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Design of Information System for the Protection of Indonesian Migrant Workers

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Abstract

Indonesian Migrant Workers, called PMI, are Indonesian workers working overseas. The existence of PMI abroad is far from the control and monitoring of the government. Various cases that are often exposed in the mass media on PMI issues involved in killings, persecution, and so on are indicators that the involvement of various parties including the government has not been maximized. These issues should ideally be minimized if there is a form of communication, and the continuation of that is the response. Communication and response become one of the media for Indonesian Migrant Workers working abroad. Providing fast and accurate information needs to be designed. For that reason, the author designs website and mobile-based information systems by proposing hardware, software, brainware, and network design. The purpose of this research is to get a blueprint or design of information system to provide protection for PMI so that it can be manifested in hardware, software, brainware, and network development later.

Keywords: Indonesian Migrant Workers, Protection, Design of Information System

1. Introduction

Government institutions that specifically handle PMI is Badan Nasional Penempatan dan Perlindungan Tenaga Kerja Indonesia (BNP2TKI) accompanied by the presence of various laws, one of which is Law No. 18/2017 concerning Protection of Indonesian Migrant Workers (Pekerja Migran Indonesia - PMI), which is that state adapted by Suradiansyah. This underlines that the government is actively involved in serving PMI. However, this foundation only shades PMI in terms of regulations and laws. Real form through Standard Operational Procedure (SOP) made by the government in the Departemen Ketenagakerjaan has not been ideally implemented, for example: A PMI must report periodically so that the existence and condition of PMI can be known. If a problem occurs, the government will also help it related to work problems (SOP for Work, Salary, Form of Work Violence, etc.). This explains that PMI when working will definitely find a problem, both small and large scale. The tendency, the continuation of this problem can be fatal if the handling is not immediately resolved. So it is not surprising that several cases of maltreatment and murder involving PMI were exposed by the mass media because they stem from handling problems that are not holistic and fast. Then for this situation, conclusion from the results of various research from Adha, Pawestri, Taufik, Sejati, and Palebang refers to problems that require an ideal solution.

There are quite a lot of cases involving PMI in various countries where PMI works. Veenstra stated, the case will be resolved when it is known to other people or raised in a mass media and social media that is categorized as citizen journalism. A question "what about the persecution and murder cases involving PMI but not exposed?", It became a homework for all parties. It is undeniable that cases of crime and violence involving PMI are like the iceberg phenomenon. According to Hasugian research, some statements that became the findings of PMI involvement with certain cases were obtained from the BNP2TKI report for 2011-2018 which stated that: 1) Malaysia, Taiwan, Hong Kong, and Saudi Arabia were the countries with the largest PMI objectives compared to other countries, 2) Complaints to data centers on PMI issues via email, SMS, telephone, underutilized social

media, 3) undocumented PMI, illness, inappropriate salary, layoffs, and repatriation are problems that often occur, and 4) The number of PMI complaints from Saudi Arabia and Malaysia is in line with the Death rates of PMI working in that country.

Basically efforts to protect workers in various countries already exist such as efforts to protect migrant workers in the ASEAN country environment such as in the country; Malaysia built the Foreign Workers Centralized Management Systems (FWCMS) known as MIGRAMS, the Philippines with the Foreign Labor Operations Information System (FLOIS), and Singapore which utilized the Geographical Information System, where this system had become the discourse of the Indonesian government for adopted into the PMI monitoring system and manifested by the presence of SIPMI, similar efforts were also made by Rismanto with the utilization of location base service technology for PMI monitoring systems abroad. Barry and Hager stated, the role and existence of Information Technology should have functioned in resolving various cases affecting PMI. When Information Technology becomes a "weapon" for PMI, they will feel safe and comfortable when working. Simply put Information Technology that is built bridges information from PMI to the government. When the government gets information from PMI, the response is to contact or meet with the PMI. This makes PMI trust and believe that they are actively protected by the government. Information technology in the form of information systems which will be integrated with existing systems within the BNP2TKI. The provision of services in the form of an integrated information system will be built by building a PMI (repository) information portal on the side of the PMI and the BNP2TKI administration environment. Mobile-based applications will be provided to PMI as a medium for sending information on the whereabouts and condition of PMI on a regular basis, while website-based applications will be built as a medium to monitor PMI for BNP2TKI. As a whole the development of digital media services is used to provide services to PMI and assist BNP2TKI in monitoring PMI. In general, the design of these media includes hardware, software, brainware, and network. That scope is a blueprint in the construction of PMI control and monitoring. For this reason, the author will design an information system which can give protection for PMI in order to obtain a design in the development of the information system later.

2. Research method

The phase of research refer to Figure 1. The research phase that the author does is mapping the needs of designing computer components in the system, namely hardware, software, brainware, and network. The design that the author builds is modeled with the Unified Modeling Language tool by translating the entire procedure into a use case. For the user interface layout built with the appearance of a mobile application that generally expresses the operational use of the system. Whereas brainware is translated into access that can be done by each stakeholder. For the network is designed by simulating using a computer network simulation tool to get the network design scheme that is connected in the system.

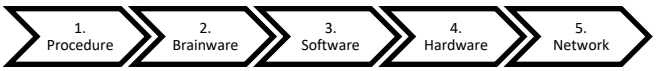


Fig. 1: Research Method

3. Result and Discussion

3.1. Procedure Design

The design procedure is carried out to obtain the pattern of activities that will work in the Indonesian Migrant Workers Protection Information System. There are seven procedures that form the basis of the system which are translated into use cases that are built based on our research before in Figure 2, namely (1) Reporting; This procedure describes the provision of the latest PMI state data through the input process based on absences, attendance photos, and questions which are the personal attributes of each PMI. Afterwards, PMI status will be assessed and mapped whether it is in a normal or emergency situation. Shortly after entering the system, the system will display three main menus namely Attendance, Emergency, and History. In the Reporting section, the system will display an Attendance menu where PMI will fill in the attendance list, provide a selfie photo, and answer a series of questions (around 5-10 questions) whose answers are PMI's personal attributes known only to PMI and BNP2TKI. For example like; a) Mother's maiden name, b) Name of the area where grandfather and grandmother are, 3) First pet name, etc. (2) Panic; Basically the same as the reporting procedure, but the

differentiator in this section is that PMI can provide reporting with direct verification without going through absences, selfies, and questions by displaying Emergency PMI notifications and current PMI locations. Thereafter, PMI Status will be mapped in an emergency and can be followed up immediately by other stakeholders, (3) PMI Status; This procedure explains the determination of PMI Status whether in a normal or emergency situation related to follow-up by the Embassy and the Authorities. PMI status is obtained from calculations based on the Analytical Hierarchy Process through three attendance variables, selfies, and questions about PMI attributes in the Verification section. Based on the calculations, the main focus is on these three variables: a) Attendance will be assessed based on how often PMI reports itself to the system, whether full absent, half absent, or absent at all, b) Selfie photos will recognize symptoms that are not appropriate, whether in accordance with the default data by using face recognition support by AWS Rekognition according to Santhoshkumar, whether PMI is in good condition or not good by photographing itself, accompanied by certain codes known only to PMI and BNP2TKI and or other stakeholders, and c) Questions originating from PMI's personal attributes known to PMI and BNP2TKI must PMI was answered with a minimum validation limit above 80%. If the values of the three variables are met then the PMI Status will be "Green" in the sense of Safe and Controlled. If one of them has a value that is not met then PMI Status will be "Yellow" in the sense of Safe and Needs Further Confirmation. Whereas if all the variable values are not met then the PMI Status will be "Red" in the sense of Requiring Serious Attention or Requiring Responsive Response, (4) Verification; In the Verification section. The system will assess the calculation process using the Analytical Hierarchy Process as explained in the PMI Status procedure. In this section the system will independently process the input data from PMI in the form of absences, photo suitability, and answer questions and produce output in the form of information about PMI status related to whether PMI falls into the category of: a) Green, b) Yellow, or c) Red, (5) Response; This procedure explains the process of follow-up by the Embassy and the Authorities in responding to the PMI Status case. If "Green" then the stakeholders do not need further response. If "Yellow" then the stakeholders must reconfirm PMI to receive valid data through other means (contact by telephone, email, social media, etc.), so that when it is found it can be entered into the "Green" or "Red" category means a different response. Whereas if "red" then the stakeholders must respond immediately through direct visit or visit in an immediate time to find out the condition and whereabouts of PMI directly, (6) Actions; Procedure Actions provide access to all stakeholders to respond responsibly (without giving administrative documents). Each stakeholder will be given authority to convey who is involved in responding to the "Red" category. Specifically, full authority rests with BNP2TKI, who is directly aware of this information by the Embassy and / or Third Parties (for example the local police, the country where the PMI works), and can subsequently be followed up with real action so that the response can be faster and on target, and (7) Report; A report that indicates every activity in the system. Existing reports in the form of: a) Data of each stakeholder in the system (PMI, BNP2TKI, Indonesian Embassy, Third Parties, and PMI Families), b) PMI Reports that do Reporting, c) Verification calculation reports, d) PMI Status Reports (Green, Yellow and Red), e) Panic Report (Emergency), and f) Response Report that has the attributes: i) Who responds, ii) Who goes to PMI, and iii) PMI under what conditions. In general, the above procedure is modeled on the use case diagram based on Figure 2. The diagram shows that actors and cases are inclusive of various activities in utilizing information system components, namely hardware, software, brainware, network, data and procedures.

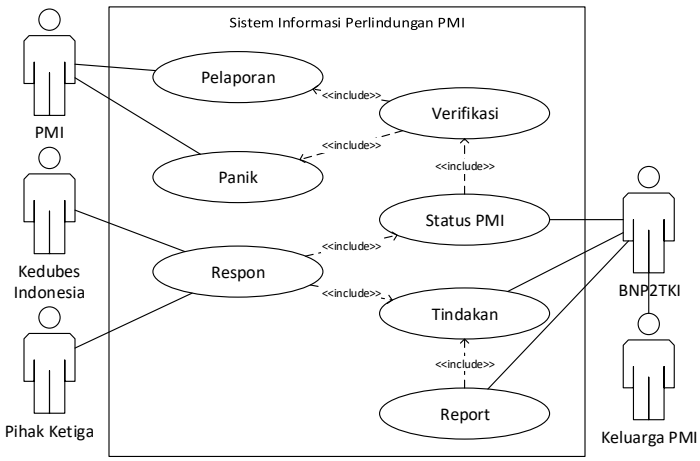


Fig. 2: Use Case of PMI Protection Information System

The procedure above discusses the activities carried out by all stakeholders. In detail in each activity there are inputs and outputs carried out by stakeholders. Based on this procedure, it can be mapped class diagrams that are manifested into the data needed in database design. Broadly speaking, the database design has PMI, BNP2TKI, Indonesian Embassy, Third Party and Family identity tables as well as response tables and actions taken by BNP2TKI, Indonesian Embassy, and Third Party.

3.2. Brainware Design

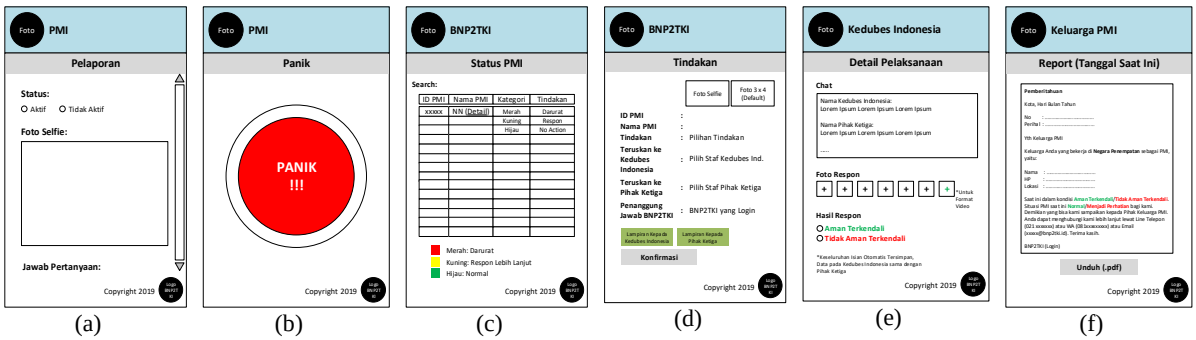
Based on the development of a PMI protection information system use case, the roles and activities of the brainware involved in the PMI protection information system are found. Table 1 describes the access and activities performed by each brainware. Each brainware has its own access (limited).

Table 1: Brainware of PMI Protection Information System

Brainware Access	Menu that can be accessed	Activities on the Menu
(Indonesia Migrant Workers) PMI	(Reporting) Pelaporan	Reporting by filling in the status form, taking selfies, and answering questions then submitting them
	(Panic) Panik	Access the panic button as an instant reporting that PMI is in an emergency by providing the latest location data
BNP2TKI	(PMI Status) Status PMI	See PMI categories whether their status is red, yellow, or green which is related to the action whether emergency, further response, or normal
	(Action) Tindakan	Checking as a form of final verification to proceed to the response of the Indonesian Embassy and Third Parties by providing information in the form of information and attachments
	(Report) Laporan	Final Report whether the PMI responded whether it has been completed or not yet finished
(Indonesia Embassy) Kedubes Indonesia	(Response) Respon	Following up on information provided by BNP2TKI by responding (visiting) and providing reports on photos and response results that are relevant to third parties
(Third Parties) Pihak Ketiga	(Response) Respon	Following up on information provided by BNP2TKI by responding (visiting) and providing reports on photos and response results in accordance with the Indonesian Embassy
(PMI Family) Keluarga PMI	(Report) Laporan	Get the latest reports on the status of PMI through downloadable documents

3.3 Software Design

Figure 3.a - 3.f refers to the design of input and output on the software to be built. The design of the software user interface is specifically built for mobile platform, besides the web platform. The context of software user interface presented will be the same on all platforms.



(a) (b) (c) (d) (e) (f)

Fig. 3: Software User Interface of PMI Protection Information System (a) PMI Reporting, (b) PMI Panic, (c) PMI Status, (d) BNP2TKI Action, (e) Indonesia Embassy Response, dan (f) Report for PMI Family

In general, Figure 3.a states the display for PMI when reporting by displaying active / inactive status, selfies, and answering questions. From this the system will be about whether there is an appropriate or not based on attendance parameters, the suitability of selfie photos with photos stored on the database server, and 10 (ten) answers to

questions whose conformity value is above 80%. Even so, according to Figure 3.b, PMI can report critical situations by pressing Panic access where PMI can be identified through the location of the device PMI is using. After that based on Figure 3.c the status of PMI will be identified to immediately proceed to assignment in Actions in Figure 3.d which will be forwarded to the Indonesian Embassy and Third Parties in accordance with Figure 3.e. Basically information and other statements will be attached with the same statement and subsequently the Indonesian Embassy and Third Parties will follow up by visiting the places that PMI has reported and they will coordinate and provide integrated reports (enter and update data together). After that the report from them will be forwarded to BNP2TKI into a report that will be forwarded back to the PMI Family in accordance with Figure 3.f.

3.4 Hardware Design

Hardware design based on minimum server and client specifications. The design is obtained based on consideration of minimum needs so that it can be later implemented. The design for servers is focused on desktop devices while for clients on desktop and mobile devices. Table 2 below is the minimum specifications of hardware used.

Table 2: Hardware Specifications of PMI Protection Information System

Server/ Client	Device Category	Minimum Specifications
Server	**Desktop**	Platform: Dual CPU Rack Server, O/S Provided: Optional, PSU: 550 W, Optical Drive: Optional, 1st Processor Onboard: Intel® Xeon® Processor Silver 4114 (10 Cores, 2.20 GHz, 13.75M Cache), 2nd Processor Onboard: Optional, Input Device Type: Optional, Dimension (W x H x D): 59 x 21 x 100 Cm, Standard Bays: 8 x 2.5" SAS/SATA HDD, Slot Provided: 6 Gbps SATA, Onboard SATA AHCI (non-RAID), 12 Gbps SAS/6 Gbps SATA, RAID 0/1/10/5/50 with RAID 530-8i, RAID 730-8i 1 GB Cache atau RAID 930-8i 2GB Flash, Chipset: Intel C622, Networking: 2 x 1 GbE Network, Video Type: Integrated Matrox G200, Chasis Form Factor: 1U Rackmount Chassis, Monitor: Optional, Standard Memory: 1 x 8GB RDIMM, Processor Type: Intel Xeon Processor, Weight: 20 Kg, 1st Hard Drive: Optional, Keyboard Type: Optional, Max. Memory: Up to 12 DIMM sockets.
Client	**Desktop**	Processor: Intel Core 2 Duo 2.0 GHz, Mainboard: Amptron G41, HDD: 80 Gb, RAM: DDR3 2 GB, VGA Card: GT 210 1 GB, DDR3, DVD RW: LG, Cassing: Castello Moluca, Power Supply: 450 Watt, Keyboard: Optional, Mouse: Optional, Monitor: Optional.
	Mobile	Processor: Qualcomm® Snapdragon™ 430 with 64bit Quadcore, Screen: 5.45" 18:9 Ultrawide display in 5' compact size, Camera: 5 MP + 13 MP, Jaringan: 2G/3G/4G, RAM: 2 GB, Memory: 16 GB.

3.5 Network Design

Domain name that can be access by the stakeholder is http://pmiprotection.id. The domain is accessed through a network which is simulated mapped based on Figure 4. Where, the server will be in contact with each host through various desktop and mobile devices. Network topology design using star topology with wide area network coverage. For the range of IP addresses use Class C with IP address 192.0.0.0. Figure 4 shows a simulation of the PMI protection information system.

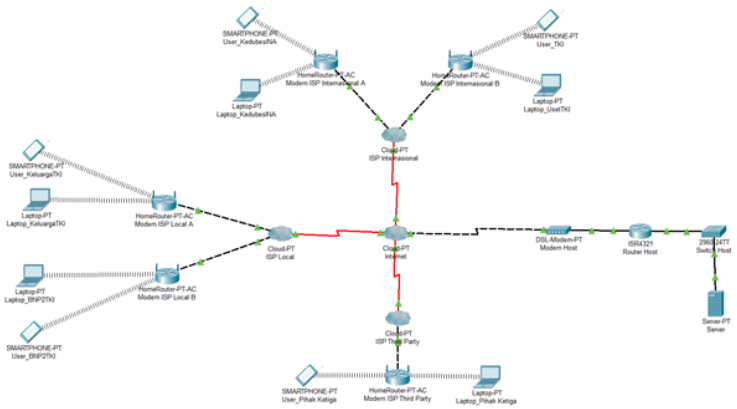


Fig. 4: PMI Protection Information System Network Simulation

4. Conclusion

Indonesian Migrant Workers problems are followed up by build the design of procedures and data, brainware, hardware, software, and networks. Based on that, blueprint is made to prepare for development information system. The design purpose is become a standard in the development of information system that able to protect Indonesian migrant workers. This design will continue to build the whole information system and do testing and evaluating to get a fit overall system.

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