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Modelling the executive compensation design model using a generalized net

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Abstract: In the paper is constructed a generalized net model of the process of constructing executive compensation design model that can be used to analyze and simulate the process.
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1 Introduction

The present paper is a continuation of previous investigations into the modelling of the typical banking activities [3, 4] using the theory of Generalized Nets (GNs, see [1, 2]). In this paper is constructed a GN model of the executive compensation design model.

This primary goal for structuring and codifying the executive compensation design process is to:

1. Optimize executive compensation to maximize value to company (fit its goals) and to executive (to be able to attract and retain best people).
2. Dynamically calculate the cost of executive compensation to the company and benefits to executive to respond to changing environment.
3. Provide tool for compensation committee/CEO/HR department to evaluate alternatives and conditions of the executive pay package and their impact on the company in positive and to model negative scenarios.

2 Generalized net model of constructing an executive compensation design model

The GN-model (Fig. 1) consists of nine transitions that represent respectively:

- the process of Description of current compensation model (transitions Z_1 and Z_2),
- the analysis of a Benchmarks and constraints (transitions Z_3 and Z_4),
- the Design phase (transition transitions Z_5, Z_6 and Z_7),
- the process of Finalization (transition Z_8),
- the process of Assessment (transition Z_9).

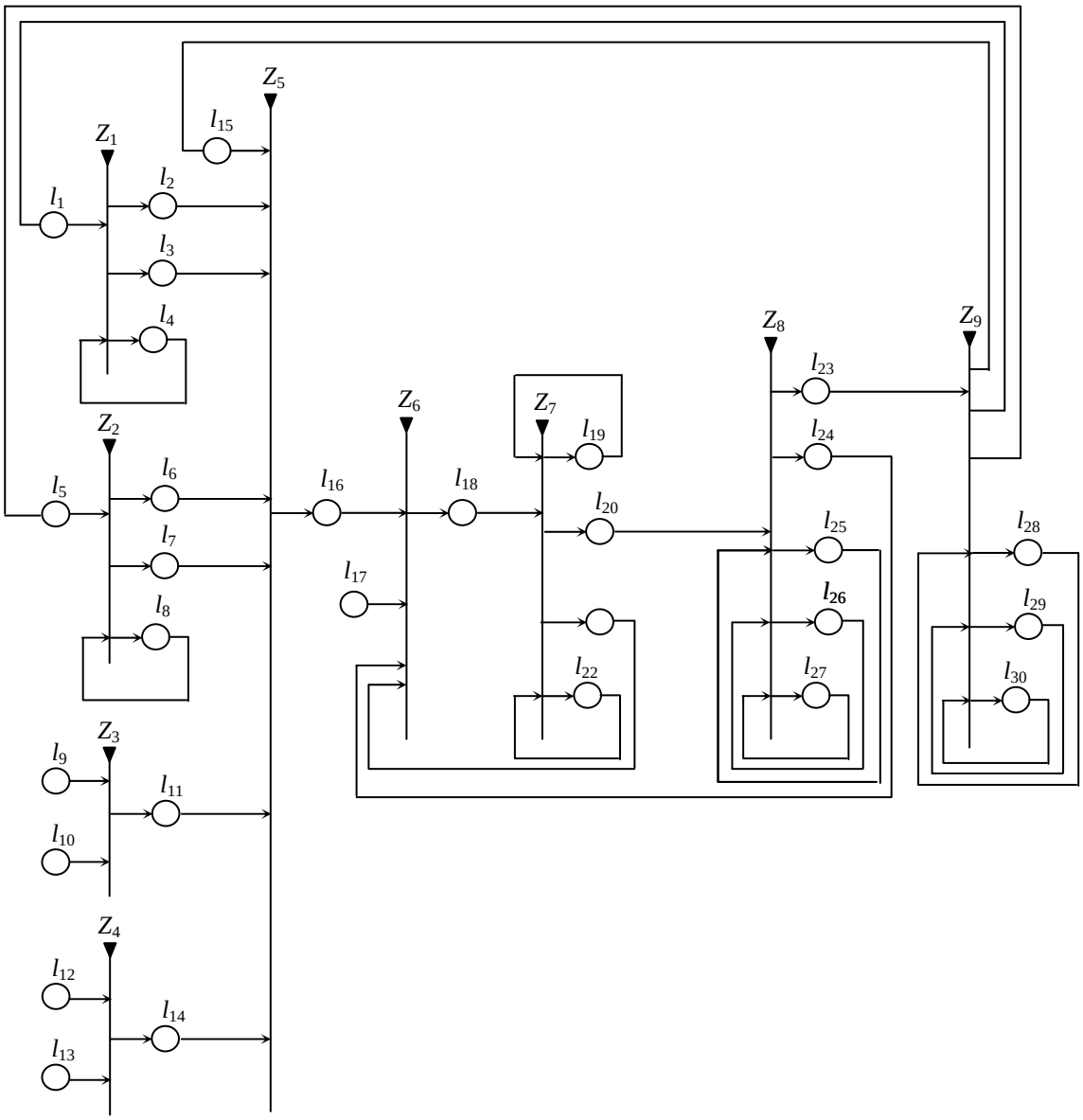

Figure 1. GN-model of the constructing executive compensation design model

Initially, the tokens α and β stay in places l_4 and l_7. They will be in their own places during the whole time during which the GN functions. All tokens that enter transitions Z_1 and Z_2 will unite with the corresponding original token (α and β respectively). While α and β tokens may split into two or more tokens, the original token will remain in its own place the whole time. The original tokens have the following initial and current characteristics:

- token α in place l_4: x_{cu}^{α} = "Currents salary levels and benefits, List of benefits available and costs, ST rewards – bonuses (target-related, results-related, discretionary), LT rewards – bonus, target related, company value related, discretionary",
- token β in place l_7: x_{cu}^{β} = "Benchmarks: Internal benchmarks, Industry benchmarks, Position specific benchmarks; Company size/compensation budget".

Transition Z_1 has the form:

$$Z_1 = \langle \{l_1, l_4\}, \{l_2, l_3, l_4\}, r_1, \vee(l_1, l_4) \rangle,$$

where

$$r_1 = \begin{array}{c|ccc} & l_2 & l_3 & l_4 \\ \hline l_1 & false & false & true \\ l_4 & W_{4,2} & W_{4,3} & W_{4,4} \end{array},$$

where

- $W_{4,2}$ = "Tables with pay levels and pay grades, rewards and benefits are prepared",
- $W_{4,3}$ = "Sets of rules for calculation of benefits and eligibility are prepared",
- $W_{4,4} = \neg W_{4,2} \,\&\, \neg W_{4,3}$.

The α_0-token that enter place l_4 (from place l_1) do not obtain new characteristic. It unites with the α-token in place l_4 with the above mentioned characteristic.

The α token can split to tree tokens. As we mentioned above, the original α token continues to stay in place l_4. The other tokens (α_1 and α_2) enter places l_2 and l_3 and obtain the following characteristics.

- Token α_1 enters place l_2 with characteristic x_1^{α} = "Tables with pay levels and pay grades, rewards and benefits";
- Token α_2 enters place l_3 with characteristic x_2^{α} = "Sets of rules for calculation of benefits and eligibility".

Transition Z_2 has the form:

$$Z_2 = \langle \{l_5, l_8\}, \{l_6, l_7, l_8\}, r_2, \vee(l_5, l_8) \rangle,$$

where

$$r_2 = \begin{array}{c|ccc} & l_6 & l_7 & l_8 \\ \hline l_5 & false & false & true \\ l_8 & W_{8,6} & W_{8,7} & W_{8,8} \end{array},$$

where

- $W_{8,6}$ = "Sets of ranges, medians, distributions are determined",
- $W_{8,7}$ = "Levels and rules for maximum/ minimum constraints are determined",
- $W_{8,8} = \neg W_{8,6} \,\&\, \neg W_{8,7}$.

The β_0-token that enter place l_8 (from place l_5) do not obtain new characteristic. It unites with the β-token in place l_8 with the above mentioned characteristic.

The β token can split to tree tokens. As we mentioned above, the original β token continues to stay in place l_8, while the other tokens (β_1 and β_2) enter places l_6 and l_7 and obtain the following characteristics.

- Token β_1 enters place l_6 with characteristic x_1^{β} = "Sets of ranges, medians, distributions";
- Token α_2 enters place l_3 with characteristic x_2^{β} = "Levels and rules for maximum/ minimum constraints".

The γ_1 and γ_2-tokens enter the GN net via places l_9 and l_{10} with characteristic respectively:

- Token γ_1 in place l_9: x_1^{γ} = "Employee expectations";
- Token γ_2 in place l_{10}: x_2^{γ} = "Employee performance – past, expected future".

Transition Z_3 has the form:

$$Z_3 = \langle \{l_9, l_{10}\}, \{l_{11}\}, r_3, \wedge(l_9, l_{10}) \rangle,$$

where

$$r_3 = \begin{array}{c|c} & l_{11} \\ \hline l_9 & W_{9,11} \\ l_{10} & W_{10,11} \end{array}.$$

where $W_{9,11}$ = $W_{10,11}$ = "The identification of strengths and weaknesses of existing compensation model is performed".

The γ_1 and γ_2-tokens unites with token γ in place l_{11} with characteristic x^{γ} = "Lists of conditions, rules for testing in new model".

The δ_1 and δ_2-tokens enter the GN net via places l_{12} and l_{13} with characteristic respectively:

- Token δ_1 in place l_{12}: x_1^{δ} = "Tax treatment of pay and benefits";
- Token δ_2 in place l_{13}: x_2^{δ} = "Legal/regulatory requirements".

Transition Z_4 has the form:

$$Z_4 = \langle \{l_{12}, l_{13}\}, \{l_{14}\}, r_4, \wedge(l_{12}, l_{13}) \rangle,$$

where

$$r_4 = \begin{array}{c|c} & l_{14} \\ \hline l_{12} & W_{12,14} \\ l_{13} & W_{13,14} \end{array}.$$

where $W_{12,14}$ = $W_{13,14}$ = "The external constraints are given".

The δ_1 and δ_2-tokens unite with token δ in place l_{14} with characteristic x^{δ} = "Sets of rules, constraints".

Transition Z_5 has the form:

$$Z_5 = \langle \{l_2, l_3, l_6, l_7, l_{11}, l_{14}, l_{15}\}, \{l_{16}\}, r_5, \wedge(l_2, l_3, l_6, l_7, l_{11}, l_{14}, l_{15}) \rangle,$$

where

$$r_5 = \begin{array}{c|c} & l_{16} \\ \hline l_2 & true \\ l_3 & true \\ l_6 & true \\ l_7 & true \\ l_{11} & true \\ l_{14} & true \\ l_{15} & true \end{array}.$$

In place l_{15} there is one ζ_0-token with characteristic x_0^{ζ} = “Compensation model template”.

Tokens α_1 and α_2 (from places l_2 and l_3), β_1 and β_2 (from places l_6 and l_7), γ (from place l_{11}), δ (form place l_{14}) and ζ_0 (form place l_{15}) merge in a ζ-token that enter place l_{16} with characteristic x^{ζ} = “Compensation model blueprint”.

Transition Z_6 has the form:

$$Z_6 = \langle \{l_{16}, l_{17}, l_{21}, l_{24}\}, \{l_{18}\}, r_6, \vee(\wedge(l_{16}, l_{17}), \wedge(l_{16}, l_{21}), \wedge(l_{16}, l_{24}) \rangle,$$

where

$$r_5 = \begin{array}{c|c} & l_{18} \\ \hline l_{16} & true \\ l_{17} & true \\ l_{21} & true \\ l_{24} & true \end{array}.$$

From place l_{17} η-token enters the net with characteristic x^{η} = “Preferences and trade-offs”.

The θ-token that enters place l_{18} obtain characteristic x^{θ} = “Compensation model proposal”.

Transition Z_7 has the form:

$$Z_7 = \langle \{l_{18}, l_{19}, l_{22}\}, \{l_{19}, l_{20}, l_{21}, l_{22}\}, r_7, \vee(l_{18}, l_{19}, l_{22}) \rangle,$$

where

$$r_7 = \begin{array}{c|cccc} & l_{19} & l_{20} & l_{21} & l_{22} \\ \hline l_{18} & true & false & false & true \\ l_{19} & W_{19,19} & W_{19,20} & W_{19,21} & false \\ l_{22} & false & W_{22,20} & W_{22,21} & W_{22,22} \end{array},$$

where

- $W_{19,19}$ = “The new system is testing vs. today’s system (total comp budget, changes per employee)”,
- $W_{19,20}$ = “The result from testing the new system vs. today’s system is positive”,
- $W_{19,21}$ = “The result from testing the new system vs. today’s system is negative”,
- $W_{22,20}$ = “The result from testing the new system vs. Next year/future’s is positive”,
- $W_{22,21}$ = “The result from testing the new system vs. Next year/future’s is negative”,
- $W_{22,22}$ = “The new system is testing vs. Next year/future’s (e.g., impact of pay progression, indexation)”.

The θ_1 and θ_2 tokens that enter places l_{19} and l_{22} obtain characteristic respectively: x_1^{θ} = “Test new system vs. Today’s” in place l_{19}, and x_2^{θ} = “Test new system vs. Test new system vs. Next year/future’s” in place l_{22}.

The θ-token that enters place l_{21} (form places l_{19} or l_{22}) do not obtain new characteristic.

When the truth values of the predicates $W_{19,20}$ and $W_{22,20}$, the υ-token enters place l_{20} with characteristic x^{υ} = “New compensation model”.

Transition Z_8 has the form:

$$Z_8 = \langle \{l_{20}, l_{25}, l_{26}, l_{27}\}, \{l_{23}, l_{24}, l_{25}, l_{26}, l_{27}\}, r_8, \vee(l_{20}, l_{25}, l_{26}, l_{27})\rangle,$$

where

$$r_8 = \begin{array}{c|ccccc} & l_{23} & l_{24} & l_{25} & l_{26} & l_{27} \\ \hline l_{20} & false & false & true & false & false \\ l_{25} & false & false & false & true & true \\ l_{26} & W_{26,23} & W_{26,24} & false & W_{26,26} & false \\ l_{27} & W_{27,23} & W_{27,24} & false & false & W_{27,27} \end{array},$$

where

- $W_{26,23}$ = “The alternatives are modelled”,
- $W_{26,24} = W_{27,24}$ = “New compensation model have to be corrected”,
- $W_{26,26} = \neg W_{26,23}$,
- $W_{27,23}$ = “The stress testing of the new compensation model is ready”,
- $W_{27,27} = \neg W_{27,23}$.

The υ_1, υ_2 and υ_3 tokens that enter places l_{25}, l_{26} and l_{27} obtain characteristic respectively: x_1^{υ} = “New compensation model, modelled alternatives” in place l_{25}, x_2^{υ} = “New compensation model, evaluated impact on executive compensation of unlikely but probable developments” in place l_{26}, and x_3^{υ} = “New compensation model, written summary of compensation rules and levels as well as description of targets to be achieved” in place l_{27}.

The υ-token that enters place l_{24} (form places l_{26} or l_{27}) do not obtain new characteristic.

When the truth values of the predicates $W_{26,23}$ and $W_{27,23}$ the κ-token enters place l_{23} with characteristic x^{κ} = “New compensation model for implementation”.

Transition Z_9 has the form:

$$Z_9 = \langle \{l_{23}, l_{28}, l_{29}, l_{30}\}, \{l_1, l_5, l_{15}, l_{28}, l_{29}, l_{30}\}, r_9, \vee(l_{23}, l_{28}, \wedge(l_{29}, l_{30}))\rangle,$$

where

$$r_9 = \begin{array}{c|cccccc} & l_1 & l_5 & l_{15} & l_{28} & l_{29} & l_{30} \\ \hline l_{23} & false & false & false & true & false & false \\ l_{28} & false & false & false & true & true & true \\ l_{29} & true & true & true & false & false & false \\ l_{30} & true & true & true & false & false & false \end{array}.$$

The κ_1, κ_2 and κ_3 tokens that enter places l_{28}, l_{29} and l_{30} obtain characteristic respectively: x_1^{κ} = “Application of the new compensation model for implementation” in place l_{28}, x_2^{κ} = “New compensation model for implementation, assess results against targets” in place l_{29}, and

x_3^{κ} = "New compensation model for implementation, identification of weaknesses, areas of misuse" in place l_{30}.

The α_0 and β_0 tokens that enter places l_1 and l_5 obtain characteristic: $x_0^{\alpha} = x_0^{\beta}$ = "Current compensation model".

The ε token that enters place l_{15} obtain characteristic: x^{ε} = "Compensation model template".

3 Conclusion

In this paper, we present an approach to structuring the design of executive compensation in order to be able to apply to it the GN model.

Our intent is to identify, organize and structure key components required for the development, testing, implementation and assessment of the compensation model.

We want in particular to identify the type of information input, way of processing it and later types of outputs to be used in the subsequent phases of the design process.

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