Satisfaction and Engagement Modeling of PT. Garuda Indonesia (Persero) Tbk Employee Using Second Order Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM)

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ABSTRACT

In order to analyze psychological relationship between employee and company, PT. Garuda Indonesia (Persero) Tbk conducts two types of survey: Satisfaction and Employee Engagement Survey. Both types of surveys have indicators that grouped into their respective latent variables. Normal multivariate assumption testing indicates that the data has followed a normal multivariate distribution. The First Order CFA results indicate that the indicators are valid, but there is one latent variable that is not reliable so cannot be used in modeling. In Second Order CFA we found fit model that can explain the relationship between latent variable with Satisfaction and Engagement, where the latent variable of Satisfaction and Engagement give a significant positive effect. The latent variables that have the highest influence on Employee Satisfaction are Career Management System (0.982), Performance Management System (0.976), and Reward System (0.970). While latent variables that provide the highest influence on Employee Engagement are Mission & Goals (0.996), Basic (0.994), and Compensation (0.972). In addition, relationship between Satisfaction and Engagement obtained a structural model, where Employee Satisfaction give a significant positive effect on Employee Engagement (0.474).

Keywords—Employee, Engagement, First Order, Satisfaction, Second Order CFA, SEM

I. INTRODUCTION

Every company needs a good employee management system to create a balance between the needs of employees with the demands given by the company to create high productivity as well as companies and employees mutually benefit each other. Therefore, the company must build a good psychological relationship with its employees. There are four levels of employees’ psychological relationships with the company, i.e., satisfied, motivated, committed, and engaged [1]. Making an engaged employee is a goal of the company because it gives a very positive impact for the development of the company.

PT. Garuda Indonesia (Persero) Tbk conducts two types of surveys aimed at identifying the psychological relationship between employees and companies. The two types of surveys are the Employee Satisfaction survey and Employee Engagement. Employee Satisfaction Survey has 13 indicators that are grouped into 6 dimensions, namely Organizational Support, Reward System, Challenging Work, Career
Management System, Performance Management System, and Working Conditions. While the Employee Engagement survey is used to determine the employee's engagement to the company. The Employee Engagement survey has 16 indicators that are grouped into 7 dimensions, namely basic, mission & goals, recognition, development, compensation, leadership, and teamwork [2].

This study conducted modeling the effect of employee satisfaction on employee engagement in PT. Garuda Indonesia (Persero) Tbk using Structural Equation Modeling (SEM) method. Structural Equation Modeling (SEM) is a statistical method used to combine several aspects of path analysis and Confirmatory Factor Analysis (CFA) to estimate some equations thoroughly or simultaneously [3]. SEM involves variables that can not be directly measured, requiring the indicator variable as a measurable variable. In this case, the variables that can not be measured are Employee Satisfaction and Employee Engagement.

One of the steps in SEM is Confirmatory Factor Analysis (CFA). CFA is a method used to test the measurement model that describes the relationship between latent variables with the indicator. In CFA, latent variables are considered as causal variables (independent variables) underlying indicator variables. CFA consists of two types, namely first order CFA and high order / second order CFA. A problem allows latent variables can not be directly measured through the indicator variables. The latent variable need another variable that can explain the latent variable. In this case the First Order Confirmatory Factor Analysis can not be used, so the higher order is used, i.e., the second order confirmatory factor analysis. This study uses Second Order CFA because the indicator variables on the employee satisfaction and engagement data can not be measured directly, thus requiring additional indicator variables.

II. LITERATURE REVIEW

A. Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) is a method that used to test a measurement model that illustrates the relationship between latent variables and their indicators [4]. In CFA, latent variables are considered as the underlying cause variable of the indicator variable. CFA is divided into two types, namely First Order CFA and Second Order CFA.

1. First Order Confirmatory Factor Analysis (CFA)

In the first order confirmatory factor analysis (CFA) a latent variable is measured based on several indicators that can be measured directly.

Figure 1. First Order CFA

CFA first order model can be written as the following equation.

\[ x_1 = \lambda_1 \xi + \delta_1 \]
\[ x_2 = \lambda_2 \xi + \delta_2 \]
\[ \vdots \]
\[ x_p = \lambda_p \xi + \delta_p \]

with,

- \( x_1, x_2, \ldots, x_p \) is an indicator of the common factor
- \( \lambda_1, \lambda_2, \ldots, \lambda_p \) is the loading factor of the model
- \( \delta_1, \delta_2, \ldots, \delta_p \) is the single factor (unique factor) for each error term equation [5].

CFAs can also be used to test the questions in questionnaires whether they are truly representative (valid) and completely accurate or consistent (reliable). Variables are valid if they have a loading factor > 0.5 and p-value <0.05. While to measure the reliability is done by using construct reliability calculated using the following formula:

\[ CR = \frac{\sum_{i=1}^{n} \hat{\lambda}_i^2}{\sum_{i=1}^{n} \hat{\lambda}_i^2 + \sum_{i=1}^{n} \hat{\delta}_i^2} \]

with \( \hat{\lambda}_i = loading\ factor \), dan \( \hat{\delta}_i = 1 - \hat{\lambda}_i \) is the indicator error variance, \( i = 1, 2, \ldots, n \). This measure is acceptable if the coefficient of construct reliability (CR) > 0.60 and indicates that the indicator on the model construct has been good [5].

2. Second Order Confirmatory Factor Analysis

The difference of first order CFA with second order CFA is that in second order CFA latent variable is not measured directly through the rating indicator, but through another latent variable.

Figure 2. Second Order CFA

The equation of the relationship between the first order confirmatory analysis and the high order confirmatory analysis is shown in the equation below [5].

\[ \eta = B\eta + \Gamma\xi + \zeta \]
\[ x = \mathbf{A} \xi + \boldsymbol{\varepsilon} \]

where,

- \( \mathbf{B} \) is the loading coefficient
- \( \mathbf{\Gamma} \) and \( \mathbf{A} \) is the loading factor of first and second order
- \( \xi \) is the random vector of latent variables
- \( \boldsymbol{\varepsilon} \) is the residual

**B. Structural Equation Modelling (SEM)**

Structural Equation Modelling (SEM) is a statistical method used to combine several aspects of path analysis and confirmatory factor analysis (CFA) to estimate some equation thoroughly or simultaneously. There are two approaches used in SEM, namely Covariance Based-Structural Equation Modelling (CB-SEM) and Variance Based-Structural Equation Modeling (VB-SEM). However, this research only uses CB-SEM approach.

CB-SEM is a covariance-based analysis and focuses on estimating a set of model parameters so that the covariant matrix constructed theoretically can be well implied by the system of structural equations obtained. In CB-SEM there are two models of measurement model and structural model. The measurement model serves to calculate the relationship between independent and dependent latent variables, while the structural model is used to calculate the relationship between the indicator variable with latent variable.

**C. SEM Parameter Estimation**

The most commonly used method for estimating parameters in SEM is Maximum Likelihood Estimation (MLE) [3]. Let \( N \) be the identical and dependent random sample \( Z \) of the variable random \( Z \) that is multinormal distributed with mean 0 and variance \( \Sigma \), then the probability density function \( f_z(z_1, z_2, ..., z_N; \theta) \) where \( \theta \) is a fixed parameter used to determine the probability of \( Z \) density:

\[
 f(z_1, z_2, ..., z_N; \theta) = f(z_1; \theta) \cdot f(z_2; \theta) \cdot ... \cdot f(z_N; \theta)
\]

The joint density is the multiplication of the marginal density of \( z_i \) because \( z_1, z_2, ..., z_N \) are independent. If observed values \( z_1, z_2, ..., z_N \) on a sample, then can write likelihood function as follows:

\[
 L(\theta; z_1, z_2, ..., z_N) = L(\theta; z_1) \cdot L(\theta; z_2) \cdot ... \cdot L(\theta; z_N)
\]

where \( L(\theta; z_i) \) is the value of \( f(z_i; \theta) \). That equation is a likelihood function commonly abbreviated as \( L(\theta) \). The probability density function becomes:

\[
 f(z_i; \Sigma) = \frac{1}{(2\pi)^{\frac{n}{2}}|\Sigma|^{\frac{1}{2}}} \exp \left[ -\frac{1}{2} z_i^T \Sigma^{-1} z_i \right]
\]

For a random sample of \( N \) independent observations of \( z \), the joint density is shown in the following equation,

\[
 f(z_1, z_2, ..., z_N; \Sigma) = f(z_1; \Sigma) \cdot f(z_2; \Sigma) \cdot ... \cdot f(z_N; \Sigma)
\]

with likelihood function as follows:

\[
 L(\theta) = \prod_{i=1}^{N} f(z_i, \Sigma)
\]

\[
 = \prod_{i=1}^{N} \frac{1}{(2\pi)^{\frac{n}{2}}|\Sigma|^{\frac{1}{2}}} \exp \left[ -\frac{1}{2} z_i^T \Sigma^{-1} z_i \right]
\]

\[
 = \frac{1}{(2\pi)^{\frac{Np}{2}}|\Sigma(\theta)|^{\frac{1}{2}}} \exp \left[ -\frac{1}{2} \sum_{i=1}^{N} z_i^T \Sigma(\theta)^{-1} z_i \right]
\]

So the likelihood function can be written as follows:

\[
 \log L(\theta) = \log \left( \frac{1}{(2\pi)^{\frac{Np}{2}}|\Sigma(\theta)|^{\frac{1}{2}}} \exp \left[ -\frac{1}{2} \sum_{i=1}^{N} z_i^T \Sigma(\theta)^{-1} z_i \right] \right)
\]

\[
 = -\frac{Np}{2} \log(2\pi) - \frac{N}{2} \log|\Sigma(\theta)| - \frac{1}{2} \sum_{i=1}^{N} z_i^T \Sigma(\theta)^{-1} z_i
\]

with,

\[
 -\frac{1}{2} \sum_{i=1}^{N} z_i^T \Sigma(\theta)^{-1} z_i = -\frac{1}{2} \sum_{i=1}^{N} tr[\Sigma(\theta)^{-1} z_i]
\]

then,

\[
 \log L(\theta) = -\frac{N}{2} \sum_{i=1}^{N} tr[\Sigma(\theta)^{-1} z_i]
\]

\[
 = -\frac{N}{2} tr[\mathbf{S} \Sigma(\theta)^{-1}]
\]

\( \mathbf{S} \) is a sample of the maximum likelihood matrix of sample covariant matrix, so \( \log L(\theta) \) can be written as the following equation:

\[
 \log L(\theta) = -\frac{Np}{2} \log(2\pi) - \frac{N}{2} \log|\Sigma(\theta)| - \frac{N}{2} tr[\mathbf{S} \Sigma(\theta)^{-1}]
\]

\[
 = c - \frac{N}{2} \left( \log|\Sigma(\theta)| + tr[\mathbf{S} \Sigma(\theta)^{-1}] \right)
\]

where,

\[
 c = -\frac{Np}{2} \log(2\pi)
\]

In the above equation, constant does not affect the selection of \( \hat{\theta} \), so it can be omitted to the following equation:
log \( L(\theta) = \log[\hat{\Sigma}(\theta)] + tr\left[ SS^{-1}(\theta) \right] \)

Maximizing likelihood function is equivalent to minimize
\( F_{ML} \) so that function is obtained [7]:

\[
F_{ML} = log \left| \hat{\Sigma}(\theta) \right| + tr\left( SS^{-1}(\theta) \right) - log |S| - p
\]

\( S \) is the sample variance and covariance matrix and \( \Sigma(\theta) \) is the variance and covariance matrix of the population parameter [3].

D. Normal Multivariate Assumption

To check whether a data follows a multivariate normal distribution or not, a multivariate normal distribution test is performed. Here is the hypothesis used:
\( H_0 : \) The data has a normal multivariate distribution
\( H_1 : \) The data does not have a normal multivariate distribution

The test statistic used is \( r_g \), by the formula:

\[
r_g = \frac{\sum_{j=1}^{n} (d_j^2 - \bar{d}^2)(q_j - \bar{q})}{\sqrt{\sum_{j=1}^{n} (d_j^2 - \bar{d}^2)^2} \sqrt{\sum_{j=1}^{n} (q_j - \bar{q})^2}}
\]

The critical area of this test is to reject \( H_0 \) at the level \( \alpha \) if \( r_g \leq r \) table obtained from Q-Q plot correlation coefficient [4].

E. Goodness of Fit

A good measure for model conformity tests and statistical tests is grouped into two ie:

- Absolute Fit Measure

Absolute fit measure is a way of measuring the overall fit model with several criteria as follows.

1. Chi-Square Statistic

The expected result is the smallest possible \( \chi^2 \) or \( p \)-value > \( \alpha \), where \( \alpha \) equal to 0.05.

\[
\chi^2 = (n - 1)F\left[S, \Sigma(\hat{\theta})\right]
\]

2. Goodness of Fit Index (GFI)

The GFI formula is as follows:

\[
GFI = 1 - \frac{F_x}{F_0}
\]

When GFI \( \geq 0.90 \) means a good fit, while, while 0.80 \( \leq \) GFI \( \leq 0.90 \) is called marginal fit.

3. Root Mean Square Error of Approximate (RMSEA)

One formative index in SEM is given the following RMSEA formula

\[
RMSEA = \sqrt{\frac{\hat{\delta}^2 - df}{N - 1}}
\]

The RMSEA value \( \leq 0.05 \) denotes close fit, whereas 0.05 \( \leq \) RMSEA \( \leq 0.08 \) indicates good fit.

- Increment Fit Measure

Increment Fit Measure is comparing the proposed model with the baseline model which is often referred to as the null model or independence model.

1. Adjusted Goodness of Fit (AGFI)

The recommended value is equal to or greater than 0.9.

\[
AGFI = 1 - \frac{\hat{d}_{b_S}}{\hat{d}_{b_m}} (1 - GFI)
\]

2. Tucker-Lewis Index / Non Formed Fit Index (TLI)

The TLI value ranges from 0 to 1, with TLI value \( \geq 0.90 \) indicates goodness if fit, whereas apabilaris 0.80 \( \leq \) TLI \( \leq 0.90 \) is often called marginal fit.

\[
TLI = \frac{(\hat{\delta}_S - \hat{\delta}_M)}{(\hat{\delta}_S - \hat{\delta}_M)} - 1
\]

3. Comparative Fit Index (CFI)

The CFI values also range from 0 to 1. For CFI values \( > 0.90 \) denotes goodness of fit, whereas 0.80 \( \leq \) CFI \( \leq 0.90 \) is often called marginal fit.

\[
CFI = 1 - \frac{(\hat{\delta}_S - \hat{\delta}_M)}{(\hat{\delta}_S - \hat{\delta}_M)}
\]

F. Employee Satisfaction and Employee Engagement

Employee satisfaction can be defined as the feelings and reactions of employees to their work environment [6]. Aspects that shape employee satisfaction are psychological aspects, physical aspects, social aspects, and financial aspects.

While employee engagement is a condition that illustrates the persistent and innovative commitment and effort of the employees to achieve organizational goals [2]. Employees who are tied to the company display the best quality work, creative in completing individual tasks as well as teams.

III. RESEARCH METHODOLOGY

A. Data Source

The data that used in this study is secondary data obtained from the database unit Human Capital PT. Garuda Indonesia (Persero) Tbk. The data analyzed is data from Employee Satisfaction and Employee Engagement survey results in September 2017.

B. Research Variable

The variables used in this study is a questionnaire given to employees. The questionnaire was answered using the likert scale, one for the choice of answer strongly disagree, two for the choice of answer disagree, three for the choice of answer agreed, and four for the choice of answer strongly agree.

<table>
<thead>
<tr>
<th>Table 1. Research Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EMPLOYEE SATISFACTION (ξ / X)</strong></td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>
C. Step Analysis

Step analysis in this study as follows:

1. Describe the respondent's data
2. Testing the assumption of normal multivariate distribution
3. Develop a theory-based model
4. Develop a path diagram
5. Convert the path diagram (a series of structural equations and model specifications) into the conversion of the path diagram, the structural model into the mathematical model
6. Selecting input matrix and estimation technique on built model that is input data in SEM can be correlation matrix or covariance matrix
7. Evaluate the model of testing the result parameters, simultaneous model test, structural model test, measurement model test, and model goodness test
8. Interpret and modify the model, if either model is interpreted and if not re-examination of the identification problem

IV. RESULTS

A. Data Characteristics

This research identifies the response of 122 employees who follow the Employee Satisfaction and Engagement Survey.

Table 1. Research Variable (Continuous)

<table>
<thead>
<tr>
<th>No</th>
<th>Dimension</th>
<th>Statement</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Working Condition</td>
<td>Work diversity</td>
<td>X5,3</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Information received that can support the work</td>
<td>X5,4</td>
</tr>
</tbody>
</table>

EMPLOYEE ENGAGEMENT ($\eta / Y$)

<table>
<thead>
<tr>
<th>No</th>
<th>Dimension</th>
<th>Statement</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic (Y1)</td>
<td>Use of the facilities provided effectively</td>
<td>Y1,1</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Balance between work and life that can enhance morale</td>
<td>Y1,2</td>
</tr>
<tr>
<td>15</td>
<td>Recognition</td>
<td>Engagement in decision making</td>
<td>Y7,1</td>
</tr>
<tr>
<td>16</td>
<td>(Y7)</td>
<td>Appreciation of ideas and suggestions for company development</td>
<td>Y7,2</td>
</tr>
</tbody>
</table>

Figure 3. Characteristic of Employee Satisfaction Response

The indicator that produces the most satisfied number of employees is found in indicator $X_{3.2}$ (satisfaction of the trust given by the company in carrying out challenging new tasks). While the indicator that produces the lowest satisfied employee number is found in indicator $X_{3.2}$ (satisfaction toward career development system applied by the company).

Figure 4. Characteristic of Employee Engagement Response

Indicators that produce the highest number of employees agree on the $Y_{6.2}$ indicator (giving incentives that match the performance achievement). While the indicators that produce the lowest number of employees agree on $Y_{4.1}$ indicator (the use of resources, time, budget effectively and efficiently).

Figure 5. Characteristics of Respondents by Generation

Figure 5 above is characteristic of respondents based on Generation / Year of birth. Most of the respondents were
employees of Generation X, followed by Generation Y / Millenial and Baby Boomers. While there are no respondents who are members of Generation Z and Alpha.

**B. Normal Multivariate Assumption Test**

Normal multivariate testing was performed using statistical correlation coefficient test Q-Q Plot.

**H₀**: The data has a normal multivariate distribution  
**H₁**: The data does not have a normal multivariate distribution

<table>
<thead>
<tr>
<th>Amount of Data</th>
<th>r₀</th>
<th>r_table</th>
</tr>
</thead>
<tbody>
<tr>
<td>122</td>
<td>0.992</td>
<td>0.989</td>
</tr>
</tbody>
</table>

Reject H₀ if r₀ < r_table or p-value > 0.05. Table 2 shows the results of a normal multivariate test which results in a r₀ (0.992) greater than r_table (0.989). So it can be concluded that the data have not met the normal multivariate assumptions.

**C. Confirmatory Factor Analysis (CFA)**

In this research will be conducted two types of CFA, the First Order CFA to test the validity and reliability of variables and Second Order CFA to confirm the factor forming variable Employee Satisfaction and Employee Engagement.

**1. First Order CFA**

An indicator is said to be valid if it yields a value of p-value < α (0.05). While a variable is said to be reliable if it yields value of Composite Reliability Composite Reliability (CR) ≥ 0.60.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator</th>
<th>p-value</th>
<th>CR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational Support (X₁)</td>
<td>X1.1</td>
<td>0.000</td>
<td>0.735</td>
</tr>
<tr>
<td></td>
<td>X1.2</td>
<td>0.000</td>
<td>0.830</td>
</tr>
<tr>
<td>Reward System (X₂)</td>
<td>X2.1</td>
<td>0.000</td>
<td>0.617</td>
</tr>
<tr>
<td></td>
<td>X2.2</td>
<td>0.000</td>
<td>0.889</td>
</tr>
<tr>
<td>Career Management System (X₃)</td>
<td>X3.1</td>
<td>0.000</td>
<td>0.734</td>
</tr>
<tr>
<td></td>
<td>X3.2</td>
<td>0.000</td>
<td>0.807</td>
</tr>
<tr>
<td></td>
<td>X4.1</td>
<td>0.000</td>
<td>0.840</td>
</tr>
<tr>
<td>Performance Management System (X₄)</td>
<td>X4.2</td>
<td>0.000</td>
<td>0.820</td>
</tr>
<tr>
<td></td>
<td>X4.3</td>
<td>0.000</td>
<td>0.865</td>
</tr>
<tr>
<td>Working Condition (X₅)</td>
<td>X5.1</td>
<td>0.002</td>
<td>0.452</td>
</tr>
<tr>
<td></td>
<td>X5.2</td>
<td>0.000</td>
<td>0.366</td>
</tr>
</tbody>
</table>

From Table 3 it can be seen that all indicator variables have been valid because it yields p-value < α (0.05). However reliability test results indicate that there is one latent variable that is not reliable, i.e. Leadership variable because it produces Composite Reliability value less than 0.60. So, Leadership variable can not be used in modeling.

**2. Second Order CFA**

CFA Second Order Modeling is done into two types of relationship patterns, namely Employee Satisfaction and Engagement.

<table>
<thead>
<tr>
<th>No</th>
<th>Goodness of Fit Index</th>
<th>Cut Off Value</th>
<th>Result</th>
<th>Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chi-Square</td>
<td>Expected Small</td>
<td>138,274</td>
<td>Not Fit</td>
</tr>
<tr>
<td>2</td>
<td>Significance Probability</td>
<td>≥ 0,05</td>
<td>0,000</td>
<td>Not Fit</td>
</tr>
<tr>
<td>3</td>
<td>GFI</td>
<td>≥ 0,90</td>
<td>0,844</td>
<td>Marginal Fit</td>
</tr>
<tr>
<td>4</td>
<td>RMSEA</td>
<td>≤ 0,08</td>
<td>0,104</td>
<td>Not Fit</td>
</tr>
<tr>
<td>5</td>
<td>AGFI</td>
<td>≥ 0.90</td>
<td>0.763</td>
<td>Not Fit</td>
</tr>
</tbody>
</table>
From Table 4 it can be seen that the resulting model has been feasible. This is because there is one criterion of Absolute Fit Measure which shows the model has fit that is GFI of 0.824 (marginal fit). In addition, there are two criteria of Increment Fit Measure showing the model has fit, i.e. CFI of 0.913 (good fit) and TLI of 0.844 (marginal fit). So the Employee Satisfaction model does not require modification and can be used for further analysis.

Table 5. Path Model Coefficient Testing of Employee Satisfaction

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>p-value</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\xi \rightarrow X_1$</td>
<td>0.892</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>$\xi \rightarrow X_2$</td>
<td>0.970</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>$\xi \rightarrow X_3$</td>
<td>0.982</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>$\xi \rightarrow X_4$</td>
<td>0.976</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>$\xi \rightarrow X_5$</td>
<td>0.860</td>
<td>0.000</td>
<td>Significant</td>
</tr>
</tbody>
</table>

*Significance Level (α) = 0.05

Based on the results of the path coefficient test in Table 5, with significance level (α) = 0.05, all the variables give a significant effect on Employee Satisfaction, because p-value is less than 0.05. Here is a measurement model that is formed. From the table above can also be seen that the largest contribution obtained by Career Management System (0.982), Performance Management System (0.976) and Reward System (0.970).

In Second Order CFA Employee Engagement model occurs Heywood Case phenomenon. Heywood Case occurs because the number of latent variable formers is too small to cause the model can not be identified and results in a loading factor > 1 and a standard error of negative value. This phenomenon occurs in latent variables Basic and Mission & Goals. One way to overcome Heywood Case is to determine the value of the variance error term which is positive and very small value. So in this research, the determination of the value of variance error of 0.005 in order to overcome the phenomenon of Heywood Case. The following is a feasibility test of the Employee Engagement model after overcoming Heywood Case.

Table 6. Feasibility Test of Structural Model of Employee Engagement

<table>
<thead>
<tr>
<th>No</th>
<th>Goodness of Fit Index</th>
<th>Cut Off Value</th>
<th>Result</th>
<th>Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chi-Square</td>
<td>Expected Small</td>
<td>174,722</td>
<td>Not Fit</td>
</tr>
</tbody>
</table>

From Table 6 can be seen that the resulting model has been fit. This is because there is one criterion of Absolute Fit Measure that shows the model has fit that is GFI of 0.818 (marginal fit). In addition, there are two criteria of Increment Fit Measure showing the model has fit, i.e CFI of 0.878 (marginal fit) and TLI of 0.847 (marginal fit). So the Engagement model does not require modification and can be used for further analysis.

Furthermore, the path coefficient is tested from the Employee Engagement model to know which variables have significant effect on the model. Table 7 below is the result of the path coefficient test in the Employee Engagement model.

Table 7. Path Model Coefficient Testing of Employee Engagement

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>p-value</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\eta \rightarrow Y_1$</td>
<td>0.994</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>$\eta \rightarrow Y_2$</td>
<td>0.996</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>$\eta \rightarrow Y_4$</td>
<td>0.887</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>$\eta \rightarrow Y_5$</td>
<td>0.940</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>$\eta \rightarrow Y_6$</td>
<td>0.972</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>$\eta \rightarrow Y_7$</td>
<td>0.752</td>
<td>0.000</td>
<td>Significant</td>
</tr>
</tbody>
</table>

*Significance Level (α) = 0.05

Based on the results of the path coefficient test in Table 7, with the significance level (α) = 0.05, all the variables give significant influence to Employee Engagement. This is because p-value is less than 0.05. From the table above also can be seen that the largest contribution obtained by the variables Mission & Goals (0.996), Basic (0.994), and Compensation (0.972).

D. Structural Equation Modelling

Modeling with Structural Equation Modeling (SEM) method is used to know the effect of Employee Satisfaction on Employee Engagement. This following figure is a model path diagram.
The following table is a feasibility test for the model of influence of Employee Satisfaction on Employee Engagement.

**Table 8. Feasibility Test of Structural Model Influence Employee Satisfaction on Employee Engagement**

<table>
<thead>
<tr>
<th>No</th>
<th>Goodness of Fit Index</th>
<th>Cut Off Value</th>
<th>Result</th>
<th>Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chi-Square</td>
<td>Expected Small</td>
<td>667,223</td>
<td>Not Fit</td>
</tr>
<tr>
<td>2</td>
<td>Significance Probability</td>
<td>≥ 0,05</td>
<td>0,000</td>
<td>Not Fit</td>
</tr>
<tr>
<td>3</td>
<td>GFI</td>
<td>≥ 0,90</td>
<td>0,710</td>
<td>Not Fit</td>
</tr>
<tr>
<td>4</td>
<td>RMSEA</td>
<td>≤ 0,08</td>
<td>0,104</td>
<td>Not Fit</td>
</tr>
<tr>
<td>5</td>
<td>AGFI</td>
<td>≥ 0,90</td>
<td>0,648</td>
<td>Not Fit</td>
</tr>
<tr>
<td>6</td>
<td>CFI</td>
<td>≥ 0,90</td>
<td>0,818</td>
<td>Marginal Fit</td>
</tr>
<tr>
<td>7</td>
<td>TLI</td>
<td>≥ 0,90</td>
<td>0,795</td>
<td>Not Fit</td>
</tr>
</tbody>
</table>

From Table 8 can be seen that the resulting model is not feasible. This is because there is no Absolute Fit Measure criterion that shows the model has fit. While from Increment Fit Measure there is only one criterion indicating that model has fit that is CFI equal to 0,819 (marginal fit). So it is necessary to modify the model on the Employee Engagement Path diagram.

From Table 9 can be seen the feasibility test results of modified model results. It appears that there is no Absolute Fit Measure criterion that shows the model has fit. However, there are two criteria of Increment Fit Measure that show that the model has fit i.e CFI of 0.826 (marginal fit) and TLI of 0.801 (marginal fit). So it can be concluded that the modified model is better than the initial model.

Furthermore, the path coefficient is tested from the influence model of Employee Satisfaction to Employee Engagement to know which variables have significant effect on the model.

**Table 10. Structural Structure Path Coefficient Testing**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>p-value</th>
<th>Info</th>
</tr>
</thead>
</table>

**Figure 6**. Model of Influence Employee Satisfaction on Employee Engagement

**Figure 7**. Model of Influence Employee Satisfaction on Employee Engagement (Modify)
\[ \xi \rightarrow \eta \quad 0.474 \quad 0.000 \] *Significance Level (\( \alpha \)) = 0.05

Based on the result of path coefficient test in Table 10, with significance level (\( \alpha \)) = 0.05, Satisfaction variable give significant influence to Employee Engagement. This is because p-value is less than 0.05. So get a model that can explain the influence of Employee Satisfaction with Employee Engagement, ie:

Employee Engagement (\( \eta \)) = 0.474 Employee Satisfaction (\( \xi \))

In other words, every increase of one unit of Employee Satisfaction will raise the value of Employee Engagement by 0.474.

V. CONCLUSION

A. Conclusion

Based on the results of the analysis and discussion, the following conclusions can be drawn:

1. First Order CFA indicates that all indicator variables are valid, but there is one latent variable that is not reliable, that is Leadership. In processing using Second Order CFA for model of Employee Satisfaction and Employee Engagement got fit model without modification. In addition, on processing using the CFA Second Order for the Employee Satisfaction and Engagement model shows that the Satisfaction and Conformity variable gives a significant influence. The latent variables that have the highest influence on Employee Satisfaction are Career Management System (0.982), Performance Management System (0.976), and Reward System (0.970). While latent variables that provide the highest influence on Employee Engagement are Mission & Goals (0.996), Basic (0.994), and Compensation (0.972).

2. Modeling influence of Employee Satisfaction to Employee Engagement using Structural Equation Modeling require modification to meet model feasibility measure. Models are formed namely:

   Engagement (\( \eta \)) = 0.474 Satisfaction (\( \xi \))

   It means that, every increase of one unit of Employee Satisfaction will raise the value of Employee Engagement 0.477. The results of the processing also shows that the variable of Employee Satisfaction gives significant influence to Employee Engagement.

B. Suggestion

Further research needs to be done by adding the new indicators to be expected be able to interpret the latent variables better and able to produce a reliable latent variable. It is intended that all the variables considered to affect the Employee Satisfaction and Engagement can be included into the modeling. In addition, the new indicators can minimize the possibility of the phenomenon of Heywood Case.

REFERENCES