Planning *training Need Analysis*to Improve The Competency of Operational Employees at PT. Intra Presisi Indonesia

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Abstract.

This study aims to identify the training needs of operational employees at PT Intra Presisi Indonesia through a Training Needs Analysis (TNA) approach that includes organizational analysis, task analysis, and individual analysis. The background of the study is based on the company's training conditions which are still reactive and not yet integrated with long-term human resource development strategies. Data collection was conducted through interviews with management and direct superiors, distribution of questionnaires to operational employees, and review of company documents. The results of the analysis indicate significant competency gaps in the Production, Quality Control, and Maintenance departments. In the Production department, competency gaps were primarily found in the operation of welding robots, die changes, and the application of the 5R principles. In the Quality Control department, the most prominent gaps were in the operation of the Coordinate Measuring Machine (CMM), the application of QC 7 Tools, and root cause analysis. Meanwhile, in the Maintenance department, limited cross-system troubleshooting capabilities and the application of Root Cause Analysis were the main problems. Based on these findings, a training program design was prepared based on competency gap priorities as a basis for developing more targeted, effective, and sustainable training to improve the company's operational performance.

Keywords: *Training Needs Analysis; Employee Competence; Training and Operational Performance.*

I. INTRODUCTION

Management is essentially the process of planning, organizing, directing, and controlling organizational resources to achieve goals effectively and efficiently. In the context of modern organizations, human resource (HRM) management plays a strategic role because a company's operational success is largely determined by the quality and competence of its employees. Manufacturing companies operating in a highly competitive and quality-oriented environment are required to manage their human resources systematically, adaptively, and data-driven to maintain their competitiveness (Harahap & Aisyah, 2024).
Operational employee competency is a crucial focus in HR management, particularly in the manufacturing sector. Competence is a combination of knowledge, skills, and work attitude that enables employees to perform their duties optimally. In the modern industrial era, competency encompasses not only basic technical skills but also digital literacy, understanding of work procedures, and adaptive problem-solving skills. Empirical studies show that employee competency significantly impacts productivity, output quality, and production process efficiency (Sutarman et al., 2024). In the Industry 4.0 environment, operator technical competency, such as operating automated machines and utilizing digital systems, is a key factor in the success of sustainable manufacturing processes (Yeo & Ong, 2024).This research was conducted at PT Intra Presisi Indonesia, an automotive component manufacturing company that relies on precision, consistent quality, and reliable production processes. In practice, the company faces challenges in the form of persistent competency gaps among operational employees, reflected in the high number of corrective actions due to work errors, defective parts, and non-compliance with process standards. Most of the corrective actions taken still involve re-education of operators, indicating that the root of the problem is more dominantly derived from the human resource competency aspect than from machine or material factors.

One of the main factors influencing this situation is the suboptimal design of Training Needs Analysis (TNA). Training implementation tends to be reactive, top-down, and not based on measurable competency gap mapping. A TNA is a systematic process for identifying differences between employees' actual competencies and those required by the job. Training initiated with a TNA has been shown to be more

effective, more targeted, and less wasteful of training resources (Kura & Kaur, 2021; Raj, 2024). Without a sound TNA, training programs risk becoming irrelevant and failing to deliver a tangible impact on operational performance.The results of an initial survey through field observations and initial communication with the management of PT Intra Presisi Indonesia indicate that technical training is unstructured and unsustainable. The knowledge transfer process remains informal, competency evaluations are not conducted periodically, and work standards are not yet understood evenly by all operators. This condition reinforces the urgency of designing a comprehensive TNA, based on field data, and integrated with the actual needs of the production line. Therefore, this research is directed at designing a Training Needs Analysis as a basis for developing operational employee competencies to support improvements in quality, productivity, and the sustainability of company performance.The underlying phenomenon of this research is the persistent gap between the competencies of operational employees and those required by company work standards, despite PT Intra Presisi Indonesia operating with relatively established production systems and procedures.

This phenomenon is reflected in the high frequency of repeated corrective actions for the same types of problems, such as material placement errors, inaccurate use of measuring tools, and non-conformity of process results to quality standards. Interestingly, most of the corrective actions taken still involve re-education of operators, indicating that basic competencies have not been fully understood and consistently mastered. This condition indicates that employee competency development has not been carried out systematically and based on real needs, but rather is still reactive to problems that arise in the field.The main problem facing the company lies not only in the low competency level of operational employees, but also in the suboptimal mechanism for identifying training needs. Training provided to date tends not to be preceded by measurable competency gap mapping, so that training materials are often not specific to work issues. Furthermore, the informal knowledge transfer process, the lack of documentation of internalized work standards, and weak post-training evaluations exacerbate the mismatch between actual and expected competencies. As a result, training has not been able to significantly impact reducing work errors and improving production quality. These problems emphasize the need for a structured Training Needs Analysis (TNA) based on field data and integrated with operational needs to ensure employee competency development is truly effective and sustainable.Various studies show that*Training Needs Analysis*(TNA) is the primary foundation for effective employee competency development, particularly in the manufacturing and operational sectors. Mamun (2021) emphasized that TNA is directly related to perceived training effectiveness, although it has not explicitly linked it to measuring actual employee competency.

Furthermore, Acerbi, Rossi, and Terzi (2022) developed an Industry 4.0-based competency assessment model that emphasizes the importance of mapping technical and digital competency gaps as a basis for designing relevant training. Faujiah and Fadli's (2023) research on the Indonesian fertilizer industry found a significant gap between operator competencies and job demands, but it was not yet supplemented with a quantitative, position-based TNA design. Harahap and Aisyah (2024) added that systematically implemented TNA can increase training effectiveness and reduce organizational cost waste, although the study was still qualitative in nature. Meanwhile, Pradita et al. (2025) through a literature review emphasized the urgency of developing a TNA integrated with HR digitalization, but noted the limited empirical evidence of TNA implementation for operational employees in manufacturing environments. These findings collectively strengthen the position of this research as an effort to bridge the gap between the concept of TNA and practical implementation based on actual competency data of operational employees.Based on a review of the research, it can be identified that there are*research gap*This is quite evident in Training Needs Analysis (TNA) studies. Most previous studies have focused on TNA conceptually, evaluatively, or limited it to non-operational sectors, such as managerial, administrative, or service (Mamun, 2021; Harahap & Aisyah, 2024). Studies focused on the manufacturing sector generally emphasize Industry 4.0 competency mapping or general training effectiveness, but have not specifically designed a TNA based on the actual competency gaps of operational employees on the production line (Acerbi et al., 2022; Faujiah & Fadli, 2023).

Furthermore, research addressing the industrial context in Indonesia is still relatively limited and tends not to integrate field data such as corrective actions, recurring work errors, and company work standards as a basis for formulating training needs. Thus, there remains a research gap regarding how to

design a TNA that is applicable, measurable, and truly based on the real-world problems faced by operational employees in a technical manufacturing environment.Novelty (*novelty*) of this research lies in the design of Training Needs Analysis which is specifically focused on operational employees in the manufacturing industry, with an approach based on identifying actual competency gaps and company work standards. This research not only maps training needs conceptually, but integrates empirical field data such as corrective action findings, production process observation results, and operator technical competency evaluations as the basis for designing TNA. With this approach, this research offers a practical contribution in the form of a contextual, relevant, and directly implementable TNA model to support the continuous development of operational employee competencies. In addition to enriching academic studies related to TNA in the manufacturing sector, this research is also expected to be a practical reference for companies in designing training programs that are more targeted, effective, and aligned with the real needs of the production line.

II. LITERATURE REVIEW

Operational Employee Competencies

Competence explains that employee performance is determined by the integration of knowledge, skills, and work attitudes relevant to job demands. In the modern manufacturing context, operational employee competency is not only technical but also encompasses the ability to adapt to technology and adhere to work standards. Adequate competency enables operators to work more accurately, efficiently, and consistently while maintaining product quality. Research shows that employee competency has a direct and significant impact on productivity and output quality in the manufacturing industry (Sutarman et al., 2024; Yeo & Ong, 2024).

Training Needs Analysis (TNA)

Training Needs Analysis (TNA) is a systematic process for identifying gaps between employees' actual competencies and those required by their jobs. TNA serves as the basis for training design to ensure that training materials, methods, and objectives are truly relevant to the organization's needs. Without a TNA, training can potentially be off-target and have no significant impact on performance. Empirical studies have shown that a structured TNA can increase training effectiveness and reduce waste of organizational resources (Mamun, 2021; Raj, 2024).

Performance-Based Human Resource Development

Performance-based human resource development emphasizes that training must align with the organization's operational goals and performance indicators. Employee competency development is viewed as a strategic investment that impacts organizational productivity, quality, and sustainability. In the manufacturing sector, performance-based training requires job competency mapping and continuous evaluation of training outcomes. Research shows that training designed based on actual job needs is more effective in improving employee performance than general or reactive training (Kura & Kaur, 2021; Harahap & Aisyah, 2024).

Research Flow

This research flow begins with the identification of problems at PT Intra Presisi Indonesia which is indicated by the gap in operational employee competency and the high number of findings.*corrective action*in the production process. The next stage is a literature study to strengthen the theoretical foundation related to HR management, operational employee competencies, and Training Needs Analysis (TNA). Based on the results of this study, field data was collected through work process observations, work standard document reviews, and*corrective action*, as well as measuring actual employee competencies. The data obtained was then analyzed to map the gap between actual competencies and job standard competencies. The results of this gap analysis were used as the basis for designing a structured and contextual Training Needs Analysis. The final stage of the research resulted in recommendations for targeted training programs aligned with the company's operational needs as an effort to continuously improve employee competency.

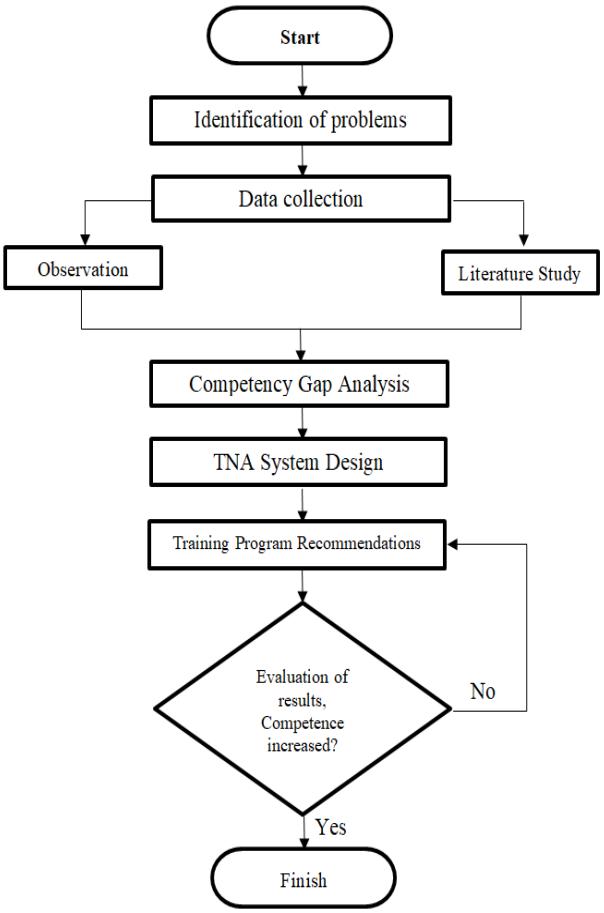

Fig 1. *Flowchart*Research Flow

III. METHODS

This study was designed using a qualitative approach to gain a deep understanding of the competency status of operational employees and actual training needs in a manufacturing environment. This approach was chosen because it captures workplace phenomena, employee experiences, and the social and cultural context of the organization that influence training effectiveness, which cannot be adequately explained through quantitative data alone.

Place and Time of Research

The research was conducted at PT Intra Presisi Indonesia, located at Jl. Raya Bekasi Km 27 No. 75, Kaliabang Tengah, Harapan Jaya, Bekasi, West Java. This company is an automotive component manufacturing industry that has operational work characteristics with high technical competency demands, making it relevant to the focus of the Training Needs Analysis (TNA) design. The research was conducted in November–December 2025. During this period, research activities included initial observations, field data collection, qualitative data analysis, TNA model design, and preparation of training recommendations based on the actual needs of operational employees.

Research Methods and Procedures

This study used a qualitative descriptive method, aiming to describe the phenomenon of operational employee competency and ongoing training practices as they exist. The qualitative approach allowed researchers to explore the perceptions, experiences, and work obstacles faced by employees on the production line. Harahap and Aisyah (2024) emphasized that qualitative interviews and observations are effective in uncovering training needs often unidentified through quantitative approaches. Similar findings were presented by Faujiah and Fadli (2023), who stated that descriptive qualitative methods are able to capture weaknesses in SOP implementation and gaps in operators' technical competencies in a more contextual manner.

The research procedure was conducted through five main stages. First, initial observations were conducted non-participatory to understand the production process, tool usage, and work patterns of operational employees. Second, semi-structured interviews were conducted with HR managers, supervisors, and operational employees to explore perceptions of competency, evaluations of previous training, and future training needs. Third, an open-ended questionnaire was distributed as supporting data to validate the observation and interview findings, as suggested in manufacturing research by Syaripudin et al. (2022). Fourth, data analysis and competency gap identification were conducted by comparing actual competencies with job standard competencies. Fifth, the TNA model was designed based on the gap analysis results as the basis for targeted training recommendations.

Data and Data Sources

The research data consists of primary and secondary data. Primary data was obtained through observations, interviews, and questionnaires with operational and management employees. Secondary data includes internal company documents such as job descriptions, competency standards, previous training data, and corrective action reports. The combination of these two types of data allows for a comprehensive and in-depth analysis.

Data Analysis Techniques

Data analysis was conducted using thematic analysis, which aims to identify key patterns and themes related to training needs. This method is considered effective for organizing complex qualitative data and supporting the design of applicable TNAs (Naeem et al., 2023). Data validity was strengthened through triangulation of methods and sources.

IV. RESULT AND DISCUSSION

Research result

This study presents empirical findings obtained from data collection through in-depth interviews, observations, and questionnaires with operational employees of PT Intra Presisi Indonesia. The research focuses on informant characteristics, operational task analysis, actual training implementation conditions, and competency gap identification, which served as the basis for designing a Training Needs Analysis (TNA).

Research Informants

This study involved five key informants purposively selected based on their position, work experience, and direct involvement in the management and implementation of operational work and employee training. The purpose of this informant selection was to obtain comprehensive information from both strategic and operational perspectives, thus providing a comprehensive picture of employee competency.

Table 1. Research Informant Data

No	Informant Code	Position / Division	Working Years	Reason for Selection
1	INF-01	General Manager	12 years old	Understanding training and HR policies strategically
2	INF-02	Head of HRD	12 years old	HR training organizer and coordinator
3	INF-03	Production Foreman	14 years	Knowing the weak points of production operator competency
4	INF-04	Foreman Quality Control	15 years	Knowing the weak points of QC competency
5	INF-05	Supervisor Maintenance	15 years	Knowing the weak points of maintenance competency

Source: Researcher interview results, 2025

The table above shows that the research informants came from various organizational levels, from top management to operational supervisors. This composition allowed the researcher to gain strategic insights into HR development policies, as well as a factual picture of the actual competencies of employees in the field. The informants' relatively long tenure strengthened the validity of the data, as they had direct experience observing the performance dynamics, training, and competency issues of operational employees.

Research Findings

1. Operational Task Analysis

Interviews indicate that the duties of operational employees in production, quality control (QC), and maintenance have been formally regulated through standard operating procedures (SOPs) and work instructions. In production, operators are responsible for carrying out stamping and welding processes, checking materials, and recording daily production results. In QC, primary duties include dimensional and visual inspections using precision measuring instruments and reporting product nonconformities. Meanwhile, maintenance technicians are responsible for conducting preventive and corrective maintenance, recording damage history, and coordinating with production operators. In general, the task structure is clear, but the level of mastery of these tasks varies among employees.

2. Actual Conditions of Training Implementation

Research findings indicate that training at PT Intra Presisi Indonesia is reactive and incidental. Training is generally conducted in response to workplace accidents, customer requests for corrective action, or preparation for external audits. A structured and sustainable annual training program is lacking. Limited HR personnel, a lack of internal trainers, and a tight production schedule are the main factors hindering the implementation of routine and equitable training for all operational employees.

3. Competency Gap Based on Interview

Interviews with management and foremen revealed a gap between expected competency standards and actual employee competencies. The majority of employees were assessed as having only mastered basic competencies, while advanced competencies had not yet been achieved. The most prominent gaps were found in welding skills, die changes, robotic welding operations, CMM use in QC, problem-solving skills, and cross-disciplinary competencies in maintenance.

Table 2. Competency Gap Based on Supervisor/Foreman Interviews

No	Material / Skills	Competency standards	Actual Conditions in the Field	Competency Gap
1	Welding	All welding operators are able to weld according to company quality standards without producing*looses*.	Some operators have not mastered standard welding techniques so that defective products are still found.	Welding competency is not yet evenly distributed; technical welding training is needed to reduce the defect rate.
2	Die Change (Stamping Machine)	All stamping operators are capable of doing*die change*independently and on time.	Only a few operators have mastered it*die change*so that there is dependence on certain operators.	Skills*die change*not evenly distributed; necessary*cross-skill training*.
3	Robotic Welding Operation	A minimum of two operators per shift must master the operation of welding robots.	Only one main operator is in control; the process stops when the operator is absent.	Robotic welding proficiency is very limited; backup operator training is required.
4	Use of CMM (QC)	A minimum of four QC personnel must master the use of CMM for precision inspection.	Only two personnel are capable of operating the CMM.	High dependence on individuals; need for equal distribution of CMM competencies.
5	Problem Solving (QC)	All QC personnel are able to analyze deviations and determine the root cause.	Some personnel only conduct inspections without in-depth analysis.	Analytical skills are not evenly distributed; RCA and 5 Why training is needed.
6	Kompetensi Maintenance (Electrical, Mechanical, Hydraulic)	Each technician has basic competencies in all areas of maintenance.	Technicians tend to specialize in just one area.	Cross-field competencies are not yet evenly distributed; it is necessary*cross-skill training*.

Source: Interview results with Supervisors and Foremen of PT Intra Presisi Indonesia, 2025

The table above illustrates competency gaps identified through direct interviews with supervisors and foremen in the production, quality control, and maintenance units. The most prominent gaps are in advanced technical skills and the distribution of skills among employees. This situation creates dependency on specific individuals and potentially disrupts the continuity of the production process. These findings underscore the need for structured training focused on equitable competency and strengthening critical skills.

Competency Gap Questionnaire Results

The questionnaire results corroborated the interview findings by showing a gap between ideal and actual employee competency scores. In production, the largest gaps were in welding, reading technical

drawings, and die changes. In QC, the largest gaps were in CMM operation and problem-solving skills. Meanwhile, in maintenance, gaps were evident in cross-sector troubleshooting and root cause analysis.

Table 3. Competency Gap Based on Operational Employee Questionnaire

No	Material / Skills	Almost Ideal	Actual Score	Gap	Information
1	Operate manual & robot welding	5.00	3.50	1.50	Understanding of machine working procedures is not yet widespread.
2	Reading engineering drawings	5.00	3.50	1.50	There are still misinterpretations of working drawings.
3	Die change independently & on time	5.00	3.50	1.50	Operators still depend on other partners.
4	Using basic measuring tools	5.00	4.00	1.00	Mastery is quite good, need standardization of practice.
5	Implementation of 5R	5.00	4.00	1.00	Implementation is not yet consistent across work areas.

Source: Questionnaire data of operational employees of PT Intra Presisi Indonesia, 2025

The table above presents the results of competency gap measurements based on questionnaires completed by operational employees in the production department. The gap values indicate a significant difference between ideal and actual competencies, particularly in welding skills, reading technical drawings, and*die change*This finding corroborates the interview results that the incidental nature of training has not been able to improve technical competence evenly and sustainably.

Discussion

This discussion aims to interpret the research results comprehensively by linking field findings, questionnaire results, and the theoretical framework of the Training Needs Analysis (TNA). The analysis is conducted through four main dimensions: organizational analysis, task analysis, individual analysis, and training program and schedule design. With this approach, the discussion not only explains the empirical conditions at PT Intra Presisi Indonesia but also places them within a theoretical perspective and previous research.

1. Organizational Analysis

The research results show that training implementation at PT Intra Presisi Indonesia remains reactive and incidental. Training is conducted in response to specific events, such as customer audit findings, workplace accidents, or the need for corrective action. This situation indicates that training has not been integrated into long-term HR development strategies. Limited HR staff and high administrative burdens further reinforce the lack of systematic training planning.These findings align with questionnaire results, which showed low employee perceptions of the sustainability and structure of training programs. Respondents assessed that training was not structured based on a competency roadmap, but rather merely met immediate needs.

This resulted in low satisfaction with the HR development system and limited sustainable competency improvement.This situation aligns with Brown's (2002) assertion that organizational analysis is the initial foundation of TNA to ensure training aligns with the company's vision, mission, and strategy. Without a thorough organizational analysis, training has the potential to become an administrative activity without strategic direction. Research by Alzahmi and Alshamsi (2024) also shows that a reactive training approach tends to fail to build long-term competitive advantage. Meanwhile, Harahap and Aisyah (2024) emphasize that a strategically integrated TNA can increase training effectiveness because the program is designed based on the organization's real needs. Thus, the results of this study emphasize the need for a paradigm shift in training from reactive to proactive, based on organizational analysis.

2. Task Analysis

Task analysis revealed significant competency gaps in core tasks within the Production, Quality Control (QC), and Maintenance departments. Within the Production department, robotic welding operation skills and the ability to perform die changes independently are not evenly distributed. Dependence on specific operators leads to downtime and production inefficiencies. Furthermore, the implementation of the 5S principles is inconsistent, even though this aspect is crucial for maintaining order and efficiency in the

production area.In the Quality Control (QC) department, limited CMM proficiency and low utilization of quality analysis methods such as QC 7 Tools and Root Cause Analysis (RCA) indicate that the QC function remains predominantly focused on product inspection rather than quality analysis. Meanwhile, in the Maintenance department, overly narrow specialization in specific areas leads to delays in repairs when cross-system failures occur. Comprehensive troubleshooting skills and the application of RCA are also limited.
The questionnaire results corroborated the interview findings by showing relatively high competency gaps, particularly in CMM operation, QC 7 Tools implementation, and electrical-mechanical troubleshooting. These findings align with Ferreira and Abbad's (2013) theory, which states that task analysis aims to identify the knowledge, skills, and abilities (KSAs) required to perform work effectively. Sundari and Kusmiati (2022) also emphasized that clear KSAO mapping will help organizations avoid overreliance on specific individuals. Thus, the study findings confirm that task analysis at PT Intra Presisi Indonesia has successfully identified critical competencies that should be prioritized for training.

3. Individual Analysis

At the individual level, research found that most operational employees still have an intermediate level of competency. In the production department, robotic welding and die change skills are not yet evenly distributed among operators. This leads to an unbalanced workload and increases the risk of production delays. The implementation of the 5S principles also relies heavily on individual awareness, rather than an ingrained work culture.In the Quality Control (QC) department, only a small proportion of personnel are capable of operating a CMM and applying data-driven quality analysis. This situation indicates that the role of QC individuals has not fully evolved from mere inspectors to quality analysts. Meanwhile, in the Maintenance department, limited cross-system capabilities and low consistency in RCA implementation indicate that problem-solving remains reactive and relies on trial and error.The questionnaire data confirms these findings by showing individual competency gaps above 1.00 points for most indicators. This indicates an urgent need for individual-level training. This finding is consistent with Brown's (2002) theory, which states that individual analysis aims to compare actual competencies with job standards. Harahap and Aisyah (2024) emphasize that a good TNA must be able to identify individuals with competency gaps to ensure targeted training. In fact, Aidilsyah (2021) states that a competency gap above 1.00 points is a strong indicator of the need for immediate training intervention. Thus, the individual analysis in this study has a strong empirical and theoretical basis.

4. Program Design and Training Schedule

Based on the results of the organizational, task, and individual analyses, the training program design is developed using a competency-gap-based prioritization approach. Competencies with the largest gaps and a direct impact on performance are prioritized, while competencies with smaller gaps are directed toward medium- and long-term training. This approach ensures that training resources are used effectively and on target.The training program design for the Production, Quality Assurance, and Maintenance departments demonstrates a clear link between the TNA results and the training design. The use of diverse training methods, including classrooms, field practice, workshops, and on-the-job training, reflects an effort to adapt the methods to the characteristics of the competencies being developed. The annual implementation schedule is also designed in stages to avoid disrupting the company's operational flow.This approach aligns with research by Salas et al. (2012), which states that training effectiveness is significantly influenced by the alignment between needs, methods, and timing. Furthermore, Noe (2020) emphasized that competency-based priority training will have a more significant impact on individual and organizational performance. Therefore, the program design and training schedule in this study are not only practically relevant but also have a strong theoretical foundation as a result of a systematic TNA process.

V. CONCLUSION

The conclusion of this study indicates that training implementation at PT Intra Presisi Indonesia has not been systematically managed and tends to be reactive, conducted in response to emerging issues, such as corrective actions, external audits, and operational incidents. This condition indicates that training has not been fully positioned as part of a long-term human resource development strategy that aligns with the

organization's goals and needs.The results of an integrated organizational analysis, task analysis, and individual analysis revealed significant competency gaps among operational employees, particularly in the Production, Quality Control, and Maintenance departments. In Production, competency gaps were primarily seen in the operation of welding robots, die changes, and the application of the 5R principles. In Quality Control, the most prominent gaps were in CMM operation, the application of QC 7 Tools, and root cause analysis. Meanwhile, in the Maintenance department, limited cross-system troubleshooting capabilities and the application of Root Cause Analysis were the main issues impacting the smooth operation of the machines.Based on these findings, the development of a structured Training Needs Analysis (TNA) is crucial as a basis for designing targeted training programs. A training program designed based on prioritized competency gaps is expected to improve employee technical skills, reduce dependence on specific individuals, and minimize the risk of downtime and product defects. Therefore, consistent implementation of the TNA can be a strategic step for PT Intra Presisi Indonesia in sustainably improving operational performance and competitiveness.

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