



Design of Data Warehouse Technology for Data Performance Management in Universities

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Abstract: The purpose of this research is Change Management for Organizations to find out change management for organizations and organizational change factors by using the nine steps methodology approach developed by Kimball. The results of this study are that information technology assistance provided by Pelindo I is the right step. Moreover, the scope of the business being managed is so wide, covering ports in the Sumatran archipelago and overseeing thousands of employees. Business process automation is becoming an effective way for companies to force irresistible change. If the rules are written, even though they have been mutually agreed upon, employees can still work around them. But technology can be coercive effectively and can eventually lead to cultural change. Performance management is simply productivity, how can employee productivity be measured based on predetermined targets? MKE Pelindo I with a technology base makes everything completely objective, transparent, and has clear measurements. When each person is competing to make an optimal contribution to the company, at that time all the wheels of the organization will move dynamically. Then based on Kotter's 8-step evaluation, the change process that was carried out for the first time in 2004-2014 which was not conducive was caused by the not forming a strong enough team to direct the process. And this is what creates resistance also from employees. Then it wasn't created at the beginning of creating the right vision, but changes had been implemented, meaning that subordinate employees were invited to change without communicating a vision.

Keywords: Evaluation; Management; Technology

Introduction

Data is the most important asset in a university (Leonard, 2018). There are various types of data in a university, such as academic data, student data, research data, and others. These data are constantly increasing in number and require special management and can be made available at any time, especially if the data will be used for higher education accreditation purposes. Data that is so abundant and contains information can be utilized to become new information or knowledge so that it can be used by tertiary institutions to better understand the conditions of these tertiary institutions (Findler et al., 2019). Currently, competition between companies in all fields focuses on the information provided to customers, this is also the case with universities (Musselin, 2018). Organizations that utilize

data warehouses have an important role throughout the world, especially in countries like America which are technology-oriented and aim to maintain a long-lasting work environment.

Organizations that use transactional data have collected over time to come up with a more realistic picture of operational activities, so they can make more informed decisions (Sarker, 2021). The use of data warehouse technology is widely used by various industries because it allows the integration of various applications or systems (Dash et al., 2019). An effective data warehouse design can help institutional management to decide on critical evaluations for their institutions (Aljawarneh, 2016). The two factors used to design a dimensional model in a data warehouse are data sources and business requirements (Togatorop et al., 2022). One of the important processes that must be

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carried out in the operation of the data warehouse is the process of duplicating data from the operational database (Nambiar & Mundra, 2022). Before operational data enters the data warehouse, an ETL (extract, transform, load) process is carried out, then a scheme is designed for data warehouse development using the Snowflake Schema model (Fana et al., 2021).

Before pre-processing the data, the data needed to be analyzed is determined beforehand and data cleansing is carried out (Lokaadinugroho et al., 2021). This research discusses the design of a data warehouse for research data in tertiary institutions using a nine steps methodology approach. An organization can increase value by changing its structure, culture, and technology. Changes in functional structure can help provide an environment in which people are motivated to act. The fundamental reason organizations need change is because something relevant to the organization has changed, or is about to change. Therefore, the organization has no other choice but to change too. This change occurred because of encouragement from internal and external companies.

The decreased performance of its employees which results in unsatisfactory service is often a trigger factor for internal organizations to make changes and the external factor is increasingly fierce business competition. The problems experienced by PT. Pelindo 1 occurred in the internal environment, namely the decreased performance of its employees, and had to adapt to existing environmental conditions. So that PT Pelindo 1 Tbk made changes such as a reshuffle of the board of directors and changes in the culture of the tagline symbol on the new logo. This change is expected to be able to re-motivate employee performance which had decreased and improve service to its customers.

Creating urgency according to Kotter is very important because many organizations are satisfied with the current conditions. This also happened in the 80s when Xerox dominated the world's photocopier market so they forgot themselves and were attacked by their competitors. This was because at that time Xerox was content with its position as the one in control of the photocopier market. Of course, what this coalition means is in the context of a positive spirit to work together towards the desired change, not to win over a group. Why is a coalition needed? The reason is simple, a change requires the involvement of individuals who experience change (Walk, 2023). The key word is only one: involvement. Individuals who feel involved will be called upon to be highly committed to following up on the agreed change plan. People who have a high commitment will immediately follow up with concrete actions toward change (Trabucchi et al., 2022). While the

name change requires concrete actions so that something can be said to have changed if there has been action.

An auto repair shop wants to double its sales in a given fiscal year. The Top Management of the workshop communicates this vision in a simple theme by putting up a large poster that reads 2 X. At every opportunity the Manager always echoes the 2 X symbols repeatedly. When asked about what profit should be doubled, he remains adamant that the most important thing is that sales increase to double. On another occasion the Manager said that he was ready to face the fact that profits would not fully double, but at least if he could achieve two sales, at least he would have mastered the market and customers, which is the most fundamental thing in maintaining the continuity of his business. For him, revenue growth is very important in terms of business continuity. Based on the explanation above, the purpose of this study is Change Management for Organization to determine change management for organizational and organizational change factors.

Method

The research method that the authors use in this study is the nine steps methodology approach developed by Kimball.

Result and Discussion

Change Management for Organizations

Change is very difficult to avoid because change is driven by internal and external organizational forces. Although the environment of an organization is continuously changing, it is necessary to assess changes in the life cycle of the organization (Beycioglu & Kondakci, 2021). This is related and highly dependent on the form of organization. Change, according to Lewin, occurs because of the emergence of pressures on organizations, individuals, or groups. The model discovered by Kurt Lewin is an analysis of the power field or the internal and external environment of the organization. It puts forward the question of "why" individuals, groups, or organizations make changes. Lewin offers three steps for organizational change (Phillips & Klein, 2023), namely: Unfreezing, Changing, and Refreezing. Unfreezing, namely a step to raise awareness among all parties in the organization about the need for change. Unfreezing will be faced with a dilemma or disconfirmation, and the individual or group becomes aware of the need for change. This first step is more focused on individuals or groups who refuse a chance to be given understanding and hope that changes will be implemented, Changing is a concrete step to strengthen the driving force and efforts to

weaken the resistance forces (Fredberg & Pregmark, 2022).

This step requires new diagnoses and models of behavior to be explored and tested. In this second step, it contains a clearer choice of offers for resisting forces, Refreezing, namely a step in implementing a new behavior to be evaluated and if it reinforces the change, then it needs to be adopted (Cummings et al., 2016). This step emphasizes the freezing process, namely the behavior that has been successfully changed needs to be supported by a reward system and is carried out using a workgroup approach (Prasetya, 2020).

Organizational Change Factors

Internal Factors

Internal factors are all the overall factors that exist within the organization and these factors can affect the organization and organizational activities (Moradi et al., 2021). Examples of Internal Factors: Changes in environmental policies, changes in goals, expansion of the target operating area, and increased volume of activities, Attitudes & behavior of members of the organization.

External Factors

External factors are all the factors that exist outside the organization that can affect the organization and organizational activities (Errida & Lotfi, 2021). Some of these factors include Politics, Law, Culture, Technology, Natural Resources, Demographics, and so on. Change is not a dashing project. Nor is it just looking for gear or building a lighthouse. However, an improvement in management practices with new patterns is considered more effective and efficient in improving company performance, without being provoked by the issue of whether the outside world knows about the process of internal change or not. This principle seems to be the guiding principle for the Pelindo I board of directors in leading the company, especially when they push the company to make changes. In contrast to several BUMNs that made high-profile breakthroughs when the new program was about to be implemented, Pelindo I's management took the opposite way. This Medan-based BUMN tends to do it quietly even though the improvement program they have implemented has been successful and has produced results.

At least that can be seen from the performance and what Pelindo I has done in the last two years. The facts show that Pelindo I's performance is indeed sleek. In 2015, Pelindo I was able to record a net profit of IDR 715 billion, far above the target set by the Ministry of BUMN of IDR 600 billion. That figure is also an increase of 33% from the previous year's net profit. In addition, despite the sluggish condition of the port and shipping business

at the macro level, Pelindo I was still able to increase operating revenues above 10% to IDR 2.34 trillion (2015).

Good financial performance cannot be separated from the changes made by the Pelindo I management team. They have been quietly making improvements to aspects of HR and organizational governance because previously they had experienced many internal problems. It turns out that revamping human resources is a blessing in disguise because it can roll a snowball that dynamizes the company's performance at a macro level. Just to look back, Pelindo I itself is a BUMN in charge of managing port services in western Indonesia. Headquartered in Medan, Pelindo I has operational areas in 4 provinces (Nangro Aceh, North Sumatra, Riau, and Riau Islands). This state-owned company manages 14 port branches, 11 port areas, and manages 4 business units namely BICT (Belawan International Container Terminal), UGK (Shipyards Business Unit), RSPM (Medan Port Hospital), and Belawan Domestic Container Terminal (TPKDB).

At Pelindo I, the impetus to make improvements cannot be separated from the organizational management situation in 2004-2014 which was not very conducive. And this is what Kotter calls Creating a sense of urgency. When photographed at the top level, for example, the management team was not solid. There have been two times when the directors were removed in the middle of the road, while the existing team was not very cohesive. In addition, there is also a concurrent function of certain directors. At that time there were almost no role models and also rules that could "force" employees to be disciplined. If we evaluate it with Kotter's 8 steps, the initial improvement movement that was not conducive was caused by the failure to form a strong enough team to direct the process (build a guiding coalition) (Lv & Zhang, 2017).

Then when looking at corporate governance, "at that time the HR management system was 'important'". There is no clarity on KPIs, as well as management performance assessments, and work programs for achieving organizational targets. Employee evaluation is only administrative in nature (Yoon, 2021). This problem was then tried to be looked for by the new team of directors assigned by the government to lead the state-owned company since April 2014. When observed, what the new management team at Pelindo did was try to raise the company's performance with a strategy of mixing various aspects of HR management. Namely by reviving employee motivation by increasing welfare and providing better expectations (Mok & Kühner, 2017), carrying out business professionalism, and carrying out a work system meritocracy with a pay-for-performance spirit. Pelindo I is quietly improving performance management by overhauling the remuneration structure

with a new pattern based on performance. However, on the one hand, it can be seen that management has not determined an appropriate vision at the beginning, then communicated this vision (Snyder, 2019). Although in the next stage, it will automate various processes within the scope of HR in the context of transparency and systematization of employee performance and its evaluation.

The latter is accomplished by implementing Electronic Mail Management and Electronic Performance Management (Kilay et al., 2022). The program was implemented simultaneously. The improvement program was started by professionalizing employees and requiring all employees to write down work plans every month (Backhouse & Ogunlayi, 2020). This Monthly Work Plan (RKB) must be filled in and this is directly related to the evaluation of the employee and the work allowance bonus received by each employee. The contents of the RKB for each employee are of course different and the filling out of the assessment is directly supervised by their respective direct superiors.

Every month, no later than the 5th, each employee is required to fill in and upload a list of tasks (for example 8 items), including the target time for completion of the action plan and derivative items, into the MKE system which has been done electronically (IT based). and integrated. The uploaded results become part of the employee's Monthly Work Plan (RKB) and allow him to be supplemented with other tasks such as special assignments, additional projects, and other assignments from his superiors. It's really about empowering employees to act on the vision and get enough short-term results to provide credibility.

Indeed, previously Pelindo 1 management had prepared an IT system to run this electronic performance appraisal model. This system was self-built and created by the internal team based on the needs and conditions at Pelindo I. The Pelindo I management team wanted to automate various business processes to increase efficiency, effectiveness, convenience, and company data security reasons. So with this system, employees are preoccupied with their respective RKB. "Between the 1st to the 5th, the RKB must be filled in, then the 15-17th of each month coaching is required with their superiors, and the 25-30th is the time for evaluating or assessing the employee's performance based on the RKB for that month. This goes on continuously and becomes a monthly routine that must be done by the employee so that they become busy and don't have much time to gossip.

Completion of this RKB is mandatory and has heavy sanctions. In the beginning, there were a lot of stubborn people, with the excuse that they were busy and couldn't open the server to fill out the form on MKE.

Some branch heads, for example, were stubborn at first because they felt they had too much routine work and objected to filling out work lists. "No problem, but we have made a rule, for those who don't fill out the RKB, later the take-home pay they receive will only be 40% of what it should be because they don't get work benefits," said Hamied who is HR director at Pelindo 1. This means building momentum to deal with the problem of change, then giving rise to new behaviors in the organizational culture.

Simultaneously with the implementation of the MKE, Pelindo I also rearranged the issue of remuneration. In this case, Pelindo I uses the principle of contribution-based remuneration. "In the past, fixed salaries contributed 60-70% of employees' take-home pay and only 30% of variable salaries. To achieve this, the Rp 14 billion profit target is then broken down into detail into the target contribution of each individual within the company (directors, GMs, senior managers, managers, to ordinary staff). In this way, Pelindo I ensures that the obligations of the Ministry of BUMN will be fulfilled properly. So, back to changes in performance management, if a branch reaches the target of above 93%, then the employee will get a bonus according to the employee's rank class. And if you look at the amount, after the improvements, the value of the performance allowance received per employee is indeed much larger than before. In the past, the amount of the performance allowance (Performance Allowance Standard) ranged from IDR 600,000 to IDR 7.5 million (according to the employee's position class). So currently it has increased by an average of 130%, ranging from IDR 1.5 million to IDR 20 million.

For example, in the past, a senior manager-level Pelindo I employee at most brought home a take-home pay salary of IDR 20-30 million, but now a senior manager-level employee with good conditions and good work unit performance, he can bring home IDR 45-50 million/month. "That's why the enthusiasm and work motivation of Pelindo employees is now very good. They know what they will get if they excel. But don't forget, that all of these practices run on the Electronic Performance Management system where all employees without exception must always fill out their work plans in the electronic system that has been provided (Brown et al., 2019), no later than the 5th of each month. The list of tasks (eg 8 task items) that has been stored in the system becomes the job desk list of the employee's tasks for that month as well as a tool for assessing his performance (by his superior). "The process of filling out the RKB is all done electronically and monitored by an HRD officer whose name is the Strategic Management Officer (SMO). SMO's work ensures that all these electronic systems run smoothly," he said.

Currently, the MKE implementation process is running smoothly and almost no one is stubborn because each person's performance allowance is at stake. "If he doesn't fill out the electronic work plan by the 5th, the employee's performance allowance will be lost. If he is a senior manager whose performance allowance for that month is Rp. 18 million, then the loss of Rp. 18 million will be felt. His wife at home can scream about why her income has dropped. That's why now everyone is automatically disciplined and enthusiastic.

Interestingly, the implementation of the MKE turned out to be an unexpected blessing in company management practices (Chen et al., 2018). The condition of the company and employee support are very conducive. "In the past, many employees gossiped in the office. Now we don't have time anymore sir. We are preoccupied with questions about filling out and running the RKB. Before the 5th we will think about it. This is related to pockets because if we are not filled, the performance allowance is zero rupiahs. ha ha ha," said M. Eriansyah, a senior employee working under the Operations and Business Directorate. Employees now don't protest much, neither do unions, they are more friendly.

The sense of belonging of employees to the company is also getting higher (Dewi & Gentari, 2021). Before the transformation, there was always an assumption that there were positions that were wet because there were lots of kickbacks (tributes) from relationships, but there were dry positions. "Now, if an employee receives a kickback, the other employees will surely scream, why not just include it in the company's official income? it is more official and halal. So other employees also supervise operations. That's why extortion that goes into personal pockets can be minimized," the company also appointed an agent of change in each work unit to help carry out supervision (Singh, 2022). On the other hand, it cannot be denied, this conducive condition is also due to the implementation of electronic mail management which is also implemented.

Now all important company documents are placed on the company's server and are completely electronic, not printed. This avoids cases that used to often occur when company letter documents were spread to many parties with no clarity. In the past, it was common for Pelindo I directors to be summoned by the police because of a large number of letters and company documents that were spread and then politicized by other parties so it became a case. Now it's more controlled. Interestingly, the success of Pelindo I's changes can also be seen from Pelindo I's bottom line figures where the net profit figures are the best among similar BUMNs. In 2015, Pelindo I was given a net profit

target by the Ministry of BUMN of IDR 600 billion. Pelindo I was able to achieve a net profit of IDR 715 billion. Even though the Rp. 715 had been deducted by two expenditure items in an unexpectedly large amount.

In 2015, the government made a new regulation whereby the port authority could no longer withdraw the port fees. It's no wonder that Pelindo (I, II, III, and IV)'s revenue was cut from this post, and Pelindo I itself lost revenue of around Rp. 180 billion from the anchoring service revenue post. Secondly, there is a new expenditure item because the government collects non-tax revenue of 2.5% of the company's income, or around Rp. 200 billion. "So that a total of Rp. 380 was lost. But still far above the target. This means that if you don't cut profits, it can reach Rp. 1 trillion. It's not wrong. If you look at Pelindo I's business achievements under the team of directors who have led it since April 2014, it is quite sleek.

Judging from the comparison of net profit from 2014 to 2015, there was a 33% jump from IDR 536 billion to IDR 715 billion. Then Pelindo I's operating revenues can also still increase amid the gloomy world shipping and port business sentiment due to falling prices of the world's main commodities which have reduced trade volume. In 2015, Pelindo I's operating revenues reached Rp 2.34 trillion, or a 12% increase compared to 2014 which was Rp 2.0 trillion. After carrying out its transformation since 2014, Pelindo I managed to increase its employee engagement from a score of 3.4 (2014) to 4.05 (2015). This result could not be separated from the changes in the management system that he did. Pelindo I in 2016 managed to record a profit of around IDR 700 billion and in 2017 targets IDR 800 billion. "The hope is that if there are no policy changes and turmoil, Pelindo I wants to be able to achieve a profit of IDR 1 trillion. Many changes in business policies like today must be anticipated with the development of human resources who are ready for business changes.

The most significant, of course, is observing the graph of the increase in the employee satisfaction index (Inayat & Jahanzeb Khan, 2021), commitment index, and employee productivity, all of which show significant changes after the change. In 2015, the employee satisfaction and engagement indexes were respectively 3.63 and 3.8 (scale 5). Of course, in practice, the change was not without obstacles. It takes extra effort to socialize this change in the HR sector. Initially, several stubborn branch heads did not want to fill in the MKE for various reasons. But the initial three months for training or trials. After three months of having to run and no compromise, the risk is they will lose performance allowances.

Conclusion

Business process automation with the help of information technology carried out by Pelindo I is the right step. Moreover, the scope of the business being managed is so wide, covering ports in the Sumatran archipelago and overseeing thousands of employees. Business process automation is becoming an effective way for companies to force irresistible change. If the rules are written, even though they have been mutually agreed upon, employees can still work around them. But technology can be coercive effectively and can eventually lead to cultural change. MKE Pelindo I with a technology base makes everything completely objective, transparent, and has clear dimensions. When each person is competing to make an optimal contribution to the company, at that time all the wheels of the organization will move dynamically. Then based on Kotter's 8-step evaluation, the change process that was carried out for the first time in 2004-2014 which was not conducive was caused by the not forming a strong enough team to direct the process, and this is what creates resistance also from employees. Then it wasn't created at the beginning of creating the right vision, but changes had been implemented, meaning that subordinate employees were invited to change without communicating a vision.

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Author Contributions

Conceptualization, data curation, funding acquisition, methodology, visualization, writing-original draft, writing-review & editing: Toga Sehat Sihite.

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Conflicts of Interest

No Conflicts of interest.

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