

**Production Management and Labor Organization System (PMLOS)**

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| Capstone project code |  | |

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# Introduction

## Purpose

PMLOS is the system that helps Quang Hanh TKV company to change the way manage production and labor from ineffective way (by excel) to manage by software to increase work efficiency and reduce risk.

## Project Information

* Project name: **Production Management and Labor Organization System**
* Project code: **PMLOS**
* Project group name**: Ready Team**
* Product type: **Web application**
* Timeline: **Dec 08 th , 2017 – Nov 13 th, 2018**

## The People

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|  |  |  |  |  |
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## Background

### History

Quang Hanh Coal Company - TKV is a member unit of Vietnam National Coal and Minerals Industry Group - Vinacomin, its headquarters is located at 302 Tran Phu Street, Cam Thanh Ward, Cam Pha City, Quang Ninh Province. The Company was established under Decision No. 2021 / QD / HĐQT November 8, 2004, of the Board of Directors of Bai Tu Long Coal Company into Quang Hanh Coal Company - TKV.

On the first day of the establishment (May 1, 2003), in the process of organizing production and business activities, Quang Hanh Coal Company encountered many difficulties and received Nga Hai mine, a mine with geological conditions, complicated, bad coal quality, greatly affected by illegal mining not according to previous planning. At that time, the contingent of workers with skills, expertise, skills, and exploitation techniques was still very limited, which greatly affected the company's construction and development strategy. In order to create motivation for the company to develop in a long-term sustainable manner, with the close attention and guidance of all levels, sectors and groups of Vietnam Coal and Mineral Industry Group, the company's leadership decided The first breakthrough was to invest in comprehensive renovation of production technology and labor force, reviewing production areas, re-planning exploitation system and investing in a series of modern equipment. , building infrastructure to serve production as well as daily life for officials and workers; Invest in buying new trucks, equipment for digging and coal mining such as COMBAI excavators, TAMROK drills, side overburden excavators, etc... Investing in new technology to prevent longwall kilns by single hydraulic column. , price portable hydraulic XDY, ZH, and ZHT. Improve the capacity of transport axes. Invest in building a continuous coal transportation system from -110 to industrial premises; Install 2 coal screening systems with a capacity of over 1,500,000 tons/year. Deploying the project to exploit below -50 Nga Hai coal mine; to build and put into use high-rise dormitories at km 9 of Quang Hanh ward for mine workers; Fully implement the regimes towards employees; Well organized activities: Culture, sports, entertainment, tourism. Every year, to organize periodical health examinations for 100% of officials and workers, to organize officials and workers with weak health for nursing, treatment of occupational diseases.

In the years 2008 - 2013, despite the impact of the world financial crisis and economic recession, due to being proactive in production, business, management, and cost reduction, the company always ensured the balance, overcome the crisis and maintain stable production and growth. The company has applied the salary, and income policy mechanism for employees based on productivity, product quality, and work efficiency of each person and each department. Building the coefficient of spacing between titles, occupations, considering paying the right salaries and bonuses to employees is making an investment in development and makes an important contribution to promoting the production labor emulation movement.

In 12 years of construction and development (May 1, 2003 - May 1, 2015), overcoming many difficulties and challenges, Quang Hanh Coal Company has achieved remarkable results:

In 2003, there were just over 1,800 workers and workers; the output of raw coal exploitation was 242,391 tons/year, total revenue of 97 billion VND 384 million.

The average income of 1,500,000 VND /person/month - but by 2014, the number of employees was over 3,500 people.

In 2014, with successful production results, the targets exceeded the yearly plan: Raw coal reached: 1,280,000 tons, exceeding the plan by 80,000 tons, over 107%.

New meter of excavation: 15,420m / plan of 14,700m, reaching 107%

The whole year's revenue is 1,868 billion dongs, reaching 120%.

Profit before tax reached: VND 26 billion equal to 100%.

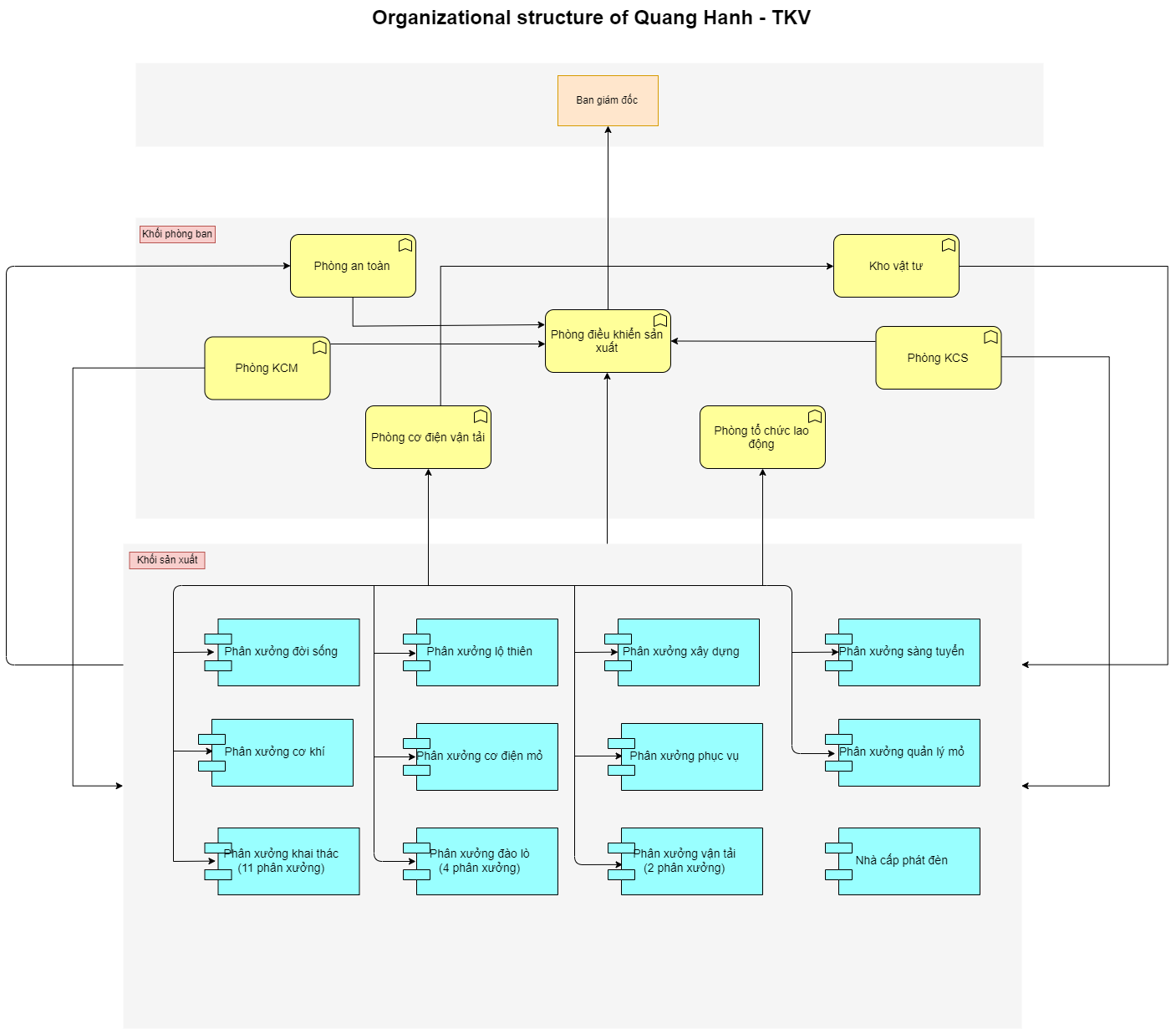
The average income of employees is 9,600,000 VND /person/month equal to 105% of the year plan. Along with success in production and business, the work of Safety - Labor protection is well implemented, there are no major incidents and serious occupational accidents during the year.

The above figures are an important milestone recognizing the development process of Quang Hanh Coal Company since its establishment until now. Sustainable development in the integration period.

Along with the results in product development and care of employees' lives, the emulation and commendation work has achieved encouraging results, mass organizations and organizations have strengthened their coordination with the mobilization expertise of laborers — effective implementation of emulation movements. Since then, many individuals and collectives have received noble awards from the Party, and the State such as there have been 05 collectives, and 06 individuals awarded the Labor Medal by the President; 01 individual won the title of Emulation Fighter nationwide; 23 collectives and individuals were awarded the Certificate of Merit by the Prime Minister, along with many other noble rewards.

Continuing to maintain sustainable development, the Company has built a development strategy for the period of 2011 - 2015 and a vision to 2020. In 2015, the Company was determined to implement the production plan successfully: 1,500,000 tons. Raw coal, new excavation: 16,900 meters furnace, revenue reached 1,823 billion VND, profit was over 20 billion VND, the average salary strived to exceed the norm labor: 10,063,000 VND / person / month, in which the kiln worker is VND 11,976,000 /person/month, according to which the Company continues to build basic technical and safety measures and measures to comprehensively accomplish the identified objectives, especially saving pay attention to the work of exploring resources and technologies of pit mining, coal mining, ensuring efficient and environmentally friendly production and business; pay special attention to the work of taking care of life for officials and workers both physically and mentally than Quang Hanh will step firmly on the path of integration.

### Organizational structure



### Department introduction

1. **Electromechanical - transport department**

The electromechanical - transport department is located in the division of Than Quang Hanh company. The electromechanical - transport department consists of 27 specialists, including head of department Tran Minh Tam in charge and in charge of the general work of Electromechanical - transport department. Deputy Head of Division Nguyen Duc Hung Responsible for technical management and safety of 35kV, 6kV and low voltage high voltage systems, directing and supervising the construction and installation of electromechanical works in high voltage systems and transformer stations apply, plan, manage and ensure the power supply for the Company's production plan, control power consumption for production, make periodic reports, prepare detailed solutions. save energy in service of production, perform calibration experiments, explosion prevention tests, periodic leakage protection relays, Testing electrical safety tools when required. Conduct training and training in the assigned areas, manage and supervise, and direct project managers assigned to perform tasks and directly manage a field but do not restrict participation in direction. other areas. Deputy Head of Division Nguyen Van Hiep directs, guides and controls the technical management, safety of electrical systems and electromechanical equipment of mining, digging and Factory Factorys as prescribed in the management decentralization, plan the need for regular repair supplies for the monthly use of underground factories, supplies of compressed air and water supply pipes of all kinds. Establishing the scheduling of direct assignment at the Control Department to draw experience from daily mechanical and electrical equipment incidents according to regulations, compile and approve the regulations, operating procedures, and technical safety procedures on equipment use. equipment in the field assigned to manage, assign to monitor with new employees of the division of the pit block, directly manage one field but do not restrict the participation in directing other fields, making calendars construction schedule, monitoring schedule of production shifts under the direction of the Head of Electromechanical - transport department from time to time, organize field inspections to supervise units performing the management, and use of electromechanical equipment ensure transportation Safety techniques, efficient and economical use of compressed air, c p Update the tracking number of the interlock cut power supplies and systems, supplemented when required. Deputy Head of Division Bui Xuan Khanh manages and prepares a monitoring file for strict safety equipment that requires inspection according to the list prescribed by the Ministry of Labor, War Invalids and Social Affairs, the Ministry of Industry and Trade, and General Management of Repair Work periodic repair of motorized loading and unloading equipment, pit equipment, planning of annual inspection of explosion equipment, electrical safety equipment, implementation schedule, planning , implement training workers to operate equipment safety strictly requiring inspection. Tracklist management and decide workers who are tasked with operating equipment with strict safety requirements, managing the number of chain hoists: inspection records, directly checking inventory, Quantity supply to Factorys using and managing the number of gauges applied to warehouse and inspection dossiers; The number of meters equipped with air compressors and steam welding. Deputy Head of the Kingdom of Hoa Hoa Participate in the periodical repair of electromechanical transport equipment (excluding motorized transport equipment): Electromechanical equipment of all kinds, motorized loading and unloading equipment in pits; hydraulic equipment, conveyors of all kinds, troughs of various types upon request of the head, directly assisting the manager in controlling mechanical processing, instructing workers to carry out manufacturing and processing activities according to daily production requirements, implementation of measures and implementation of processing clusters of details, details of manufacturing mechanical structures, numbering schedules of all current electromechanical transport equipment Yes, direct the numbering when the equipment is brought to the repair Factory, participate in equipment installation at the production site when required, the manager of the management work of the repair and management mechanic Factory directly one field but not limited to participating in directing other fields, directly carrying out the repair l P placed the coal conveyor belt surface and underground, established demand and control inventory supplies the field device management assigned. Deputy Head of Department Do Ngoc Son directly directs and manages motorized transport equipment according to the management decentralization, manages to update records, recommends and monitors periodic repairs, overhauls of motorized equipment and tunnels furnaces, managing registration, insurance vehicles as prescribed, implementing the planning of equipment maintenance, needs of materials and equipment for monthly production. Acceptance of equipment as prescribed to serve the settlement. Documents, forms, and technical norms in the assigned field, updated statistics of incidents, investigated causes of incidents, learning experience to prevent and carry out specialized inspection. transport equipment, transport routes, loading and unloading sites, open-cast mining areas, processing areas to coal preparation to direct and recommend the implementation of safety measures for active equipment. From the roles and duties undertaken, the division manager assigns details to execute professionals.

1. **Warehouse supplies**

The warehouse has the role of managing materials and equipment as prescribed in the monitoring and management of supplies and assets of production units; regulations on management of supplies, equipment for repair, installation, recycling, and monthly planning of materials from the production units to the company, from which the calculation and balance of material procurement plans are calculated, investment. Ensure proactive production, reasonable reserves, the procurement of supplies is made according to the process from the stage of planning materials - procurement plan - estimating - organizing the price offering - assessment and approval of the selection of suppliers to sign contracts, organize acceptance of supplies and goods imported to the settlement of contracts shall comply with the current process and regulations, ensure publicity and transparency, transparent and objective. The company has organized a thorough recovery of equipment and materials in the production process, to restore recycling to bring back production, reduce the cost of new supplies. Implement the principle of only granting new materials when there are no more recovered and recycled materials. At the same time, all materials recovered to the warehouse are organized for a specific classification. With re-usable materials, they shall be transferred back to the warehouse for production to the production units; For supplies that must be repaired and repaired, the Electricity Factory and the Mechatronics Electrical Appliance must be repaired and repaired then stored in the company for distribution to units. Also, for materials that cannot be repaired and repaired, the company takes advantage of processing, processing into other materials such as troughing troughs to cut troughs and inserting the furnace because the furnace cannot be restored, it is cut as bracing.

1. **Control Department**

The production control room is like the brain of the whole company. The Control Department is responsible for: Developing monthly operational plans and reviewing reviews, advising the mobilization of equipment and resources to perform tasks in production, updating daily production situation of the whole Cong. and report as prescribed, supervise and direct the process of ore production, sorting, processing aluminum, associating to receive information and process information in a timely manner as prescribed. To regularly urge relevant departments to prepare construction conditions for all Factory fully, according to technical measures - safety, statistics, and specific reports on the results of the performance of production and business tasks. Shift sales at the request of the leaders and units, report the shortcomings and propose timely solutions to the executive director of the production executive, check the delivery and receipt of staff, orders, assignments, especially must carefully check the construction methods to ensure safety. Participate in inspection and supervision at the production site of the units to ensure full compliance with safety measures, administering the production process to ensure safety, productivity, quality, and efficiency. In addition, the Control Department is responsible for collecting reports from departments, summarizing reports to the Board of Directors monthly, quarterly, and yearly.

1. **KCS department**

It is the advisory and assisting department for the Company in the management of the quality of input materials, the quality of production stages, and product quality before consumption and operating raw materials in the input warehouse, administering product consumption. Acceptance of products of the production stages as a basis for payment of the units Makes the report as prescribed. Tasks: Analyze and manage the quality of input materials for the screening plant to ensure the quality of the products produced meets quality and efficiency standards, and product and batch quality control. Products, according to the quality of products, achieved building regulations on quality control of input materials, and manufactured products. Guide units to take appropriate measures to improve product quality take responsibility for properly evaluating product quality and propose measures to improve product quality, administer, monitor, update input raw materials, regulate product consumption, manage and implement the monitoring and statistics on the quality of manufactured products. Organizations are managing processing equipment and tools for analyzing product quality. Organizing the appraisal and inspection of product quality measuring instruments, organizing the inspection and supervision of the sampling work; organize the sampling, processing, processing, and analysis of samples of manufactured and consumer products, and assume the prime responsibility for settling problems and complaints about product quality in the process of production and supply. Products for customers, make periodic quality reports, provide the necessary data for the management department within the professional scope of the room, organize the compilation of documents, fostering, and teaching instruction — professionalism for specialized workers.

1. **KCM department**

It is the advisory office, having the role of technical management of bauxite ore exploitation, selection techniques, production techniques, advisory management of irrigation works; Resource Management, Geology, Surveying; Innovating technology development and applying scientific and technical advances in the company's technology of exploiting, sorting ore and producing. Participate in training courses to improve technical workers, rain, and storm prevention. Permanent product inspection council throughout the company. Managing the system of equipment and technology lines that are not under the management of the M&E department such as boiler systems, furnaces, gas pipelines, technological pipes, tanks in the entire production line system. Export coal factory. Participate in the management of constructions and architectural objects within the delegated authority within the company. The KCM Division is responsible for: Applying the technical management regulations of ore mining, ore sorting, and production of the company or competent agencies to implement in accordance with the specific characteristics and conditions of the company. It is decentralizing the management of technical exploitation, ore sorting, and alumina production, including Technical planning, technical dossier construction, and construction execution, boundary management, waste dumping and testing collection of product volumes, quality control and inspection of quantity and quality of products and building technology and schedule. Technology plan of exploitation, classification, production monthly, quarterly, yearly, medium-term, and long-term. Development of technological innovation and development plan, application of technical advances in the company's production process. It is building a system of technical and technological norms, technical norms in the stages of ore mining, sorting, and production close to the specific targets and conditions of the company. Proposing technology and participating in appraising plans of departments and units about technology, technical solutions, and solutions of production organization that bring high production and business efficiency, improve working conditions for workers.

1. **Screening Factory**

Screening Factory is a Factory to process products after exploitation. The function of the Factory is to classify coal into different categories, with the main stages: Preparation of coal feeding, sorting, and finishing products. The mission of the screening plant is: Operating the sieves: Preliminary screening of raw coal, sieving separating dry bran, dehydrating sieve, fine-grained sieving, washing, sieving and sorting clean coal into different grain grades Size according to national standards, base standards or according to customer requirements, operating crushers and crusher to reduce the size of lump coal, intermediate coal, waste gases according to technology requirements and customers. Operating sorters: washing troughs, sediments, suspensions, suspension cyclones, troughs, flotation machines for the purpose of producing clean coal of high quality and removing waste rock from coal pristine. Operating auxiliary equipment: Pumps, air compressors, peat concentration equipment, filter presses, laboratory equipment, and instruments for coal quality analysis.

1. **Mining Factory**

The Exploitation Factory is a unit within the company's production division. The Exploitation Factory consists of 11 sub-Factory, with the role of managing materials, assets, human resources, and boundaries assigned to serve the exploitation of products, export coal. The mining factory has the main tasks: Mining raw ore in accordance with the mining process and rules issued by the company. Studying technical design documents, implementing construction plans, measures to organize the construction, and organize the implementation of production tasks assigned by the company. Master, allocate, and use the existing resources: quantity, type, quality, the capacity of motor vehicles, equipment, technical materials, construction materials, and human resources assigned by the company to organize. Produce the highest efficiency. They are monitoring the situation of equipment, materials, production capacity for the Control Room and Electromechanical - transport department.

1. **Transport Factory**

The Exploitation Factory is a unit within the company's production division. The Exploitation Factory consists of two sub-Factorys, managing and operating Mechanical equipment and transport equipment to perform the production and business tasks joint. The main task of the transport factory: Transporting soil, raw ore to the temporary warehouse, and pouring into the screening plant warehouse. Transporting materials, equipment for construction, and other production services throughout the company. Monitoring and reporting back to the Control and Electromechanical - transport department on productivity, fuel consumption, and the status of motorized equipment.

1. **Building factory**

The Exploitation Factory is a unit of the company's production division. Construction Factory has the role of managing and operating the construction and assembly parts. Management of materials, property, human resources, and religious boundaries. The construction factory has the main task: Managing and monitoring the status of assigned construction structures. Detecting and promptly dealing with minor failures, proposing a plan to handle serious failures for the Company leaders to consider and solve. Management, operation, and protection of works in service of exploitation, raw water pumping system for production and daily life of Factory, Construction of construction and installation items (construction and mechanical parts), and bearing responsibility for the quality of the construction work. Report progress of works, equipment, and materials to Control and Electromechanical - transport department offices.

1. **Kiln digging Factory**

A tunneling department is a unit in the production block of Quang Hanh Coal Company. The tunneling & exploitation department consists of 4 sub-department. The Factory is responsible for exploiting coal in the kiln - a very difficult task, requiring high technology, accurate calculations to exploit and manage good people to ensure safety rationally, employee health. After each shift, the Factory must report the estimated output, used materials, recovered materials, to the control room. But this is only an estimated number, so at the beginning of each subsequent shift, the Factory must add an accurate report of the output, used materials, recovered materials, etc. to the control room. In terms of output, the Factory will have to report the coal production, the number of meters digging, and other minerals that can be obtained. Regarding materials used for manufacturing. Including materials related to engineering work and materials related to electromechanical work, transportation, etc. Regarding human resources, reports on timekeeping, accidents, and labor productivity will be reported. At the moment, attendance is being done manually by humans, but another team is developing attendance through a private attendance device operated by another project. Regarding the recovered inventory of content, the reporting criteria are similar to the used materials report, which will be reported to the control room so that the control room can control the materials being delivered to the Factory. Technical materials consumed and recovered must also be reported to the control department.

1. **Labor organization Department**

The labor organization department is in the block of departments of Than Quang Hanh Company. The structure of the Division of Labor Organization includes professionals in charge of management tasks, making decisions for employees, storing employees' paperwork, managing certificates, monitoring the labor productivity of an employee. For the function of employee management, the staff will be in charge of the management work. The specialist in charge of management tasks will be in charge of receiving staff records, making decisions for the Director to approve. The function of keeping records and hard-copy papers is currently being carried out by experts in charge of papers. The responsibility of paperwork will be required to keep all employee documents and update them in an electronic resume (excel) for employees. Every day, the factory will send a list of tasks for each employee to a certificate manager who is a certificate manager. Each task will be equivalent to a certificate. If an employee does not have a certificate and is still on duty, when the accident occurs, the responsibility of the certificate manager and Factory manager is huge because it affects the safety of the children people. So this is a very important task. Finally, labor productivity management, each factory will have to notify the labor productivity manager to manage this issue. From labor productivity, labor productivity managers will synthesize a lot of information and many formulas to get the salary for each employee.

1. **Labor organization Department**

The life department is a department belonging to Quang Hanh Coal Company that has the task of looking after material and spiritual life for employees, workers, and workers in the whole company. This department for a living is the only department serving all diets for employees in the whole company, serving conference guests. Wide area of ​​operation, where there is a production site, some areas collectives of workers, there are Factorys serving life. To complete the tasks assigned by the company, right from the beginning of the year, the trade union combines with the specific skills to implement the tasks agreed in the Factory's workforce, such as meal finance, food menu. It is openly hanging in the dining room for all employees to know. The purchase and sale of goods signed with partners are guaranteed to be of the right quality and as required. Transporting goods to the cafeteria is guaranteed on time and safely. Labor is assigned a reasonable position for each cafeteria position. The wage unit price is paid in accordance with the regulations and is reasonably public. This department is interested in improving the working conditions of the company, spacious dining rooms, boiler systems, and gas cookers are civilized installation, equipment, and furniture, utensils not only durable but also meet the needs. Workers are fully equipped in line with the service profession, taught by teachers to improve food processing. The weekly life department will receive meal request information from all departments to plan meal plans. This is a very important task, but there is no reasonable solution to perform this task well.

1. **Safety department**

Safety Department is one of the most important departments of Quang Hanh coal company because it is considered as a high-explosive gas field (CH4), the area of ​​re-exploitation is increasingly deep, the pressure of the mine. Therefore, the risk of labor safety (OSH) in Quang Hanh Coal Company - TKV is always permanent. Determining this limitation, Quang Hanh Coal Company - TKV has focused highly on both human and material resources to determine the effective management and control of the risk of accidents during the production process. Safety Department is responsible for managing the safety of employees, equipment, troubleshooting of the whole company. In addition, the training of occupational safety is also focused. The safety department will have to research and develop occupational safety training programs for workers and employees of the whole company with the goal of being ready to handle possible incidents.

1. **Electromechanical – mines factory**

Electromechanical - mine is a factory to help manufacture mechanical products, install underground equipment to support coal mining according to the method of underground mining. Responsible for repairing and taking remedial measures when an incident occurs, analyzing the causes of incidents of equipment damage, thereby proposing measures to prevent and overcome incidents in service of the underground work mining. People of the electromechanical - mines can work on the Factory or in the mines without natural light and harsh environmental conditions in terms of temperature, air, noise, dust, etc. Equipment and tools used for electromechanical - mines are mainly electrical and mechanical testing tools and devices used for equipment assembly.

1. **Mine ventilation management factory**

The ventilation management factory helps manage the entire mine ventilation system; Controlling mine gas, exploration drilling in pits. Factory Ventilation management pit is to ensure clean air (O2) for workers, dilute toxic gases, prevent risks, incidents of fire, explosion, asphyxiation in the tunnel furnace, ensuring safety in production labor, limiting incidents that may occur in the pit. In fact, surface ventilation works generally ensure design techniques, limiting air leakage. The ventilation works below the mine include: air vents, retaining walls, adjustable gates made of wood and iron.

### Responsibility in business of each department

*M - Trách nhiệm chính với nghiệp vụ;*

*X - Có liên quan*

| **Mã nghiệp vụ** | **Nghiệp vụ** | **Phòng, Phân xưởng, Đơn vị liên quan** | | | | | | | | | | | **Tham chiếu & Viện dẫn** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **BLĐ** | **P.ĐK** | **P.KCS** | **P.KCM** | **P.CV** | **P.An toàn** | **PX Khai thác đào lò** | **PX Sàng tuyển** | **PX Đời sống** | **P. TCLĐ** | **Kho vật tư** |
| NV.01 | 1. Báo cáo thực hiện ngày (Sản lượng, vật tư sử dụng, vật tư thu hồi…) |  | X | M | X | X |  | M | M |  |  |  | Mục 2.1 |
| NV.02 | 2. Báo cáo suất ăn ca |  | X | X | X | X | X | X | X | M | X | X | Mục 2.2 |
| NV.03 | 3. Quản lý số lượng và thông tin nhân lực | X | X | X | X | X | X | X | X | X | M | X | Mục 2.3 |
| NV.04 | 4. Điều động nhân lực | X | X | X | X | X | X | X | X | X | M | X | Mục 2.4 |
| NV.05 | 5. Khen thưởng và kỷ luật | X | X | X | X | X | X | X | X | X | M | X | Mục 2.5 |
| NV.06 | 6. Lập và giao kế hoạch (KH thực hiện; KH chỉ tiêu công nghệ) | X | X | X | M | X | X | X | X |  | X | X | Mục 2.6 |
| NV.07 | 7. Báo cáo đánh giá sử dụng vật tư chủ yếu liên quan đến công tác kỹ thuật (vật liệu nổ…) | X | X | X | M | X | X | X | X |  | X | X | Mục 2.7 |
| NV.08 | 8. Luân chuyển diện thi công |  |  |  | M |  |  | X |  |  |  |  | Mục 2.8 |
| NV.09 | 9. Quản lý Kế hoạch tiêu thụ và Xuất, Nhập than |  | X | M |  |  |  |  | X |  |  |  | Mục 2.9 |
| NV.10 | 10. Quản lý kiểm định thiết bị |  |  |  |  | X | M |  |  |  |  |  | Mục 2.10 |
| NV.11 | 11. Quản lý huấn luyện an toàn LĐ |  |  |  |  |  | M |  |  |  | X |  | Mục 2.11 |
| NV.12 | 12. Báo cáo chung kết quả thực hiện ngày của Công ty | X | M | X | X | X | X | X | X | X | X |  | Mục 2.12 |
| NV.13 | 13. Quản lý và điều động máy móc thiết bị |  |  |  |  | M |  |  |  |  |  |  | Mục 2.13 |
| NV.14 | 14. Quản lý lý lịch thiết bị |  |  |  |  | M |  |  |  |  |  |  | Mục 2.14 |
| NV.15 | 15. Sửa chữa thường xuyên và Bảo trì Máy móc thiết bị |  |  |  |  | M |  |  |  |  |  |  | Mục 2.15 |
| NV.16 | 16. Quy trình đầu tư mới | X |  |  |  | M |  |  |  |  |  |  | Mục 2.16 |
| NV.17 | 17. Quản lý vật tư tiêu hao |  |  |  |  | M |  |  |  |  |  |  | Mục 2.17 |
| NV.18 | 18.Quy trình cấp phát đèn, bình tự cứu |  |  |  |  |  |  |  |  |  |  |  | Mục 2.18 |

### Current system

- Recruitment: When the company wants to recruit an employee to working, the candidates will have to interview with a person responsible for interviewing in the company. If the applicant passes the interview, the interviewer will call the recipient of the basic application, including some information such as: Full name, age, gender, hometown, phone number phone, .... The person responsible for receiving that file will create a word file containing the applicant information and submit to the Board of Directors for confirmation. If the board of directors does not agree, the staff will notify the applicant that is not accepted to do, and if the board of directors agrees, the recipient will call to notify the applicant to bring additional documents to other recordkeepers so that they can proceed to receive and enter information profile into an excel file named ‘Inside Profile’. This new employee information needs to be informed to the Factory and the board of directors, so the record keeper needs to call the Control Room so they can add new information to the excel file and post it on the board of directors and The corresponding Factory (if the employee is in the Factory) for them to enter the excel file, the list of Factory employees to work on the next day.

-Changing employee information: When an employee wants to change the information in the record, they must meet directly with the person who has the right to change the profile and present the information to be changed such as phone number, address permanent resident, or can add qualifications .... If the person has the right to confirm the correct changes for employees, they will contact the recipient of the profile so that they can search for employees to edit in the excel file (if personnel Members who add additional information to the record they need to go to the person who stores the record to return the relevant documents to add). When the editing is complete, they will have to contact the control room and the (if the employee changes the information in that) for those department managers to edit in the excel file. corresponding edits.

-Payroll calculation: This payroll job only applies to factory workers, who in other departments will get a fixed salary every month. The salary calculation will take place every Monday to Friday at each, the attendance manager will track this by writing a notebook, then at the end of the day they will give it to the person who has it. task of calculating each employee's salary coefficient by volume, catches of the day to sum up in the excel file. The completed report form will be contacted to the Labor Organization department, the person in charge. General work in the Labor Organization will have a calculation formula to fill in an excel file called the labor productivity of employees in the department by day, month or quarter.

-Track meals: Every day the company will prepare meals for employees in each in 3 shifts: morning, lunch and dinner. The person in charge of recording each ration of each will ask one person for one ration a day for a week. The job will be recorded by a notebook, and it will take place by the end of the sixth day of the week, so the registration for this meal is planned for the next week. When the assembly of the is completed, they will call to notify the party organizing the work recorded on this day, ca to register how many meals for each in an excel file. The Labor Organization party will summarize all the meals, if any does not notify within the specified time, they will assume that the other party does not register any meals for the next week. After the summary, they will contact the life to give them an excel copy so that they can prepare the ration for each in the next week. This excel file will have the actual meal ration of the week for each shift so that the life will record it in each excel file. At the end of the week, they will return the excel file to the Labor Organization department, so that they can synthesize the actual meals and plan for each.

- Directing employees: When a certain needs people for a certain job, the person with the right to mobilize (the manager in the or the competent person). They will create a word file containing the basic information of that information and the job that they want to mobilize for the employee. Once completed, they will contact the Labor Organization room to send that word file. Then the Labor Organization department will check if the basic information of the employee is appropriate or not, if the information is appropriate, they will send the word file to the board of directors to request a decision to dispatch. The director agrees that they will print a word file with the dispatch number for this employee and send it to the Labor Organization. The Labor Organization will edit the employee's information in the excel files containing the information. news of that employee. After editing, they will first notify the control room for them to summarize the list of employees in the excel file to send to the board of directors, the next will send information to the new and the old of that dispatching staff to change each in the excel file of each.

- Contract Termination: There are 2 types of contract termination in the company: active and passive. Passive is the person who has the authority to make an application for the employee to quit. This termination applies to all employees in all departments. The resignation application will be sent to the Labor Organization office, the Labor Organization department will check and confirm basic information to send to Board of Director. The board of directors will contact the employee and the manager of the staff to confirm. After agreement, the board of directors will create a word file with the employee's decision to terminate with the reason for termination. send it back to the Labor Organization department. The Labor Organization department will search for employees in the internal file to delete and put in the external file. If the employee's profile change process is complete, the person who keeps the record will contact that terminated employee will let them come to the document store owner to get back the paperwork, this store keeper is responsible for recording in the excel file the file in addition to the information already given to the employee.

- Certificate management: With certificate management, the Labor Organization department will have 2 jobs to check the duties of employees in the and manage all certificates of employees and employees. Firstly, the certificate management, all employee certificates that the company has are summarized in the excel file including the name of the certificate, the certificate code, the expiry date ... and the certificates of the existing employees. including the employee name, employee code, certificate type information. The second is to check the duties of employees in the, with each they will have a list of certificates of employees at that so that they are assigned to work every day by the Labor Organization. the working day, the manager will assign tasks to each worker in the corresponding to the certificate of the existing employee, but to confirm this task is appropriate, the owner will send the file. excel the tasks of each employee in that to the Labor Organization room. The Labor Organization department will check if the list of employees assigned to the job matches the employee certificate that they have, or is available but is about to expire to notify the to let the worker. If an employee does not conform to the assigned duties and the is intentionally assigned to the worker, all consequences will be borne by the.

* Add a certificate: Workers at the after school to get a certificate, or need additional information about the certificate, they will go to the certificate manager directly to check and confirm. then they will contact the file keeper to get up the certificate. The Labor Organization department will update it in the file of the certificate of the worker, after completing this they will inform the certificate manager for updates in the certificate management file in the company and employees. When the whole process ends, the certificate manager will notify the corresponding so that they can update the certificate for the workers in the corresponding in the excel file so that the next day they can assign the task.

- Company-wide list: The Labor Organization department will summarize the list of all employees in the company's office in an excel file. This file will be posted to the board of directors whenever needed.

- Safety department: At the, if a worker has an accident during work, the manager will be responsible for sending that worker's status in a word file to the control room for them. Edit the file format to complete some requirements and they will send it to the labor safety room. The Safety department reviews the situation and sends people down to check the situation of the accident to confirm and send it to the Labor Organization office to see how the accident rate is to send an application to the board of directors. If the worker decides to quit, the employer will receive the decision to terminate and delete the worker in the internal and professional file. Go to the external file with the reason that termination is an occupational accident. All the profile information of the worker is updated, the Labor Organization department will contact the control room and the of the former worker. Jobs for them to update in the excel file the corresponding employee list.

### Business between TCLD department and other departments

### Existing system

Quanh Hanh Coal Company is a large-scale manufacturing company. They manage large numbers of employees, supplies and equipment. Previously, to control this large data, they used supporting software such as: Dispatch management software, supplies management software, attendance software.

Introducing about customers software which have used:

1. Attendance software:

Process:

* Attendance

Điểm danh ( sổ sách )

Nhập dữ liệu (excel)

TCLĐ

Nhân viên kinh tế

Quản đốc

Chuyển đến

Chuyển đến

Lưu

Giấy tờ

Description: At the end of each shift, the foreman at the workshops will take note of each employee who works and record them in the notebook. The foreman will then send this data to economic staff. They will enter excel and send it to the labor organization department to manage employees working during the day. That data will be used in the payroll calculation.

* Timekeeping
* Report 1:

Báo cáo sơ bộ

Tính lương

Excel

TCLĐ

Sàng tuyển

Lưu

Chuyển đến

* Report 2:

Báo cáo chi tiết

Tính lương



TCLĐ

Excel

Sàng tuyển

Lưu

Chuyển đến

Description: After the attendance report of the employee, they will perform the timekeeping according to the amount of work in the day. On the screening side, they will make a preliminary report to the labor organization department to conduct salary calculation. In the event that the director requests information immediately, they use the preliminary report. Case two is the detailed report. The screening department will report in detail and accurate the next day to the labor organization department. After consolidation, the labor organization department will save the data into excel. In the excel sheet, there will be two columns: Payroll first and Payroll later. This data must be printed on paper and signed for certification as a basis for calculating salaries for employees.

Currently, Quanh Hanh coal company is developing automatic timekeeping software. They plan to deploy in early 2020. However they are still having technical problems.

1. Dispatch management software

Phê duyệt

Soạn thảo

Server

BGĐ

Công văn

Chuyển đến

Post

Description: Each dispatch after being drafted will be forwarded to the moderating board of directors before being publicly displayed. In essence, this software only helps them display and search published documents more easily.

1. Supplies management software.

Phân xưởng

CĐVT

Thiết bị, vật tư

Gửi yêu cầu

Lập kế hoạch (excel)

Phòng kế toán

Chuyển đến

Phòng vật tư

Xem xét

Chuyển đến

Kho vật tư

Mua

Chuyển đến

Tạo báo cáo (excel)

Chuyển đến

Vật tư, thiết bị

Chuyển đến

Description: If workshop need to buy supplies, they will send requests to electromechanical transport department. The electromechanical transport department will plan and transfer to the accounting department for handling. When the plan is approved, the accounting department will notify the materials department to buy and put into the warehouse. The workshop will pick up supplies in the warehouse to use. As for equipment, it is usually purchased in a small retail package, so it does not require accounting Factory side will buy and finalize later. They will report to the office of supplies purchased (usually by phone). All reports on materials are managed by the support department. All reports distributed and withdrawn by decision use excel.

### Conflict and difficulty of current system

1. **Recruitment:**

**Applicant - Labor Organization - Director - Coordinator - Workshop**

When someone wants to work at the company, the first thing is that the Human Resources department of the Labor Organization will have to collect the basic information of the employee who wants to recruit and save to the excel file. After that, the human resources department will have to submit a paper-based recruitment application and submit it to the Board of Directors for approval, and the Board of Directors will then send a written request to the HR department. If there is an employee is accepted, the Labor Organization party will have to make a docs notice to the employees received for the Control side to arrange the Workplace for that employee, the Control side will arrange for it. The document sent to the Labor Organization side to update the information in each workshop. This process takes a lot of time because of the need to travel back and forth and exchange documents between the parties, the number of documents is too large, leading to the consumption of too many resources and the large number of employees. Re-storing files and updating information are time-consuming and prone to errors or shortages during the import process. This process takes a lot of time because of the need to exchange documents between the parties, the number of documents is too large, leading to the consumption of too many resources and the large number of employees. Re-storing files and updating information are time-consuming and prone to errors or shortages during the import process.

1. **Change employee information:**

**Staff - Labor Organization**

While working, employees may have changes in personal information such as certificates or qualifications, phone numbers, home addresses, marital status, health status, … Because all employees are managed on the excel file, the Labor Organization would like to add and delete employees' information must search and locate the employee's information store. The retrieval process will take a lot of time because we have to determine which factory employees and the management file then checks some other authentication information before we can modify. If there are too many employees need to modify, it also takes more time to classify and when opening too many management files at the same time, there will be computer lag or errors not responding on excel. In case the Labor Organization changes its information manager, the new information manager will spend a lot of time getting used to the management files.

1. **Calculating Labor Productivity:**

**Workshop - Labor Organization**

For each workshop, after a daily attendance list with a list of employees in the workshop on a hard copy, then the list will be given to an employee under the workshop that estimates the salary coefficient of each employee over the volume of declared output. Tap that employee's workday and enter in the excel file. At the end of the day, that estimate will be sent to the Labor Organization Department to summarize the labor productivity of each department by day and by month. With the large number of employees, the attendance for each employee is too time-consuming because for every person who needs to report the name of the person to call, the person will have to search and mark the attendance for the staff. reduce employee productivity and productivity losses for both employees and the company. In the process of inputting errors or intruders altering the number affecting the estimation process, it will cause a great loss to the company. When the labor organization party receives the estimated file every day as well. will have to enter data for each employee to calculate the monthly salary, this process takes a lot of time and there is no security in the management file, so it is easy for intruders to change and change the data.

1. **Track food intake:**

**Departments Workshops - Living room**

Every Friday, the departments and workshops will call the Living Department to provide information on the number of meals for each department and workshop. After receiving information from the Living Department, the information will be saved in excel file and implemented in accordance with the updated excel file. Every Friday, having too many departments or workshops calling at the same time will create congestion or be the recipient of information and data input must be done too quickly at the same time can make a small mistake. Errors lead to inaccurate numbers, inadequate cases will not serve all workers, they will not be able to continue, excess cases will result in waste and small loss of profits of the company. .

They collect information once a week and run for the whole week if something goes wrong: a virus attacks a computer, a computer problem, or a stranger accidentally deletes a file, Life's room cannot do it. work. They will have to go back to the departments and workshops, and the workshops and rooms you have to update will take too much time.

1. **Dispatching employees:**

**Central - Labor Organization - Director - Labor Organization - Workshop**

After the central government creates a mobilization request, the Labor Organization will need to create a paper decision and submit it to the Director. When the Director reviews and ceases, he hand over the documents to the Labor Organization. The Labor Organization will then need to make a written notice to the employee's old Workshop and the new Workshop. The information of that employee must also be passed on to the new Workshop manager. This process takes a lot of time because of the need to move back and forth and exchange documents between the parties, the amount of text is so large that it consumes too many resources. In addition, the number of staff required to manipulate is so large that it is time-consuming to find files that store information and update information and make mistakes or errors during the import process. Emergency dispatching is not possible because of too many processes.

1. **Termination of contract:**

**Staff - Labor Organization - Director - Labor Organization - Workshop**

When an employee terminates his/her contract, he/she must notify the Labor Organization department so that the Labor Organization department can create a decision form and send it to the Board of Directors for approval. Board of Directors will censor documents must be transferred to the Department of Labor Organization. The Labor Organization will send a written notice to the Workshop and transfer that employee's information from the Internal Profile file to the External Profile file. This takes a lot of time because you have to move documents over and over and convert employee information from one file to another, and if an employee takes a break, manage that employee's information in files. task division, mobilization, ration will no longer. The volume of files needs updating quite a lot, there may be unintended errors.

1. **Add the certificate:**

**Staff - Labor Organization**

An employee who wants to update a close friend's certificate to the company must submit a hard copy to the Labor Organization department. Information that the person who receives the paper or hand over to the person who stores it is recorded and managed in an excel file. After obtaining the certificate, the Labor Organization will have to update the certificate for the employee and notify the task manager to control what the employee is eligible to do. The process takes a lot of time and searching for the employee's information store takes a lot of time. All information is stored in excel file, which is not very good security. If you happen to encounter errors such as a dead computer hard drive or a virus or someone access to sabotage, you will lose a large amount of information, causing damage to both the company and its employees.

1. **Labor Safety:**

**Workshop - Production control - Labor safety room - Labor organization**

The workshop creates an application to update the situation of the accident of the employee and then creates a text to send to the Production control, the Production control will transfer the documents to the Labor safety room for evaluation and then send the results to the labor organization. The Labor Organization department will consider if the employee is not fit, he/she will create an application and send it to the Director to cease the job. Too much times waste, too many documents will consume resources. If the employee can continue working but the processing process is too long, the employee cannot go to work, the employee cannot earn money and the company will reduce productivity if the number of employees waiting to handle is too much. In case the employee cannot continue to work, but in the course of erroneous document delivery, the workshop receives false information for the next employee, it will cause serious consequences related to the human network. In the event that it is completed, the steps of terminating the contract must be completed again for the employee and it takes more time and resources.

## The Proposed system

### The idea

Considering the problems of the current manual system, PMLOS was created to solve all those problems. This will be an intuitive, comprehensive management system, help the management becomes faster, multitasking, simpler, more efficient, eliminating the limitations of the system manual, improve productivity efficiency, minimize risk of error. Employees will be managed by department and certificate will be managed by employee. PMLOS will provide searching employee feature and filter by department feature to make searching information of an employee and his/her certificate more easily.

### Technical requirement

Because the business of Quang Hanh Company involves work in the mines. Mine is an extremely dangerous place with difficult and complicated. It is difficult to carry many devices, equipment and in addition the managers do not know much about computers and complex technology. With the condition of a Wi-Fi pit, PMLOS is built to website, that will best suit with above conditions. With users using office IT to get acquainted with the software faster and more user-friendly during using. Software will manages the server power, automatically disconnects data, links and takes over the control of the Company's existing digital radio system for power outage operation.

### Functional requirement

Because there are many different positions in the labor organization department, the features and the screens will be assigned and only authorized people can handle the features and screens. There are positions in the labor organization department such as paperwork managers, certificate managers, mobilization managers, recruitment and termination managers, labor productivity managers, and department managers. So the features will be developed based on the positions and jobs in the labor organization department .

For paperwork managers, because their current difficulty is that the management on excel is scattered in many different files,this wastes a lot of time for searching to add new or update, due to the risk of lossing data, the software will help the paperwork manager to manage more focusly. There will be a screen of employees record management in the company by list. When selecting the employee will have a screen showing all the information of this employee. The manager can add and edit information in this employee's profile. The software will also provide the ability to search by employee code, employee name or employee filtering by department to help find information of employees to edit quickly. The manager can also easily see what the employee's profile is missing so that he can notify the employee to add. After the addition of the record, the history of the record addition will also be kept for the manager to manage.

For recruit and terminating contracts managers, their difficulty is the management of the recruited employee records as well as the employee termination records. This makes it difficult for the company's labor statistics as well as total of recruitment and termination. The software will support the feature of creating contract termination and recruitment of employees. After the manager has obtained a decision code from the board of directors, the manager will fill in the decision code on this form. The software will handle both decided and undecided form. After an employee has made a decision to recruit, it will be managed by the software in the company profile and with the decision to terminate the contract will be stored in the profile outside the company. The number of terminations and employment of the two departments : Mechatronics and Exploitation will be re-listed to serve for making monthly and annual reports on total termination and employment easily.

For the company's certificate and employee’s certificate manager, they are currently facing a lot of difficulties and are time-consuming with this, mainly focusing on looking for employee records and adding certificates as well as renewing certificates for them, besides managing whether employees are working have certificates for the assigned tasks or not. The software will support by having both the certificate management feature of both the company and the employee. For the whole company's certificate management, when it needs to add new, edit information or remove Out-of-date certificates, the software will make this easier and employees who have this certificate will automatically be dropped. Valid or expired certificate status will also be shown. The certificate manager can also track employees who are assigned to a task who have a certificate for that task yet in the task certificate tracking screen. At this screen, the manager can renew for the expired employee certificate and add a new certificate for the non-certified employee. Searching and filtering functions will also be added to the software to help managers find employees and certificates more easily.

For managers who mobilize employees, the difficulty they encounter is similar to recruit and terminating contracts managers when they have to manage the mobilization orders that have a decision code and have no decision code. from the board of directors. Besides, they have to notify the factory that employees are transferred to the factory to managers for assigning work and take daily attendance for this employee. The software will also assist the manager to easily manage the dispatched units that have decision and no decision. After the decision of the application is made, the assigned employee is automatically added to the list of employees in the assigned factory. The ability to search and filter employees by workshop is also added to make it easy and quick to find employees.

For labor productivity managers. The software will support the aggregate labor productivity entered by the factory. Labor productivity will be aggregated by two types : by month and by day. This will make it easier for managers to make reports as well as monitor labor productivity with the goals set out. In addition, in the management of labor productivity, managers can also track the number of long-term sick leave workers to serve the timely dispatch of workers to the workshop to be able to accomplish the set goals.

There will also be a dashboard screen to view quick reports: number of expired certificates, number of mobilizations, number of accidents, unreasonable number of unused employees, daily output report, human chart. This dashboard screen is accessible to all managers.

For the head of the labor organization department, the software will provide a history tracking feature for how managers take action during the day. For example, actions such as mobilizing employees, adding certificates, extending certificates, recruiting, terminating contracts with employees... will be saved as: action + performers + execution time. This feature is only available to the manager. The convenient feature for the head of the department to monitor all activities that occur in the labor organization room, and when an incident occurs, the task of accountability can be done more easily.

For the production team, there will be managers who handle issues such as attendance, labor productivity reporting to the control room, and assign tasks to employees. The corresponding features will also be designed to help production teams reduce time and increase labor productivity. The attendance manager will be able to take attendance for employees of their workshop in shifts. A task manager can assign a task to an employee and track what this employee is doing and have a certificate for this task or not. Searching feature is also added to help managers can search for employees by name or by employee code so that the search can be done quickly.

### Out-of-Scope Functions

Due to the time factor, some features will be developed in the next phase such as the feature to view the history of actions for the manager.

# Software project management

## Problem Definition

### Name of this Capstone project

Capstone project name is “Production Management and Labor Organization System”. This is a web application to help management Production and Labor Organization for Quang Hanh company.

### Problem Abstract

As an introduction to the project, the main objective of this system is to help the company manage the Production and Labor Organization more easily, conveniently and efficiently. There are a lot software that also help with software management, but those software are generally have many conflicts and difficulties, not suitable for integration with the current system of the company and more importantly. Managers in the company are mostly want a system that is intuitive, simple, easy to use and effective. Therefore, the system must have characteristics as intuitive, clear interface, create a familiar feel, close to the current system of the company for users, simple, convenient, all functions are displayed out of the screen, not too many pages, too much work to see or edit something.

### Project Overview

#### The Current System

The current management system of Quang Hanh Company is a large-scale system, but ineffective operation still has some limitations. The system requires a large number of personnel to handle and handle the system, but it is still high risk, too much manual and general management features have not been developed. Although there have been other supporting software different from Ready group’s software, the data has not been synchronized between the management departments and the factory. The management of an employee's information is still difficult because of manual way by excel, which makes it difficult to add information to this employee as well as the notice of attendance to calculate the salary for employees from factory to the labor organization department.

#### The Proposed System

The software will be developed by C # ASP.NET MVC5 and MS SQL Server 2012 for the following reasons:

**Control**: When you use the ASP.NET MVC5 framework, you are provided with a very powerful set of controls on JavaScript, HTML and CSS compared to controls provided by some traditional forms on the web.

**Testable**: The ASP.NET MVC Framework supports testing of web applications very well. Therefore, if you want to test your web application before giving it to users, you can simply use ASP.NET MVC5.

**Compact**: This framework does not use ViewState, aids in reducing the bandwidth of requests a lot.

**View and Size of Control**: ASP.NET frameworks often face the problem of viewstate and the size of control in HTML. The view stores all rendered data and therefore the size of the HTML files becomes larger. If you use a slow internet connection, the loading of web pages and applications will be observed. This problem no longer exists in the ASP.NET MVC5 framework nor does it contain a concept of a view in it. By using ASP.NET MVC, you will no longer face page load issues.

**Integration**: When integrating MVC with jQuery, it is possible to write code that runs in web browsers. This will help reduce the load on the web server.

**Quickly**: How to connect MS SQL Server 2012 with ASP.NET MVC5 application very quickly and has the support of Entity framework and ADO.NET to help make model and querry happen quickly, minimize coding time.

#### Boundaries of the System

For the duration of the capstone project, the scope includes:

* Complete all functions of certificate management
* Complete all functions of recruiment and termination management
* Complete all functions of mobilization management
* Complete all functions of labor productivity management
* Complete all functions of department management
* Complete all functions of paperwork management
* Complete all functions of attendance management

#### 2.1.3.1.4 Development Environment

*2.1.3.4.1. Hardware*

|  |  |
| --- | --- |
| **Processor** | Intel core i5 or higher |
| **Memory** | Minimum 4GB RAM |
| **Hard disk** | 10GB available hard-disk space for installation |

*Table 2.1 Hardware environment*

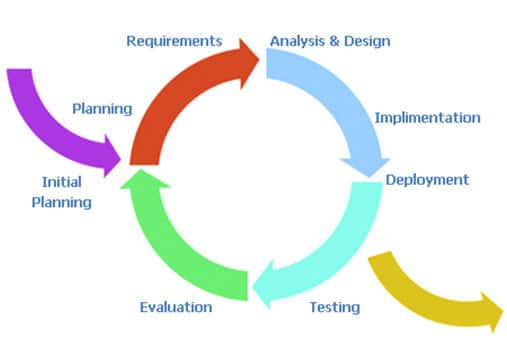
*2.1.3.4.2. Software*

|  |  |
| --- | --- |
| **Microsoft Windows** | Windows 10 |
| **IDE** | Visual Studio 2017 |
| **Web Server** | IIS 10.0 |
| **DBMS** | Microsoft SQL Server 2012 or higher |
| **Framework** | .NET Framework 4.5 , Entity Framework 6.2.0, ASP .NET MVC 5.2.4 |
| **Architecture tool** | Microsoft Visio |
| **Browsers** | Chrome, Mozilla Firefox |
| **Other** | Microsoft Project, Microsoft Office, GitHub |

## Project organization

### Software Process Model

The incremental model has been applied to structure, plan and control the process of development and maintenance the system. Follow this model, project will have 3 cycles



*Figure 2.1: The incremental model*

### Roles and Responsibilities

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Team member** | **Role** | **Responsibility** |
| 1 | Phan Duy Vy | PM, BA, QA | Manage process  Business analysis  Design UI and architecture  Test  Write Meeting Minutes |
| 2 | Nguyen Thi Huong | Dev, Designer | Code  Design detail architecture  Test |
| 3 | Nguyen Dinh Hoang | Dev, CM | Code  Manage configuration  Deployment |
| 4 | Vu Ngoc Thuong | Designer, Tester | Create test plan, test design and test case and test data  Test  Design detail architecture |
| 5 | Giap Minh Luat | Dev, Tester | Code  Test  Create test data |

### Tools and Techniques

Tools: Visual Studio 2015, Visio 2013, Microsoft Office (word, excel, PowerPoint), Microsoft Project, Chrome, Firefox, Microsoft SQL Server, GitHub

## Project management plan

### Tasks

#### Initiating:

|  |  |
| --- | --- |
| **Description** | Project register  Kick-off  The original idea |
| **Output** | Report project introduction |
| **Deliverables** | Before Dec 5th, 2019 |
| **Resources Needed** | 5 persons |
| **Dependencies and Constraints** | N/A |
| **Risks** | N/A |

*Table 2.4 Initiating*

#### Planning:

|  |  |
| --- | --- |
| **Description** | * Meeting customer, preliminary evaluation of the current system * Create project plan * Project plan approved |
| **Output** | Report management plan |
| **Deliverables** | Before Dec 15th 2019 |
| **Resources Needed** | 3 persons |
| **Dependencies and Constraints** | N/A |
| **Risks** | N/A |

*Table 2.5 Planning*

#### Software requirement specification:

|  |  |
| --- | --- |
| **Description** | Analysis customer system  Analysis of customer requirements  Create prototype  Create Software Requirement Specification (SRS) |
| **Output** | Report Software Requirement Specification (SRS) |
| **Deliverables** | * For capstone project : Before Sep 21st, 2019 * For project : Before Sep 21st, 2019 * Upgrade system : Before Sep 31th, 2019 |
| **Resources Needed** | 5 persons |
| **Dependencies and Constraints** | N/A |
| **Risks** | Customers do not know or cannot describe their system is needed and missing something also do not know what you want |

*Table 2.6 Software requirement specification*

#### Software design:

|  |  |
| --- | --- |
| **Description** | Design database  Design high-level architecture  Design detail architecture |
| **Output** | Software Design Description (SDD) |
| **Deliverables** | * For Capstone Project : Before Oct 15th, 2019 * For project : Before Oct 15th, 2019 * Upgrade system : Before Oct 27th, 2019 |
| **Resources Needed** | 5 persons |
| **Dependencies and Constraints** | Complete SRS |
| **Risks** | May be mistakenly choose the wrong architecture type that leads to difficult system for maintains or high coding efforts |

*Table 2.7 Software design*

#### Implementation:

|  |  |
| --- | --- |
| **Description** | Coding  Create Software User’s Manual ( SUM ) |
| **Output** | Source code, SUM |
| **Deliverables** | * For Capstone Project : Before Dec 15h, 2019 * For project : Before Dec 01th, 2019 * Upgrade system : Before Dec 05th, 2019 |
| **Resources Needed** | 3 persons |
| **Dependencies and Constraints** | Complete SRS, SDD |
| **Risks** | All members is newbie in ASP .NET . It’s take a lot of time and high efforts to study and implement |

*Table 2.8 Implementation*

#### Testing:

|  |  |
| --- | --- |
| **Description** | Execute test |
| **Output** | Test report |
| **Deliverables** | * For Capstone Project : Before Dec 15th, 2019 * For project : Before Dec 15th, 2019 * Upgrade system : Before Dec 28th, 2019 |
| **Resources Needed** | 3 persons |
| **Dependencies and Constraints** | Complete SRS, SDD |
| **Risks** | N/A |

*Table 2.9 Testing*

#### Deployment:

|  |  |
| --- | --- |
| **Description** | Input current data  Deploy web to Internet |
| **Output** | Final product |
| **Deliverables** | * For Capstone Project : Before Dec 16th, 2019 * For project : Before Dec 20th, 2019 * Upgrade system : Before Dec 28th, 2019 |
| **Resources Needed** | 5 persons |
| **Dependencies and Constraints** | Complete all other task |
| **Risks** | Problem about data and server |

*Table 2.10 Deployment*

#### Closing:

|  |  |
| --- | --- |
| **Description** | Create final report, final presentation |
| **Output** | Final report, final presentation |
| **Deliverables** | * For Capstone Project : Before Dec 20th, 2019 * For project : Before Dec 25th, 2019 * Upgrade system : Before Dec 31th, 2019 |
| **Resources Needed** | 5 persons |
| **Dependencies and Constraints** | Complete deploy web |
| **Risks** | N/A |

*Table 2.11 Closing*

### Task Sheet: Assignments and Timetable

Project plan contain in [PMLOS\_Management\_Plan](file:///C:\Users\Vy%20Phan\AppData\Roaming\Microsoft\Word\refer\TSB_Management_Plan.mpp)

### All Meeting Minutes

Contain in [folder PMLOS\_ MeetingMinute](file:///C:\Users\Vy%20Phan\AppData\Roaming\Microsoft\Word\refer\TSB_%20MeetingMinute)

## Coding Convention

C# coding convention <https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/inside-a-program/coding-conventions>

JS coding convention <https://www.w3schools.com/js/js_conventions.asp>

Html coding convention <https://github.com/xfiveco/html-coding-standards>

## Other material

### Risk management plan

Refer to [PMLOS\_RiskPlan](file:///C:\Users\Vy%20Phan\AppData\Roaming\Microsoft\Word\risk%20plan.xlsx)

### Project communication

#### Project reporting

|  |  |  |  |
| --- | --- | --- | --- |
| Activity | Participants | Frequency/When | Method |
| Weekly Status Report | Author: VyPD  Distribution list: BanTQ, VyPD, ThuongVN, HoangND, HuongNT, LuatGM | Thursday | Face to face  Face to face |
| Discussion  (Emergency situation) | Initiator: Any participant  Participants: BanTQ, VyPD, ThuongVN, HoangND, HuongNT, LuatGM | Event-based | Skype  Facebook  Face to face |

*Table 2.12 Project reporting*

The initiator of meetings and discussions will circulate an agenda to all participants at least 24 hours before the scheduled time of the meeting or discussion.

The initiator, or another designated participant, will circulate meeting minutes to all participants within 12 hours of the conclusion of the meeting.

#### Escalation path

Quang Hanh Escalation Path

Ready Escalation Path

Project Team

Phan Duy Vy

Staff

Nguyen Thi Thuy

*Figure 2.2: Escalation path*

#### Delivery method

Deliverables from Ready to Quang Hanh, and vice versa, will via Skype and upload into Ready’s server. The detail of server will be informed later when we use it.

On the final delivery date we will upload website to Quang Hanh’s server.

# Software Requirements Specifications (SRS)

## User requirement specification

## System requirement specification

# Software Design Description (SDD)

## Overview

This document constructs the software design for PMLOS . Include system architecture design, web application architecture, detail design and database design.

System architecture design describes overall architecture of system.

Web application architecture describes architecture for web.

Detail design describes static and dynamic structure for each component, including class diagrams, class explanations and sequence diagram of the main use cases.

Database design contains ERD and Data Description for each table in database.

All diagrams are drawn according to [[1]](https://msdn.microsoft.com/en-us/library/dd409389.aspx) , [[2]](https://www.ibm.com/developerworks/rational/library/dec04/bell/) , [[3]](https://msdn.microsoft.com/en-us/library/dd409465.aspx)

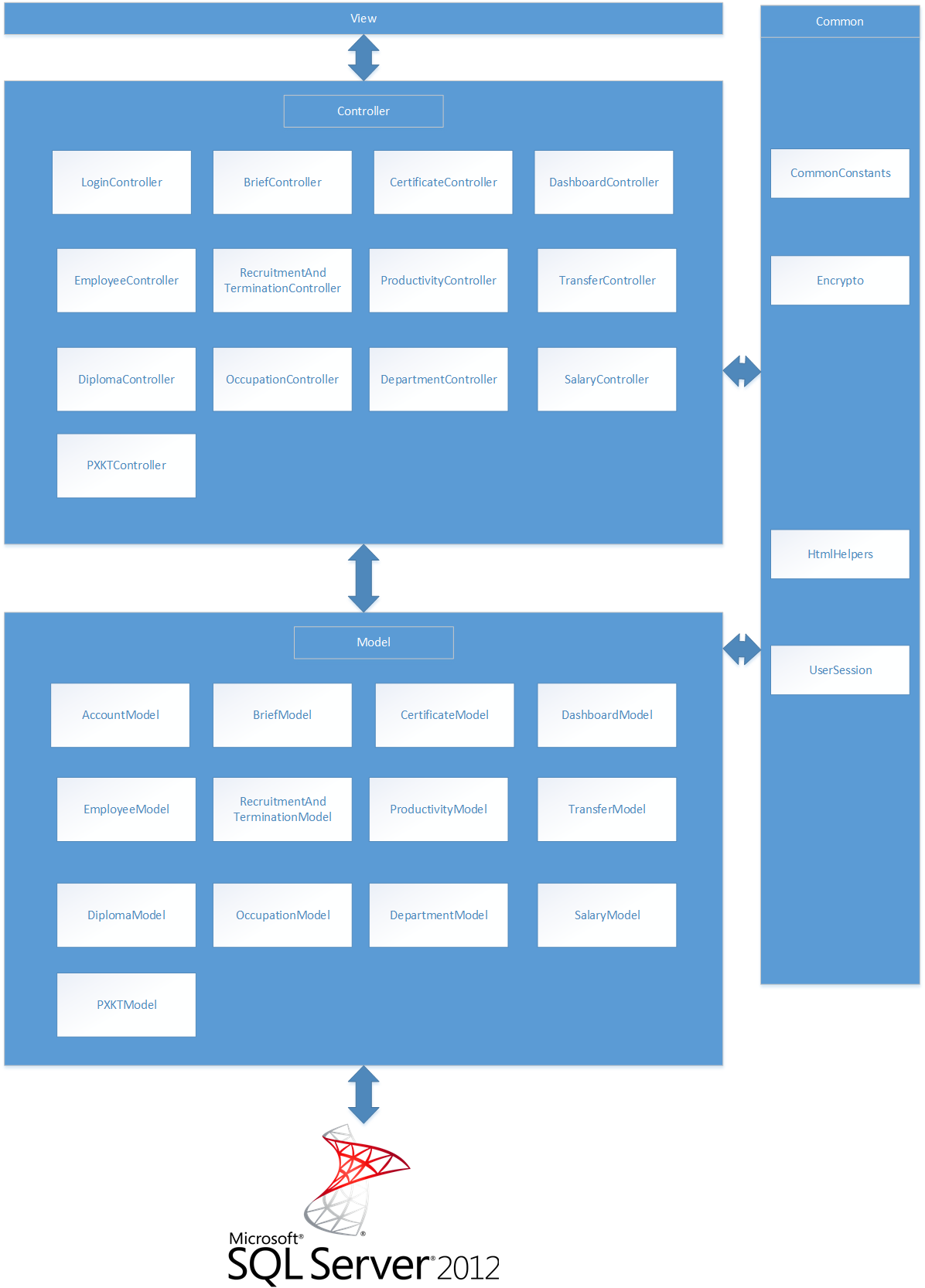
## Overall System Architectural

 Figure 4.1: Overall System Architecture

User: include 6 kinds of user: Certificate manager, paperwork managers, recruit and terminating contracts managers, mobilize employees,production manager, administrator. User will interact with system via web browser and via normal protocols ( HTTP, HTTPS). System send request to web server and web server queries data from database to response requests

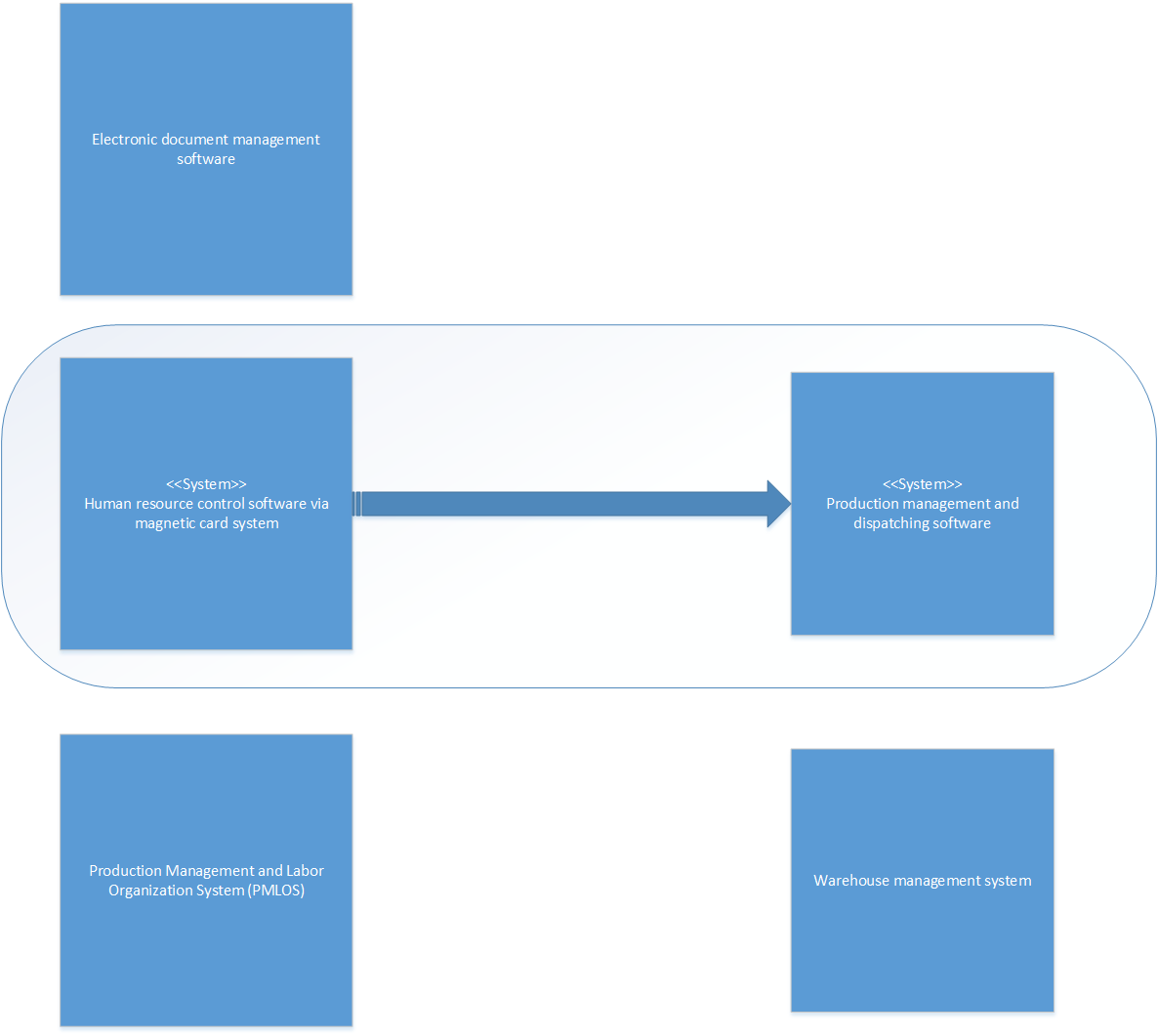
## Architectural Layer Design

### System layer design



*Figure 4.2: Architecture layer design*

### Context diagram



*Figure 4.13: system context diagram*

## Software detailed design

### Activity process

### Context diagram

### Detail description

## Database Design or Data Structures

### Entity Relationship diagram

### Data Description

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **NhanVien** | | |
| **Description** | **Contain information of employee** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| MaNV (Primary key) | nvarchar(50) | NO | Primary key |
| Ten | nvarchar(100) | NO |  |
| Tenkhac | nvarchar(100) | YES |  |
| GioiTinh | bit | YES |  |
| CapUyHienTai | nvarchar(100) | YES |  |
| PhuCapChucVu | float | YES |  |
| NgaySinh | date | YES |  |
| NoiSinh | nvarchar(100) | YES |  |
| DanToc | nvarchar(100) | YES |  |
| QueQuan | nvarchar(100) | YES |  |
| TonGiao | nvarchar(100) | YES |  |
| NoiOHienTai | nvarchar(100) | YES |  |
| SoDienThoai | nvarchar(50) | YES |  |
| TPGiaDinhXuatThan | nvarchar(100) | YES |  |
| NgayThamGiaCachMang | date | YES |  |
| NgayVaoDangCSVN | date | YES |  |
| NgayChinhThuc | date | YES |  |
| NgayVaoToChucCTXH | date | YES |  |
| ToChuc | nvarchar(100) | YES |  |
| NgayNhapNgu | date | YES |  |
| NgayXuatNgu | date | YES |  |
| QuanHamChucVuCaoNhat | nvarchar(100) | YES |  |
| HocHamHocViCaoNhat | nvarchar(100) | YES |  |
| LyLuanChinhTri | nvarchar(100) | YES |  |
| NgoaiNgu | nvarchar(100) | YES |  |
| CongTacChinhDangLam | nvarchar(100) | YES |  |
| NgachCongChuc | nvarchar(100) | YES |  |
| MaNgach | float | YES |  |
| DanhHieuDuocPhong | nvarchar(100) | YES |  |
| SoTruongCongTac | nvarchar(100) | YES |  |
| CongViecDaLamLauNhat | nvarchar(100) | YES |  |
| KhenThuong | nvarchar(100) | YES |  |
| KyLuat | nvarchar(100) | YES |  |
| TinhTrangSucKhoe | nvarchar(100) | YES |  |
| ChiTietSucKhoe | nvarchar(100) | YES |  |
| ChieuCao | float | YES |  |
| CanNang | float | YES |  |
| NhomMau | nvarchar(100) | YES |  |
| HangThuongBinh | nvarchar(100) | YES |  |
| GiaDinhChinhSach | nvarchar(100) | YES |  |
| SoCMND | nvarchar(20) | YES |  |
| NgayCapCMND | date | YES |  |
| NoiCapCMND | nvarchar(100) | YES |  |
| NgayDiLam | date | YES |  |
| MaUyQuyen | int | YES | Foreign key reference table Role\_detail (Role\_ID) |
| SoBHXH | nvarchar(100) | YES |  |
| NgayTraBHXH | date | YES |  |
| MaCongViec | int | YES | Foreign key reference table Role\_detail (Role\_ID) |
| MucLuong | float | YES |  |
| MaTrinhDo | int | YES | Foreign key reference table Role\_detail (Role\_ID) |
| MaTruong | int | YES | Foreign key reference table Role\_detail (Role\_ID) |
| BacLuong | nvarchar(100) | YES |  |
| NgheTruoc | nvarchar(100) | YES |  |
| NgayTuyenDungTruoc | date | YES |  |
| CoQuanTruoc | nvarchar(100) | YES |  |
| HeSo | float | YES |  |
| TuThang | int | YES |  |
| MaTrangThai | int | YES | Foreign key reference table Role\_detail (Role\_ID) |
| MaChuyenNganh | nvarchar(100) | YES | Foreign key reference table Role\_detail (Role\_ID) |
| MaPhongBan | nvarchar(150) | YES | Foreign key reference table Role\_detail (Role\_ID) |
| MaBacLuong\_ThangLuong\_MucLuong | int | YES | Foreign key reference table Role\_detail (Role\_ID) |

*Table 4.62 Data description table NhanVien*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **ChamDut\_NhanVien** | | |
| **Description** | **Contain information of employee has been terminated** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaQuyetDinh(Primary key) | TINYINT | NO | Foreign key reference table Role\_detail (Role\_ID) |
| MaNV(Primary key) | NVARCHAR(50) | NO | Foreign key reference table Role\_detail (Role\_ID) |
| LoaiChamDut | nvarchar(100) | YES |  |
| NgayChamDut | date | YES |  |

*Table 4.63 Data description table ChamDut\_NhanVien*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **Truong** | | |
| **Description** | **Contain information of University** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaTruong (Primary key) | int | NO | Primary key |
| TenTruong | nvarchar(100) | NO |  |

*Table 4.63 Data description table Truong*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **TrinhDo** | | |
| **Description** | **Contain information of standard** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaTrinhDo (Primary key) | int | NO | Primary key |
| TenTrinhDo | nvarchar(100) | NO |  |

*Table 4.63 Data description table TrinhDo*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **DieuDong\_NhanVien** | | |
| **Description** | **Contain information of mobilized employee** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaQuyetDinh (Primary key) | int | NO | Foreign key reference table Role\_detail (Role\_ID) |
| MaNV(Primary key) | nvarchar(50) | YES | Foreign key reference table Role\_detail (Role\_ID) |
| LyDoDieuDong | nvarchar(1000) | YES |  |
| DonViMoi | nvarchar(100) | YES |  |
| ChucVuMoi | nvarchar(100) | YES |  |
| BacLuongMoi | nvarchar(100) | YES |  |
| DonViCu | nvarchar(100) | YES |  |
| ChucVuCu | nvarchar(100) | YES |  |
| BacLuongCu | nvarchar(100) | YES |  |
| MucLuongCu | float | YES |  |
| MucLuongMoi | float | YES |  |

*Table 4.63 Data description table DieuDong\_NhanVien*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **TuyenDung\_NhanVien** | | |
| **Description** | **Contain information of recruit employee** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaQuyetDinh (Primary key) | int | NO | Foreign key reference table Role\_detail (Role\_ID) |
| MaNV(Primary key) | nvarchar(50) | NO | Foreign key reference table Role\_detail (Role\_ID) |
| NgayTuyenDung | date | NO |  |

*Table 4.63 Data description table DieuDong\_NhanVien*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **QuyetDinh** | | |
| **Description** | **Contain information of decision** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaQuyetDinh (Primary key) | int | NO | Primary key |
| SoQuyetDinh | nvarchar(50) | YES |  |
| NgayQuyetDinh | date | YES |  |

*Table 4.63 Data description table DieuDong\_NhanVien*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **QuanHeGiaDinh** | | |
| **Description** | **Contain information of family relationship of employee** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| LoaiGiaDinh (Primary key) | int | NO | Primary key |
| LoaiGiaDinh | nvarchar(100) | YES |  |
| MoiQuanHe | nvarchar(100) | YES |  |
| NgaySinh | date | YES |  |
| LyLich | nvarchar(100) | YES |  |
| MaNV | nvarchar(50) | YES | Foreign key reference table Role\_detail (Role\_ID) |
| HoTen | nvarchar(100) | YES |  |
| NoiThuongTru | nvarchar(100) | YES |  |
| SoDienThoai | nvarchar(20) | YES |  |

*Table 4.63 Data description table QuanHeGiaDinh*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **DiemDanh\_NangSuatLaoDong** | | |
| **Description** | **Contain information of family relationship of employee** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaNV (Primary key) | int nvarchar(50) | NO | Foreign key reference table Role\_detail (Role\_ID) |
| HeaderID(Primary key) | int | YES | Primary key |
| ThoiGianThucTeDiemDanh | datetime | YES |  |
| HeSoChiaLuong | float | YES |  |
| DiemLuong | float | YES |  |
| DuBaoNguyCo | nvarchar(1000) | YES |  |
| DiLam | bit | YES |  |
| GhiChu | nvarchar(1000) | YES |  |
| LyDoVangMat | nvarchar(1000) | YES |  |
| GiaiPhapNguyCo | nvarchar(1000) | YES |  |

*Table 4.63 Data description table DiemDanh\_NangSuatLaoDong*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **ChungChi\_NhanVien** | | |
| **Description** | **Contain information of employee’s certificate** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| SoHieu (Primary key) | nvarchar(100) | NO | Primary key |
| NgayCap | date | NO |  |
| MaNV | nvarchar(50) | YES | Foreign key reference table Role\_detail (Role\_ID) |
| MaChungChi | int | NO | Foreign key reference table Role\_detail (Role\_ID) |
| NgayTra | date | YES |  |

*Table 4.63 Data description table ChungChi\_NhanVien*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **ChungChi** | | |
| **Description** | **Contain information of certificate** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaChungChi (Primary key) | int | NO | Primary key |
| TenChungChi | nvarchar(100) | YES |  |
| ThoiHan | int | YES |  |
| KieuChungChi | nvarchar(100) | NO |  |

*Table 4.63 Data description table ChungChi*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **ChiTiet\_NhiemVu\_NhanVien** | | |
| **Description** | **Contain information of employee’s task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaChiTiet\_NhiemVu\_NhanVien (Primary key) | int | NO | Primary key |
| MaNV | nvarchar(50) | NO | Foreign key reference table Role\_detail (Role\_ID) |
| MaNhiemVu | int | NO | Foreign key reference table Role\_detail (Role\_ID) |
| NgayNhanNhiemVu | date | NO |  |
| IsInProcess | bit | NO |  |
| LanCuoiCapNhat | datetime | NO |  |
| IsUpdated | bit | YES |  |

*Table 4.63 Data description table ChiTiet\_NhiemVu\_NhanVien***ngChi**

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **NhiemVu** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaNhiemVu (Primary key) | int | NO | Primary key |
| MaChungChi | int | NO | Foreign key reference table Role\_detail (Role\_ID) |
| TenNhiemVu | nvarchar(100) | NO |  |
| Loai | nvarchar(100) | NO |  |

*Table 4.63 Data description table NhiemVu*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **ChiTiet\_BangCap\_GiayChungNhan** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| SoHieu (Primary key) | nvarchar(100) | NO | Primary key |
| MaBangCap\_GiayChungNhan | int | NO | Foreign key reference table Role\_detail (Role\_ID) |
| NgayCap | date | YES |  |
| NgayTra | date | YES |  |
| MaNV | nvarchar(50) | NO | Foreign key reference table Role\_detail (Role\_ID) |

*Table 4.63 Data description table ChiTiet\_BangCap\_GiayChungNhan*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **ChuyenNganh** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaChuyenNganh (Primary key) | nvarchar(100) | NO | Primary key |
| TenChuyenNganh | nvarchar(100) | YES |  |
| CapBac | nvarchar(100) | YES |  |
| MaNganh | nvarchar(100) | YES | Foreign key reference table Role\_detail (Role\_ID) |
| ChiTiet | nvarchar(100) | YES |  |

*Table 4.63 Data description table ChuyenNganh*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **Nganh** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaNganh (Primary key) | nvarchar(100) | NO | Primary key |
| TenNganh | nvarchar(100) | YES |  |

*Table 4.63 Data description table Nganh*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **HoSo** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaNV(Primary key) | nvarchar(50) | NO | Primary key |
| NgayNhanHoSo | nvarchar(100) | YES |  |
| NguoiGiaoHoSo | nvarchar(100) | YES |  |
| CamKetTuyenDung | nvarchar(100) | YES |  |
| QuyetDinhTiepNhanDVC | nvarchar(100) | YES |  |
| QDChamDutHopDongDVC | nvarchar(100) | YES |  |
| NLDHocTheoChiTieuCTDT | nvarchar(100) | YES |  |
| NguoiBanGiaoBangNhapKho | nvarchar(100) | YES |  |
| NguoiGiuHoSo | nvarchar(100) | YES |  |
| TrangThaiHoSo | nvarchar(100) | YES |  |
| NgayQuyetDinhTuyenDung | date | YES |  |
| NgayDiLam | date | YES |  |
| DonViKyQuyetDinhTiepNhan | nvarchar(100) | YES |  |
| NgayQuyetDinhChamDut | date | YES |  |
| NgayChamDut | date | YES |  |
| DonViKyQuyetDinhChamDut | nvarchar(100) | YES |  |

*Table 4.63 Data description table HoSo*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **Department** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| department\_id (Primary key) | nvarchar(150) | NO | Primary key |
| department\_name | nvarchar(150) | NO |  |
| isInside | bit | NO |  |
| department\_type | nvarchar(150) | NO |  |

*Table 4.63 Data description table Department*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **CongViec** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaCongViec (Primary key) | int | NO | Primary key |
| TenCongViec | nvarchar(500) | YES |  |
| PhuCap | float | YES |  |
| MaThangLuong | int | YES | Foreign key reference table Role\_detail (Role\_ID) |

*Table 4.63 Data description table CongViec*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **CongViec\_NhomCongViec** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaCongViec\_NhomCongViec (Primary key) | int | NO | Primary key |
| MaCongViec | int | YES | Foreign key reference table Role\_detail (Role\_ID) |
| MaNhomCongViec | int | YES | Foreign key reference table Role\_detail (Role\_ID) |

*Table 4.63 Data description table CongViec\_NhomCongViec*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **NhomCongViec** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaNhomCongViec (Primary key) | int | NO | Primary key |
| LoaiNhomCongViec | nvarchar(100) | YES |  |
| TenNhomCongViec | nvarchar(100) | YES |  |
| MaDienCongViec | int | YES | Foreign key reference table Role\_detail (Role\_ID) |

*Table 4.63 Data description table NhomCongViec*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **DienCongViec** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaNhomCongViec (Primary key) | int | NO | Primary key |
| LoaiNhomCongViec | nvarchar(100) | YES |  |

*Table 4.63 Data description table DienCongViec*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **ThangLuong** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaThangLuong (Primary key) | int | NO | Primary key |
| MucThangLuong | nvarchar(50) | YES |  |

*Table 4.63 Data description table ThangLuong*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **BacLuong\_ThangLuong\_MucLuong** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaBacLuong\_ThangLuong\_MucLuong (Primary key) | int | NO | Primary key |
| MaBacLuong | int | YES | Foreign key reference table Role\_detail (Role\_ID) |
| MaThangLuong | int | YES | Foreign key reference table Role\_detail (Role\_ID) |
| MucLuong | nvarchar(100) | YES |  |

*Table 4.63 Data description table BacLuong\_ThangLuong\_MucLuong*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **BacLuong** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaBacLuong (Primary key) | int | NO | Primary key |
| MucBacLuong | nvarchar(50) | YES |  |

*Table 4.63 Data description table BacLuong*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **Account** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| ID (Primary key) | int | NO | Primary key |
| Name | nvarchar(50) | YES |  |
| Username | nvarchar(50) | YES |  |
| Password | nvarchar(50) | YES |  |
| Position | nvarchar(50) | YES |  |
| NVID | nvarchar(50) | YES |  |
| CDVT | bit | NO |  |
| TCLD | bit | NO |  |
| BGD | bit | NO |  |
| DK | bit | NO |  |
| DK | bit | NO |  |
| PXKT | bit | NO |  |
| PXDL | bit | NO |  |
| PXVT | bit | NO |  |
| PXST | bit | NO |  |
| PXPV | bit | NO |  |
| PXDS | bit | NO |  |
| PXCDM | bit | NO |  |
| PXTGQLM | bit | NO |  |
| PXXD | bit | NO |  |
| PXLT | bit | NO |  |
| AT | bit | NO |  |
| KCM | bit | NO |  |
| ADMIN | bit | NO |  |

*Table 4.63 Data description table Account*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **LichSuBoSungSYLL** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| ID (Primary key) | int | NO | Primary key |
| NamBoSung | nvarchar(50) | YES |  |
| MaNV | nvarchar(50) | NO | Foreign key reference table Role\_detail (Role\_ID) |

*Table 4.63 Data description table LichSuBoSungSYLL*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **TrangThai** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaTrangThai (Primary key) | int | NO | Primary key |
| TenTrangThai | nvarchar(100) | YES |  |

*Table 4.63 Data description table TrangThai*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **QuaTrinhCongTac** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaCongTac (Primary key) | int | NO | Primary key |
| ChucDanh | nvarchar(100) | YES |  |
| ChucVu | nvarchar(100) | YES |  |
| DonViCongTac | nvarchar(100) | YES |  |
| NgayBatDau | date | YES |  |
| NgayKetThuc | date | YES |  |
| MaNV | nvarchar(50) | YES | Foreign key reference table Role\_detail (Role\_ID) |

*Table 4.63 Data description table QuaTrinhCongTac*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **GiayTo** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| MaNV | nvarchar(50) | YES |  |
| TenGiayTo | nvarchar(100) | YES |  |
| KieuGiayTo | nvarchar(100) | YES |  |
| MaGiayTo(Primary key) | int | NO | Primary key |
| NgayTra | date | YES |  |

*Table 4.63 Data description table GiayTo*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **Account\_Right** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| ID(Primary key) | nvarchar(50) | NO | Primary key |
| ModuleID | nvarchar(50) | YES |  |
| GroupID | int | YES |  |
| [Right] | nvarchar(70) | YES |  |
| isBasic | bit | YES |  |

*Table 4.63 Data description table Account\_Right*

|  |  |  |  |
| --- | --- | --- | --- |
| **Table** | **Account\_Right\_Detail** | | |
| **Description** | **Contain information of task** | | |
| **Attributes** | **Data type** | **Allow null** | **Description** |
| Attributes | Data type | Allow null | Description |
| ID | int | NO | Primary key |
| AccountID(Primary key) | int | NO |  |
| RightID(Primary key) | int | NO |  |

*Table 4.63 Data description table Account\_Right*

## References

# Software Test Documentation (STD)

## INTRODUCTION

### Purpose

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# Software User’s Manual (SUM)

## User’s Guide

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