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# Workload Analysis Using the Full-Time Equivalent Method Based on the Business Process Management Approach at PT XYZ

**Gima YumimaAlemisa Br Sinulingga[1*], Satya Risky Suhermanto[1], Annisa Rahmania[1], Sri Tjondro Winarno[1]**

[1]Agribusiness Study Program, Faculty of Agriculture, UPN "Veteran" East Java, Indonesia

*Correspondence E-mail : 23024010152@student.upnjatim.ac.id

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**ABSTRACT**

Effective human resource management is a key factor in ensuring the smooth operation of a company. Mismatches between the number of employees and the workload must be addressed to prevent low productivity or waste of resources. PT XYZ is a corn seed processing company. PT XYZ's warehouse plays a crucial role in the entire process, from receiving to shipping out seed materials. This underscores the importance of measuring the workload within the warehouse. This workload measurement employs the Full-Time Equivalent (FTE) method through a Business Process Management (BPM) approach. Data was collected primarily through interviews, observations, and time measurements using a stopwatch, supplemented by secondary data in the form of warehouse Standard Operating Procedures (SOPs). Based on the analysis, the warehouse workflow at PT XYZ is divided into three categories: Work in Process (WIP), Production Material Chemical Material (PMCM), and finished goods. The calculated workload per employee in the warehouse is 1.034. This indicates that the workload level in the warehouse is considered normal.

**Keywords**: Workload, Full-Time Equivalent (FTE), Business Process Management (BPM), Labor Requirements.

## 1. INTRODUCTION

A company's operational success is marked by the achievement of satisfactory performance, which is influenced by the management of its human resources. Uneven work distribution typically takes the form of either an excessive workload (overload) or an insufficient workload (underload). An excessive workload (overload) can lead to stress and a decline in productivity. Conversely, underload can lead to cost inefficiencies that hinder sustainable economic growth and a healthy work environment.

PT XYZ is a company engaged in corn seed processing services. The process involves several stages, ranging from receiving raw materials, drying, shelling, cleaning, seed treatment, to packaging according to client needs. As the industry enters a new era focused on maintaining operational stability in the seed industry as exemplified by PT XYZ the efficiency of internal business processes in logistics and warehousing plays a crucial role (Syamsuddin et al., 2022). A warehouse serves not only as a storage facility but also as the operational hub for managing the

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inflow and outflow of seed supplies, inventory management, and preparation for distribution to consumers.

PT XYZ faces complex operational management challenges in this situation, where workflows must adapt to fluctuations in demand as well as seasonal patterns namely, peak and off-peak seasons. The main challenge is the imbalance between workload volume and the available workforce capacity in the warehouse. To systematically address these challenges, a comprehensive framework such as Business Process Management (BPM) is required. This framework should be mapped out in detail, analyzed for effectiveness, and realigned to identify activities that involve overlapping tasks which hinder warehouse productivity (Ardiansyah et al., 2021).

To take concrete steps in optimizing the business process mapping identified through the BPM approach, quantitative workload measurement is required by applying the Full-Time Equivalent (FTE) method. This method works by converting the total working hours spent by warehouse staff to complete a specific series of activities, such as receiving, inventory recording, bagging, and loading. The FTE method will produce a real workload index that indicates the ideal number of workers needed by the warehouse. Thus, the integration of the BPM approach will streamline the workflow structure and the FTE method to measure workload with precision. PT XYZ will gain an objective picture of manpower utilization. This analysis is useful for detecting whether there is an overload or underload that could lead to inefficiencies in the company's operating costs (Matiro et al., 2021).

## 2. RESEARCH METHOD

This research utilizes a quantitative descriptive approach. The descriptive approach focuses on mapping, documenting, and analyzing the actual operational workflow (As-Is) of the warehouse using BPM concepts. The quantitative approach is applied through the calculation of staff standard task completion times to generate a real workload index based on the FTE method. The research was conducted at the warehouse of PT XYZ Plant Malang, East Java. Operational data collection and field observations were carried out intensively during the internship program period from February to June 2026.

The primary focus of this research is the entire sequence of business processes and workflows within the warehouse area of a hybrid corn seed industry company. The workflow components investigated encompass three major process groups: Work in Process (WIP), Production Material Chemical Material (PMCM), and Finished Goods. The subjects of this work observation are the warehouse operational taskholders (Warehousemen), validated by the Assistant

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Manager of the Warehouse at PT XYZ. The data analysis execution stages integrate the process improvement cycle in operations management, which is divided into four main phases: identifying the warehouse workflow mapping, measuring the actual working time of warehousemen, and determining the real effective annual working time by deducting official holidays, annual leave, and other official absence entitlements applicable in the company in 2026. The effective working hours are then converted into the total available working minutes per year. Subsequently, the Full-Time Equivalent (FTE) index calculation is performed by dividing the total identified actual task completion time by the Total Effective Working Time. The FTE formula applied is:

$$\text{FTE Index} = \frac{\text{Total Actual Task Completion Tine}}{\text{Total Effectife Working Time (EWT)}}$$

With the following FTE index value classifications:

1. **FTE < 1.00 (Underload):** Indicates excess labor capacity or an underloaded task burden, potentially triggering cost inefficiencies.
2. **FTE 1.00 - 1.28 (Normal/Optimal):** Indicates a workload distribution that is already balanced, proportional, and productive.
3. **FTE > 1.28 (Overload):** Indicates a significant workload excess, risking the onset of job stress and a decline in staff operational performance.

Data collection was conducted using primary data obtained through direct participatory observation methods in the field during the internship period to record the duration of logistics activity cycles, in-depth interviews with warehouse staff, and documentation of actual work instructions. Secondary data were obtained through documentation studies of the company's internal archives, Work Order (WO) files, the organizational structure of Plant Malang, official working hour policies, and relevant previous journal literature.

## 3. RESULTS AND DISCUSSION

### Warehouse Workflow of PT XYZ

Workflow comprises sequential steps utilized within a specific process, executed by multiple parties and involving various distinct resources (Pekerti et al., 2021). A structured workflow serves not only as a daily operational guideline but also acts as a crucial instrument in mitigating the risk of seed contamination, maintaining inventory accuracy, and ensuring the efficiency of traceability for managed seeds. Workflows are implemented to optimize efficiency,

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enhance quality, and minimize errors within business processes or projects (Yennimar et al., 2023). An in-depth analysis of the warehouse workflow at PT XYZ categorizes it into three distinct operational streams: the Work in Process (WIP) workflow, the

Production Material Chemical Material (PMCM) workflow, and the Finished Goods workflow.

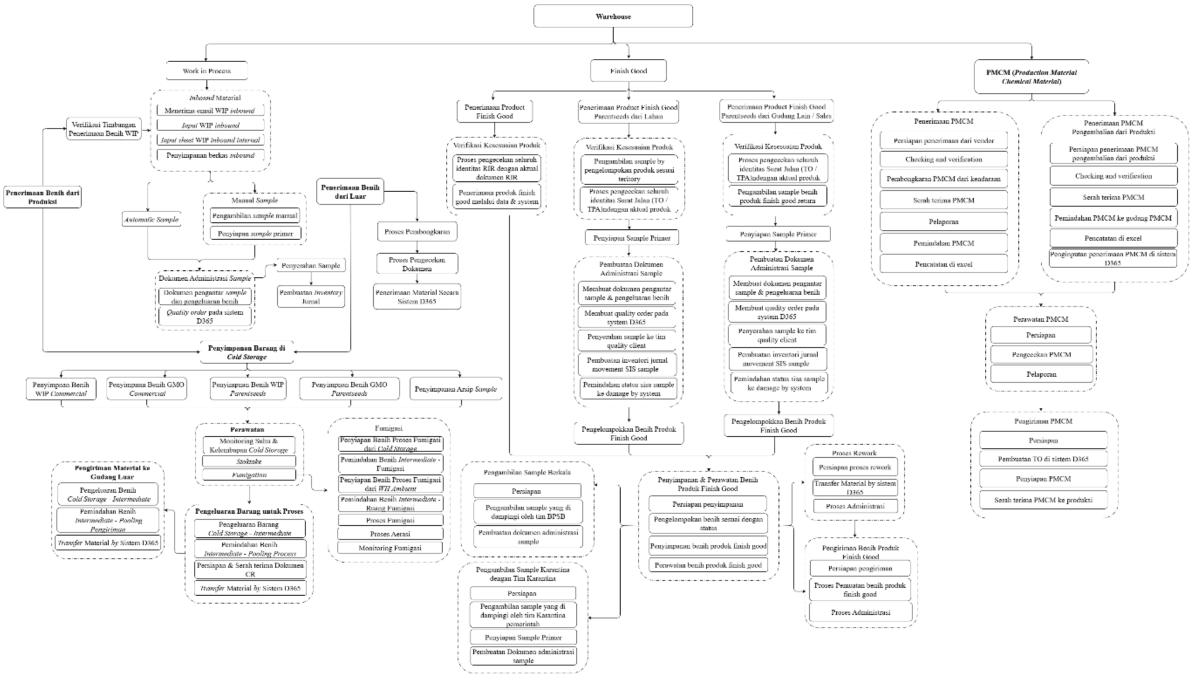

Figure 1. Warehouse Workflow of PT XYZ (Source: Author, 2026)

**Work in Process (WIP)**

**Seed Receiving**

The role of PT XYZ in WIP operations begins with receiving activities, which are bifurcated into seed receipt from production and seed receipt from external warehouses. Seeds arriving from production undergo verification to confirm the actual weight, metal box or jumbo bag number, lot number, and hybrid type specified in the Stock in Transit (SIT) documentation furthermore, it is ensured that incoming seeds are sealed and color-coded according to their respective seed types. Verified seeds are processed through inbound material logging, serving as official validation that the incoming seeds have been legitimately received by the warehouse personnel.

Additionally, supporting administrative documentation includes an internal WIP inbound sheet, which certifies that the seeds delivered to the warehouse conform to the prior verification results. Seeds entering the warehouse are sampled through both automated and manual methods. Each seed sample must be accompanied by administrative documentation, specifically a sample

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transmittal document and a seed release form these documents serve as legal proof of the physical transfer of samples from the warehouse to the quality control team, thereby ensuring that any seed leaving the warehouse has been formally authorized by management. The prepared seed samples, along with their administrative paperwork, are then submitted to the quality control team for seed testing.

The final stage of seed receipt from production involves generating an inventory journal movement in the Stock Inventory System (SIS) for the sample, which aims to record the transfer or reduction of seed stock due to quality testing allocations. Seed receipt from external warehouses initiates with material and administrative verifications. Delivery notes are cross-referenced with the material planning data received from the client, followed by unloading the seeds from trucks and inspecting each package individually to guarantee that no jumbo bags are punctured, soiled, or infested with pests. Once confirmed secure, the jumbo bags are transferred to designated areas allocated for external warehouse seed receipt. The receipt of seeds from external warehouses is also integrated with administrative logging to validate that the incoming consignment has been officially accepted by the warehouse.

**Seed Material Storage**

Seed storage activities are categorized into five distinct types based on the seed variety: WIP commercial seed storage, GMO commercial seed storage, WIP parent seed storage, GMO parent seed storage, and sample archive storage. Storage for WIP commercial, GMO commercial, WIP parent, and GMO parentseeds must be conducted within metal boxes to comply with biosafety and biosecurity regulations. Each metal box is restricted to housing a single variety, a measure designed to minimize the risk of varietal cross-contamination.

Any movement of metal boxes or jumbo bags necessitates an immediate update of the stock layout tak document to reflect the identity and exact quantity of the positioned packages. Sample archive storage begins with verifying identity compliance, including the SIT, lot number, and hybrid type. Furthermore, sample containment is partitioned into two types of receptacles: mesh bags (waring) are utilized for parent seed lots in metal boxes, while plastic bags are used for parent seed lots. The archived samples are stored in designated cardboard boxes, requiring mandatory updates to both the internal box labels and an Excel tracking file detailing the PIC, lot number, hybrid type, container, quantity, box number, and specific storage location.

**Seed Material Maintenance**

The subsequent phase entails seed maintenance, which encompasses temperature and humidity monitoring within cold storage, stocktake, and fumigation. Temperature and humidity

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monitoring in cold storage serves as a vital quality assurance and risk management mechanism to prevent seed degradation during storage. This monitoring process begins by compiling environmental data downloaded from HOBO data loggers inside the cold storage, followed by an evaluation to determine whether the temperature and humidity remain within prescribed standard parameters. The analytical findings are subsequently reported to supervisors. Stocktake is executed to cross-reference system records with the physical inventory of the stored seeds. Stocktake is conducted quarterly, amounting to four audits per annum. This involves verifying the warehouse seed stock against physical data, recording the entries into the client's stock-take log, and submitting the final audit report to the client.

Fumigation represents a maintenance treatment focused on pest control, utilizing toxic gases known as fumigants inside a tightly sealed, airtight chamber for a specified duration. Preparing the seeds for treatment constitutes the initial phase of the fumigation procedure. Seeds designated for fumigation may originate from either cold storage or ambient warehouse storage. For seeds sourced from cold storage, a transit period of 2 x 24 to 3 x 24 hours in an intermediate room is required before fumigation, whereas seeds from ambient storage are moved directly to the fumigation chamber without a transit phase. Following fumigation, seeds undergo an aeration process to dissipate residual fumigant efficacy, which involves extracting gas parts-per-million (PPM) into the open air to safely release the gas into the atmosphere.

**Seed Material Release**

Prior to being handed over to the processing team, seeds designated for release must be physically prepared and administratively cleared. Seeds retrieved from cold storage are mandated to undergo a transit phase in the intermediate room for 2 x 24 to 3 x 24 hours. Upon completing the transit duration, the seeds are relocated to the processing pool, with all movements of metal boxes or jumbo bags assisted by forklifts. The transfer from the intermediate room to the processing pool concludes with an update to the corresponding stock layout tag.

Seed release for processing is accompanied by administrative compliance, specifically archiving Change Request (CR) documentation. The physical seeds and the CR document are formally handed over to the processing team additional administration involves an electronic material transfer via the Dynamics 365 (D365) system, which serves as the official ledger entry for corn seed positioning and tracking. Seed Dispatch to External Warehouses the preparation of corn seeds marks the initial step for dispatching stock to external warehouses. Corn seeds kept in cold storage must first be moved to the intermediate room for a staging period of 2 x 24 to 3 x 24 hours. The release of seeds from cold storage to the intermediate room is executed based on a Production

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Work Order (SPK). The seeds are then transferred to the shipping pool, ensuring that the seed identities match the SPK specifications prior to movement. Seed dispatch to external warehouses requires the generation of a Transfer Order (TO) via D365, which functions as administrative verification that the stock has been reallocated and formally transferred to the external warehouse repository.

**Finished Goods**

**Finished Goods Receipt**

Finished goods receipts originate from three sources: finished goods from production, finished parent seeds from fields, and finished parent seeds from other warehouses or sales returns. Finished goods receipt from production starts with verifying that the physical products conform to the identity stated in the Receiving Inspection Report (RIR). Furthermore, personnel log the details in the RIR handover logbook, update the finished goods storage mapping, and submit the fully signed RIR to the logistics data controller to complete the digital handover in the D365 system.

Upon the arrival of finished parent seeds from the field, verification must be performed to align the actual product with the corresponding Transfer Order (TO). Compliant finished parent seeds are physically segregated and positioned based on territorial classification subsequently, a sorting report for finished parent seed field returns is emailed to the client. Territorial grouping of seed products requires sampling, which is conducted based on the identity of the specific seeds undergoing quality verification. Concurrently, administrative sampling protocols must be fulfilled, including sample transmittal documents, seed release forms, and quality orders. Once the documentation is complete and the physical samples are prepared, they are handed over to the client’s quality control team. The receiving operation for finished parent seeds from fields concludes with generating an SIS sample inventory journal movement and adjusting the status of sample remnants to damaged within the D365 system. Receipt of finished parent seeds from external warehouses or sales returns involves verifying physical conformity against the TO. These finished goods are physically categorized and segregated according to their designated status. Warehousemen identify and separate finished parent seed products into intact packaging, damaged packaging, and non-original bags. This structural identification is subsequently reported to the client via email.

Sampling is also conducted on these returned finished goods to evaluate the seed quality of the returns. Concurrently, the necessary sampling administration—consisting of sample transmittal sheets, seed release logs, and quality orders—must be satisfied. When all required administration is finalized and the physical samples are ready, they are transferred to the client’s quality control

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department. The receiving activities of finished parent seeds from fields conclude with the execution of an SIS sample movement journal entry and updating residual sample statuses damaged in D365.

**Finished Goods Storage and Maintenance**

The role of PT XYZ in storage extends beyond providing a warehouse facility it encompasses ensuring that the warehouse environment meets finished goods storage standards, which includes maintaining non- humid floors and walls, deploying pallets as bases, ensuring leak-free roofing, providing adequate ventilation, maintaining distance from flammable materials and foul odors, and preparing pallets specifically for finished goods stacking. Finished goods are grouped according to status, categorized into ready for sale, non-ready for sale, and damaged/discarded. Stacking guidelines dictate that finished good can be piled to a maximum of fifteen layers, or three stacked pallets, with each pallet comprising five layers.

Additionally, a minimum clearance of 15 cm must be maintained between the walls and the finished goods to facilitate warehousemen in identifying warehouse mapping layout. It is also critical to verify that each pallet features a pallet tag indicating the finished good's identity and its corresponding weight load. Finished goods preservation is managed by upholding warehouse sanitation, such as regular cleaning schedules and controlling warehouse pests identified within each storage facility. Furthermore, room temperature and humidity logs are recorded as secondary datasets monitoring warehouse conditions, which are then reported to management alongside executing preventative actions to mitigate damage from pests or other external factors.

**Finished Goods Dispatch**

The dispatch of finished goods begins with shipment preparation activities, which include receiving the SPK from the client, checking inventory alignment against the SPK, and completing the truck/trailer inspection report form. The loading of finished goods onto trucks or trailers is accompanied by tally sheet administration, requiring authorization signatures from the warehouseman, driver, and vehicle vendor checker. Once the tally sheet is finalized, subsequent administrative steps are executed. These additional administrative processes include generating the finished goods delivery note via a TO document within the Enterprise Resource Planning (ERP) system and refreshing the warehouse On-Hand inventory report data.

**Periodic and Quarantine Sampling**

Periodic sampling is enforced for all finished goods reaching their expiration within the upcoming three months. This periodic sampling is triggered by the receipt of an SPK from the client targeting near-expiry finished goods. This periodic sampling procedure is conducted under

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the supervision of the Seed Control and Certification Services (BPSB) team. Seed sampling must rigidly adhere to International Seed Testing Association (ISTA) standards. The sampling process demands complete identity alignment between the product's external packaging and the designated sample container.

The extracted seed samples are processed through a gamet divider machine, repeated for three iterations. The final sample weight submitted to the quality control team ranges approximately between 1 kg and 1.5 kg. Concurrently, sampling paperwork must be satisfied, encompassing sample transmittals, seed releases, and quality orders. When documentation is complete and the physical specimens are prepared, they are cleared for submission to the client's quality control division. Periodic sampling activities conclude with administrative logging, namely creating an SIS sample movement journal and updating residual sample statuses to damaged in the D365 system.

Quarantine sampling is monitored by the government quarantine authorities, and is applicable to finished seed products bound for destinations outside Java or incoming imported seed lots. The quarantine sampling workflow initiates upon the issuance of an SPK from the client. Seed extraction protocols must strictly comply with ISTA standards. The collection process requires precise cross-matching of product package data with the sample receptacle labels. The quarantine officers tally the inventory and sign off on the products selected for sampling. The gathered seed samples are then put through a gamet divider machine for three successive rounds. The weight of the sample slated for quality control testing is approximately 1 kg to 1.5 kg. Concurrently, specific sampling administration must be fulfilled, including sample transmittal notes, seed release forms, and quality orders. Once paperwork is compiled and the physical samples are ready, they are prepared for delivery to the quarantine team along with the sample transmittal and SIS documents.

Furthermore, sample submission is formalized by generating a Transfer Pemakaian Aset (TPA) document as validation of handover to the quarantine team. Handing over samples to the quarantine authorities requires a thorough re-verification of information across documents against the physical characteristics of the sample. The operation concludes with administrative updating, changing the leftover sample status to damaged via the D365 system.

**Rework Process**

The rework process represents the reprocessing of finished goods that have fallen short of quality specifications the objective of reworking is to salvage defective batches and realign them with ISTA- mandated quality standards prior to market distribution. Finished seed products are routed for reworking upon PT XYZ receiving an SPK from the client, which prompts a product

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verification process based on the incoming work order. The finished goods are then prepared if the inventory is currently stationed in cold storage, it must be staged in the intermediate room for 2 x 24 to 3 x 24 hours to prevent moisture condensation on the seeds. Before transferring these seeds to the processing pool for reworking, administrative mandates such as drafting a Transfer Order (TO) must be completed. This documentation acts as verification that the defective finished goods previously stored in cold storage have been successfully relocated to the processing pool. The defective finished goods are delivered to the processing pool in tandem with the physical TO document.

**Production Material Chemical Material (PMCM)**

**PMCM Receipt**

PMCM receiving workflows are categorized into two based on material origin vendor-supplied PMCM receipts and production-returned PMCM receipts. Vendor-supplied PMCM receipt begins when security personnel provide notifications regarding the arrival of transport vehicles hauling PMCM from vendors. The warehouseman reviews the details listed on the delivery note to confirm alignment with the physical goods. The workflow continues with PMCM unloading, moving materials from the truck into the receiving staging pool with forklift assistance. Completion of the handover is formalized by the warehouseman signing and applying a physical stamp to the delivery note, alongside securing a duplicate copy of the delivery document from the driver.

Unloaded PMCM in the receiving pool is promptly transferred to designated allocation zones. Production materials are relocated to the internal warehouse production material storage room, whereas chemical materials are stored inside designated containers located outside the main warehouse structure. The relocation of PMCM is accompanied by updating material tags to accurately reflect the actual quantities received.

Production-returned PMCM receipt occurs when residual PMCM remains available after the completion of WIP or reworking processes. Returns of PMCM are initiated upon receiving an email notification and a TPA document from the production team. Handover of the PMCM and its duplicate copies from production is finalized once the warehouseman verifies material consistency against the TPA. The warehouseman shifts the residual production materials into the dedicated warehouse storage room, while surplus chemical items are moved to the external containers. Stocking is executed following First Expired, First Out (FEFO) protocols, followed by updating the material tags to mirror actual inventory volumes. This receiving sequence is systematically integrated with administrative data logging in the PMCM Excel monitoring ledger.

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**PMCM Dispatch**

PMCM dispatch is routinely conducted to supply production lines this occurs upon PT XYZ receiving a request order via email. The warehouseman verifies the requested materials against the data in the order request. Administrative preparations mandate that the warehouseman draft a Transfer Order (TO). PMCM preparation operates in accordance with standard operating procedures (SOPs) for PMCM handling, pulling stock based on FEFO parameters. This is followed by updating the material tags and applying new product labels if the materials are transferred into containers differing from their original retail packaging. The staged PMCM is transferred to the production PMCM receiving pool, and the TO documentation is handed over to the production personnel. Handover of the PMCM concludes once the production team verifies physical consistency against the TO and signs off on the document.

**PMCM Maintenance**

PMCM maintenance conducted by PT XYZ involves weekly cycle counts designed to audit the current PMCM inventory levels. Preparations for the cycle count begin by extracting On-Hand inventory metrics from the D365 system and pulling layout mapping figures from the monitoring Excel file. A physical verification of PMCM is executed against the compiled on-hand records, and the warehouseman is obligated to submit the audit findings.

**Determination of Available Working Time**

The determination of available working time serves as a foundational step in operational management to calculate the net working time available for personnel to execute productive warehouse tasks at PT XYZ over a specific timeframe. Net working time is derived by multiplying the total number of net working days by the net working hours per day. The net working days total is calculated by subtracting non-productive allocations—such as Sunday rest days, annual leave entitlements, official public holidays, and sickness or training absences—where sickness and training allowances are collectively assumed at 4%. This training aims to improve skills, mirroring how extension services enhance competencies and expertise (Budiwan et al., 2026). The final figure represents the total calendar days in a year minus the accumulated non-productive days. Net daily working hours are calculated by subtracting allowances for natural losses, including fatigue and personal time, from the standard daily shift duration. In accordance with internal company standardization policies aligned with scientific industrial management methods outlined by the International Labour Organization (ILO), the allowance for natural losses is established at 30 minutes.

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Tabel 1. Determination of Effective Working Hours for the Year 2026

| **GENERAL** | **Time** |
|---|---|
| **Total calendar days in** 1 **year** = | 365 |
| **Total Sunday rest days** = | 52 |
| **Annual leave entitlement** = | 12 |
| **Official public holidays** = | 25 |
| **Sickness** + training **allowance** (4%) | 9 |
| **Total net working days** = | 267 |
| **Ideal daily working hours** = | 8 |
| Allowance natural losses (fatigue+private time) | 0,5 |
| **Net working hours per day** = | 7,5 |
| **Net working minutes per year** = | 2.003 |
| **Total Net working minutes per year =** | **120.150** |

(Source: Personally managed data, 2026)

The calendar year 2026 contains 365 days, incorporating non-productive days comprising Sundays, leave entitlements, public holidays, and allowances for sickness or training. Specifically, Sunday rest days account for 52 days, annual leave entitlements comprise 12 days, public holidays in 2026 equal 25 days, and the allowance for sickness and training is assumed at 9 days. The valuation of the sickness and training allowance is based on the average manpower metrics at PT XYZ, yielding a total of 267 net working days for the year 2026. Through this standardized framework, every operational phase can be executed consistently, minimizing human error risks while optimizing time and cost efficiencies.

Allowances are classified into three core categories: personal needs allowance, fatigue allowance, and delay allowance (Suroso & Yulvito, 2020). For relatively light tasks executed across an 8-hour workday without formal rest intervals, approximately 2% to 5% (or 10 to 24 minutes) daily is typically allocated to fulfill personal requirements (Salsabila, 2020). PT XYZ enforces a standard baseline of 8 working hours per day, with the allowance for natural losses fixed at an assumed 0.5 hours. Consequently, the net daily working duration is 7.5 hours, culminating in a total annual net capacity of 2,003 hours or 120,150 minutes.

**Warehouse Workload of PT XYZ**

Workload measurement is imperative for corporate enterprises (Darsan et al., 2026). Workload manifests directly within the execution and completion of tasks assigned by an organization to its personnel. Measuring workload aims to acquire quantitative metrics regarding operational effectiveness and efficiency, structured around the volume of tasks successfully

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finalized (Sabilah & Daonil, 2023). Effectiveness and efficiency are paramount in every industrial operation to maximize the utility of existing organizational resources (Winarno & Harijani, 2022).

Workload variations can be influenced by both internal and external factors external dynamics encompass specific tasks, corporate organizational structures, and the ambient work environment. Meanwhile, internal drivers include psychological (psychic) and physiological (somatic) factors (Sofiana et al., 2020). Moreover, workload can be conceptualized as the sum of physical, mental, and social demands placed upon an individual that must be resolved within a constrained timeframe, constrained by the worker's physical capacities and load tolerance thresholds (Dilla et al., 2023).

This workload assessment utilizes the Full-Time Equivalent (FTE) method, a framework designed to determine the exact volume of human resources required to execute or complete a specific series of activities over a defined duration (Hardiansyah et al., 2022). Thus, the evaluation of the warehouse workload at PT XYZ is structured around the FTE methodology. This technique evaluates the cumulative time spent on executing various tasks relative to the baseline effective working time available. An aggregate FTE index exceeding 1.28 denotes an overloaded condition, values between 1.00 and 1.28 indicate a normal operational state, while an FTE index ranging from 0.00 to 0.99 signifies an

underloaded condition or underutilized capacity (Gunawan et al., 2023).

Tabel 2. Workload Data for  PT XYZ Warehouseman

| **Process Model** | | | | | | | | **Person in Charge** | **Total Minutes** |
|---|---|---|---|---|---|---|---|---|---|
| **L1** | **L2** | **L3** | **L4** | **L5** | **L6** | **L7** | **L8** | | |
| Inventory management X | | | | | | | | | |
| | **WIP (*Work in Process*)** | | | | | | | | |
| | | Seed receipt from production | | | | | | WHman & Forklift | 239731,29 |
| | | Seed receipt from external WH | | | | | | WHman & Forklift | 85461,36 |
| | | Material storage | | | | | | WHman & Forklift | 70301,1 |
| | | Stored seeds maintenance | | | | | | WHman | 414751,2 |
| | | Material release for processing | | | | | | WHman & Forklift | 98541,69 |
| | | Material dispatch to external WH | | | | | | WHman & Forklift | 34710 |
| | **Finish Good** | | | | | | | | |
| | | Finish good receipt from production | | | | | | WHman & Forklift | 28500 |

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Tabel 2. Workload Data for PT XYZ Warehouseman

| Process Model | | | | | | | | Person in Charge | Total Minutes |
|---|---|---|---|---|---|---|---|---|---|
| **L1** | **L2** | **L3** | **L4** | **L5** | **L6** | **L7** | **L8** | | |
| | | Finish good PS receipt from field | | | | | | WHman & Forklift | 8944 |
| | | Finish good PS receipt from external sales/WH | | | | | | WHman & Forklift | 4572,48 |
| | | Finish good storage and maintenance | | | | | | WHman | 106700 |
| | | Finish good dispatch | | | | | | WHman & Forklift | 99126,55 |
| | | Periodic sampling | | | | | | WHman | 30720 |
| | | Quarantine sampling with quarantine team | | | | | | WHman | 15120 |
| | | Rework Process | | | | | | WHman & Forklift | 48110,4 |
| | **PMCM (Production *Material Chemical Material)*** | | | | | | | | |
| | | PMCM receipt | | | | | | WHman & Forklift | 30000 |
| | | PMCM dispatch | | | | | | WHman & Forklift | 68757,5 |
| | | PMCM maintenance | | | | | | WHman | 3290,04 |
| | | | | | | | | Required working time | 1398025 |
| | | | | | | | | Effective working time available | 120150 |
| | | | | | | | | FTE | 11,64 |
| | | | | | | | | Assumed NVA | 20% |
| | | | | | | | | Adjusted FTE | 9,308529 |
| | | | | | | | | 1 warehouseman | 1,034281 |

(Source: Personally managed data, 2026)

According to the Business Process Management (BPM) architecture of the PT XYZ warehouse, three core process groups are defined: Work in Process (WIP), Finished Goods, and Production Material Chemical Material (PMCM). Within the WIP process group, seed receipt from production records a total duration of 239,731.29 minutes, seed receipt from external warehouses requires 85,461.36 minutes, material storage spans approximately 70,301.1 minutes, stored seed maintenance takes 414,751.2 minutes, material release for processing consumes 98,541.69

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minutes, and material dispatch to external warehouses accounts for 34,710 minutes of operational time. Tasks within the WIP framework are executed by warehousemen with forklift assistance to streamline and accelerate material transit and relocation. Forklifts serve as essential supporting infrastructure in warehouse operations (Kodariawan et al., 2025).

In the Finished Goods process group, receiving finished goods from production requires 28,500 minutes, receiving finished parent seeds from fields takes 8,944 minutes, and receiving finished parent seeds from external repositories or sales returns demands 4,572.48 minutes. Storage and maintenance workflows for finished seed products account for a completion duration of 106,700 minutes. Finished goods dispatch operations span an execution duration of 99,126.55 minutes. Periodic sampling requires an operational window of 30,720 minutes, while quarantine sampling conducted in conjunction with government authorities demands 15,120 minutes. The rework process, including workflow staging and electronic material transfers, is executed over a total duration of 48,110.4 minutes.

For the PMCM process group, vendor-supplied PMCM receipts consume 30,000 minutes. PMCM dispatch to production lines accounts for 68,757.5 minutes, while PMCM maintenance tasks take 3,290.04 minutes. The cumulative activities across WIP, Finished Goods, and PMCM domains engage a staff of 8 warehousemen supported by 1 forklift operator. This aggregates to an active field workforce of 9 personnel within the warehouse facility. Based on the cumulative operational durations of all assigned tasks, the total labor time required reaches 1,398,025 minutes. Comparing this against the annual effective working capacity per worker of 120,150 minutes yields an initial FTE index of 11.64. This raw index incorporates Non-Value-Added (NVA) allocations, which must be minimized to capture true productive efficiency (Utomo et al., 2025). Factoring in an assumed NVA threshold of 20%, the adjusted operational FTE index is determined to be 9.309. When distributed across the 9 existing employees, the individual workload index equates to 1.034 per worker. Based on these calculations, the workload value of 1.034 indicates that while individual assignments remain within a manageable normal range, they slightly exceed the nominal capacity of a single full-time laborer. This marginal overload of 0.034 FTE equates to approximately 90 minutes of extra work time per week, which can be readily accommodated via minor overtime schedules without requiring headcount expansion.

## 4. CONCLUSIONS

Based on the analytical discussions presented, the following conclusions are established, the warehouse workflow at PT XYZ is structurally categorized into three processing streams: the

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Work in Process (WIP) workflow, the Production Material Chemical Material (PMCM) workflow, and the Finished Goods workflow. Each respective workflow encompasses an end-to-end operational sequence consisting of receiving, storage, maintenance, and dispatch activities, each integrated with rigorous administrative compliance frameworks. Workload evaluation utilizing the FTE method reveals an individual labor load index of 1.034 per worker. This index of 1.034 indicates a normal operational state that marginally surpasses the ideal full-time equivalent workload baseline. The surplus variance of 0.034 FTE corresponds to approximately 90 minutes of incremental weekly labor, which can be managed via standard light overtime without necessitating personnel recruitment.

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