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Web-Based System for Job Recruitment using WISDM

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Abstract: The COVID-19 pandemic has changed people's lives and working styles. Due to the government's movement control order (MCO), which restricted people's movements, technology has become a necessity for communication and commerce. Many jobs were created for ad-hoc purposes, especially in restaurants and delivery services. Ad-hoc jobs mean job vacancies for temporary and minimal qualification requirements. Since employers are looking for faster hiring, job advertisements need technology for faster response time and served as a communication media. Therefore, a web-based system for job recruitment was developed, known as EZJob, using Web-based Information System Development Methodology (WISDM). This system helps to minimize the response time, which benefits both employers and job seekers and it can be accessed via the Internet.

Keywords: ad-hoc job, job recruitment, web-based, WISDM, technology

1 Introduction

The world has been hit by the COVID-19 pandemic which resulted in the closing down of many companies and, due to that, many people have lost their jobs. Movement Control Order (MCO) had been issued in many countries to restrict people's movements and to prevent the increase in COVID-19 cases. The use of computers and Internet technology has risen drastically during this period. Companies must adapt to the new working style where technology is no longer a luxury but a necessity. Suddenly, the use of the Internet has risen drastically, and it is widely used by people from different walks of life to help them survive during this pandemic era. All the communications, workings, shopping, delivery services, and restaurant services, to name a few, are relying on computer and Internet technology to survive. Employers have been posting online job recruitments while job seekers likewise are using online platforms to look for job vacancies [1]. No doubt, the Internet seems to provide an advantage as a search and match platform for those who are in need. Job seekers can search for job vacancies faster and over a wide geographical area. This also enables them to screen for vacancies that meet their certain characteristics [2]. Some job seekers are looking for ad-hoc jobs that hire on a temporary basis with minimal requirements on consolidated pay. Employers are also looking for fast hiring to meet the arising customer demands. Online job recruitment has become the standard method for achieving respective goals for both employers and job seekers.

Traditionally, the advertisements of temporary part-time jobs were done by using flyers or even by posting them on walls or bulletin boards. This method somehow is no longer appropriate especially during the MCO period. It has got to be replaced by technology and the Internet. Online job search is one of the most effective methods which can be viewed and reached by much larger audiences. Electronic communications are expected to grow 15.9% annually through 2018, and printing only grows 2.8% annually [3], therefore, there was an increased number of people using the Internet to look for jobs.

This online recruitment method will reach larger target audiences and employers, therefore, can get better candidates to fulfill their job vacancies. The number of job applicants responding to online advertisements was more than 2.5 times compared to applicants responding to printed advertisements [4].

The main objective of this paper is to describe the development of a web-based system called EZJob for advertising job recruitments for ad-hoc or temporary jobs by employers and also by job seekers. The development method used for this web-based system is called Web-Based Information System Development Methodology (WISDM).

2 Related Works

After graduating from university or college, graduates will normally proceed with job hunting activities either to look for a permanent or temporary job [5]. They will search for job vacancies either through traditional or online methods. The traditional method requires job seekers to spend their time looking for jobs by scrutinizing through newspaper advertisements and advertisements posted on walls or bulletin boards, then making personal contacts with potential employers, making phone calls to companies, or contacting employment agencies [5]. This traditional method was time-consuming and tiring. Alternatively, with the advancement of computer technology and the availability of the Internet, finding suitable and appropriate jobs has become much easier and faster for job seekers. Both employers and job seekers can achieve their goals in a shorter time [6]. The Internet has the potential to promote information sharing between employers and job seekers while lowering the cost and reducing the response time in looking for a suitable job [7]. One of the main objectives of job search websites is to enable information sharing via Internet among employers and job seekers [1].

A Online jobs

There are many advantages of online job search that can be highlighted. Job seekers rely on the Internet for job information since it is straightforward and time-saving [5]. Those who find a job on the Internet are better prepared and willing to adapt to change, hence, more optimistic towards their jobs compared to traditional job seekers [4]. The Internet provides access to information on job openings in various areas and wider coverage of placements. Moreover, it helps employers update the job openings and requirements more consistently, easily, and faster [8]. Even now, many employers do not only advertise job recruitment online but also conduct online interviews with their potential employees. This will enable them to make faster decisions and the candidates also do not have to wait that long to know the result of their job interviews. What's more, employers can also keep the candidates' profiles organized in a database for future reference. Of course, this will also make the human resource department's jobs easier and more effective [9].

B Web-Based Systems

The web-based system development offers a dynamic environment that can assist employers in easily updating and expanding their job recruitment specifications. It is also accessible on a variety of platforms and is maintained by the host company. This enables the company to reduce maintenance and deployment costs [10] [11]. Moreover, the web-based system is significantly more efficient in processing any tasks that involve numerous data collections and retrievals [10].

C Current job online websites

According to *the balance* website, the ten best job search websites in the year 2022 are *Indeed*, *Monster*, *Glassdoor*, *FlexJobs*, *Ladders*, *AngelList*, *LinkedIn*, *Getwork*, *Scouted,* and *Snagajob*. Each of these websites has its strengths and weaknesses. These top 10 websites were selected among two dozen different job websites considering the number of listings, ease of use, costs, advanced features, industries and experience levels served, and reputation [12].

3 Methodology

There were several common methodologies used in the system development process which included Waterfall, Prototyping, Incremental, and Spiral models. However, these traditional models cannot be used directly and are not really suitable for web-based system development. Web applications have unique characteristics which make them more difficult to develop compared to traditional system development [11]. The Web-based Information System Development Methodology (WISDM) is a new methodology for web-based system development based on the Multiview framework. The Multiview framework relies on an engineering approach and rationality; however, it is not sufficient enough for an information system [12]. Therefore, an improved methodology which includes technological, organizational, social, and human aspects of system development was introduced known as WISDM.

WISDM mainly focused on organizational analysis, information analysis, technical design, Human-Computer Interaction (HCI), and work design as shown in Figure 1 [12].

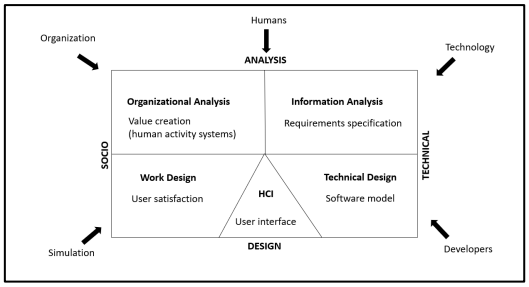

Figure 1: WISDM

i. Organizational Analysis

Organizational Analysis focused on the interest of the stakeholder and users who can access the system from anywhere via the Internet [12]. The organization's information requirements were obtained through interviews with stakeholders and also job seekers as the users. The findings from this phase defined the problem statement, objectives, and scope of the system development. The respondents were selected randomly to gather their needs and requirements in general.

There were 30 respondents selected and the summary of their demographic is shown in Table 1. The majority of the respondents were aged between 18 to 30 years old (70%), of Malaysian nationality (83.3%), and had high school education (50%).

Table 1: Summary of Respondent Demographic

Criteria	Category	Frequency	Percentage (%)
Age	17 years or younger	5	16.7
	18 years – 30 years	21	70
	31 years – 45 years	4	13.3
	46 years and above	0	0
Gender	Male	15	50
	Female	15	50
Nationality	Malaysian	25	83.3
	Indonesian	5	16.7
	Others	0	0
Education	No formal education	2	6.7
	High school or equivalent	15	50
	Diploma	7	23.3
	Bachelor's degree	6	20

Table 2 analyzed the respondents' experience in finding the jobs of their needs. A majority of the respondents found jobs via social media such as Facebook (26.7%) and most of them said it was moderate (50%) and difficult (33.3%) to find jobs currently. A majority of the respondents (80%) preferred a website that they can use to search for job openings.

Table 2: Summary of job-seeking experiences

Criteria	Category	Frequency	Percentage (%)
Experience in job seeking	Yes	15	50
	No	15	50
How do you know about the job openings?	Advertisement or Bulletin Board	7	23.3
	Facebook or any social media platforms	14	46.7
	Recommended by Friends	8	26.7
	Not Sure	1	3.3
Experience in looking for job openings	Easy	5	16.7
	Moderate	15	50
	Difficult	10	33.3
	No experience	0	0
Do you prefer searching for job openings using a website?	Yes	24	80
	No	0	0
	Maybe	6	20

Table 3 summarizes the functional requirements for web-based job recruitment. A majority of the respondents prefer searching by job titles (83.3%) rather than job types. The respondents preferred if there is an application form to be filled out and submitted online (90%). Moreover, they prefer to check the status of their applications by using an identification number or passport number (63.3%).

Table 3: Summary analysis of Functional Requirements for web-based Job recruitment

Criteria		Frequency	Percentage (%)
Searching for job openings	By job title	25	83.3
	By job type	24	80
Online application for job openings	Yes	27	90
	No	0	0
	May be	10	3
Checking the status of the application	By phone number	8	26.7
	By identification number or passport number	19	63.3
	By e-mail address	3	10

ii. Information Analysis

The information analysis phase gathered the requirement specifications for system development. The web developer analyzed, collected specific user requirements, and determined other requirements to be added [13]. In this phase, the information is collected from gathering data, reviewing documents, and researching previous studies done in similar areas. The outcomes include the functional and non-functional requirements which were appropriate for system development. The Unified Modeling Language (UML) use case and sequence diagram were developed to describe the major functionality of the proposed system and main users as shown in Figure 2 and Figure 3.

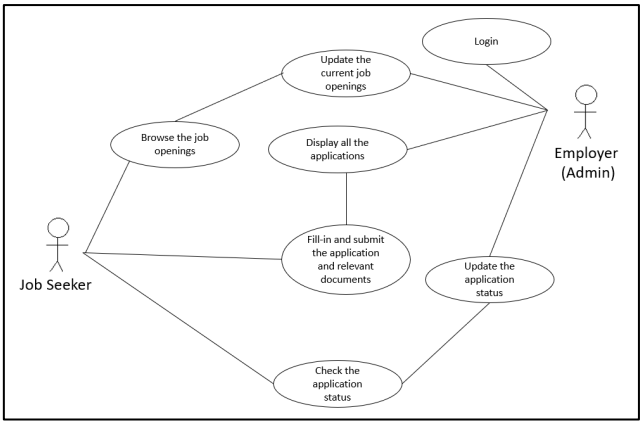

Figure 2: UML use case of EZJob system

Figure 3 is the sequence diagram of EZJob to illustrate how the sequence of the process and the interaction between the objects in the system. It showed the system requirements of the EZJob system.

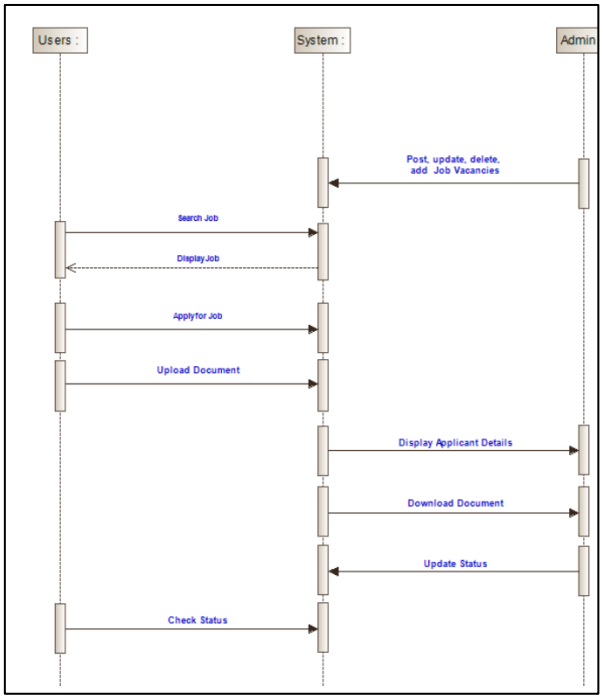

Figure 3: Sequence Diagram of EZJob

iii. Work Design

Work design represents user satisfaction and quality of the system developed. In web information system development, user satisfaction is essential since it allows the web developer to design the website according to the user's needs and requirements. The developed web-based system has got to have the element of usability which means it must be easy to use and user-friendly. The navigation menu must be consistent and remain at the same location to avoid any confusion from users. The interface must be attractive and user-friendly to attract users to keep using the system without any hesitation. The information on the website must be accurate, relevant, and up-to-date. The security and privacy of the information collected must be protected so users feel more secure when using this system. The output from this phase will be the design of the framework and storyboard for the user interface which complies with HCI requirements.

Figure 4 is the EZJob framework which displays the layout of the overview system. The computer server and database were located within the company and can be accessed either through local area network (LAN) or via the Internet with certain accessibility to secure the company's data. Public users can access the system via the Internet.

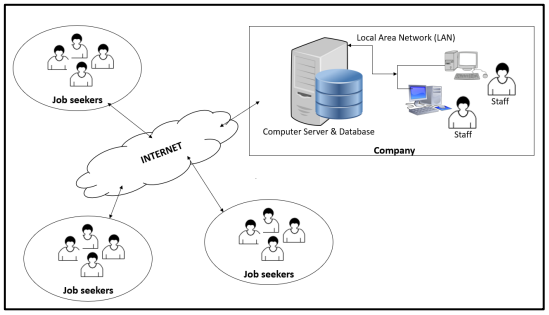

Figure 4: EZJob Framework

Figure 5 shows the storyboard of the EZJob system for job seeker users. There are functions for displaying the list of job openings, and application forms and checking the status of the applications.

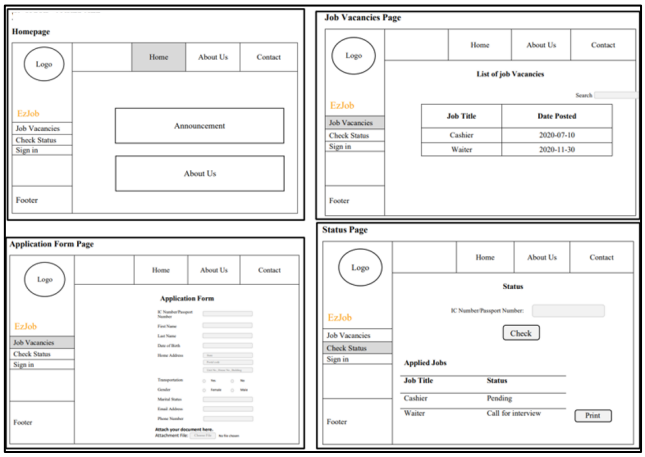

Figure 5: Storyboard of EZJob for job seekers

Figure 6 shows the storyboard of the EZJob system for Admin user. Admin user is the staff of the company who is in charge of job recruitments.

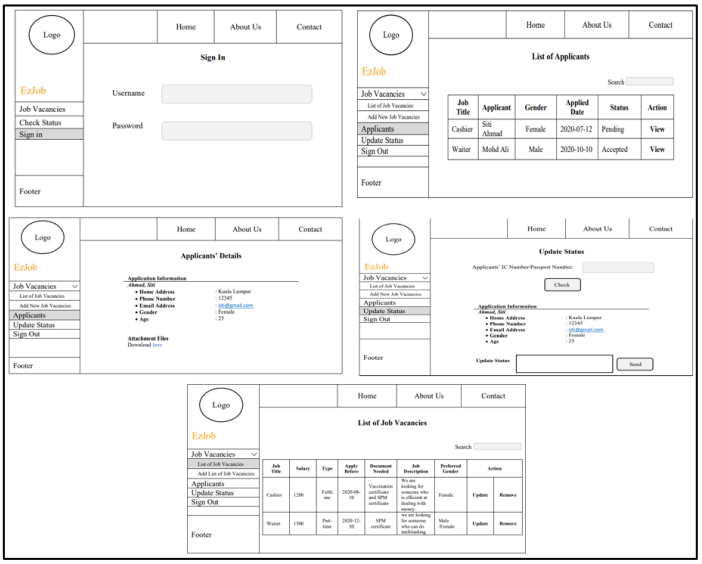

Figure 6: Storyboard of EZJob for Admin user

iv. Technical Design

Technical Design represents the software model where the designing of the screen interface and database took place. There is a variety of programming languages used in developing web-based systems. In EZJob development, Hypertext Preprocessor (PHP), Hypertext Markup Language (HTML), Cascading Style Sheet (CSS), and JavaScript were used. PHP is a general-purpose scripting language that is used specifically in web development. It is a powerful scripting language for developing dynamic and interactive web applications. Moreover, PHP has a faster development cycle which allows developers to work with HTML code and not much programming knowledge [14]. MySQL database server is used to store data in a database so that it can be managed accordingly since it is easy to install, configure and manage [14]. Figure 7 shows the Entity Relationship Diagram (ERD) for EZJob database. It is a conceptual model which consists of tables to store the data collected for the job recruitment process.

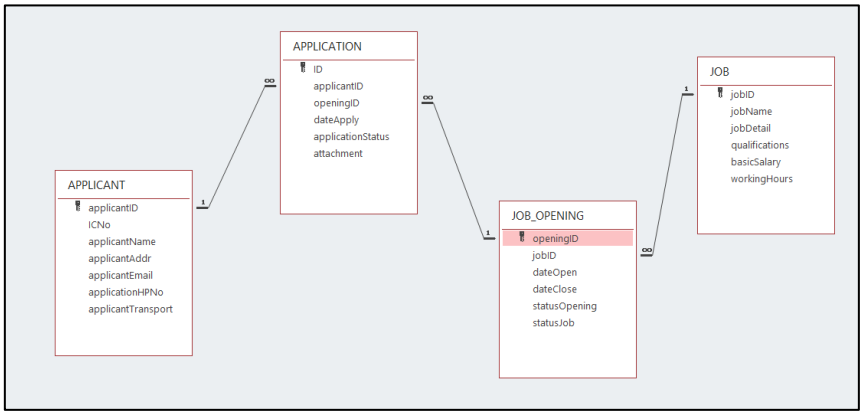

Figure 7: ERD for EZJob database

v. Human-Computer Interaction (HCI)

Human-Computer Interaction (HCI) denotes the interaction with a user interface where the storyboard was designed in the work design phase and also the designing of the screen interface using PHP and MySQL database in the technical design phase. The user interface design process is crucial to the overall development process since it will be more personalized to the user's technical skill, experience, and expectations [13]. Web design follows the design principles which represent the font, color, screen resolution, images, page layout elements, and audio and video displays. All user requirements and expectations included in the work design must comply with the HCI element.

The user testing was conducted to get feedback from users who are the employers or stakeholders and job seekers. This study has chosen Wau Bulan Sdn Bhd company to become our pilot study so it will be able to be tested by specific users. Wau Bulan Sdn Bhd company is a restaurant which looks for temporary workers such as cooks, cleaners, and waiters. Users were selected randomly and asked to use the system. The feedback on how easy and friendly the EZJob system was collected. A majority of them agreed EZJob is easy and friendly to use when they are looking for jobs, submitting applications, and checking the status of their applications. A staff who is in charge of job recruitment at Wau Bulan Company agreed that EZJob has helped him to expedite the process of posting job openings, getting the list of applicants, and updating the status, even though the filtering and selection of suitable applicants were still done manually. However, the processing time has been reduced and helped him organize the data more effectively.

4 Results and Findings

The EZJob system was completed and focused more on job seekers' functions. The employer will be able to see the list of all the applications submitted and update the status of those applications. The filtering and selection of the applicants were still done manually by the person in charge of job recruitment at the company. Figure 8 shows the site map of the company website and EZJob. The site map shows all the functions available in the EZJob. EZJob system will be embedded in the company website.

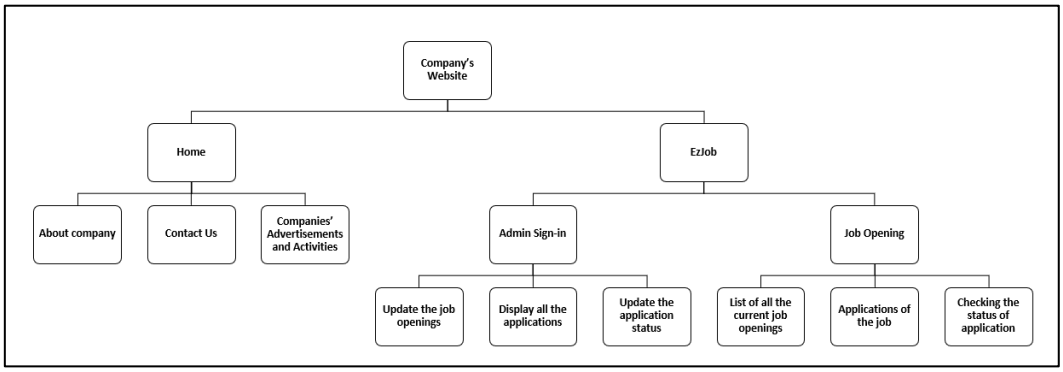

Figure 8: Functions available on the Company Website and EZJob system

Figure 9 is the EZJob system interface for job seeker users. These interfaces are used to display all the job openings posted by the company. If they are interested, they can fill in the application form and attach the documents needed. Once the application is submitted, job seekers can regularly check their application status by entering their identification card number and the status can either be "called for interview", "pending" or "rejected".

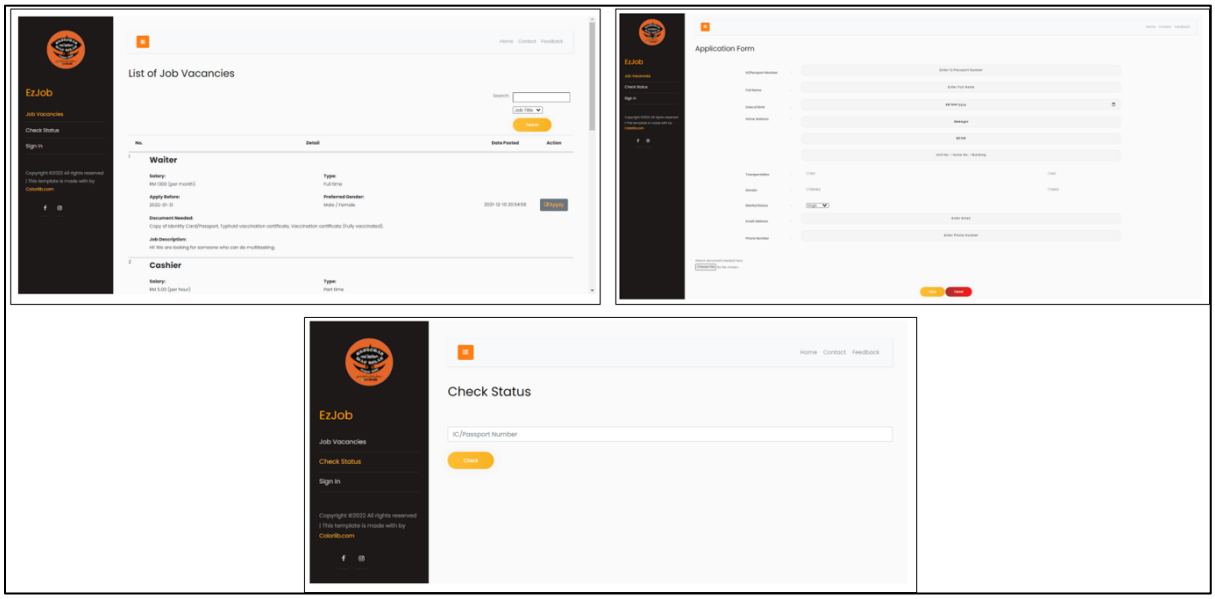

Figure 9: EZJob system for job seekers.

Figure 10 shows the screen interface for staff in charge of the job recruitments in the company. This page can only be accessed by authorized users. There is a login page that will authenticate the users to make sure only valid users can access the pages. The screen interfaces are to display all the applications submitted by the job seekers and download all the necessary documents to be processed. The filtering and selection processes were done manually by the staff in charge. Once the decision is made, the staff will update the status of the applications. The staff will also be able to update and add the job openings.

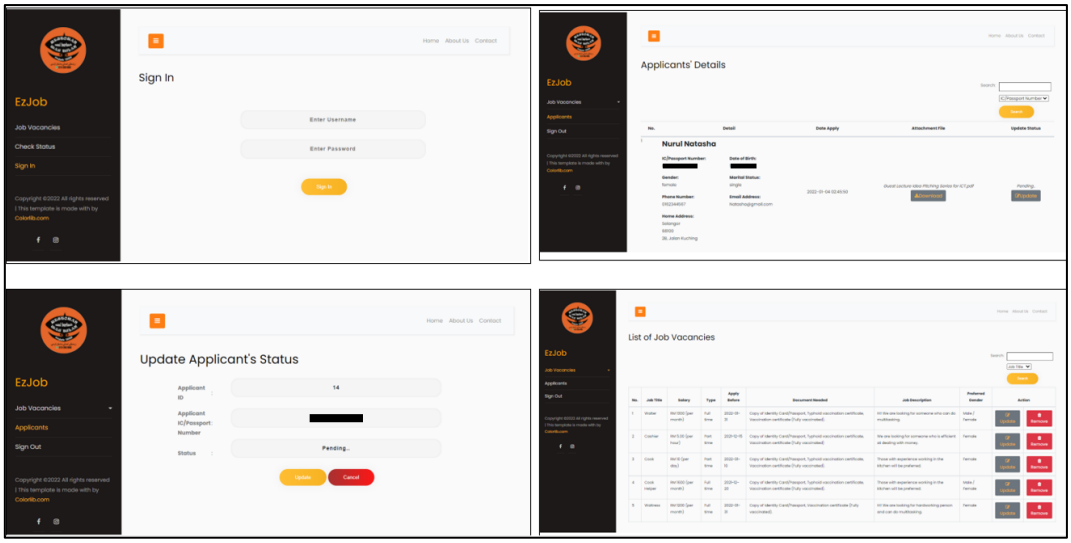

Figure 10: EZJob system for Admin user (Staff in charge of job recruitment).

5 Conclusion

This paper reports the web-based system developed for job recruitments using the WISDM methodology. This system will be used by the company and embedded in their company website for the users to search for any job openings offered by the company. The system developed is mainly used for job seekers to search, apply for the job, and check their application status. The feedback from job seekers gave a very positive response to the system. Therefore, the web-based system developed for the company will increase the number of users visiting the company website and applying for any job openings. However, the EZjob system must be further improved to include functions for employers in handling the recruitment process from job application, selection, and decision in hiring suitable applicants.

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Conflict of Interest Statement

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and declare the absence of conflicting interests with the funders.

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