



มหาวิทยาลัยมหิดล
Mahidol University
Wisdom of the Land

Project Phase-0

Job Center System

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Project Description

In the field of software development, it is crucial to comprehend end-user requirements. This project aims to simulate the software development process, with applicants and recruitment sections as its primary actors. This platform will facilitate communication between key stakeholders, enhancing both parties' recruitment processes. In this phase, we will emphasize requirement elicitation. The outcome will be a list of requirement statements.

The term "applicants" refers to individuals visiting the platform for employment opportunities. These individuals are the system's end users. They rely on it to find employment opportunities that match their qualifications, preferences, and career goals. The other side consists of recruitment units. These entities are businesses and organizations that are actively recruiting new employees. For them, the platform is a valuable resource for attracting, evaluating, and ultimately employing qualified candidates for open positions. The project aims to expedite the recruitment process for these units, enabling them to manage job postings and candidate interactions better. The project focuses on bridging the divide between employment applicants and recruiting units. The platform's primary purpose is to facilitate matching qualified candidates with employment openings, emphasizing user-centric design and effective functionality.

We divide the requirement into nine parts. These are registration, job announcement, the main requirement, homepage (job recommendation and search included), job application, job interview, payment, admin, and support system (Chatbot included).

The initiative integrates with multiple external systems to improve the platform's functionality. The first one is the Microsoft Azure OCR Service. Microsoft Azure's cloud-based OCR (optical character recognition) service is crucial to expediting the registration procedure. It allows users to rapidly scan and extract information from their citizen ID cards, reducing the need for manual data entry and improving user convenience. Second, we have the 2C2P Payment API. The system's integration with the 2C2P payment service provider enables efficient payment processing. It facilitates secure deposit and service fee transactions, ensuring a seamless payment process for applicants and recruitment units.

The third component is the Ministry of the Interior System API. During the user registration, the external API from the Ministry of the Interior (MOI) is used to validate Thai citizenship. This validation is crucial for preserving the integrity of user data and ensuring regulatory compliance. The last one is the Microsoft Azure QnA chatbot. The initiative includes a QnA chatbot service from Microsoft Azure that assists users in Thai and English. This chatbot answers common user questions, enhancing the overall user experience.

To effectively service both "applicants" and "recruitment units," the project includes a comprehensive set of functional and non-functional requirements. These requirements guarantee the system's seamless and secure operation throughout its lifecycle. The integration with external systems, including the Microsoft Azure OCR Service, 2C2P Payment API, Ministry of the Interior System API, and Microsoft Azure QnA chatbot, amplifies the platform's functionality and offers a seamless user experience. These integrations streamline crucial processes such as document verification, payment processing, citizenship validation, and user support, enhancing the overall efficiency and effectiveness of the platform. After that, we will do the context diagram in the next phase.

Requirements Gathering

Registration

Functional requirements

R-F1: The system allows both applicants and recruitment units to register by using a citizen ID number.

R-F2: The system allows users to choose either to put in citizen ID card information manually or by using the OCR (Optical Character Recognition)¹ system from Microsoft Azure (take and upload a picture of the ID Card). ****Bonus****

R-F3: The system must be able to validate citizen ID numbers by using the external API from the MOI (Ministry of Interior).

R-F4: The system must be able to accept users' input to get users' information for the registration process.

R-F4.1 For applicants, the registration form includes citizen ID number, email, telephone number, password, picture, first name, last name, date of birth, address (house number, street, sub-district, district, province, postal code), education, work experiences (company name, type of work (part-time/ full time), work function (drop-down list), position, start date, end date, addition description), type of interested work (part-time/ full time), and function of interested work.

R-F4.2 For recruitment units, the registration form includes citizen ID number, company name, company address (house number, street, sub-district, district, province, postal code), company registration number, industry, email address, telephone number, and website.

R-F5: The system must be able to validate user input to match the correct format. E.g. Citizen ID number is composed of 13 digits, etc.

R-F6: The system verifies a newly created account via email or OTP.

R-F7: After the registration, the system allows users to log in using their email or telephone number (The system can check whether the input is an email or a telephone number) and password.

R-F8: After the registration, the system can allow users to modify/edit and suspend their account.

R-F9: If the users want to suspend their account, the system sends a verification code via email or mobile phone.

¹ OCR (Optical Character Recognition)

<https://learn.microsoft.com/en-us/azure/ai-services/computer-vision/overview-ocr>

Non-functional requirements
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Job Announcement

Functional requirements
<p>JA-F1: The system allows recruitment units to create job announcement posts. A job announcement post consists of type of work (part-time/full-time), work function (drop-down list), position, location, age range, number of acceptances, starting salary, work experience (e.g. 3 years), degree requirements (e.g. bachelor of science), and additional description (optional, includes responsibilities and welfare and benefits).</p> <p>JA-F2: During the job announcement posting process, the system must inform recruitment units about the pricing condition (5,000 THB per 1 successful recruitment).</p> <p>JA-F3: The system can record the date that a job announcement post is created.</p> <p>JA-F4: The system allows the recruitment units to modify/edit or delete their job announcement post.</p> <p>JA-F5: The system can record the number of views (clicks) that a job announcement post has.</p> <p>JA-F6: The system can show the live number of views that a job announcement post has to the post creator when the post creator clicks on the post.</p>
Non-functional requirements
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Homepage, Job Recommendation & Search

Functional requirements

H-F1: After a job announcement post has been created, the system can show the posts to applicants related to the job description based on their profile on their home page (give job recommendations).

H-F2: The system allows applicants to search for a job (job announcement post) via the search box.

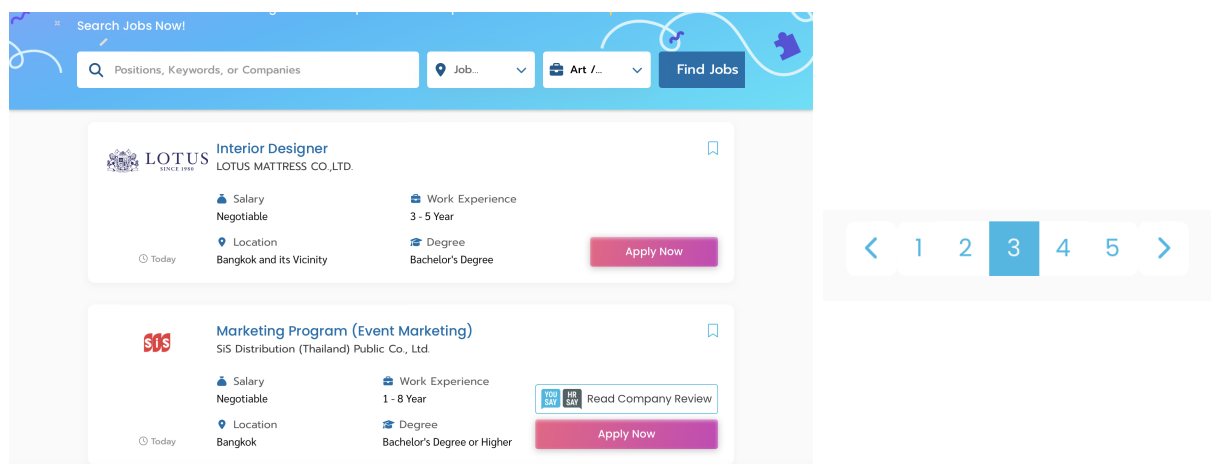
H-F3: The search system must support criteria search. The search system can return the result from one or more criteria that the applicants input.



H-F4: The search system can support up to 3 criteria which are text-based input (keywords such as positions, companies, work functions, etc.), location (drop-down list of provinces in Thailand), and type of work (drop-down list).

H-F5: If the applicants do not put in any information in the search box, the system returns all the results related to the applicants' profiles.

H-F6: The search result and home page are **displayed in a list of cards²** showing some key information. Applicants can also navigate through pages of posts (click on next page, previous page, or select a page number).



² Cards in HTML and CSS: https://www.w3schools.com/w3css/w3css_cards.asp

H-F7: Cards also contain an “add to bookmarks” button which applicants can click to add the jobs to a list that they can view later.

H-F8: Applicants can click on the card to view the full post and its additional details.

Non-functional requirements

H-NF1: The text-based input (search box) is not case-sensitive and allows up to a maximum of 100 characters.

H-NF2: The system displays a maximum of 30 cards per page.

H-NF3: Applicants can add up to a maximum of 20 jobs to their bookmarks.

Job Application

Functional requirements

JA-F1: If the applicants are interested in job announcements, they can click on the apply button. The system will send their profile to the recruitment unit automatically.

JA-F2: For the recruitment units, the applicants’ profiles are shown as picture (from ID card), first name, last name, date of birth, education, work experiences (company name, type of work (part-time/full time), work function, position, start date, end date, addition description), and type of interesting work.

JA-F3: The system allows applicants to submit their CV or résumé if they would like to.

JA-F4: The applicants can apply for many interesting jobs.

JA-F5: After the recruitment unit receives the applicants’ profiles, they can click to reject or accept each applicant.

JA-F6: If the recruitment unit accepts an applicant, the system will ask the recruitment unit about the date and time slots for the job interview.

JA-F7: The system sends an email to respond to the applicants, which results in the decision of the recruitment unit. If the recruitment unit accepts the applicant, this email also gives details for the interview.

JA-F8: The email for accepting the applicant contains details about the date, the interview time slot given by the recruitment unit for the applicant to choose from, and optional details from the recruitment unit. The applicants can choose the date and time that they prefer.

Non-functional requirements

JA-N1: The recruitment unit must choose a date and time for interviewing at least 1 option.

JA-N2: The CV or résumé must be in PDF format and the file size limit is 100 MB.

Job interview

Functional requirements

JI-F1: After both the recruitment unit and the applicant have agreed on an interview appointment, they must receive a friendly reminder notification 3 days and 1 hour before the meeting on both the website and via email. The notification contains the company name, the recruitment name, the interview date, the interview description, and a link to the interview website.

JI-F2: The system must provide a calendar menu for applicants to view all their interview appointments, displaying the interview date, company name, company logo, recruitment name, and interview description (optional).

JI-F3: The system must provide an online meeting service for job interviews.

JI-F4: The applicant and recruitment units are allowed to cancel the interview meeting at least 24 hours prior to the appointment.

JI-F5: Recruitment units and applicants receive an email confirming the interview appointment with the company name, the recruitment name, the interview date, the interview description, and a link to the job recruitment.

JI-F6: The meeting service provides a system check (check system requirements, microphone, and camera).

JI-F7: The system should notify both recruitment units and applicants that the video is going to be recorded before joining the meeting and force recruitment units and applicants to click accept policy.

JI-F8: During the interview, recruiters and applicants can turn off or turn on their microphones and cameras.

JI-F9: During the interview, recruitment and applicants can adjust the speaker volume and set the sound devices.

JI-F10: During the interview, recruitment and applicants are allowed to share their screens.

JI-F11: During the interview, recruitment and applicants can text each other in the chat box but cannot send an external link or contact.

JI-F12: At the end of the interview, the system displays the text “Your interview is completed. The result will be sent to you within 7 days.” on the applicant’s screen and the close button.

JI-F13: At the end of the interview for recruitment units, the system displays the interviewee’s information, recorded video, expired date, accept button, and decline button. If there is no response within 7 days, the system will assume that the recruitment unit has declined the interviewee.

JI-F14: If the recruitment unit clicks on the decline button, they may write the feedback to the interviewee in a maximum of 500 characters (optional).

JI-F15: Recruitment units and applicants receive notification of interview results.

JI-F16: The applicant should respond to the positive interview result within 7 days to decide if they want to apply for the job in advance or not. If there is no response within 7 days, the system will assume that the applicant has declined the job.

Non-functional requirements

JI-N1: Interview sessions are recorded with 1080p video quality.

JI-N2: Interview sessions cannot last more than 3 hours (180 minutes).

Payment

Functional requirements

P-F1: After both the recruitment unit and the applicant have agreed on an interview appointment, the system initiates the payment process for a deposit payment (250 Baht for the applicant, 2500 Baht for the recruitment unit).

P-F2: If the applicant is accepted after the interview, the system must initiate the payment process to charge the rest of the service fee. (another 250 Baht for the applicants, 2,500 Baht for the recruitment units).

P-F3: The system can also make refunds for the applicant and recruitment unit in case the applicant is not accepted.

P-F4: Payment processing should handle both successful and failed transactions without data loss or discrepancies.

P-F5: The system must make applicants and recruitment units pay via credit card.

P-F6: The system must integrate with an external API from 2C2P to process credit card payments.

P-F7: The system must generate clear and concise payment confirmation notifications for both applicants and recruitment units once the payment is successful. In case of payment failures, informative and user-friendly error messages should guide users in resolving issues.

P-F8: The system must have robust monitoring tools in place to track the performance, availability, and security of the payment process.

P-F9: Detailed logs and reports must be generated for payment transactions and interactions with external systems for auditing and troubleshooting purposes.

Non-functional requirements

P-N1: The system must handle around 10,000 transactions per day. (Both success and fail cases) and 1,000 concurrent transactions.

P-N2: The system should ensure high availability to prevent disruptions in payment processing and communication between applicants and recruitment units.

P-N3: The system must have a robust failover mechanism to minimize downtime in case of server failures or other technical issues.

P-N4: The system must ensure the utmost security and confidentiality of citizen ID numbers, personal data, and payment information.

P-N5: The system must occur within an acceptable timeframe to maintain a seamless user experience.

P-N6: The system's response time for citizen ID validation and payment processing must meet predefined performance benchmarks.

P-N7: The system must adhere to all relevant legal and regulatory standards for payment processing and data privacy.

P-N8: Coordination with external organizations, such as the Ministry of Interior and the bank, should comply with established guidelines and regulations.

P-N9: The payment process must be intuitive and user-friendly for both applicants and recruitment units.

Admin

Functional requirements

A-F1: The admin must have the ability to suspend user accounts, including applicants and recruitment units.

A-F2: The admin must be able to view and validate user-submitted information.

A-F3: The admin must have the capability to suspend job announcement posts.

A-F4: The admin must be able to view the number of views/clicks on each job announcement post.

A-F5: The admin must be able to log in using their credentials to access administrative functions.
(secure login process):

A-F6: The admin must be able to see the creation date of job announcement posts.

A-F7: The admin must be able to see the real-time number of views on job announcement posts.

A-F8: The admin must have the ability to back up important data and perform maintenance tasks.

A-F9: The admin must have access to various statistical data, including registered user counts, successful recruitments, failure recruitments, user engagement metrics, demographic insights, transactions, and usage trends.

A-F10: The admin must be able to collect the statistical data and other information from the application to keep in the company's data storage.

A-F11: The admin is able to add and create a new admin account to the system.

Non-functional requirements

A-N1: The statistical data should only be accessible to authorized admins to ensure data privacy.

A-N2: The admin interface should be user-friendly and accessible for efficient management of the website.

A-N3: The statistical data should be presented in a clear and organized manner within the admin dashboard for easy interpretation.

A-N4: The admin dashboard should load quickly, especially when displaying real-time data like post views.

A-N5: The admin dashboard should efficiently display the statistical data without significant delays.

A-N6: The admin system should be able to handle a growing number of users, posts, and interactions.

ChatBot and support system

Functional requirements
<p>C-F1: The system must integrate a QnA chatbot into a system from Microsoft Azure³.</p> <p>C-F2: Users can text the chatbot to ask for help in general questions and problems at all times.</p> <p>C-F3: The chatbot must support both Thai and English language. It can also detect the input language automatically.</p> <p>C-F4: From 9.00 to 17.00, the systems notify human support teams when the chatbot receives difficult questions.</p> <p>C-F5: The chat can be switched from bot-generated answers to human support.</p>
Non-functional requirements
<p>C-N1: The chatbot must be trained with a set of 50 common questions in both Thai and English related to the system only. (No job recommendation, consultant).</p>

Main Requirements

Functional requirements
<p>MR-F1: All interactions with external APIs (Ministry of Interior and banks) must be secured using encryption to prevent unauthorized access.</p> <p>MR-F2: The system supports 2 languages (English and Thai). Users can switch between the two languages.</p>
Non-functional requirements
<p>MR-N1: The system must use a secure protocol to send and receive data</p> <p>MR-N2: The system must be available 24/7.</p> <p>MR-N3: The system can receive and send data to the server in less than 6 seconds</p>

³ Microsoft Azure AI Bot service: <https://azure.microsoft.com/en-us/products/ai-services/ai-bot-service>

MR-N4: The UI and text are big, simple, and easy to use for all people. The text size is around 18-60 px.

MR-N5: The UI's main colors are yellow and orange.

MR-N6: The system must be designed with modularity and maintainability in mind, making it easier to implement updates, bug fixes, and improvements.

MR-N7: Adequate technical support and maintenance processes should be established to promptly address any issues that arise, including payment-related errors.

MR-N8: The system should be designed to accommodate an increasing growth of statistical data over time

MR-N9: The statistical data should be backed up regularly to prevent data loss.

MR-N10: The system must be optimized to efficiently utilize hardware resources, ensuring optimal performance and cost-effectiveness.

MR-N11: The system must handle at least 10,000 users per day and 1,000 concurrent users.

Actors

<u>Actor</u>	<u>Description</u>
Applicant	Users who register into the system to use it as a platform to find a job.
Recruitment unit	Users who register into the system to use it as a platform to recruit employees.
Admin	Admins are the main operators of this system. They manage the system to make sure that everything works as usual. They also verify information on the system (announcement posts, user info.) and have the power to suspend any content that violates the system regulations.
Human support	Human staff who work during the day (from 9.00 to 17.00) to handle difficult questions from the users that the chatbot cannot answer.
MOI system API	The external API from the Ministry of Interior (MOI) that the system connects with is used as a tool for Thai citizenship verification during the user registration process.
Microsoft Azure OCR service	The external OCR service deployed by the cloud service Microsoft Azure. The system integrates this service to scan and extract citizen ID card information during the registration process.
2C2P payment API	The external API from 2C2P payment service provider. The payment process of our system uses this API to make payments via card.
Microsoft Azure QnA Chatbot	The external chatbot service deployed by the cloud service Microsoft Azure. The system makes use of this service to help facilitate users' experiences on the website and help ease the work of human support by answering common questions from the users.