ASSESSMENT OF HUMAN CAPITAL MANAGEMENT (HCM) IMPLEMENTATION AND ITS EFFECT ON INNOVATION

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Abstract: The financial crisis in 1998 requires the state to stop its funding to PT DI. Lack of funds forced PT DI to cut its employees in large numbers in order to sustain the company survival with business turbulence encountered. This massive layoff was followed by experts skill left the company. This condition raises some problems for companies which are lack of expertise, employees age gap and based on previous research there is still a lack of trust in leaders. Improvement of Human Capital Management (HCM) is required considering problems faced is about human resource management, and must be conducted effectively and accurately targeted because of PT DI limited funds. HCM framework used in this study is framework developed by Laurie Bassi and Daniel Mc Murrer (2007) which states there are five drive (driver) HCM which are leadership, engagement, knowledge accessibility, workforce optimization dan learning capacity. Assessment of HCM implementation in PT DI using questionnaire tool shows that implementation of HCM in PT DI is still at low level and the driver with the lowest score is Engagement. Innovation used as the expected result because PT DI as aircraft manufacturing company is intense company with innovation. HCM correlation analysis with company innovation capability is conducted by Partial Least Square (PLS) using software smart PLS 2.0. PLS analysis generates that Engagement is the driver with the highest correlation to innovation. The series result of research steps indicate that the Engagement is the driver with the highest correlation to the level of innovation as well has the lowest value of implementation level, so that the increase in HCM should be concentrated on the driver Engagement. In this study, the researcher recommends enhancement Engagement with conduct performance management.

Keywords: Human Capital Management (HCM), Innovation, PT Dirgantara Indonesia

1. Introduction

PT.DI is one of the aircraft manufacturing companies in the world which located in Bandung, Indonesia. In 1998, crisis hit mostly of Asian countries including Indonesia. In order to overcome the economic crisis, the Indonesian government was reducing the allocation of funds within government spending, one of them by no longer giving injection of funds for PT DI. Terminated the funding from the government which is the sole funding source of PT DI cause a great financial crisis happened in internal company resulting in massive layoffs of 16000 employees (2000 engineers) to only 3500 employees (900 engineers). This situation emerged some problem which are human capital shortage because many of employees especially the experts left the company, the human resource demography in PT DI is not proportional because age gap between senior management and junior employee is too far, beside that there would be much of senior employees will retire in 2015. Previous research by Utami (2013)also shows employee level of trust to leader is only in moderate level which show that employee do not feel secure to fully put their trust to their leader. Aerospace industry is knowledge intense industry which relies on people as its knowledge worker and key resources, so when company loses the people and the composition of its people in the organization is not proportional, it can disrupt the business processes and cause the company more difficult to achieve the sustainability, even struggle to be survived. PT DI must improve its Human Capital Management to fix the problems at PT DI which is in line with rescue strategy that PT DI designed in 2003 to safes the company from the crisis was much talk about human capital development. PT DI still in the phase of recovery and financial condition has not stable yet, it means that PT DI need to be efficient in its spending especially in human capital development. Efficient could be achieved by maximizing its return of investment in people, so the investment or spending to develop human capital is right on target and as needed by the company. Due to the limited time and widespread scope of PT DI as research object is very wide then author limits the scope of research. The research limitation conducted by selecting directorate that represents the whole company

which are directorate of engineering and directorate of production.

Human Capital Management

According to John Ingham (2007) definition of Human Capital is "the relevant knowledge, skills, experience and learning capacity of the people available to the organization". Based on that definition of Human Capital, then he defines Human Capital Managements as a "strategic approach to people management that focuses on the issues that are critical to an organization's success". A company has a competitive advantage when it provides products and services that meet costumer's needs better than competitors do. According to Finn (2002), "HCM leverages the most valuable asset – the people – to improve business performance and grow competitive advantage. Focusing on the issue that attract, motivate and inspire the best talent, HCM mobilizes every aspect of the operations to achieve a single goal: sustained business success."Human capital management is a system for improving the performance of those in critical roles those with the biggest impact on corporate core competence (Bradley, 2008). This research uses human capital framework by Laurie Bassi and Daniel McMurrer (2007). According to Bassi and McMurrer organization HCM performance is determined by its drivers which consist of five major categories: leadership practices, employee engagement, knowledge accessibility, workforce optimization, and organizational learning capacity. Each of HCM drivers has dimensions reflect how effective organization could gather through contribution each driver and these dimension called HCM practices. HCM practices are practical form of HCM drivers which represents the HCM drivers itself.

Innovation

According to top executive, innovation is an important element in PT DI business process and needs to be improved along the time. John Bessant and Joe Tidd in their book titled 'Innovation and entrepreneurship' (2011) defines "innovation is about growth – about recognizing opportunities for doing something new and implementing those ideas to create some kind of value. Innovation is a complex process which needs systematic careful and management and carries risks. Innovation is not a single events, it is an extended process of picking up on ideas for change and turning them into effective reality. According to Bessant and Tidd the core process of innovation involved recognizing opportunities, finding resources, developing the venture and creating value. In line with Bessant and Tidd who perceive innovation as a series of process, Hansen and Birkinsaw view innovation as a value chain. Viewing innovation as end-to-end process rather than focusing only on a part allows company spot both weakest and the greatest part of the innovation process. The integrated flow of the innovation as a value chain presents innovation as a sequential process that comprises three phases: starts from idea generation then to idea conversion and finally idea diffusion.

a. Idea Generation
   This phase explain about how company could generate idea and the source of idea. It could be in-house where the ideas come from inside a unit, on their own functional groups or business units
b. Conversion
   After generates some idea from inside and outside, company must screen and fund the idea which has selected. Organization or company must do screening and funding mechanism properly.
c. Diffusion
   The ideas and concepts that have been generated, selected, funded and developed need to receive buy-in which not only from customers but also across the company.

Project management process of engineering directorate in PT DI is divided into several processes, namely: first, the initiation process which includes analysis of market studies, feasibility studies; second, planning process that includes planning of all resources for the realization of products including the budget, man power, technology, schedule; third, executing process which is the execution stage of projects that already planned; fourth, controlling process which includes analysis of performance, control all the stake holders involved then reality cross check with the planning (comparing JAS and JAR). From the series steps of project management process in directorate of engineering, executing process is the processes that have the most intense of innovation.

2. Conceptual Framework

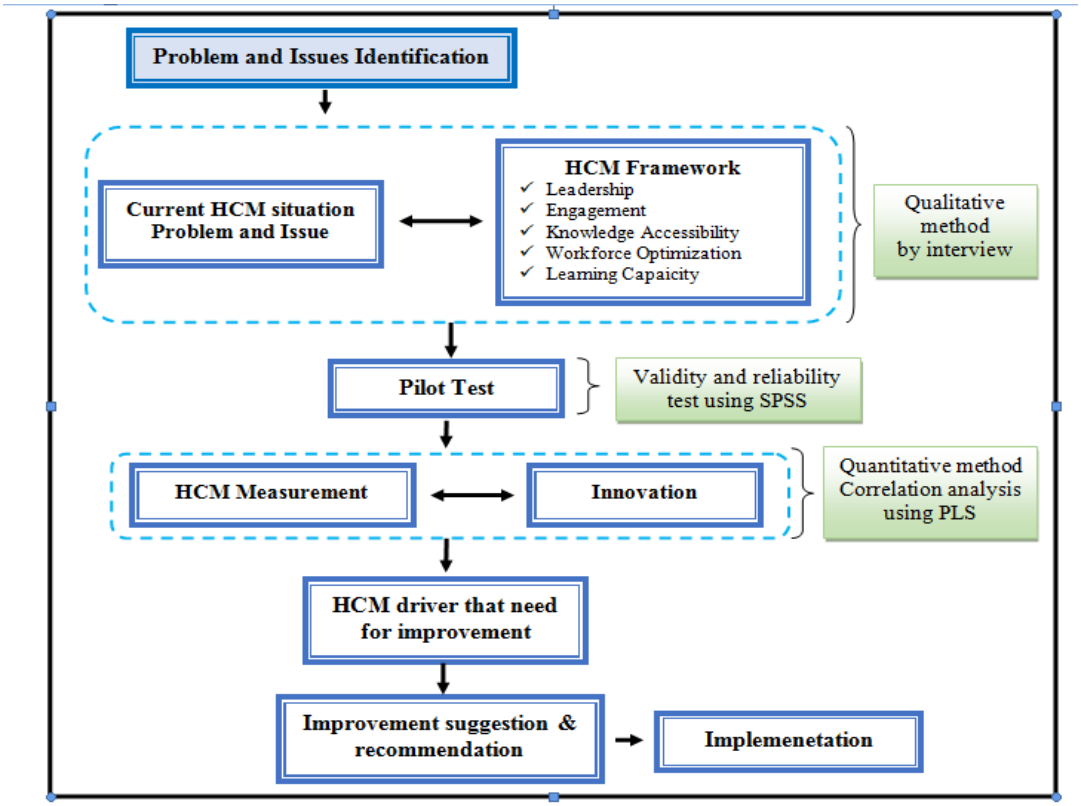


Figure 1. Conceptual Framework

After identify issue and problem, current HCM situation of PT DI that include problems and issues will be associated with Human Capital Management framework by alignment process that conducted by doing interview with some representative respondent that could represents PT DI situations. Knowing that the problems and issues are associated with Human Capital Management, it needs to do improvement in implementation of HCM at PT DI to fix the problem. Before doing improvement, survey and measurement of HCM implementation is conducted first. Survey and measurement of HCM implementation is conducted using tool kit that developed by LaurieBassi and Daniel McMurrer (2007)in the form of questionnaire.

The result of HCM measurement then associated with organization innovation using Partial Last Square (PLS) to identify which driver of HCM has the most critical role that drives organization innovation. These series of analysis phases will show and detect which HCM driver that need for improvement as well as has the most critical role to determine organization innovation. Having known the HCM driver that need for improvement, recommendation and suggestion could be arranged as needed and precisely targeted to solve problems and issues which are faced by company and improve company performances.

3. Research Methodology

To capture the situation and explore the problems, researcher does both quantitative and qualitative research. The processes of the research are problem/issues/phenomena identification, aligning problem/issues/phenomena with human capital framework by interview and literature review (qualitative method, instrument design, pilot test to 30 respondents for validity and reliability testing, data collection, processing data and analysis (quantitative method), conclusion, propose conclusion and recommendation. This research using two types of data which are primary data (data is obtained by conducting interview, questionnaire distribution, and discussion with research objects) and secondary data (data is obtained from article, literature study corporate data, media reports that related with the research). Researcher set margin of error at the level of 10% (confidence level of 90%) which had been applied at many social studies that result sample number of 96.78 means the minimum sample of the research should 97 persons.

Alignment methodology

Alignment process of keyword the result from interview with Bassi's HCM is conducted to determine whether the framework corresponds to company issue, problem and condition or not and also to cross check problem and issue that had identified before. The more correspond keyword with HCM framework, the more fit or suitable HCM framework with company problem and issue. It means that if the keywords correspond to HCM framework, then the framework is applicable to be used to examines and solve company's problem.

Table 1. Matrix Matching Between HCM with the Conditions and Problems

Leadership Practices	Employee Engagement	Knowledge Accessibility	Workforce Optimization	Learning Capacity
Communication Communication is highly desirable, but still not well established because of gap generation	***Commitment*** There is no clear performance management, KPI (Key Performance Indicator) still in planning phase	***Availability*** Job-related information and training are readily available because it is very necessary but still not conducted in effective way	***Conditions*** Working conditions made to support high performance for each area	***Innovation*** New ideas are welcome but still take long time to being implemented.
Systems Leadership development and transition systems are not conducted well, there is no coaching and file transfer from predecessor to the successor	***Time*** Workload still not evenly distributed, because some area are overloaded because shortage of people, some are underloaded	***Collaboration*** Teamwork is encouraged and enabled but data transfer across department still not running well because lack of trust to colleague	***Hiring*** Hires are chosen on the basis of skill project required; new hires complete a thorough orientation an basic training	***Training*** Training is practical and supports project goals, and could be based on customer request.
	Systems There is no continually employee engagement evaluation	***Systems*** Collection systems are conducted but information is not available easily because there is no portal information.	***Systems*** Employee performance management systems are not established yet	***Development*** Formal career development plans still not well established, especially in directorate of production.

Table 1. shows that company current situation and problem is all correlated with Bassi HCM framework. It means that this framework is fit with company current situation and problem. The Tool of questionnaire which used to measure HCM implementation is adapted from Bassi framework and accepted by Head of Human Capital Development Division.

Pilot test (Validity and Reliability testing)

Validity test with number of samples 30 and confidence level of 95% has the r table value of 0.361. It means in order to be classified valid, the r score of each item indicator must greater than 0.361.all item in Human Capital Management variable have r Score greater than r table (0.361) which means that all items are valid so do the item on innovation variable (Sugiyono, 2005).This research uses *Cronbach Alpha* as basis of the reliability testing. According to Nunnally et al. (1994) instruments could be classified as reliable when it has *Cronbach Alpha* greater than 0.7. All variables have Cronbach Alpha greater than 0.7 which means that all variable are Reliable.

HCM Measurement

According to Bassi and McMurrer (2007) HCM data capture and analysis proceeds in three steps: Step 1. Employees and managers are surveyed to quantify variations in HCM maturity across functions, business units, regions, and job categories and also to document organizational HCM strengths and weaknesses Step 2. Variations in HCM maturity are linked to variations in key organizational outcomes, either financial or non financial. This

phase identifies which HCM factors are most critical to organizational performance. The outcome is usually tracked by top management and in this research the outcome is Innovation. Step 3. Results in first two steps are used to identify the HCM factors that significantly drive organizational performance as well as those that also represent areas of relative weakness. The result of this series of analysis will highlight where the organization should concentrate its HCM development efforts.

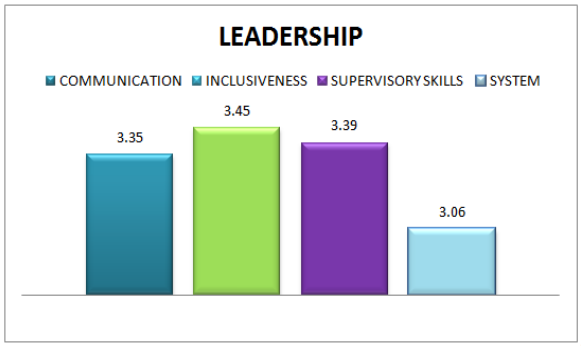
Respondents of this research are 175 person which meets the sample size was calculated using the formula of Slovin. Questionnaire used for the assessment is adapted from toolkit developed by Bassi and McMurrer (2007). This questionnaire using a 1-to-5 scale (1, strongly disagree; 2, disagree; 3, neutral; 4, agree; 5, strongly agree).
The assessment result of HCM implementation in PT DI is shown in Figure 2. and Table 2. Table 2. show total score of HCM implementation in PT DI while Figure 2. show the chart of each practice of HCM driver score and score of innovation sub variables.

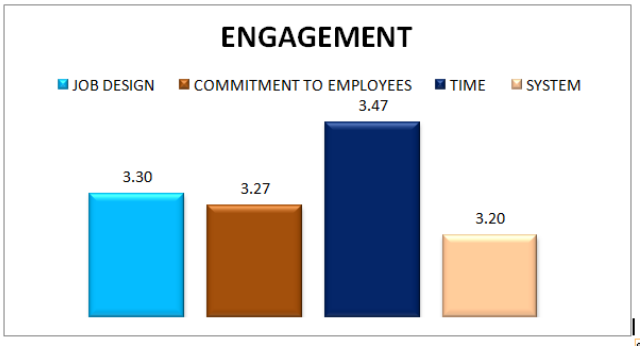
Table 2.Total Score of HCM Implementation at PT DI and comparison to Bassi HCM Score Criterion

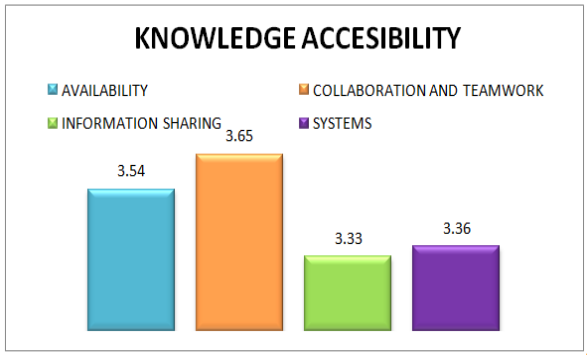
Human Capital Driver	SCORE
LEADERSHIP	13.25
ENGAGEMENT	13.23
KNOWLEDGE ACCESIBILITY	13.87
WORKFORCE OPTIMIZATION	14.08
LEARNING CAPACITY	13.27
TOTAL	67.70

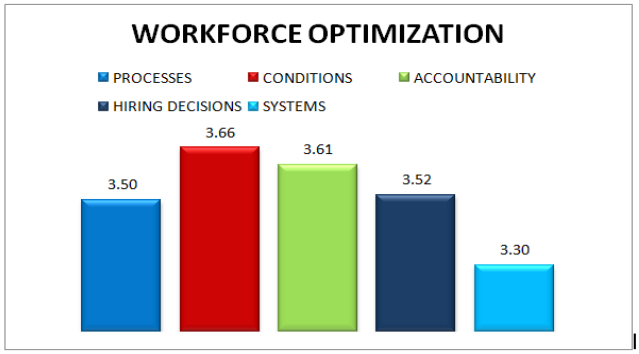
Total score	Level of HCM
90 to 100	Superior
80 to 89	Adequate
70 to 79	Marginal
69 and below	Poor

Shown in Table 2 the total score of HCM implementation in PT DI is 67.70. As seen in Table 2, driver that has the lowest subtotal score is engagement, followed by leadership and learning capacity. the total score of HCM implementation in PT DI which valued at 67.70 is categorized as Poor level of HCM. Poor level is the lowest category level of HCM that means HCM implementation in PT DI still far from optimal and need serious attention for improvement especially engagement, leadership and learning capacity driver.









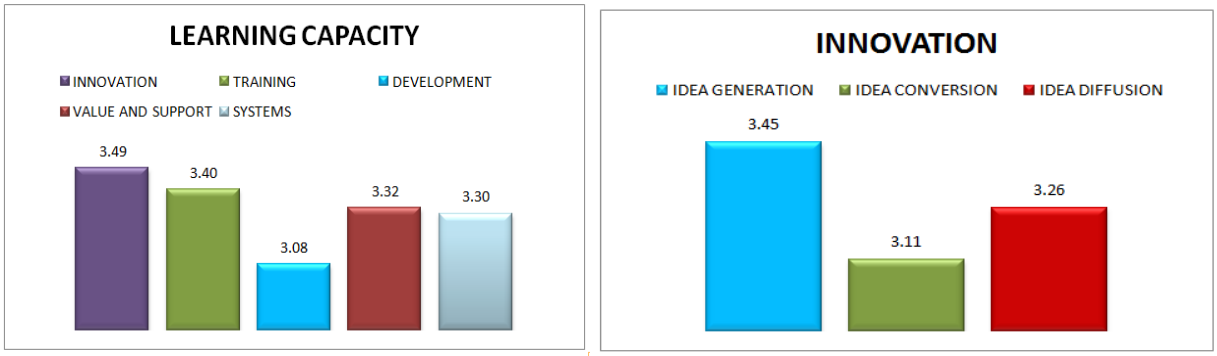


Figure 2. Each practice of HCM Drivers and Innovation Sub Variables Score

Summarize of total score of HCM implementation has explained in Table 2. While from innovation variable, sub variable idea conversion has the lowest score; it means that PT DI has the weakest point in this area. Idea conversion area is about funding, taking risk in investing the new ideas, completion time of new product or business process, and support for management.

Previous research about correlation between Human Capital with Innovation

Fang Yen (2013) conducted a research about the impact of bank's human capital on organizational performance. The research finding shows that build human capital could enhance innovative capabilities. For the banking industry, the higher the human capital, the greater the innovative capabilities are. Wang & Chang (2005) conduct a study titled "Intellectual Capital and Performance in Causal Models. Evidence from the Information Technology Industry in Taiwan". The research results that human capital has a direct impact on innovation capital, then describe that if we try to improve innovation capital, we need to improve human capital too. Elsetouhi and Elbeltagi (2013) conduct a research titled "The Role of Human Capital and Customer Capital in Supporting Product Innovation". The research findings confirm that human capital has a directly positive effect on product innovation.

Partial Least Square (PLS) method

Determining which human capital driver has the critical role to innovation could be conducted by find out the correlation between both of these variables. Tool that is used to analyze the correlation between human capital drivers and innovation is smartPLS 2.0 software while the data using data of questionnaire that had been distributed. The hypothesis of the research is:

H0 : Human capital drivers has no correlation to innovation
H1 : Human capital drivers has significant positive relationship to innovation

There are seven steps phase that has to be followed in order to get the precise interpretation and conclusion about the relation between human capital drivers and innovation.

Stage 1 – Specifying the structural model

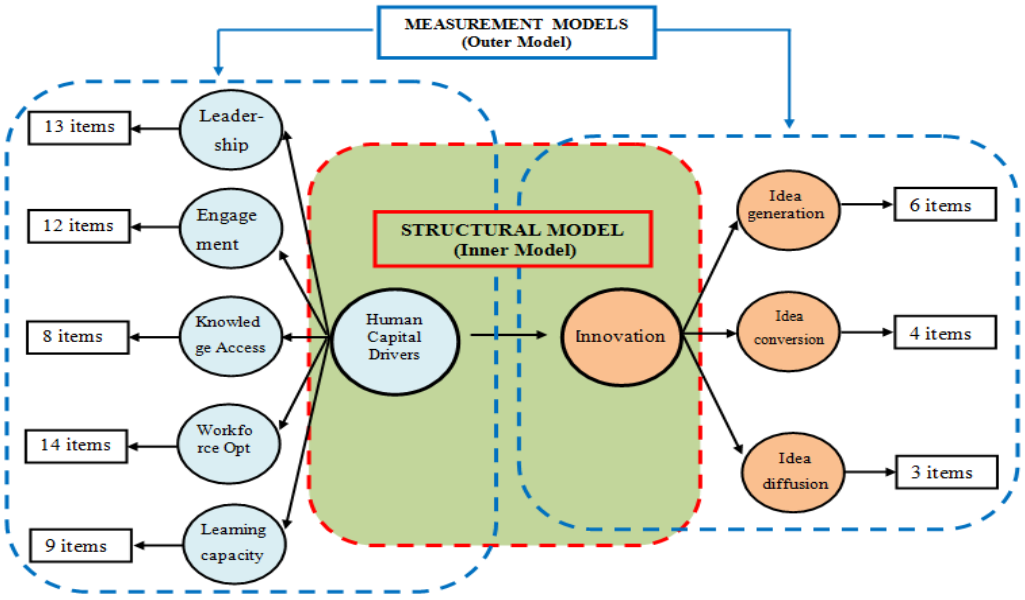


Figure 3Structural Model (Inner Model) and Measurement Model (Outer Model) Area

Figure 3 describes that Human Capital Drivers as exogenous latent variable while another's as endogenous latent variable. Because of the characteristic of model that has the larger number of endogenous variable than exogenous variable, so it could be classify as unfocused model (Hair, et al, 2011). In this research model, as we can see in Figure 3, the red dotted line points the area of inner model. So inner model that needed to be tested in this research is innovation variable influenced by Human Capital Drivers variable

Stage 2 – Specifying the measurement model

The measurement models include the unidirectional predictive relationships between each latent construct and its associated observed indicators (Hair et al, 2011). Measurement model also known as outer model in PLS. Figure 3. Shows that outer model pointed by blue dotted line in the model. Outer model describes the relation between variables and sub variables with each of its manifest variables (indicators). So models that needed to be tested in outer model are:

a. The latent variable of Human Capital Drivers measured by five latent variables, which are leadership practices, employee engagement, knowledge accessibility, workforce optimization, and learning capacity. Furthermore latent variable leadership will be measured by 13 items of its indicators, latent variable engagement will be measured by 12 items of its indicators, latent variable knowledge accessibility will be measured by 8 indicators, workforce optimization will be measured by 14 indicators, and latent variable learning capacity will be measured by 9 indicators.
b. The latent variable Innovation measured by three latent variables, which are idea generation, idea conversion and idea diffusion. Latent variable idea generation will be measured by 6 items of its indicators, latent variable idea conversion will be measured by 4 indicators, and latent variable idea diffusion will be measured by 3 indicators.

Stage 3 – data collection and examination

Data collection had been explained in section research methodology. Data that will be used and examined in this PLS is data primer which is get from questionnaire.

Stage 4 – PLS-SEM model estimation

PLS model of this research shown in Figure 3. The relationship between latent variables and indicators in this

model also categorized as reflective model that shown by direction of arrows which begin from the latent variable toward its indicators. A model categorized as reflective model is when functions of the variables and changes in the variables are reflected in changes in the items/indicators. (Hair et al, 2011)

Stage 5 – assessing PLS-SEM result for reflective measurement models

a. Indicator reliability

For indicator reliability the evaluation of measurement model has standardized indicator loading equal or larger than 0.70, but in exploratory study, loading of 0.40 are acceptable (Hullan ,1999 in Hair et al, 2011). According to this provision, indicators that has indicator loading less than 0.40 will be removed from the model. The model of the research already reliable after exclude 3 indicators which are EJD 3, WAC 1 and EJD 3. Table indicator loading score could be shown in Appendix.

Table 3.The Composite Reliability Score, AVE and R Square Scores

	Composite Reliability	AVE	R Square
HCD	0.975818	0.437152	
LEADERSHIP	0.952182	0.605514	0.680795
ENGAGEMENT	0.930627	0.574844	0.814302
KNOWLEDGE ACCESSIBILITY	0.906862	0.551537	0.747118
LEARNING CAPACITY	0.934878	0.616301	0.799141
WORKFORCE OPTIMIZATION	0.934920	0.530911	0.795864
INNOVATION	0.953026	0.612188	0.661427
IDEA CONVERSION	0.932639	0.776131	0.858013
IDEA DIFFUSION	0.906296	0.763528	0.828404
IDEA GENERATION	0.914360	0.643151	0.882394

b. Internal consistency reliability

In Internal consistency reliability, we refer to the score of composite reliability. According to Bagozzi and Yi (1988) in Hair, et al (2011), the score of composite reliability must be equal or larger than 0.70, but in exploratory research 0.60 is considered acceptable. Table 3 shows that composite reliability score of each latent variable is larger than 0.7 which means that construct classified as reliable.

c. Convergent validity

Convergent validity refers to the degree of agreement in two or more measures the same construct. Conducting convergent validity refer to value of average variance extracted (AVE). The construct classified as reliable when AVE is equal or higher than 0.50 (Bagozzi and Yi, 1988 in Hair, et al, 2011). But according to Ghozali (2008), even if not all of the AVE scores are higher than 0.50 both exogenous and endogenous constructs can be classified as reliable because all of the composite reliability scores are higher than 0.70. So, if referred to that provision, the construct of this research still classified as reliable.

d. Discriminant validity

To determine discriminate validity, we refer to cross loading. Each indicator should load highest on the construct it is intended to measure to determine a model has good discriminant validity (Chin,1998; Grégoire and Fisher, 2006; Hair, 2011). .All indicator in the research already load highest on the construct compare to the others, it means that correlation scores of the indicators with its construct are higher than the correlations scores of the indicators with the other constructs. Based on this condition could be concluded that the model has good discriminant validity.

Stage 6 – assessing PLS-SEM results for structural model

One of the criteria in assessing PLS-SEM results for structural model is R^2 and the acceptable R^2 level depends on research context which 0.02, 0.15, 0.35 for weak, moderate, strong effects (Hair, 2010). R^2 is useful to explain the ability of independent variables explain the dependent variable. The higher the R^2 value, the greater the ability of the independent variables can explain the dependent variable. Table 3 shows that the R square scores of each of the variables is larger than 0.35. It means that HCD as exogenous variable has strong effects and great ability ofexplainthe endogenous variables.

The inner model evaluation can also be defined as the analysis of the relationship between the construct. To determine the relationship as significant, we have to compare T-statistic with t table score. This research has confidence level of 95% and 175 cases, which has t table score for two tail test valued at 1.96. Calculation of T-statistic obtained by conduct bootstrap calculation in smart PLS 2.0 software. HCD to Innovation relationship has T-statistic score of 29.455 which is larger than 1.96. It means that t score is in the H0 rejection area, and acceptation of H1.

Stage 7 – Interpretation of Result and Drawing Conclusion

In structural model assessment, based on the R square scores, exogenous variable has strong effects to endogenous. The R square scores of Innovation is 0.6614 (classified as strong effects) which means HCD influence Innovation for 66.14% while the rest is influenced by another variables that is not measured in this research. With significant level of 0.05 or confident level of 95%, T-statistic score higher than t table which result the acceptation of H1 which states Human capital driver has significant positive relationship to innovation.

Path coefficient (original sample O score) of HCD to Innovation is 0.8133 which means that HCD has a positive correlation with Innovation. If the correlation coefficient is positive, then the two variables have a unidirectional relationship which means that if the value of variable HCD is high, then the value of the variable Innovation will be high also. The path coefficient score of 0.8133 or 81.33% means that the correlation is strong. Some classified the correlation score 0.75 – 0.99 as a very strong correlation. The correlation of HCD to its sub variables also classified as positive and very strong correlation, but the three strongest are Engagement (0.9024), Learning Capacity (0.8939) and Workforce Optimization (0.8921). This circumstances show a relationship where the higher Engagement, Learning Capacity, and Workforce Optimization the higher will be Human Capital Driver and finally the higher also Innovation level will achieved.

4. Business solution

According to the result of the assessment using questionnaire tool, identified that Human Capital Drivers that has the lowest score are engagement and leadership and learning capacity while PLS tool discovered that engagement is driver that has the highest correlation score to innovation, which means that engagement become the most critical driver that drives organization innovation. In this case, the solution must concern about how to drive employee engagement in PT DI because this driver is the most critical driver that significantly drives organizational innovation performance as well as those that also represent areas of relative weakness.

Improvement of employee engagement in PT DI must be conducted effectively and should be undertaken with minimum cost because of the limited fund. Mone et al. (2011) conducted a study titled "Performance Management at the Wheel: Driving Employee Engagement in Organizations" that describe performance management could drive employee engagement in organization. First activity of performance management activities is setting performance and development goals. Goal setting is a critical component of performance management so when managers or executives set the goal collaboratively with employee, employees could become more engaged (Mone and London, 2009). In PT DI Implementation could be adopted GE "Work Out" process applied by routinely conducted initial discussion with employee about project execution. Second activity is providing ongoing feedback and recognition. According Mone and London (2009), effective use of feedback is an important component of performance management that if conducted well could improve employee performance and finally will drive employee engagement. The implementation could applied by built appropriate KPI (Key Performance Indicator).To achieve the best fit KPI, PT DI then conduct benchmarking to TELKOM, PINDAD, also to ASTRA to create KPI formulation in accordance to the conditions of corporate.

The third activity is managing employee development. Development, in the context of performance management, is the accumulation and application of new knowledge and skills over time, including the capacity to view the world through a more-informed inclusive perspective (Mone and London 2009).The solution implementation in this phase is built and implement career plan and also conduct coaching and transfer file and document. the fourth activity is conducting mid-year and year-end appraisals. According to Mone and London (2009) being satisfied with the overall quality of appraisal discussion, especially year-end appraisal discussion could improve engagement. The fifth activity is building a climate of trust and empowerment with employees. Trust and empowerment are related because trusts form the basis of empowerment. According to Mone and London (2009), having manager who could be trusted by employee is a primary driver of engagement. Managers in PT DI must improve their communication skill, capability to persuade, and being the role model. After improve their skills and build employee's trust, managers then need to empower employee by delegate authority to employee to give their best, examine their work and make decisions.

Conclusion

Based on the results of research, the conclusion of research result could describe as follows,

i. Overall HCM implementation in PT DI still in "poor level", and driver that has the lowest score is Engagement, followed by Leadership Practice and Learning Capacity. It means that this area is PT DI weaknesses of implementing Human Capital Management, and PT DI must put serious attention in this three driver. Driver that has the highest score is Workforce Optimization which become although the score is not enough to achieve adequate level of HCM standard score.
ii. The result of HCM measurement then linked with company performance outcome, which is innovation using Partial Least Square. The linkage result that Engagement has the strongest correlation to Innovation with correlation score 0.9024, followed by Learning Capacity (0.8939) and Workforce Optimization (0.8921). HCM measurement and the linkage shows that Engagement is the most critical HCM factors that significantly drives organizational performance as well as those that also represent areas of relative weakness. Engagement is the area where the organization should concentrate its HCM development efforts.
iii. The solution to improve and enhance engagement is by conduct a proper performance management. There are several steps to conduct performance management through manager behaviour which are setting performance and development goals, providing ongoing feedback and recognition, managing employee development, conducting mid-year and year-end appraisals, and building a climate of trust and empowerment with employees

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