The online model of the Vocational Guidance Management System (VGMS) for vocational high school

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Abstract. Useful vocational guidance can equip the individual to mediate the uncertain labor market. This study aims to develop a model of the vocational guidance management system (VGMS) based online information system for vocational high school, which also linked to the labor market system. This research developed Borg and Gall’s research and development methodology. Following this method, it has built the online model of VGMSs’ architecture consisting of hardware, software, cloud, network, and database. The result of the online VGMS model was feasible and reliable to the vocational guidance process in vocational high school. This online model can help the school parties, vocational counselors, and vocational students to manage their activities related to career and job problems. And for industry, this online system is also helpful to access vocational high school graduates to be employed. This system needs further development to improve the capacity of an information system for broader career counselee.

1. Introduction

Producing graduates who have academic abilities and specific skills that make them able to: ready to work, entrepreneurship, or continuing to higher education, characterize the Vocational High School (VHS). These specific characteristics of VHS become the reference for serving career guidance that distinguishes them from other education. But in practice, the vocational guidance services is not by following the specific characteristics of VHS. Some problems with vocational guidance are short duration and dissonance to the vocational education program that delivers the transition process between schools and industries [1].

VHS should emphasize developing long-term graduates’ characteristics that they adequate to face uncertainty work and their careers in the future. At secondary school, vocational education provides practical knowledge and skills required specific occupation [2]. Following the VHS task, career advice and guidance has a vital role to play in helping young people to navigate the different needs and pressures driving the decision-making process, raising awareness, and signposting the new occupational opportunities [3].

Proper vocational guidance plays a significant role in preparing VHS students for the workplace. However, because of some problems, it is difficult to get suitable vocational guidance services. The lack of student data inventory, limited access to work information, and partial connectivity of schools and
industries still appeared on vocational guidance service [1]. Also, online career information provided by the government has not optimized into vocational guidance programs.

IT-based vocational guidance services must accompany the current information system trends. Previous studies had examined the validity of the Internet-based system for career planning [4]. The Internet applies to a career management system that would challenge for educators, but students most needed [5]. The use of job information centers is helping the individual to escalate occupational knowledge [6]. Also, the career intervention based on occupational information network was effective in reducing career decision-making difficulties [7]. Other research had developed a labor market information system for VHS, but it had without the vocational guidance integrated [8]. Hence, this research aims to develop an online IT-based management system for vocational guidance services for the students to have employed readiness.

1.1. Information system and technology

Information systems (IS) defines as formal, sociotechnical, organizational systems designed to collect, process, store, and distribute information. Meanwhile, information technology (IT) defines as hardware, software, and telecommunication equipment [9]. The benefits of the new information and technology system can facilitate access to information and work system management.

The utilization of IT-based information systems in managing the educational institutions has four fundamental components that must work together to deliver the information processing functionalities. The four components of an IT-based information system are IT, people, processes, and structure [9]. These essential elements grouped into two subsystems: the technical and the social subsystem. The technical subsystem is comprising IT and processes. Meanwhile, the social subsystem is comprising people and whom in the organizational structure. Figure 1 below describes these essential components.

![Figure 1. Components of IT-based information management system.](image)

To make appropriate decisions in this IT-based information management system, the school parties need to have a solid understanding of each of the four components and how they interact. The structure is a school organization that has a form of a command and coordination line. People are those individuals or groups directly involved in the schools’ system, including internal and external constituents such as the school principals, teachers, students, school staff, industries, and communities. Meanwhile, technology defines as hardware and software devices. And the process is defined as the process of education and vocational guidance in VHS.

IT-based information management relies on an information systems infrastructure consisting of hardware, software, storage, networking, and data centers to support decision-making and processes. The processes can define as the activities school organizations perform to reach vocational guidance goals, including core activities such as teaching and learning. The information systems infrastructure enables processing, storage, and transmission of data that transform inputs and produce outputs and supporting vocational guidance to take place [10].
1.2. Vocational guidance

Vocational guidance has a close relationship to career guidance in terms of concept and practice. Some experts view vocational guidance as part of career guidance. Vocational guidance is defined as a guiding process to attain VHS students’ future careers and helping to face uncertainty about work [1]. Formal vocational guidance services have described being a part of economic development to supplement the division of labor, and the extend industrialization [11].

There are five critical components of vocational guidance designed to help VHS students become job-adjusted, including the following services: individual inventory services, job information services, counseling services, a placement services, a follow-up and evaluation services [12]. The structure of the work skills development on career advice and guidance consists of potential students, the information, vocational counseling, and the decision-making process [3]. The following Figure 2 describes the structure of the vocational guidance model.

![Vocational Guidance Model](image)

**Figure 2.** Services in the vocational guidance program.

Guidance is an activity to provide students with recognition and preparation for vocational careers. To achieve this guidance goal, the counselors use the vast amount of data relating to both individuals and the world of work [12]. Vocational counseling aims to increase student awareness to build practical vocational skills and to form independence in taking and acting on career choice decisions in the future. In that way, the counselor hopes to hold each student accountable for his vocational decisions. Behavioral change is the goal of vocational counseling; evaluation becomes much meaningful, and a self-elaboration can occur [11].

2. Methodology

This research produced the online model to support vocational guidance practice in VHS. This study applied the research and development methodology by Gall, Gall, and Borg. According to this method, there are ten steps as follow: research and information collecting; planning; develop a preliminary form of product; preliminary field testing; primary product revision; main field testing; operational product revision; operational field testing; final product revision; and dissemination and implementation [13]. This article simplified the steps into three main phases design, development, and testing.

At the design phase, we chose the type of IT-based management system to develop. This phase continued the process to the next step by aligning the IT system to the vocational guidance process. The development phase built an architecture system confirming to IT infrastructure. After the infrastructure system is complete, the next step is the validating system. At the testing phase, there was a system assessment by the IT specialist. The expert conducted adjustments to examine the validity and reliability of the system before it is fit to implement field testing.

Then, we conducted the field testing in VHS in North Jakarta involving 56 students. This field test aims to examine whether this online system aligns with the vocational guidance process in VHS or not. There is a list of detailed criteria in table 1 to evaluate the effectiveness of the vocational guidance program [12].
### Table 1. The VGMS assessment criteria.

| Services                  | Indicator/Statement                                      | Quantitative Score | Qualitative Meaning |
|---------------------------|----------------------------------------------------------|--------------------|---------------------|
| Individual analysis service | Primary data, attendance, and identification available | 1 – 3              | Low                 |
|                           | Essential attendance, identification, and achievement information available. Incomplete cumulative records | 4 – 7              | Moderate            |
|                           | Complete, thorough, well used, skillfully interpreted cumulative records | 8 – 10             | High                |
| Information service       | No organized means to provide such services              | 1 – 3              | Low                 |
|                           | Some attempts made to provide such services              | 4 – 7              | Moderate            |
|                           | A comprehensive attempt made to provide these services. Includes occupational, educational, personal, social, orientation information | 8 – 10             | High                |
| Counseling service        | No organized service provided. Need not felt.            | 1 – 3              | Low                 |
|                           | An organized but limited attempt made.                   | 4 – 7              | Moderate            |
|                           | An excellent program is available, with well-trained personnel and a wholesome professional attitude | 8 – 10             | High                |
| Placement services        | No placement service or merely incidental help           | 1 – 3              | Low                 |
|                           | Some responsibility felt—some help given.                | 4 – 7              | Moderate            |
|                           | A well-organized program, with follow-up                 | 8 – 10             | High                |
| Follow-up service         | No follow-up service exists.                             | 1 – 3              | Low                 |
|                           | There is some follow-up work done, and the information thus gained is put to some use. | 4 – 7              | Moderate            |
|                           | All students followed up, and the information gained is used as much as possible. | 8 – 10             | High                |

### 3. Result and discussion

The use of an information system in VHS aimed to gain competitive advantage and to improve educational service for students. Not only this purposes, but it also is useful for collecting the data for policymaking. Based on these objectives, the vocational guidance model developed is called a vocational guidance management system (VGMS). Through this system, data about students and companies can be obtained and well-managed for improving educational services. The following figure 3 is showing the proposed online VGMS scheme.

![Proposed online Vocational Guidance model](image-url)

**Figure 3.** Online model Vocational Guidance Management System (VGMS) scheme.
Based on the developed model in figure 3 above, the terms for VGMS is IT-based service models. Under this model, the VGMS offers the individual data inventory services, guidance and counseling services, occupational information services, and control system. This VGMS provides such easy access and flexible communication in the process of vocational guidance. To achieve this flexibility and agility, VGMS has designed to align with the strategy and processes of vocational guidance. Therefore, VGMS architecture has developed to support the following process in Figure 4.

![Figure 4. Online model VGMS architecture.](image)

Figure 4 above provides an overview of how online model VGMS applications support vocational guidance processes. It shows how hardware (computer/mobile devices), system software, storage (cloud), networking, and database can interact with the form of VGMS infrastructure. Data are essential for both the executing and gaining vocational guidance goals. Individual data inventory of students and labor market information are all type of data that VGMS collect and analyze to turn into beneficial information. Application software helps to automate the vocational guidance process and enables updating of data inventory about students and the labor market system. VGMS uses a database to store data and to make the data accessible where and when needed.

Online VGMS enables to interconnect, allowing internal and external constituents (students, counselors, teachers, and industries) to communicate and collaborate. By using the Internet, VGMS provides a sizeable worldwide collection of networks that use a standard protocol to communicate with each other and to store and process the data. The working process of VGMS describes in the further process of personal data inventory, occupational information, guidance and counseling, follow-up, and evaluation.

### 3.1. Individual data inventory
VGMS serves the form of facts of the individual case history. Figure 5 describes the user interface for students to enter and to fill data form. For a useful individual inventory of the student, there are types of data needed: personal data, physiological and health, psychological data, achievement data, and socio-
economic (parent condition). This verified student can engage and access this VGMS by using computers or mobile devices.

![Figure 5. User interface VGMS for student.](image)

Figure 5. User interface VGMS for student.

Figure 6 describes the user interface for the school parties and counselor. The school parties are responsible for managing and verifying all activities in the VGMS. This process is also the function of the control system. The control system is vital to protect the VGMS from unnecessary activities that can make user applications (students and industries) feel uncomfortable and insecure.

![Figure 6. User interface VGMS for school parties.](image)

Figure 6. User interface VGMS for school parties.

3.2. Occupational information
Useful vocational guidance fully equipped with all forms of occupational information. Figure 7 describes the user interface for industries to engage VGMS and to provide such information. This information would include companies-related information: names and addresses of company, recognition, affiliation, job or apprenticeship offered, admission procedures, and facilities available. The benefit for industries on VGMS is not only that they can promote their business to user application, but also they can get direct feedback for selective prospectus employees as they need.

![Figure 7. User interface VGMS for industries.](image)

Figure 7. User interface VGMS for industries.

3.3. Guidance and counseling
The online VGMS serves a room space for intensive two-way communication between counselor and counselee. The counselors have a crucial role in guaranteeing that the guidance and counseling process
occurs. Both the students and counselors can use the chatting room to send and receive a message from their account. This communication space can facilitate the following guidance process such as schedule students for interviews, the interview setting, preparing for the interview, establishing rapport, identifying and analyzing problems, planning a course of action, and following up the interview. Figure 8 below shows a communication room.

![Communication Room](image)

**Figure 8.** Two-way communication room for guidance and counseling.

### 3.4. Job placement

This VGMS devotes its efforts chiefly to activities job placement and handling data for employment and unemployment of VHS students. This system administered tests at the school, provide job information, and offer helpful suggestions on how to apply for a job.

### 3.5. Follow-up and evaluation

This system held follow-up by investigating, whereas activities, problems, and needs of VHS graduates and their feedback from vocational guidance services accommodate. This process involves collecting and analyzing data used for evaluation. The data offered on VGMS is useful as a source of analyzing and justify the effectiveness of the system.

To measure the effectiveness of the online VGMS is conducted by analyzing the data from questionnaires given to 56 involved students. The following table 2 describes the analysis of the VMGS.

| Services       | Average Score | Qualitative Criteria |
|----------------|---------------|----------------------|
| Individual analysis | 5.2           | Moderate             |
| Information    | 5.3           | Moderate             |
| Counseling     | 5.6           | Moderate             |
| Placement      | 3.5           | Low                  |
| Follow-up      | 4.3           | Relatively moderate  |
| **Average total** | **4.8**       | **Moderate**         |

Table 2 describes that the overall services on VGMS can be assumed to be moderately active. But there is still low in placement service and relatively moderate in follow-up service. It means that some of the services on VGMS run enough but still need improvement for some others. The IT-based system is not solely to be determinant factors for the effectiveness of career intervention. It could determine by a cross-cultural factor, socio-economic, and the validity of the system [4,7]. The further development of the system is needed to examine the other influenced factors.

Although this study was an early development, these findings complement the other work done [4], [8], and relay the promoting IT-based application for other educational activities. Moreover, this VGMS provides online counseling services that most students need to discover suitable occupations by using automate counseling system [14]. These results also reinforce other research that online intervention was useful as a tool for providing counseling services [15]. Therefore, the VGMS has made it easy to access vocational guidance services in VHS.
4. Conclusion

Vocational guidance management system (VGMS) based information system, and technology is a partition of the three parts of processes, data processing of students, school parties and counselor managing process, and occupational information process (industry provide job information and receive verified applicant). This online VGMS model was feasible and reliable to the vocational guidance process in VHS. The guidance and counseling process runs on the online system, which enjoyed as ease of access to vocational guidance services. It is recommended for VHS institutions to implement and to strengthen the existing employment service based on IT. The online model resulted from this research can be implemented by the practitioners as a support system to develop students’ potentials for their careers. This model also still has a vulnerability to be examined by its validity and reliability for the broader user. The improvement of the system is needed for further development to enrich literature in the field of vocational education.

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