Scenario Planning using System Dynamics for Reducing Uncertainty on Managing Employee Turnover

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Presentation Outline

• Background
• Literature Review
• Turnover System Dynamic Model
• Scenario Building
• Discussion & Conclusion
Turnover is a serious problem for firms

**Background**

Turnover is still a problem faced by many firms and with higher complexity to manage *(Riaz, 2013)*

- **Needs to retain best talents**
  Many reports encourage firms to retain best talents in order to stay competitive. Many named this era as the war for talent *(Rix, 2012)*

- **Causes lower work productivity**
  Voluntary turnover leads to the loss of talents and consequently causing the significant decrement in work productivity *(Collision, 2005)*

- **Leads to more expense**
  Cost to replace each employees who left can amount up to 60% of the total and with the indirect cost, can amount up to 200% of the total annual salary *(Cascio, 2006)*

Firms in Indonesia are also facing the same problem

- **70%** firms at least face the challenge of talent shortage
- **83%** firms face talent retention issues
- **80%** firms face the issue of talent attraction *(Source: Deloitte Consulting, 2013)*

It is predicted that if the trend continues, by 2020 firms in Indonesia will have talent shortage of
- 6% in the senior management level
- 56% in the middle management level
- 17% in the entry management level *(Source: BPS, 2013; BCG Report, 2013)*
Firms need to formulate strategy for the long run to overcome the turnover issue

Background

Previous research had identified the factors that drives turnover which were considered for generating strategy

- Organizational commitment & Job Satisfaction (Rhodes, Eisenberger, & Armeli, 2013; Whitener, 2001)
- Remuneration (Tosi, Werner, Katz, & Gomez-Mejia, 1998; Miller, Hom & Gomez-Mejia, 2001; Blakemore, 1987)
- Individual, environment, and organizational structural (Prince, 2001)

The key factors were considered as the basis for generating the strategy of the solutions

The strategy should consider its impact over the long term

- The assumptions used on previous research changes along the time.
- This results in uncertainties of the strategy implementation impact
- The rise of uncertainty pushes firms to a higher risk, especially when the implemented strategy is ineffective
- Therefore, further research is needed to consider the changes of the assumptions

This research attempted to answer the challenge of organizations by constructing a system dynamic model that can simulate strategy to manage turnover and learn the impact over the long term while considering the possibility of changes in assumptions
This research aims to develop scenarios and evaluate the implication of the strategy

Literature Review

A system dynamic model is used to simulate the scenarios

- System dynamics could be a powerful approach for developing a dynamic model, it gives a better understanding on why turnover behavior occurred (Lee & Mitchell, 1999).

- System dynamic model gives advantage not only in describing the structure of a system and the resulting behavior, but also evaluating some scenarios that may occur (plausible) in the future

- Scenario itself is described as some alternatives of events that could happen in the future (Chermark et al, 2001)

- Scenario is used to minimize uncertainty in the future (Wack, 1985; Morecraft & Van der Heidjen, 1992; Schoemaker, 1995; Morecroft, 2007)

- This research will use the scenario planning approach (Schwartz, 1996; Van der Heidjen, 2005)
This research utilizes the system dynamics model of turnover problem

System dynamic model of turnover problem

- The model was developed in 2014 with the case study of a professional firm in Jakarta, Indonesia
- The model predicted the number of employee leaving in a period of time, using a logistic regression equation & simulated for 10 years
- The model was used to test four alternatives strategy:
  1. Training & Development Strategy: increasing Training & Development session
  2. Engagement Strategy: encouraging knowledge sharing & performance based incentive
  3. Compensation Strategy: Increasing basic salary & apply performance based incentive
  4. Recruitment Strategy: Introducing job preview and cultural fit assessment
- The model also considered financial variable, hence generated the most effective strategy with the best return on investment through normalized value
‘Training & Development’ strategy was the best recommendation

Previous model results

While ‘Compensation Strategy’ resulted in the lowest turnover rate...

...‘Training & development’ had the best ROI value

<table>
<thead>
<tr>
<th>Strategy Option</th>
<th>%ROI / year (Estimation)</th>
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</thead>
<tbody>
<tr>
<td>Training &amp; Development</td>
<td>74%</td>
</tr>
<tr>
<td>Engagement Strategy</td>
<td>38%</td>
</tr>
<tr>
<td>Compensation Strategy</td>
<td>-132%</td>
</tr>
<tr>
<td>Recruitment Strategy</td>
<td>-65%</td>
</tr>
</tbody>
</table>

‘Compensation Strategy’ gave the result of the lowest turnover rate
Scenario planning for reducing uncertainty

Scenario Building

The design of scenarios follows the eight step processed proposed by Schwartz (1996)

1. Identify the main interest of the actors
2. Identify affecting key variables
3. Identify driving force that encourages changes in key variables
4. Place weighting of importance level an uncertainty
5. Form and choose the logic of the scenario (the matrix structure)
6. Make the narrative of the selected scenario
7. Check the implications of the decision under the scenario that has been selected
8. Choose and set a leading signpost to each scenario
There are four scenarios generated

Scenario Building

- **Scenario #1 Sustained Competitive**
  - Strong growth of competitor and abundant talent

- **Scenario #2 Excessive Supply**
  - Weak growth of competitor but talent is surplus

- **Scenario #3 Battle for Talents**
  - Strong growth of competitor but scarce talent

- **Scenario #4 Downshifting Economy**
  - Weak growth of competitor and scarce talent

2 key variables identified
Additional driving forces are added to the original model

Model testing on different scenario

New variables added to the model

- Quality of education
- Economic growth

Revised causal loop diagram (with scenarios)
The model was tested under different scenarios
Model Results Scenario 1 & 2

### Scenario #1
**Sustained Competitive**

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Average on Reducing Turnover Rate per Year</td>
<td>0.6 (Value : 10%)</td>
<td>0 (Value : 7.03%)</td>
<td>0.58 (Value : 9.94%)</td>
<td>1 (Value : 11.91%)</td>
</tr>
<tr>
<td>Average ROI per Year</td>
<td>0.49 (Value : 140%)</td>
<td>1 (Value : 222%)</td>
<td>0 (Value : -59.17%)</td>
<td>0.7 (Value : 173.74%)</td>
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<tr>
<td>Total Score</td>
<td>1.09</td>
<td>1</td>
<td>0.58</td>
<td>1.7</td>
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<td>Rank Order</td>
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<td>3</td>
<td>4</td>
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### Scenario #2
**Excessive Supply**

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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Average on Reducing Turnover Rate per Year</td>
<td>1 (Value : 9%)</td>
<td>0 (Value : 1.6%)</td>
<td>0.19 (Value : 3.07%)</td>
<td>0.19 (Value : 3.07%)</td>
</tr>
<tr>
<td>Average ROI per Year</td>
<td>1 (Value : 163%)</td>
<td>0.86 (Value : 129%)</td>
<td>0.18 (Value : -90%)</td>
<td>0.18 (Value : -44.24%)</td>
</tr>
<tr>
<td>Total Score</td>
<td>2</td>
<td>0.86</td>
<td>0.66</td>
<td>0.37</td>
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<td>Rank Order</td>
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Most recommended strategy
The model was tested under different scenarios
Model Results Scenario 3 & 4

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<tbody>
<tr>
<td><strong>Battle for Talents</strong></td>
<td></td>
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</tr>
<tr>
<td>Average on Reducing Turnover</td>
<td>0.78 (Value: 6%)</td>
<td>0</td>
<td>1</td>
<td>0.36 (Value: 3.4%)</td>
</tr>
<tr>
<td>Rate per Year</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Average ROI per Year</td>
<td>1 (Value: 74%)</td>
<td>0.82 (Value: 38%)</td>
<td>0</td>
<td>0.32 (Value: -65%)</td>
</tr>
<tr>
<td>Total Score</td>
<td>1.78</td>
<td>0.82</td>
<td>1</td>
<td>0.68</td>
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<tr>
<td>Rank Order</td>
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<td>2</td>
<td>4</td>
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<tbody>
<tr>
<td><strong>Downshifting Economy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average on Reducing Turnover</td>
<td>0.55 (Value: 4.46%)</td>
<td>0</td>
<td>1</td>
<td>0.32 (Value: 3.19%)</td>
</tr>
<tr>
<td>Rate per Year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average ROI per Year</td>
<td>0.94 (Value: 22.81%)</td>
<td>1</td>
<td>0</td>
<td>0.37 (Value: -69%)</td>
</tr>
<tr>
<td>Total Score</td>
<td>1.49</td>
<td>1</td>
<td>1</td>
<td>0.69</td>
</tr>
<tr>
<td>Rank Order</td>
<td>1</td>
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<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Scenario #3
Battle for Talents

Scenario #4
Downshifting economy

Most recommended strategy
The most frequent recommended strategy leaned towards ‘Training & Development’

Model Results Summary

<table>
<thead>
<tr>
<th>Strategy Option</th>
<th>Sustained Competitive</th>
<th>Excessive Supply</th>
<th>Battle for Talents</th>
<th>Downshifting Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training &amp; Development</td>
<td><em>Most frequent recommended strategy</em></td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Engagement</td>
<td></td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Compensation</td>
<td></td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Recruitment</td>
<td></td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

One last important step in scenario planning is to determine in which direction is the real world currently heading to. This is called the leading signpost.
Symptoms of the real world is currently leaning towards ‘sustained competitive’

Leading Signpost

1. Indonesia’s positive and re-strengthen economic growth.
   In the first quarter 2016, Indonesia’s economic growth is 4.91% and in the second quarter of 2016 increased to 5.18%. \textit{Source: Bank Indonesia, 2016}

2. Infrastructure development intensified
   Supported by 2015 government economic package. The establishment of \textit{Komisi Percepatan Penyedian Infrastruktur Prioritas} (KPIPP) has accelerated the national strategic project.

3. Government are trying to improve the quality of education
   Government are more concern to improve the quality of education in Indonesia. In fact, in 2016, broke the budget allocation record for education.

4. Decreasing rate of unemployment
   Open employment in 2015 was 5.81% from total population and decreased to 5.5% in 2016. \textit{Source: BPS, 2016}

The most suitable strategy for this scenario is the ‘recruitment strategy’
### Discussion

**Understanding each strategy alternatives’ trade offs**

#### Discussion Points

<table>
<thead>
<tr>
<th>Insight</th>
<th>Discussion Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In the initial system dynamics model, the best strategy was ‘Training &amp; Development’.</td>
<td>This solution would be highly relevant to be applied if in the next few years there are no significant changes in assumptions.</td>
</tr>
<tr>
<td>2. Under four different scenarios, ‘Training &amp; Development’ is the best strategy for 3 different scenarios.</td>
<td>The results of these three scenarios showed the same pattern, so that firms can better determine which strategy is most suitable to be implemented and prepare for changes in the assumptions of the future.</td>
</tr>
<tr>
<td>3. Firms need to be careful of one particular scenario that showed different results, which is ‘sustained competitive’.</td>
<td>As the signpost shows symptoms of the real world leaning towards this scenario. The recommended strategy for this scenario is ‘recruitment strategy’</td>
</tr>
<tr>
<td>4. Decision maker who does not want to take a big risk are advised to choose ‘training and development’ strategy.</td>
<td>If changes in assumption were inaccurate, recruitment strategy would cause a bigger loss to the organization.</td>
</tr>
</tbody>
</table>
Scenario planning helps to evaluate strategy alternatives under different future conditions

Conclusion

• This research aims to help organizations in preparing to face the challenges in the future through scenario planning.

• Formulating the right scenario could provide insight to decision makers that when a simulation model is run with different assumptions, it will also generate different output recommendations.

• The effectiveness of the strategy applied does not only depend on the understanding of the problem structure, but also taking into account the basis of assumptions used and how it may change in the future.
Shortcomings in this study

Suggestions

• Solutions and recommendations presented may only be suitable for companies that we have studied.
• The strategy that we have tested was just a single-strategy testing. There are many firms that use more than one strategy simultaneously to control turnover.

Hopefully, this shortcomings can be accommodated in future research.
Thank you for your attention!
Any questions, comments, or suggestions are welcome
Reference

• De Haan, A, & De Heer, P. (2012). *Solving Complex Problem. Eleven International Publishing*
Reference

Reference

• VDM Verlag Dr. Mueller e.K.
Appendix
MODEL
CONCEPTUALIZATION

- Financial Performance Loop
- Qualified Employees Loop
- Development Support Loop
- Pay Satisfaction Loop
- Work Pressure Loop

**Equations:**

1. **Financial Performance Loop:**
   - $R1 = \text{Financial Performance}
   - $\text{Level of employees' skills} \rightarrow \text{Desired Number of Employee}
   - $\text{Project Performance} \rightarrow \text{Project Growth}

2. **Qualified Employees Loop:**
   - $B1 = \text{Qualified Employees}
   - $\text{Gap} \rightarrow \text{High Qualified Employees Leaving}
   - $\text{Number of Recruitments} \rightarrow \text{High Salary Incentive}

3. **Development Support Loop:**
   - $B2 = \text{Perceived Development Support}
   - $\text{Training per Capita} \rightarrow \text{Job Satisfaction}
   - $\text{High Salary Incentive} \rightarrow \text{Work Pressure}

4. **Pay Satisfaction Loop:**
   - $B3 = \text{Pay Satisfaction}
   - $\text{High Salary Incentive} \rightarrow \text{Work Pressure}
   - $\text{Job Satisfaction} \rightarrow \text{Work Pressure}

**Note:**
- All arrows indicate the direction of influence.
Based on objective from problem owner, there are 2 important criteria as output basis for model:

- Percentage of annual employees that leaving organization (%)
- Financial Performance for each strategy that implemented (% ROI)
There are 4 strategy alternatives we tested on the model:

**A1: Recruitment Strategy**
Introducing job preview and cultural fit assessment in recruitment

**A2: Training & Development**
Increasing training & development session

**A3: Compensation Strategy**
Increasing basic salary & apply performance based incentive

**A4: Engagement Strategy**
Encouraging knowledge sharing & performance coaching
New variables added to the model

MODEL DEVELOPMENT
Stock and Flow Diagram with added variables