

# Optimizing TNA Method thru the Use of Cloud based App

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## ABSTRACT

Talent development is essential to ensure organization ready to survive in the market. Although it is essential, many organizations have yet taken it seriously and relies on traditional method. Recent IT technology development has changed the way the company develops its talents. It enables to simplify major bureaucracy, save unnecessary costs and talent development can be done ubiquitously. The article takes a case study of PN, an Indonesian state-owned energy company to enhance talent development program especially Training Need Assessment (TNA) methods. The PN director has mandated the current TNA method should embrace recent IT technology, to simplify TNA preparation and improve efficiency in delivery time. The article examines the use of cloud-based TNA application to promote TNA program to prepare world class talents as mandated in corporate program. Cloud technology facilitates the course designers and Subject Matter Experts (SMEs) in all training centers to collaborate and reuse the TNA materials and delivery.

**Key words:** TNA method, recent IT technology, simplification, efficiency

## 1. INTRODUCTION

Training Need Analysis (TNA) is an essential activity that needs to be conducted before delivering material [1]. Although it is important, many companies do not have proper TNA mechanism to produce sufficient materials that will be useful for learners [2]. As a result, the objectives of training may not suit the learner's objectives. Common problems can be found such as: increasing training costs, plain and general materials where learners do not learn sufficient materials to do their work or to make them more adept to carry out their work [2].

TNA is a complex process, since it involves multiple parties and meticulous steps in designing training materials [3]. The complexity of TNA may increase along with the size of the organization. In larger organizations, TNA mechanism frequently involves political and social interests, so it is essential to simplify the TNA mechanism to

eliminate complexity of work and direct to the objectives of training. The article takes a case study of an state-owned Indonesian energy company, PN, that has high complexity to design TNA material. Currently, PN has 11 training centers (TCs) that spread in major cities and prepare intensive training programs for more than 40 thousand staff to reach world class standard.

The paper examines the common TNA pain points in PN company can be summarized as:

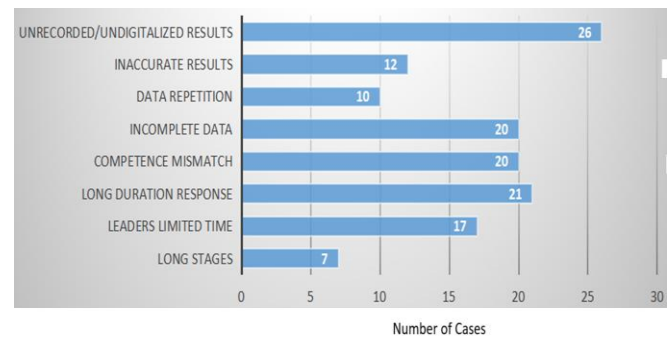


Figure 1. TNA Current Pain Points (internal source).

Figure 1 addresses the major TNA pain points related to unrecorded and undigitized TNA results. Lack of proper TNA documentation has contributed to more redo works, incomplete data, longer TNA stages, and creating competence mismatch. Lack of proper TNA causes longer TNA duration response. Other factors such as limited involvement of leaders' efforts to evaluate TNA mechanism. It may understand the current TNA needs many efforts and longer bureaucracy. The PN board of directors have addressed the TNA inefficient mechanism needs to be simplified and accelerated. For this reason, the article proposes the use of holistic TNA application by utilizing cloud technology to address those issues.

## 2. THEORETICAL FRAMEWORK

### 2.1. Talent Development

Talent development represents an essential component of the talent management process. As a result, organizations are willing to allocate major investments in talent development

activities [4]. Major talent development is carried out to ensure there are no talent shortage, ensure succession plan, easy mobility and replacement, and enhance organization's reputation as talent magnet [1]

Garavan *et al.* address the type of talent development programs can be summarized as [1]:

1. Formal programs. The formal program is a routine and repetition program that is introduced for all staff to enhance generic skills and behaviors. Formal programs cover a broad spectrum of strategies including conceptual and skill-based development programs, personal growth development programs, feedback-based development interventions and action focused development interventions.
2. Relationship based developmental experiences. Relationships topics are the most significant and include peers, senior leaders, customers and suppliers. The relationship program provides a variety of developmental functions such as: sponsorship, coaching, mentoring, psycho-social support and career advice.
3. Job-based developmental experiences. Job provides five significant developmental opportunities such as: bosses and superiors, turnaround situations, increases in job scope, horizontal job moves, and new initiatives such as doing a stretch task, implementing change and developing new practices.
4. Informal/non-formal developmental activities. Informal/non-formal developmental activities are related to unplanned, ad-hoc with no specified outcomes predominantly experiential.

PN company has applied those four program types in several TCs that spread in Indonesia major area.

## 2.2. Training Need Analysis (TNA).

TNA is a diagnosis mechanism that involves a process of information gathering and analysis [5]. TNA processes have a strategic role since they provide clear guidelines as to which professional deficiencies should be improved and future direction of the trainees. Training needs usually address underdeveloped skills, insufficient knowledge, or inappropriate worker attitudes [6]. Michael and Murray examine common issues related to traditional TNA such as [5]:

- Investigate the flaws that are allegedly introduced when performance appraisal systems relate with person assessment techniques. TNA is a complex process that needs to be reviewed regularly to maximize its process and efficiency. The article examines the common flaws in PN company such as: unrecorded and undigitized TNA results. Major important TNA documents are not managed properly and may create potential problems such as: incomplete data, competence mismatch, and longer response to TNA inquiry.
- Identify the limitations of contemporary needs analysis systems and neglect organizational aims and individual

aspirations. In many cases, the TNA mechanism does not address the organization aims and individual aspirations. Therefore, there are gaps that may occur between training and trainee expectations. These problems are illustrated in Fig.1.

- Explore the feasibility of a diagnostic needs analysis to overcome conventional performance appraisal mechanisms. Scholars [7] examine the conventional performance appraisal mechanism and do not appreciate the achievement of the training. Fig.1. shows lack of time that was spent by leaders to supervise TNA mechanism.
- Determine training and development needs at organizational, task and employee level that illustrates its application within corporate environment. The article addresses the urgency of TNA mechanism to address these issues. The rapid environmental change has made high priority for simplifying TNA development stages.

Rodrigo and Gardenia further addressed the common issues related to developing TNA mechanism such as: [6]

- Diagnose training needs for professionals. Frequent reviews are required to ensure the TNA mechanism has produced the expected results. The article proposes TNA application that can assist in diagnosing common training needs.
- Describe challenges for TNA practice. The TNA application enables addressing the common problems that faced by learners. These problems will be further examined and developed for the next training materials.
- Describe weaknesses in current TNA approaches. Current TNA steps are considered long and tedious, the PN management has addressed the urgency to simplify and save unnecessary costs.
- Describe/propose TNA procedures and Construct TNA instrument. The article examines the importance of using cloud-based solution to implement TNA application.

## 2.3. Cloud Computing

Cloud computing is an Internet-based computing system that utilising shared computer processing resources (Figure 2) [8].



Figure 2: Basic Cloud Computing.

The cloud computing is classified as: public cloud, private cloud, and hybrid cloud. The article uses corporate private cloud to support TNA service for all TCs.

The use of cloud computing for TNA service has several advantages such as: [9]

- a. Reliability. All TCs can utilise TNA service. Course designers and Subject Matter Experts (SMEs) in all TCs can collaborate and reuse the TNA materials.
- b. Cost savings. By having TNA service available on the cloud, All centres can save many costs related to training costs, transportation and accommodation costs, and other unnecessary costs etc.
- c. Manageability. Cloud computing allows easy management system to TNA service, such as: installation and operation, upgrade and maintenance, data backup and security, access, etc.
- d. Strategic edge. Cloud computing supports mobile access that allows management to monitor and evaluate TNA process and results directly. It allows easy implementation of change management that frequently take place in TNA mechanism.

The PN management has collaborated with Cloud vendor to anticipate with common problems such as:

- a. Downtime. The Service Level Agreement (SLA) has been agreed with cloud vendor to ensure minimum downtime whenever is possible.
- b. Security. The SLA also covers upgrading data and system security to ensure TNA process and results secure.
- c. Vendor lock-in. Cloud vendor agrees to train and prepare PN's IT staffs to manage TNA operation and maintenance.
- d. Limited control. Cloud administrator have collaborate with IT vendors to ensure secure access to TNA process and materials.

### 3. RESEARCH METHOD

#### A. PN Corporate University

The article takes a case study of PN, state-owned company that has 48 divisions and 9 directorates with more than 45 thousand employees. As an energy company, PN company requires fast decision making process based on high precision data and complete information. As an energy company, PN company should serve many constraints such as limited room to setup price, high stakeholders demands come from industries, households and local and national government program [10].

The PN company has developed corporate university division to develop world-class professional talents in energy area. Currently, PN has 11 TCs in major cities in Indonesia with different topics to be highlighted. Each talent centre carries main TNA steps such as:

1. Initiate TNA plan. The TNA plan is developed based on comprehensive analysis done by board of directors. Frequent TNA plan may take place due to dynamic change in energy environment and national policy.

2. Identify business and management expectations. The common business and management expectations are provided by national program. They should address the trending demands of industries, households, external environment analysis, and government program.
3. Identify critical and priority programs. Since PN management needs to accommodate various stakeholder needs, so developing critical and priority programs is not an easy task. It frequently creates longer TNA steps and more bureaucracy before deliver it.
4. Evaluate learning needs. The course designers and Subject Matter Experts (SMEs) are required to evaluate the materials and ensure the learning objectives fits to expectation of the learners and the user (department).
5. Validate TNA plan. The evaluation results needs to report to board of directors to map further talent utilisation. Current reports show increasing gap between TNA plan and expectations. It creates further domino effects needs to be addressed immediately.

We address the common business process related to applying TNA steps above.

#### B. TNA Mechanism

The TNA steps are implemented into 3 major categories:

- Preliminary steps (*Back Form*), comprises 2 steps:
  - (Form 1): Prepare TNA preliminary administrative documents, and budgeting (plan and approval).
  - (Form 2): Prepare availability of trainers and trainees; and timeline of trainings. Synchronizing availability of trainers and trainees for all training centres and corporate activity calendar.
- TNA steps (*IN Form*), comprises 3 steps:
  - (Form 3): Prepare business strategic issue.
  - (Form 4): Prepare management expectations.
  - (Form 5): Prepare program priority.
- Post-TNA steps (*Re-Form*), comprises 2 steps:
  - (Form 6): Identify critical learning issues, learning needs, and continuous learning.
  - (Form 7): Approval process from supervisors General Manager/Executive Vice President for learning plan.

The PN company uses the terms of *Back-Form*, *In-Form*, and *Re-Form* to illustrate Pre-TNA, TNA, and Post-TNA steps. The current TNA mechanism normally takes 2 weeks to accomplished. We develop cloud based TNA application that integrates TNA steps and mechanism above and be able to simplify the TNA mechanism from 2 weeks into 3 days.

**C. Research Questions and Data Gathering Method.**

We apply following research questions:

1. What are the current problems related to TNA preparation, mechanism, and implementation.
2. What are the common issues raised by the course designer, SMEs, trainers, and learners.
3. What are the common issues raised by the management related to TNA reports.

The article applies observation and focus group discussion (FGD) methods with those major key PICs such as: manager of the TCs, course designers, SMEs, trainers and learners. Those PICs are the staffs frequently involved with TNA development process and they have studied the progress of learners for years. The findings will be followed up with FGD to explore hidden problems lie in current TNA steps and mechanism.

The distribution of respondents are illustrated in Table 1 below.

**Table 1.** Profile of respondents.

Talent Development Centre	No.of Res-pondents	Directorate	No. of Res-pondents
HQ	7	Human Talent Development	1
Tuntungan	2	Lampung Distribution Unit	1
Padang	2	Southern Sumatera Generation Unit	1
Palembang	5	South Sumatera, Jambi, Bengkulu, Bangka Unit	2
Suralaya	1	HC Management Directorate	1
Jakarta	1	Sumatera Kalimantan Business Regional Directorate	1
Bogor	1		
Semarang	2		
Pandaan	2		
Banjarbaru	2		
Makassar	2		

**Table 1.** Profile of respondents (continued).

Talent Development Centre	No. of Respondents
Human Talent Development Area 2.	1
Human Talent Development Area 3.	1
Human Talent Development Area 8.	1

**4. FINDINGS AND DISCUSSION**

4.1. Initiate TNA Plan.

In TNA initiation plan, we gather data from respondents and map them in table 2 below.

**Table 2.** Comparison Current and Expected Result.

Pain Points	Current Situation	Expected Results
Un-recorded Results	TNA archive is stored manually and hardly to share.	TNA archive is shareable and visualised. Archive has reporting history.
Inaccurate Results	Input data is not verified properly.	Input data is verified with standards (supported with indicators and algorithm).

**Table 2.** Comparison Current and Expected Result (continued).

Pain Points	Current Situation	Expected Results
Incomplete and Data Redundancy	Data is not integrated with risk-based corporate budget work plan. There is no mechanism to check the data integrity.	Data is integrated with risk-based corporate budget work plan. Data integrity is checked within the system. Course planner in all centres can check and access the data and reuse them in next TNA session.
Mismatch Competency	(1). There is no proper mechanism to verify staff competency. High subjectivity dominates in selecting staff.  (2). SME	(1). Competency data is stored in company competency directory. More details specs fieldname can be added to store more detail staff competency. More detail staff competency will be useful for further recruitment.  (2). Subject Matter Expert and Human Talent Development
Longer Duration Response.	Anytime, any where, real-time completing all forms.	Online web application.
Leaders Limited Time	Improved coherence, time standard in filling forms and approval convenience.	e-mail notification, progress bar, QR code.
Long stages (7 stages)	3 quick and precise stages.	1. Application Programming Interface. 2. <i>Back-Form, In-Form, Re-Form.</i>

4.2. Identify business and management expectations.

The current business and management analysis is conducted through manual process with traditional filling system. We focus on developing effective mechanism to support easy process to identify business and management expectations process. Major respondents have addressed the current process needs improvement due to many of ineffectiveness and tedious process. We summarised the findings (Table 3) as below.

**Table 3.** Summary of Findings (continued).

No	Problems to be highlighted	Freq
1	TNA needs longer time due to management approval process.	17
2	TNA needs longer bureaucracy. It proceeds hierarchical structure from line manager to directors.	21
3	TNA is not supported by web-based application (incomplete data).	20
4	TC Developer late to address the completion stage of each TNA Forms ( <i>Back, In, and Re Form</i> ).	7
5	TNA process experiences many manual mismatches.	20
6	Improper TNA creates data repetition.	10
7	TNA results from all TCs are not integrated, unrecorded and undigited.	26
8	TNA implementation does not meet the objectives.	12

4.3. Identify critical and priority program.

We highlight the mechanism of determining critical and priority program as shown below (Table 4).

**Table 4.** Problem Identification.

Budget	Material	Man-power
Many manual works: TNA process, many ineffective meetings, and paperworks. Management has addressed the TNA process should be simplified and direct to summarise the critical and priority program, and link them with budget preparation.	TNA critical and priority program should be well documented. Current manual process should be simplified and needs application based approval.	(1). Novice staff frequently do not understand TNA process. Identifying critical and priority program should become priority TNA program for all staff including novice staff.  (2). As a result of inadequate TNA program, Major slow responses time occur in TNA mechanism.

**Table 4.** Problem Identification (continued).

Budget	Material
Method	Mechanics
(1). No push-pull notification (status of TNA progress). Identifying critical and priority program needs further collaboration that required push-pull notification from major staffs.  (2). TNA process is done in manual process. The current manual process may file incomplete critical and priority program and make them hard to reuse. Many rework needs to be done.	(1). Manual data entry and filling.  (2). Manual data and information integration.  Current manual works create inefficient, errors, and longer response time.  Current TNA critical and priority program has lack incomplete data and arguments.

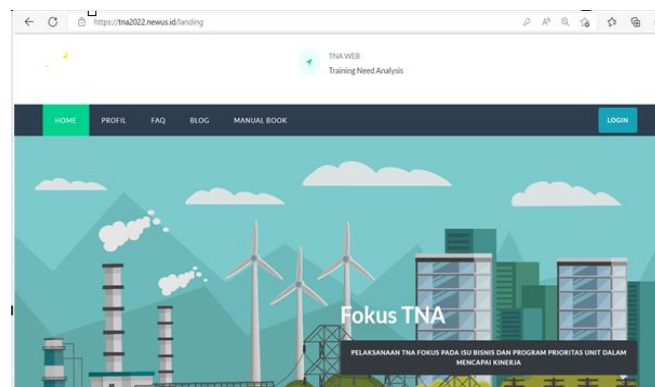
4.4. Evaluate Learning Needs mechanism.

Based on mapping user requirements above, we develop TNA needs as follows:

1. TNA web-based application with cloud access to support TNA mechanism. TNA app is installed in corporate cloud.
2. Features that allow user(s) to input TNA data simultaneously and synchronization mechanism for course designers, SMEs in all TCs. Approval process for TC manager can be done in TNA app.
3. TNA app addresses the needs of developing critical and priority program through integrating competence directory, profession trees, and hierarchy of staff into TNA app.
4. TNA app simplifies the Form (*Back, In, and Re-Form*) mechanism and reporting process. It supports easy evaluation and reporting process.
5. TNA app supports process validation and approval mechanism through QR code.
6. Progress bar to remind user the status of TNA mechanism. It triggers alerts whenever the user does not comply with the step.

4.5. Validate TNA Plan (Design).

The TNA application design (Figure 3 -13) is illustrated as:



**Figure 3:** TNA web-based app.

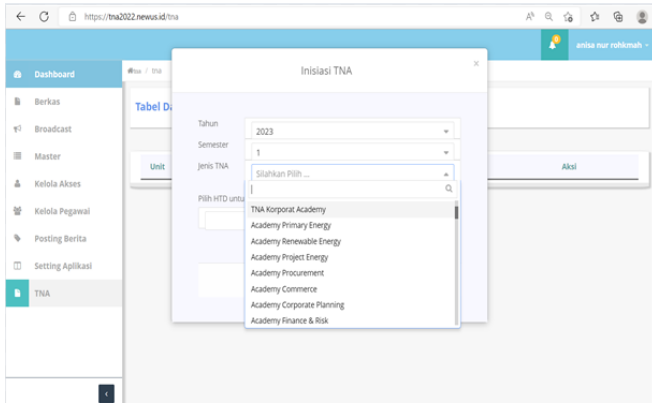


Figure 4. TNA initialisation.

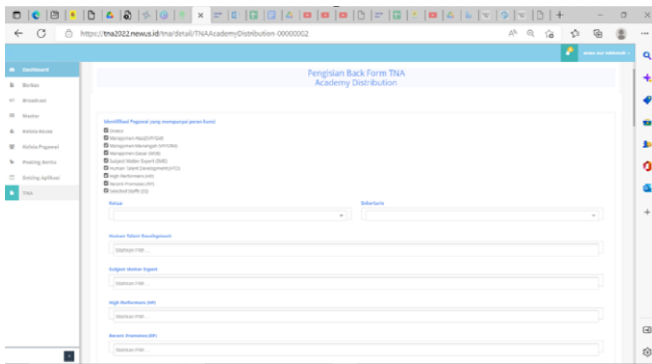


Figure 5: Key Role Identification.

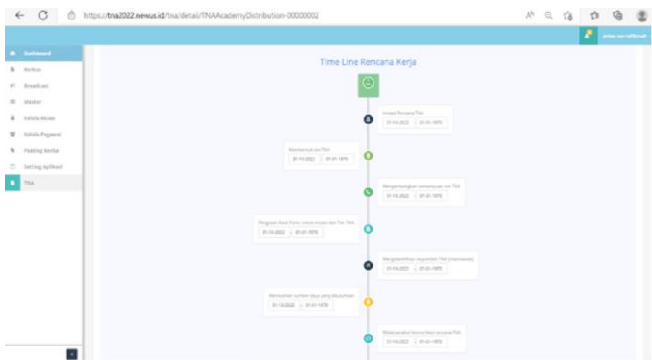


Figure 6: Workplan Timeline and Budgeting.

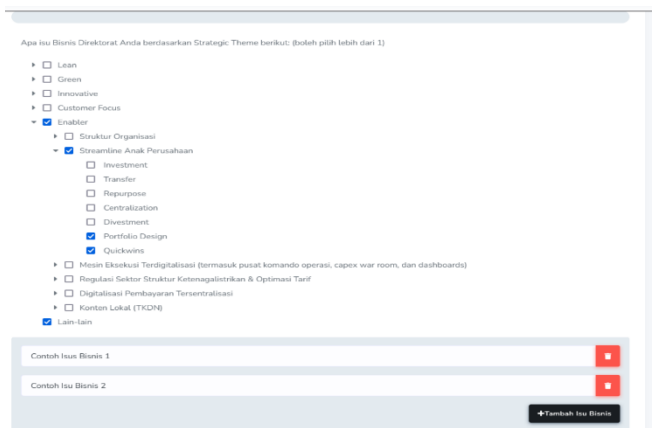


Figure 7: Business issues and constraints.

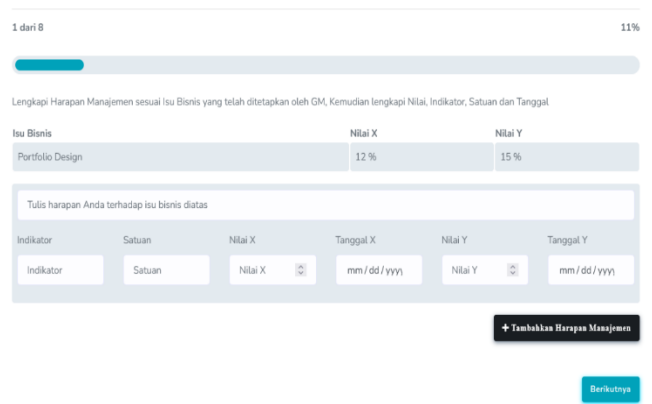


Figure 8: Management Expectation.



Figure 9: Priority Program



Figure 10: Approval Process.

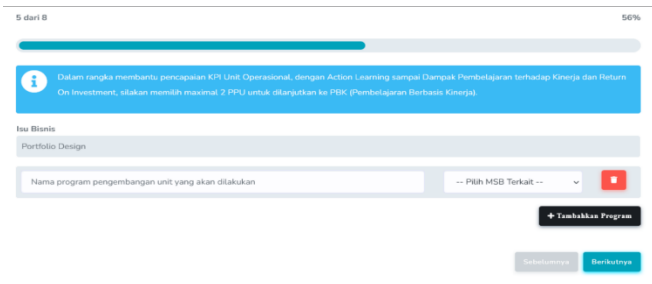


Figure 11: Competency Mapping (Course designer and SMEs).



Figure 12: TNA documentation.

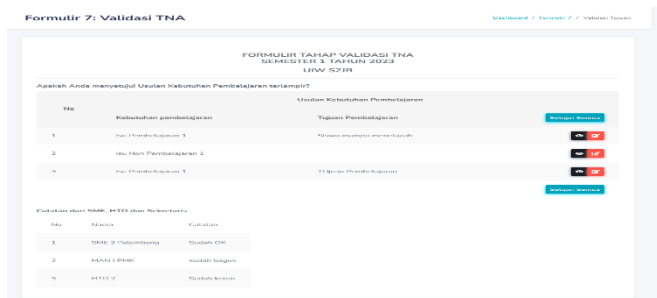


Figure 13: Learning needs and validation.

4.6. Comparison Current Pain Points and TNA design (Table 5).

Table 5: Comparison Current Pain Points with TNA App solution.






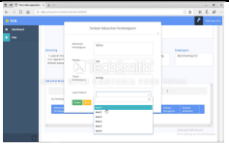
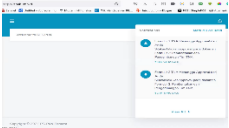

Current Pain Points	TNA Design	Interface
Un-recorded Results	Archive and Accessible Reporting History.	
Inaccurate Results	Parameter Algorithm based on S.M.A.R.T principles (Specific, Measureable, Achievable, Realistic, and Time Bound)	

Table 5. Comparison Current Pain Points with TNA App solution (continued).

Current Pain Points	TNA Design	Interface
Data Repetition	Integration with Risk-Based Corporate Budget Work Plan Application.	

In-complete Data	TNA app provides Auto Suggestion features and links with Risk-Based Corporate Budget Work Plan Application	
Competence Mismatch	Quick Accessible Company Competency Directory Form Archive Feature  SME and Human Talent Development Insights discuss and recorded in digital notes.	
Longer Response Duration	Online Web Application for Form fillings (ubiquitous access): easy, anytime, anywhere, and real-time.	
Leaders Limited Time	E-Mail Notification and Progress Bars to improve coherence works among Stakeholders, Time Standard in Filling Forms and Approval Convenience.	
Long Stages	Simplification and acceleration process for: Back, In, and Re-Form.	

We have addressed the pain points problems into TNA app (Table 6) as follows:

Table 6. Impacts to Current TNA mechanism.

Pain Points	Impacts to current TNA mechanism
Unrecorded and undigitized results	TNA app can identify missing documentation and inform course designer and SME about incomplete tasks. TNA results are stored in corporate cloud can be accessed thru mobile app.
Inaccurate results	TNA app provides SMART measurable indicators and eliminates gaps between course objectives and stakeholder expectations. These features are important for course designer and SME to measure the outcome of TNA as valuable evaluation for management.
Data repetition	Integration with corporate budget work plan app can eliminate data redundancy and work repetition. It can save budgets of carry out repetition works.
Incomplete data	TNA app provides “Auto Suggestion” feature to identify the incomplete data entry in Risk-Based Corporate Budget Work Plan App.

	Incomplete data entry may occur due to late risk analysis reports related business trending issues and management expectations. Incomplete data entry may cause misinterpretation of TNA results and deliver further impact to creating competence mismatch.
Competence Mismatch	TNA results may deal with some internal dynamic changes in organizational business process and organization structure. In some cases, the changes may come faster than anticipated TNA expected results. The TNA app has applied change management feature by providing “Adjustments” feature to TNA mechanism and results. Based on simulation, TNA app can anticipate more than 75% immediate changes when they are taken place. “Adjustments” feature can be accessed thru mobile app and automatic synchronization for all TCs.
Longer Response Duration	TNA app can shorten current TNA mechanism from 14 days to 3 days. All stakeholders such as course designer, SMEs, TC managers, and directors can collaborate in TNA mechanism in mobile app. They can monitor, make suggestion and give approval directly. Further corrections also can be done in TNA app whenever there are some contents needs some adjustments.
Leader limited time.	TNA app allows all stakeholders to collaborate ubiquitously. The communication barriers that common take place can be eliminated thru using TNA app.
Long Stages	TNA app can simplify TNA mechanism from 7 long stages into 3 short stages. The approval process is simplified and synchronized amongst TCs in TNA app.

## 5. SUMMARY AND DISCUSSION

The cloud based TNA application can simplify the TNA efforts and facilitate collaboration for course designers, SMEs in all TCs. Evaluation and approval mechanism become easier, where directors and high level managers can monitor and evaluate entire TNA steps and mechanism in any place and any time. As a result, the involvement of higher managers in TNA become more intense.

The involvement of higher managers is essential since TNA steps are highly related to corporate change management strategy. Energy industry is highly related to global and national trends where they contain uncertainty with volative prices such as coals and gas prices, and political uncertainty. These factors have caused PN company to prepare alternative energy especially renewable sources and supply chain management associated with them. Other challenges such as high energy demands come from industries and households, and government national program. Energy is highly regulated industry where operating costs has increased from year on year, while selling price cannot easily increase. Directors have mandated corporate university to take necessary measures to use recent IT technology to remove unnecessary costs, simplify TNA bureaucracy and delivery to prepare staffs meet with corporate goals and uncertainty energy environment.

## 6. CONCLUSION

Training Need Assessment (TNA) is an essential method to support talent development. Improper TNA method may increase gaps between TNA objectives and staff’s expectation. As a result, the dissatisfaction amongst users and learners to learning objectives increase. The article takes a case study of PN, a state-owned energy company that receive many issues related to TNA mechanism.

Energy industry has high uncertainty, since it tied with global high price in energy sources such as oil and gas prices. In recent years, the global oil and gas prices show increasing trends. While in domestic, PN deals with high demands from industries, households, and government expectations. With limited option to increase selling price, PN directors have mandated to corporate university to promote effective program through cutting unnecessary costs and simplified TNA bureaucracy and delivery. TNA material is highly related with corporate program and surrounds with many uncertainty (change management). The article proposes the use of TNA application that enables to address the major TNA issues such as: cutting unnecessary costs, simplifying major bureaucracy, fixing data integrity and documentation, eliminating data redundancy, improving overall TNA quality and response time, promote collaboration for course designers, SMEs and TC managers, and promote intensive involvement of leaders into TNA process. With PN app supports easy TNA monitoring and accelerates approval process.

## REFERENCES

- [1] T. N. Garavan, R. Carbery, and A. Rock, “Mapping talent development: Definition, scope and architecture,” Jan. 27, 2012. doi: 10.1108/03090591211192601.
- [2] D. Gould, D. Kelly, I. White, and J. Chidgey, “Training needs analysis. A literature review and reappraisal,” *Int J Nurs Stud*, vol. 41, no. 5, pp. 471–486, 2004, doi: 10.1016/j.ijnurstu.2003.12.003.
- [3] R. E. Lewis and R. J. Heckman, “Talent management: A critical review,” *Human Resource Management Review*, vol. 16, no. 2, pp. 139–154, Jun. 2006, doi: 10.1016/j.hrmr.2006.03.001.
- [4] J. M. Montero Guerra, I. Danvila-del-Valle, and M. Méndez Suárez, “The impact of digital transformation on talent management,” *Technol Forecast Soc Change*, vol. 188, 2023, doi: 10.1016/j.techfore.2022.122291.
- [5] M. J. Leat, “Training needs analysis: weaknesses in the conventional approach”.
- [6] R. Rezende Ferreira, “Training Needs Assessment: Where We Are and Where We Should Go.” [Online]. Available: <http://www.anpad.org.br/bar>
- [7] A. Sánchez-Bayón and E. Trincado Aznar, “Rise and Fall of Human Research and the Improvement of Talent Development in Digital Economy,” *Studies in Business and Economics*, vol. 16, no. 3, 2021, doi: 10.2478/sbe-2021-0055.
- [8] N. Taleb and E. A. Mohamed, “Cloud computing trends: A literature review,” 2020. doi: 10.36941/ajis-2020-0008.



- [9] S. Shilpashree, R. R. Patil, and C. Parvathi, ““Cloud computing an overview,”” *International Journal of Engineering and Technology(UAE)*, vol. 7, no. 4, 2018, doi: 10.14419/ijet.v7i4.10904.
- [10] A. D. Cahyati, T. Lestari, W. Mulyasari, and I. Idriana, “Environmental disclosure, governance score, and tax avoidance: Evidence from Indonesian energy sector companies,” *International Journal of Management and Sustainability*, vol. 12, no. 4, 2023, doi: 10.18488/11.v12i4.3525.