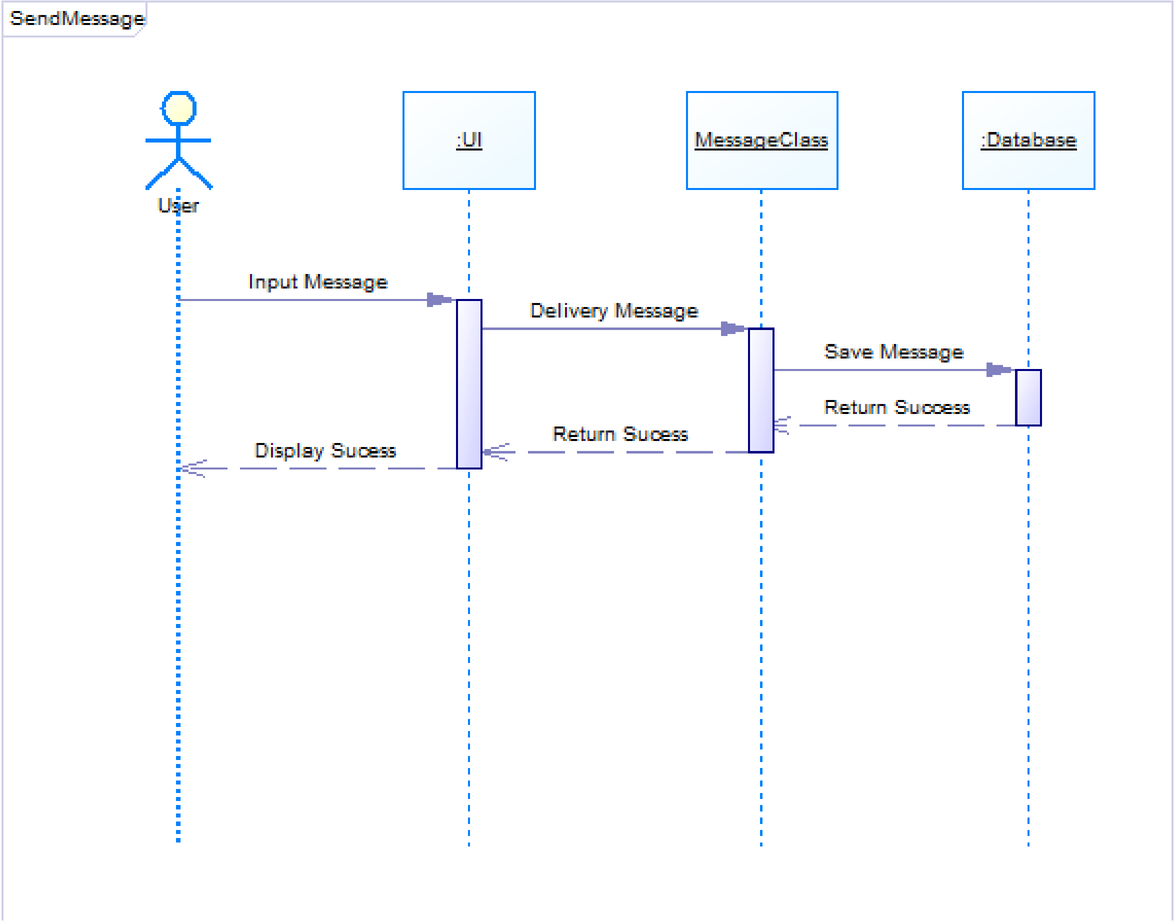

User
System
Enter update info page
Display update info page
Input updated info
Validate input
Valid input?
Display error
Add to database
Display successful update

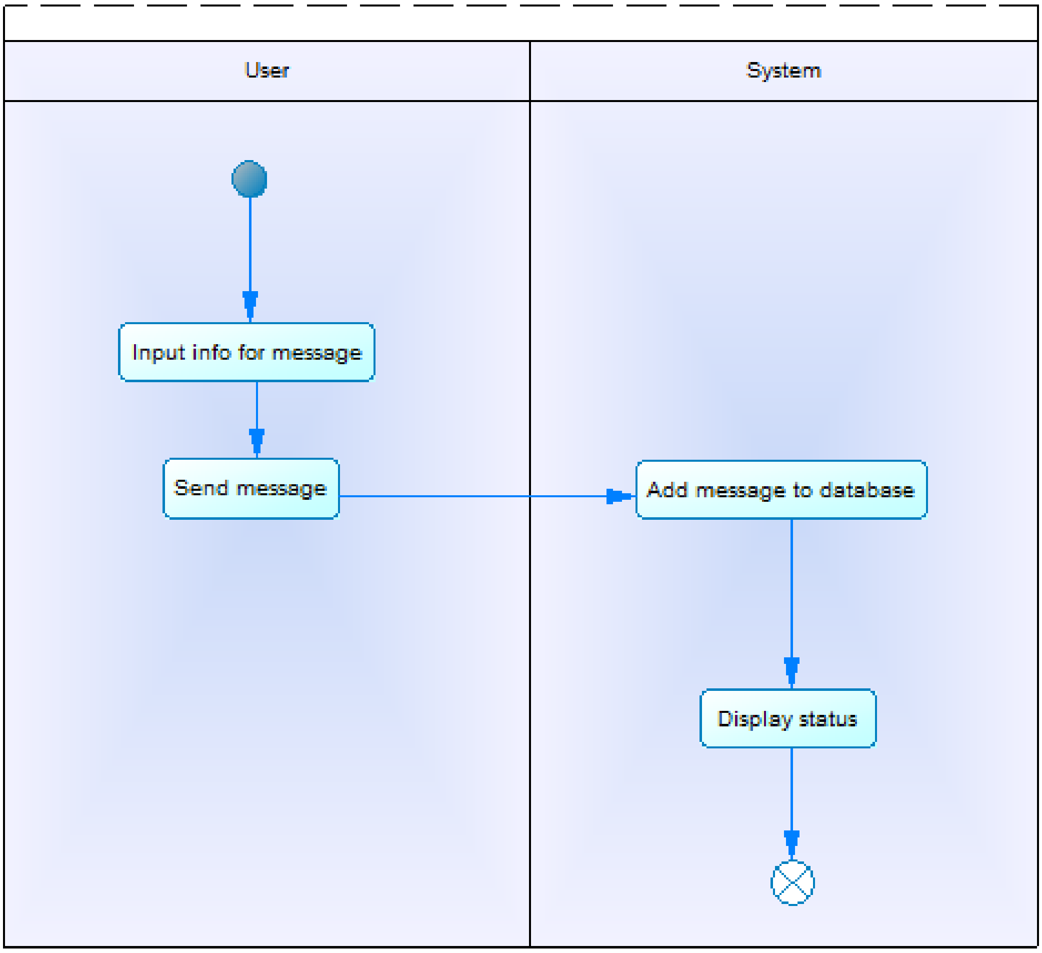
4.6. Approve Vacancy



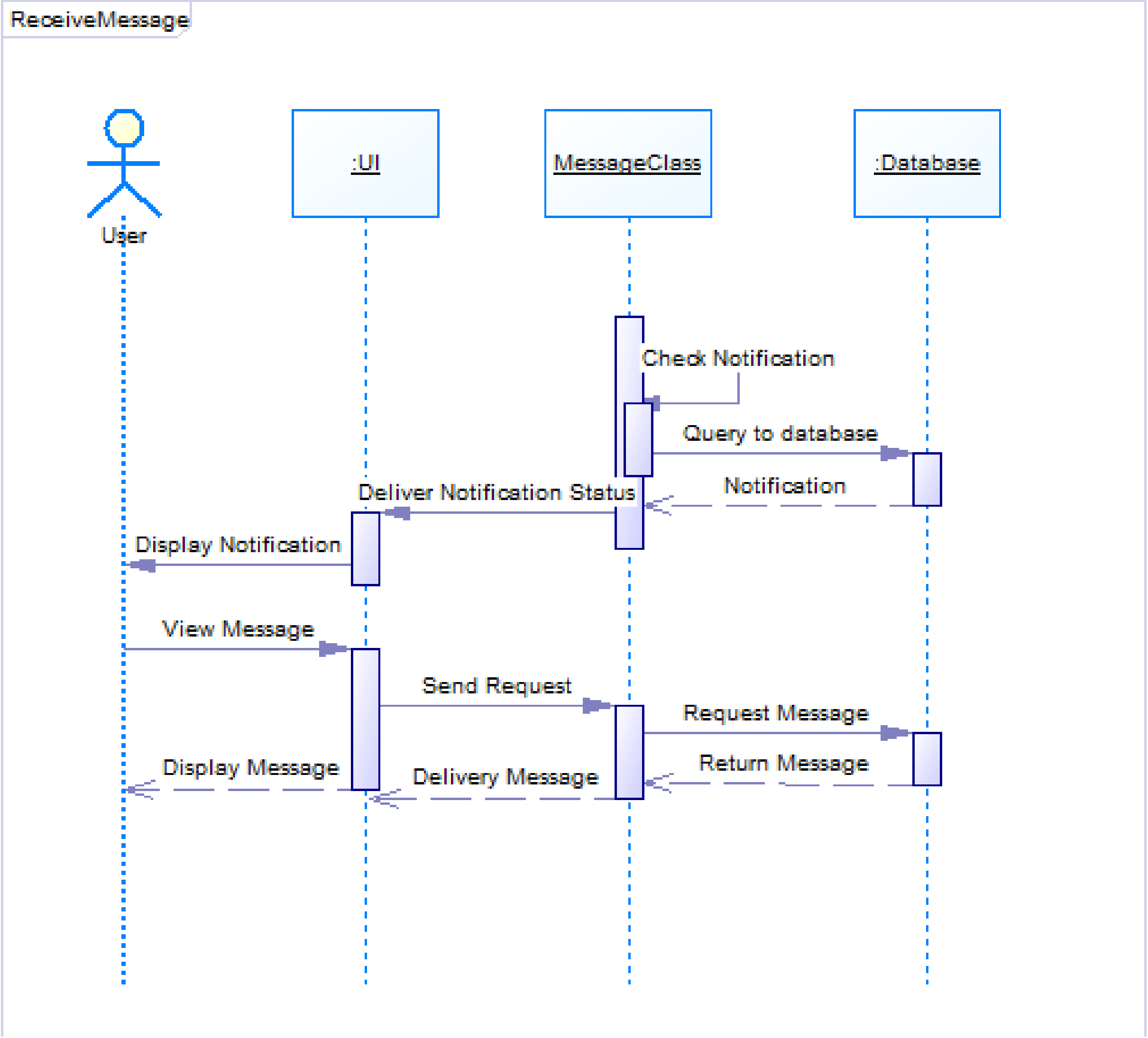

Staff
System
Request Vacancy
Call database
Select aprove or not
Display Vacancy
Update Status

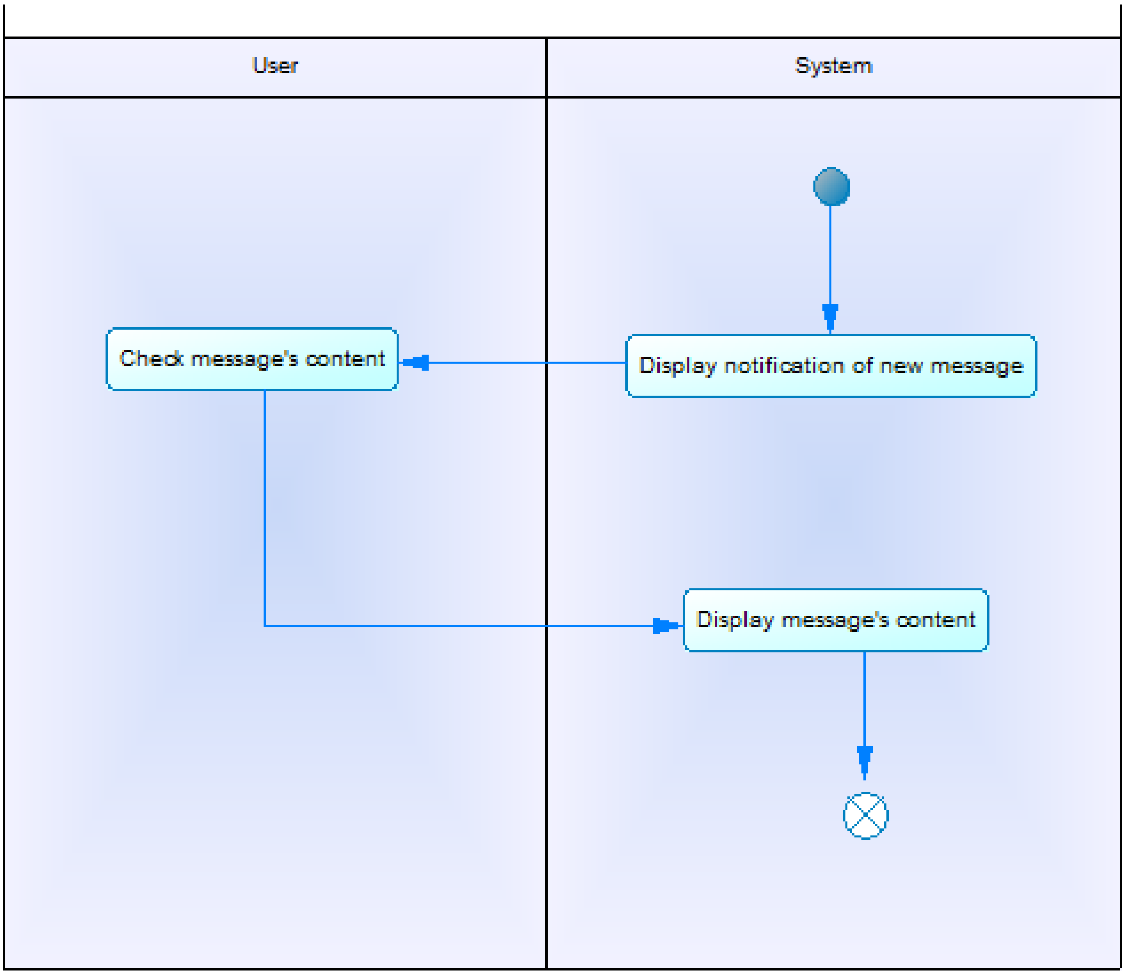
4.7. Send Message




User
System
Input info for message
Send message
Add message to database
Display status

4.8. Receive Message




User
System
Check message's content
Display notification of new message
Display message's content

V. Risk Management

	Probability of Occurrence	Loss Size (Days)	Risk Exposure (Days)
Insufficient QA time to validate on all browsers and OS types.	45%	6	2.7
Lack of verifiable sample data may affect the ability of the primary external stakeholder to validate end product.	35%	18	6.3
Inadequate staff available from external stakeholders until very late in cycle.	25%	7	1.8
Following end-user testing, more effort on the user guide may be necessary.	25%	18	4.5
Backup and restore requires 3rd-party solutions (not evaluated yet).	20%	12	2.4
Insufficient time for external stakeholders to submit feedback on layout and composition of reports.	10%	5	0.5

VI. References

https://www.smartdraw.com/uml-diagram/

https://youtu.be/EkjaiDsiM-Q (QT C++ GUI Tutorial for Beginners)

https://youtu.be/_u7TcjIDNzw (Qt5 C++ Connecting Qt Application to MySQL Database #28)

VII. Github Link

https://github.com/hoanglam3232/SE-Employment-Agency

In dev branch.