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The Development of Indonesian Labour Market Information System (LMIS) for Vocational Schools and Industries

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Abstract. This paper is aim to developing Information system for the labor market which specifically linking vocational schools (SMK) graduates and industries. The methods of this application using Research and Development (R&D) from Borg and Gall conducting in North Sulawesi Province in Indonesia. The result are reliable and acceptable for the graduate students. The Labor Market Information system (LMIS) can help the industries to find a labor/graduates that matched with the company requirement at a real time. SMK may have a benefit by extracting the Information from the application, they can prepare their students for the specific work in the industries. The next development of the application will designed to be available not only for the SMK graduate students.

1. Introduction

Vocational School (SMK) is a High School formal education institutions. This SMK organizes vocational education at secondary level as a continuation of the first secondary School or equivalent. Vocational education is education that prepares students to work in certain occupations, such as engineering, catering and fashion, hospitality, crafts, administration offices, and others [1]. According to what its states on Indonesia Law Number 2 in the Year of 2003, the law it is about Indonesia education law that concerning the national education system mentioning about how the education intended to preparing student to work based on the what he/she mastered for. It also had the similarity with the regulation that created by the government of Indonesia that support the meaning of the vocational education.

The government, in this case, realize the importance of development of SMK, with some research conducted in 2006 on the benefits of SMK than SMA (general senior high school) provides conclusions for the government to take a decision long-term plan to make the ratio of Vocational higher compared with the SMA to a ratio of 70% SMK and 30% SMA [2].

The results of the education and training that are specific for macro human capital is to create a student who has a skilled needed by the world of work/Industries. DPSMK (Indonesian Directorate of TVE) conducted a research, by using quantitative methods to correlate the proportion of students of



SMK:SMA with RGDP (Real GDP) and economic growth rate. The primary data from BPS and PSP (center for education statistics) from 2006 to 2010, the result showed that there is a positive correlation between the ratio of SMK students and the RGDP. The result showed that almost in every province, conclude that the higher the SMK student ratio the higher the RGDP ratio.

Indonesia is an archipelago, SMK spread across all provinces in Indonesia as well as with industries. Geography condition is one of the factor that vocational graduates cannot get jobs in different areas, lack of information makes the Industries with different areas cannot be mutually beneficial with SMK (see table 1).

Table 1. Industries percentage distribution.

No	Island	Percentage
1	Java	75
2	Sumatera	17
3	Kalimantan	3.41
4	Sulawesi	2.6
5	Bali, NTT,NTB	2.6
6	Papua, Maluku	0.27

(Sources: Ministry of trade and industry Indonesia)

The government has made an initiative to establish a LMIS for job Seeker to find a job. But Indonesia's LMIS currently lacks a labor market signalling framework, which can provide detailed analysis of fluctuations in labor market supply and demand. In the LMIS it is very important that there is a signal or flexibility of labor Market Information with the attribute of information is maintained the originality [3]. Signals of this information are very important to provide guidance to prospective workers who will take the decision to apply for a job in accordance with the capabilities. In Indonesia LMIS problems sometimes do not provide the information to the Job seeker, the data held is not volatile and flexible. The ability of LMIS in Indonesia is still very questionable because many major features can not be used, and some information can not be analyzed completely.

2. Literature Review

The literature review will based on the perspective of the expert and researcher on how to define the LMIS concept with the mutual advantages for vocational education and industries, this review is very important to develop a framework of the concept. The literature is divided into vocational education and Labour Market Information System review.

2.1 Vocational education

Vocational education is one part of the national education system in Indonesia that purposes to help the student to develop professional attitude and able to compete in mastering skilled to entering the industries (world of work). Today economy has little room for those who cannot solve problems using technology, manage resource, work in team and continue to learn on the job. SMK also part of education system that preparing individual to work on specific job. Vocational education has the main purpose is to helping student to prepare what needed to be in the world of work, the job will be inside or outside from home, the other meaning is to work in every particular area [4].

2.2 Labour market information system

The Concept and definition of the LMIS may be very various in every country, the concepts have the same meaning but have a different translation. The perspectives of the concepts can be developed in some overall sense toward the definition of the LMIS. The International Labour Organization (ILO) defines a Labour Market Information as information relating to the functions, problems, opportunities contained in the Labour Market, comprising the relationship between the job seekers and the industries who are looking for employees. The perspective from the ILO shows that once the Information related

with the employee who is needed for a job or in the industries that needed for employee must be define as the Labour Market Information.

The concept has a different perspective raised in Northern Ireland, the use LMIS be describe as Labour Market Intelligence with the same functions, Labour Market Intelligence has the distinction of purpose and leads or focus toward how to provide solutions in the decision, to determine what work the most desirable, most suitable and in line with their expertise. Labour Market Intelligence reports on these decision making and also make the report that shows how the effectiveness of the Labour Market Intelligence [5]. LMIS in Northern Ireland has transformed into multi functioned as a decision support system. LMIS have the capability to collecting the data that concern about job vacancy in single window, it is also evaluate and disseminate all about labour market information to all the stakeholders that needed the for making decision [6].

Since the development of LMIS, it occurs to have a step forward by the changes views on the Labour Market, LMIS theory leads to the relationship between the Labour Market Planning and a good decision making. LMIS also supports career development for people who need jobs, Information Systems that assist in planning the career of a person should be integrated into the Labour Market [7]. Different terms also on LMIS are in the United State of America (USA), the government uses the term Workforce Information to provide guidance to the Labour Market and the information itself. The system is then defined by the government of the USA (Workforce Information Council) as a provider of information are the times to keep up to date on all matters that are closely related to each rate salary of jobs available, the specification needs to get a job, and to provide wide assistance to decision makers in choosing a job for the future of the customer.

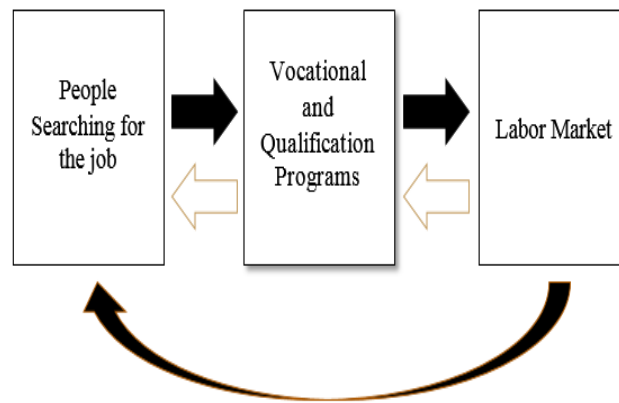


Figure 1.
LMIS.

Information flow on

Information Flow

The View of LMIS is an active Labour Market that have a policy of collecting data, evaluating and providing everything in the form of Information Systems to both parties to the supplier and the demand side [8], the purpose of the optimal LMIS as an active labour shown in Figure 1, the meaning of the Figure is to make the cycle in form of systems that connect the supply and demand of the market and especially the SMK as actively. The information flow must be align with the people who was searching for the job qualifications program. The Labour Market will run with the labour profile, and job placement based on information flow in Figure 2.

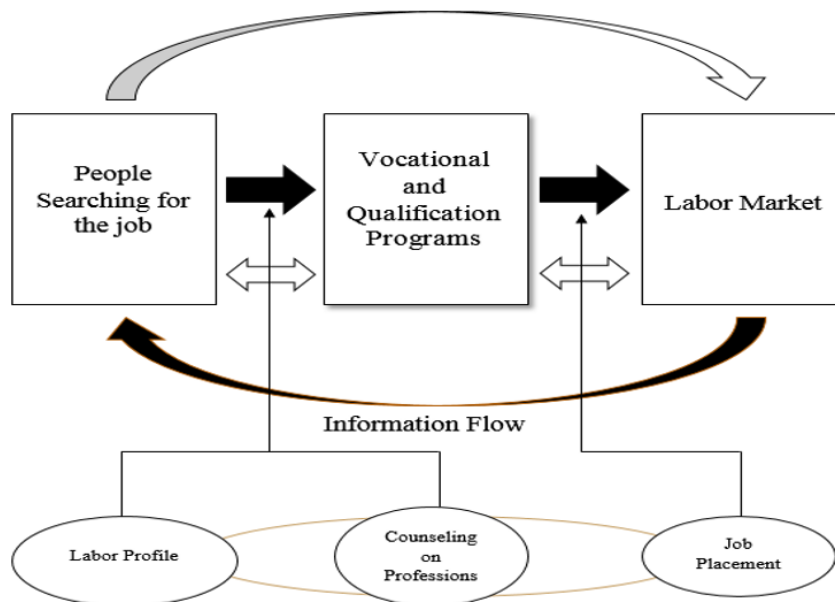


Figure 2. Function of LMIS.

There has been a various studies regarding the LMIS in many countries, the outline of a number of common constraints in the development of these systems. The strengthening of labour market Information Systems will allow for employment outcomes to be monitored more closely in Indonesia. In this regard, it may be useful to assess of the utility of producing a “job vacancy rate” or “employment projections” as part of employment monitoring systems. The distinction about Labour Market becomes clearer, The concept is more than a connection between employers and job seeker but also make a model that run for short term and long term with the interlink of the Institutions, from the larger labour market transaction, Information System could be the most important one for creating the opportunity for each job seeker to recognized the flow of employers requirements for short or long period of time [9]. The LMIS is created to make link between SMK and industries in Indonesia with the information as the bridge. The research framework is based on three stakeholders that interact with system directly, which are; SMK, Government/Labour Department, and Relation between SMK and industries in Indonesia. The feature in the LMIS should including the carrier decision support for the job seeker.

This LMIS not a new idea for several country (from the explanation above), but for linking directly to job seeker and the industries from mobile is kind a breakthrough of the information system for the labor market, the remodeled of the general LMIS by using mobile based application in several unique ways.

3. Methods

The development Method using Research and Development (R&D) Method, R&D is the research that purposes to produce a product to solve problem that occur in workplace. Development Research is a process to develop and validate product that used in education and learning [10].

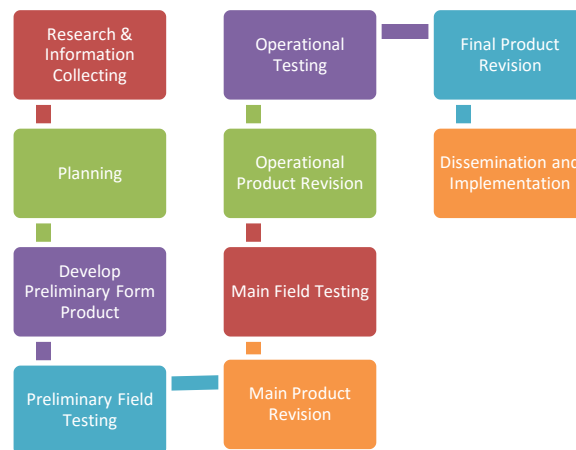


Figure 3. Research and development design.

Research and Development is a process used to develop and validate a product of education [10]. The steps of this process is usually referred to as the cycle of R & D, which consists of studying the research findings related to the product and developing the products based on these findings. The finding of this research are based on literature study and field observation based on Indonesia SMK and labour market conditions. The 10 phase on the figure 3 will be simplified in 3 phase by the researcher, the phase are:

3.1 Information collecting

Beside the literature study, the researcher collecting information to develop the LMIS by the government, industries and SMK point of view in North Sulawesi Province.

3.2 Planning and design

At this phase researcher converted the information into the Application framework, this include develop the alfa product (pre product), this preparation needed a form of concepts framework, the rich picture, and the application modeled (all include the application user interface completely).

3.3 final product main testing and revision

Product tested in advance to obtain input from SMK students response by spread questionnaires. The data were obtained and analyzed use as reference to look at the correctness, efficiency and usability of the application has been made. The research sample comprised 20 SMK students from 4 different schools. we informed to the participants that we were testing the application and they have to pay attention and follow the instruction. After operated the application, they requested to completed questionnaires related to correctness, efficiency and usability of the application.

The research measurements consisted of three sets of categories which are (a) correctness, (b) efficiency, (c) usability. We employed pen-end-paper questionnaires to conduct the test. All were ranked using 4-point scale (1 = Very Less to 4 = Very Good) and indicates for all items were reliable. For validity criterion, item instrument must meet r Product Moment Correlation coefficient table for $N = 20$ of 0.444 in 5% significance. In this test used benchmark r Product Moment of 0.361 with a significance level of 5%. So the item price has r count $> 0,361$ declared valid and item has price r count < 0.361 disqualified. To measure the validity of instrument used interpretation of the correlation coefficient table (see Table 2). Then test the reliability of research instrument in the form of a questionnaire using Cronbach Alpha formula (see Table 3). SPSS 21.0 software used to analyze both validity and reliability of instruments. Further, Evaluation System by Students for a third aspect of the assessment using the data conversion table of the quantitative data into quantitative data scaled 5 (see Table 4) [11]. The detail of data analysis shows in result section.

Table 2. R coefficient correlation (validity).

Raw Score	Interpretation
0.800-1.00	Very High
0.600-0.799	High
0.400-0.599	Moderate
0.200-0.399	Low
0.000-0.199	Very Low

Table 3. R coefficient correlation (reliability).

Raw Score	Interpretation
0.800-1.00	Very High
0.600-0.799	High
0.400-0.599	Moderate
0.200-0.399	Low
< 0.200	Very Low

Table 4. Qualitative to quantitative data.

Interval	Grade	Interpretation
$x > 3.40$	A	Very Good
$2.80 < x \leq 3.40$	B	Good
$2.20 < x \leq 2.00$	C	Moderate
$1.60 < x \leq m_1 - 2.20$	D	Bad
$x \leq 1.60$	E	Very Bad

4. Results and Discussion

The main purpose of the LMIS is to make information about job description that company needed, the reason is to have a better information show what the qualification needed, the qualification of a job has a similar with the SMK output, the SMK eager to make the graduate have a specific skill that can help the person to have a job. Optimal LMIS is simple when we know how to designing an information flow with the job description specification, the optimal system will be automatically sort by whom is qualified to enter the industries job interviewed (see figure 4).

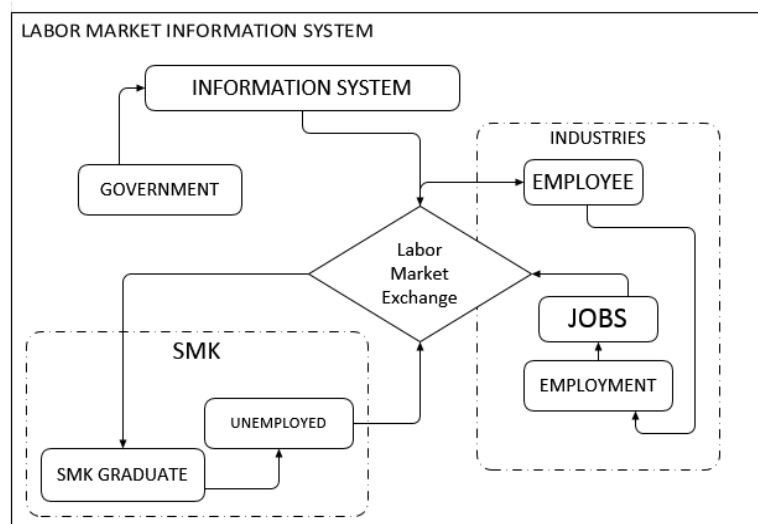


Figure 4. Indonesian LMIS concept for SMK.

From Figure 4 Show the result of the concept based on literature into the framework and can be integrated into mobile Application LMIS that has the capability of the key modules of the framework. The purposes to create Mobile based Application to make the system can be used more flexible and

agile. The design of the LMIS should know what the most needed in this technology based era. User Interface (UI) should be more realistic and make people interested to access the Information System. The ideal application is the design should be like hierarchy structured from top to bottom, the monitoring of the system should be step by step in order to response with the changing of the LMIS model from time to time. Figure 5 show the information system can be flow to the SMK graduates and the Schools so the SMK teacher can be prepared their students skilled based on the Industries needed.

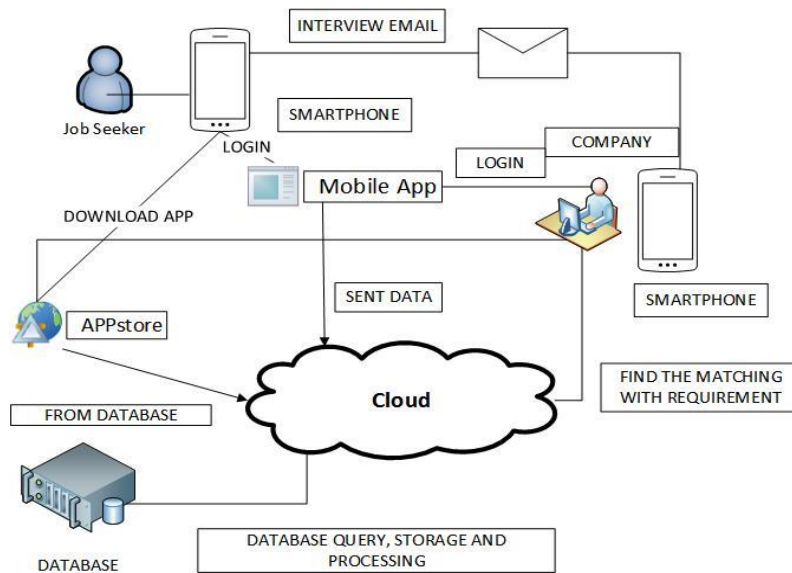


Figure 5. Rich pictures of proposed LMIS.

The final product (LMIS application) screen can be seen from this picture below.

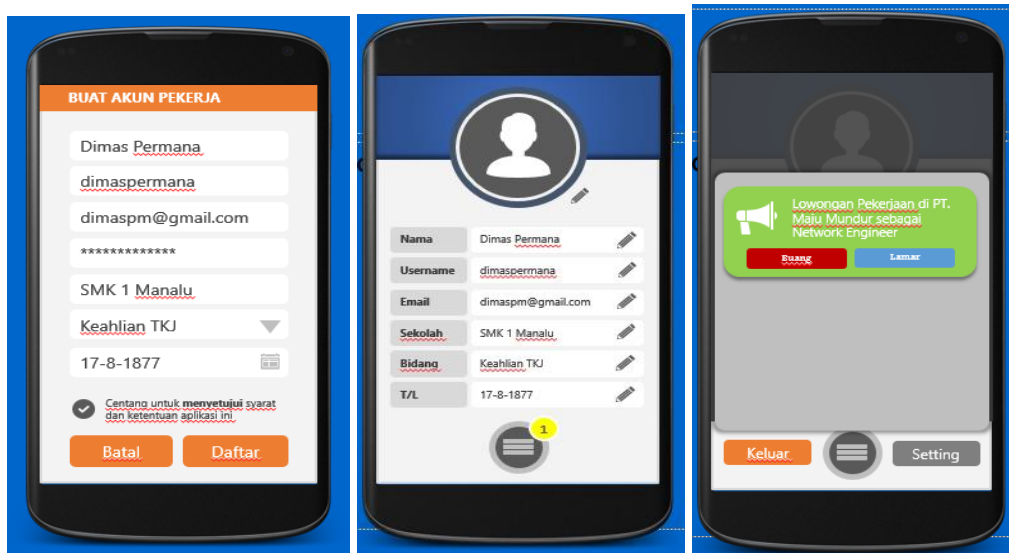


Figure 6. User Interface LMIS for user.

On the figure 6 explain the register screen from (the left picture), the register consist the data (curriculum vitae) that need to be filled by the job seeker (skilled need to be filled), on the middle picture are the next screen shows after the student has registered, the system automatically search for the job that match with the industries that looking for the employee with the specific skills. When the

system found the suitable job for the job seeker, the message will show as a popup in the student smartphone (right picture). The student can view the company profile before choose to apply for job or to ignored the company offers, once the student apply for the job, the system will directly sent the student data to the company private email.



Figure 7. User Interface LMIS for Company

On the figure 6 show the user interface from company point of view. the register screen (left picture) same on the process that explain in the figure 7, the different is the company must filled the company profile as the main company data to be saved in database on server, the middle picture show on the company that filled the employee available from with the job description that company needed. The response of the job seeker will be in the private email of the company. Based on figure 8 show the user interface LMIS for Government on PC.



Figure 8. User Interface LMIS for Government on PC

Table 5 describes the validity and reliability score of 3 sets of items. The analysis result shows that all instruments were reliable and valid based on measurement reference.

Table 5. Validity and reliability score of 3 sets of items.

Category	Item	Validity	Interpretation	Reliability	Interpretation
Correctness	1	.628	High	.996	Very High
	2	.609	High		
	3	.804	Very High		
	4	.865	Very High		
	5	.812	Very High		
	6	.835	Very High		
	7	.595	Moderate		
	8	.852	Very High		
Efficiency	1	.639	High	.977	Very High
	2	.545	Moderate		
	3	.492	Moderate		
	4	.467	Moderate		
	5	.622	High		
	6	.556	Moderate		
Usability	1	.659	High	.976	Very High
	2	.488	Moderate		
	3	.572	Moderate		
	4	.508	Moderate		
	5	.541	Moderate		
	6	.598	Moderate		

Table 6 shows the result of student’s assessment toward this application based on spread questionnaires divided into 3 aspects which are correctness, efficiency and usability. The number of question for each aspect is 8, 6, 6 respectively.

Table 6. Validity and reliability score of 3 sets of items.

M-Learning in Social Media Platform	Average	Std. dev
Correctness of	3.45	0.53
Efficiency of	3.46	0.35
Usability of	3.45	0.35

To sum up, the evaluation study was successful because it gave us some good feedback on what the students think about our LMIS. It should be pointed out that the small sample size of the study limits the generalization (or external validity) of the results. Nevertheless, this gives the first picture of the usefulness of the applications that have been created.

5. Conclusions

The Concept of LMIS will be more flexible and more accurate for SMK Graduates to gain Information that specific with the skill of the Graduates The needed of the system for link and match, to create a connection from SMK and Industries is possible nowadays, it is possible by review on every aspect that concern with the stakeholders of the system, which is requires a features that can provide information on the vocational needs of the industries. The schools are able to prepare graduates according to the needs of the working world, this system should be online and can be updated, and there will be a direct relationship between SMK and the world industries through the system from the internet using application from mobile phone. LMIS specific for SMK and industries will have many benefit for the stakeholders in specific ways:

- For the government: the information system will help government to mapping what is the specification of the human resources that needed for industries, displaying which SMK

competency that match with the Industries needed, and can be the next step to developing the partnership between industries and SMK employee.

- For SMK; the Information system will help the school to :prepared their student to work on Industries based on what that Industries needed, gain a lot of information about the world of work, have a better partnership with Industries.
- For the industries; the information system will help the industries to have a human resources with the skilled matched with the needed and create a partnership with government and SMK to prepared for the skilled labor.

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