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Constructing Vietnamese State-Owned Corporations' Employee Motivation Model In the Era of Industry 4.0

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Abstract

Industry 4.0 has set a harshly competitive context for world of business. In that context, Vietnam economy has been preparing for the giant battle ahead; and the crucial part of that preparation process lies in the leading state-owned enterprises of Vietnam. This is mainly because they have received many privileges from the government to become the driver of the national economy. Thus, there is an urge for 10 biggest state-owned corporations (SOCs) among those to do somethings to prepare for the upcoming changes in human life, work and demands, especially things with their human resources management. This paper has a focus on employee motivating issues in the SOCs because this a crucial task to raise the labourers' productivity and enliven their working spirit. Therefore, the research has been conducted through an intensive survey with various labourers in these 10 SOCs. Their responses have been arranged into 5 different groups of contents due to the stages of A. Maslow hierarchy of needs (1943), which the research bases on as an initial researching framework. SPSS version 22 has been used to help the researchers analyse the data which have been collected from the survey. The final aim is to visualise a new concept of motivational model for the SOCs' employees in the context of Vietnam. The model, then, is inferred from the regression equation of employee motivation status (EMS) and other nine affecting factors. Hopefully, this can suggest some adaptive actions to the management of the SOCs.

Keywords: *Employee Motivation, Human Resources Management, Industry 4.0, State-Owned Enterprise, Vietnam.*

Introduction

Industry 4.0 has set a herald of a next revolution in the world of business since the day the term was coined in 2011 in Germany (Jozef Hercko, Jozef Hnat, 2015). Fundamentally, it is thought to be built on the foundation of the Industry 3.0, which was widely known to have gone with the automation in manufacturing industries. The Industry 4.0 is believed to combine the human beings' accomplishments in a variety of fields in a highly digitalised context, making the lines between the industries to be blurred and

connecting the physical, digital and biological worlds into one common habitat (Klaus Schwab, 2016). In this, the world manufacturing forces have to be adapted to the changes in ways people produce things, provide the services and live in an unprecedented direction in their empirical knowledge. Those changes have been characterised through nine areas of innovation, such as big data analysis, autonomous robotics, reality simulation, system integration, IoT, cybersecurity, cloud computing, additive manufacturing and augmented reality (Markus Lorenz et al., 2015). They pose the threats to the job opportunities of the working classes, businesses of the enterprises and even the country governance of the authorities in the whole world, especially the small and developing ones with less resistant ability and more vunerable possibility to the rapid impulses that are happening.

In that context, Vietnam, a small but important country in terms of geoeconomics and geopolitics in the ASEAN region, has been being very determined to pursue its ideology of a communist society with a crucial role of the state-owned enterprises (SOEs) in leading the national economy (VOV, 2017). Moreover, the SOEs are led by the 10 biggest mother-daughter modelled corporations (*litterally called SOCs*) in either heavy and light industries or service sector, including chemistry (Vinachem), oil and petrol (Petrolimex, PVN), coal and mining (Vinacomin), electricity (EVN), rubber (VRG), telecommunication and information technology (VNPT, Viettel), textile (Vinatex) and finance-banking (Bao Viet) (Nguyen Thanh Hai, 2016). In table.1, the annual revenue/GDP ratios of the SOCs in the period of 2014-2016 have been accounted for 24%-28%. This proves their driving power to the national economy.

Table 1. Vietnam SOCs' revenue/GDP ratios, 2014-2016 Unit: US$

Corporations		**2014**	**2015**	**2016**
		Revenue*	Revenue*	Revenue*
1	Bao Viet	611,519,015	712,508,244	873,950,319
2	EVN	8,909,606,507	10,275,225,324	12,223,829,413
3	Petrolimex	9,092,679,710	6,444,449,330	5,413,365,575
4	PVN	16,414,376,786	12,901,296,988	10,287,975,379
5	Viettel	8,661,244,230	9,791,162,893	9,960,782,590
6	Vinachem	1,812,134,535	1,810,727,632	1,768,608,485
7	Vinacomin	3,433,941,526	3,359,375,687	4,448,450,209
8	Vinatex	593,009,453	667,443,394	680,852,935
9	VNPT	2,248,889,866	2,224,049,242	2,336,293,691
10	VRG	758,496,373	664,585,623	691,316,773
Total		52,535,898,000	48,850,824,357	48,685,425,368
Vietnam GDP**		**186,205,000,000**	**193,241,000,000**	**202,616,000,000**
Ratio (%)		**28%**	**25%**	**24%**

*.Compiled from the corporations' annual reports. Current exchange rate of Joint Stock Commercial Bank for Foreign Trade of Vietnam (VCB): 22,745VND = 1 USD

** World Bank Data for Vietnam (https://data.worldbank.org), date of access: 22nd Nov.2017

Source: Authors' research (2017)

Moreover, SOCs are considered the pillar and the main driver of the economic system of the country because of their being granted priorities in capital, land and human resources usage. Thus, in the economic integration process of Vietnam, the 10 corporations have to cope with the urge of adjusting their business models and preparing their human capital for the requirements of the new job specifications in the fourth industrial revolution (Konstantin M. Wacker, 2016). This, on one hand, may involve employee retainment to deploy the up-to-date business strategies. On the other hand, this certainly requires a feasible strategy of employee motivation for them to be loyal, common target-oriented, innovative and enthusiastic in work to produce better results for the corporations' higher competency in their global businesses.

Regarding employee motivation, there have been many researches and models that instruct the managers of the companies how to stimulate their subordinates' interests at work. The prominent ones are Abraham

Maslow's hierarchy of needs (1943), which classifies people ascending needs into five stages of a pyramid (psychological, safety, belongingness and love, self-esteem and self-actualisation) (Mahmoud A.Wahba, Lawrence G.Bridwell, 1976); Frederick Herzberg's two-factor theory (1959), which divides employee motivating factors into two groups of creating job satisfaction and dissatisfaction (George K.A., 2011); David McClelland's three needs theory (1961), which explains how the achievement, power and affiliation monitor the acts of workers from a managerial perspective (Zulkiflee D., Shahrom T., 2013); Victor Vroom's expectancy theory (1964), which reveals the relationship between expectancy, instrumentality and valence in contributing to the trigger of human behavior (Pranav Parijat, Shilpi Bagga, 2014); Richard Hackman and Greg Oldham's job characteristics theory (1980), which proposes a model of work features of five that influence the employees' final outcomes (Richard Hackman, Greg. R. Oldham, 1976). Among these, the classic model of A.Maslow has become the most cited theory in the field of motivation. This is partly because it is easy to be comprehended and used. The hierarchy mentions people needs from the very first stage of psychological needs, such as food, water, warmth and sex, the second stage of security and safety, then the belonging and love needs with the intimacy that people create towards their friends and organisations, to self-esteem (personal prestige and accomplishments) and self-actualisation (one's full potentials fulfilling) stages at the peak (A.Maslow, 1943). Normally, people have to act to meet these needs from the bottom to the peak of the hierarchy again and again. This also resembles the daily tasks of a typical employee in Vietnamese enterprises. Therefore, the authors have decided to use it as the guidance on contents of employee motivation that the ongoing model should embrace.

Methodology

This paper uses the A.Maslow's hierrarchy of needs as the research framework for the survey, which has been designed in 34 questions including 4 demographic ones and the rest 30 for testing the different needs status of the corporations' 896 employees (in Likert scale of 5), mainly focused on the direct labourers working at sites and in the offices. The respondents are asked to rate their motivational state from the most negative level of 0/1 to the most positive level of 4/5. All of the questions have been coded for convenient data collection and analysis (see tab.2).

During the surveying period of 2016 – 2017, the snowball sampling method (Mark Saunders et. al., 2012) has been used to enable the authors to get as many valid and relevant response as possible for more precise conclusions in the SPSS 22.0 regression analysis. This non-probability sample can also help the authors overcome their lack of close relationship with the respondents. The analysis, in turn, first comes along with the Cronbach's Alpha calculation to identify irrelevant questions to be crossed off. Then, the exploratory factor analysis (EFA) is utilised with the use of KMO and Bartlett's tests and the rotated component matrix from the Principal Component Analysis (PCA) in combination with Varimax rotation method (Hair, J.F. Jr., Anderson, R.E., Tatham, R.L., & Black, W.C., 1998). Lastly, it ends with the regression model on the employee motivation for the SOCs in Vietnam, which will be used for the formation of the new motivational model that is to be proposed to the corporations and managing authorities.

Table 2. Encoding the questions in the survey for SPSS analysis

Variables	Codes	Question contents
Psychological needs	PS11	Monthly income
	PS12	Annual bonus package
	PS13	Annual total income
	PS21	Hygienic conditions of the working place
	PS22	Working environment
	PS23	Creative arrangement of the working place
	PS31	Modern working equipments
	PS32	Resting places and cafeteria

	PS33	Playing ground and exercising facilities
Safety needs	SA11	Working safety
	SA12	Safety equipments
	SA2	Long-term working position
	SA31	Trade Union's care about employees' normal life
	SA32	Periodical paid leave and vacations
	SA33	Trade Union's protection (work-related interests)
Social needs	SO1	Teambuilding activities
	SO21	Power distance index (regarding respecting employees' ideas, proposals)
	SO22	Managers' assisting work to subordinates' work and life
	SO3	Charity or community work
Self-esteem needs	ES11	Satisfaction with the current position
	ES21	Organisational appraisal and recognition
	ES22	Pritities or privileges granted
	ES31	Colleagues' respect (concerning the other employees' opinions)
	ES32	Privacy protection
Self-actualisation needs	AC11	Internal training and shortcourses joining chances
	AC12	Domestic and international long-term training courses joining chances
	AC21	Transparency in promotion
	AC22	Career path building
	AC31	Work and trained knowledge suitability
	AC32	Work and degree/certificate suitability

Source: Authors' research (2017)

Findings and Discussion

Cronbach's Alpha Calculation

The variables with Cronbach's α of below 0.7 and the corrected item-total correlation coefficient of below 0.3 are not acceptable and the questions are deemed unreliable to the research results (Nunnally, J. C., Bernstein, I.H., 1994). Therefore, removing 9 questions that are not fitted with the aforementioned conditions, the authors keep the following 21 variables for further analyses.

- PS group (6): α=0.804 (PS11, PS13, PS22, PS23, PS31 and PS33)
- SA group (4): α=0.799 (SA11, SA12, SA32 and SA33)
- SO group (3): α=0.802 (SO1, SO21 and SO3)
- ES group (5): α=0.822 (ES1, ES21, ES22, ES31 and ES32)
- AC group (3): α=0.834 (AC11, AC12 and AC22)

Exploratory factor analysis (EFA)

The EFA is used with the PCA and the Varimax rotation method at the (Eigenvalues) $\lambda \geq 1$. This method requires that the following conditions are met for the reliable rotated component matrix afterwards (Lawrence S. Meyers et. al., 2013).

- Cummulative extraction sums of squared loadings ≥ 50%,
- 01≥ KMO ≥ 0.5, and
- (Bartlett's test of sphericity) Sig. < 0.05

Table 3. KMO and Bartlett's tests with variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**0.876**
Bartlett's Test of Sphericity	Approx. Chi-Square	18679.799
	df	210
	Sig.	**0.000**

Factor	Initial Eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cummulative %	Total	% of variance	Cummulative %	Total	% of variance	Cummulative %
1	10.693	50.920	50.920	10.693	50.920	50.920	5.159	24.568	24.568
2	2.249	10.711	61.631	2.249	10.711	61.631	4.636	22.078	46.646
3	1.685	8.026	69.657	1.685	8.026	69.657	4.197	19.986	66.632
4	**1.161**	5.530	75.187	1.161	5.530	**75.187**	1.797	8.555	75.187
5	0.893	4.254	79.441						
6	0.747	3.559	83.000						
7	0.590	2.811	85.811						
8	0.470	2.239	88.049						
9	0.366	1.741	89.791						
10	0.326	1.554	91.345						
11	0.288	1.373	92.718						
12	0.280	1.332	94.050						
13	0.212	1.009	95.059						
14	0.197	0.937	95.995						
15	0.180	0.857	96.853						
16	0.177	0.845	97.697						
17	0.145	0.693	98.390						
18	0.116	0.553	98.943						
19	0.096	0.456	99.398						
20	0.067	0.320	99.719						
21	0.059	0.281	100.000						
Extraction Method: Principal Component Analysis.									

Source: Authors' research (2017)

The table.3 shows that (KMO = 0.876) > 0.5, Bartlett's test Sig. = 0.000 < 0.05, then the variables are correlated in general. Moreover, the cummulative extraction sum of squared loadings is of 75.187% (>50%). This illustrates that the 4 extraction factors can explain 75.187% of the data fluctuation at the Eigenvalues of 1.161 (>1). Later on, we have a concise rotated component matrix as the results of iterations and rotation to leave out some factors, for they are not fitted with the conditions (Maximum |Factor Loading| of each variable ≥ 0.4, and in each factor the discrepancy between the maximum |Factor Loading| and any other |Factor Loading| should be 0.3 or above) (Lawrence S. Meyers et. al., 2013) (see table.4).

Table 4. Final rotated component matrix[a]

	Component	
	1	2
PS31	0.847	
SE12	0.801	
PS23	0.770	
SO21	0.746	
PS33	0.533	
ES32		0.859
SE32		0.828
SE33		0.783
ES31		0.778
Extraction method: Principal Component Analysis. Rotation method: Varimax with Kaiser Normalization.		
a. Rotation converged in 03 iterations.		

Source: Authors' research (2017)

Regression analysis

Table 4 leads us to the idea of forming a multivariate linear equation between employee's motivation status (coded as EMS, calculated by the mean of all of variables) and the nine variables left above. The general equation shall look like:

$$EMS = \beta_0+\beta_1.PS31+\beta_2.SE12+\beta_3.PS23+\beta_4.SO21+\beta_5.PS33+\beta_6.ES32+ \beta_7.SE32+ \beta_8.SE33+ \beta_9.ES31+\varepsilon_i$$

In which, EMS is a dependent variable; other 9 variables are independent ones; ε_i is the residual error (unmeasured item), while β_0 is the EMS-intercept and β_1, β_2, β_3, β_4, β_5, β_6, β_7, β_8, β_9 are the regression coefficients that we need to find out in the following regression analysis. However, we still need to check the correlations between the 9 variables and EMS by taking the Pearson test beforehand. Because of the limitation of the research presenting space, the authors would like to merely inform that the test has been well done with Sig. (<0.05) and/or (<0.01) and all of the Pearson correlations coefficients are of (1;1), which meet the statistical requirements for the research to continue to the final phase of the analysis.

Table 5. Multivariate linear regression results for SOCs' employee motivation

Model Summary				
Model	R	R^2	Adjusted R^2	Std. error of the estimate
1	0.965[a]	**0.932**	0.931	0.13723
a. Independent variables: (Constant), PS31, SE12, PS23, SO21, PS33, ES32, SE32, SE33 and ES31				

ANOVA[a]						
Model		Sums squared	df	Mean squared	F	Sig.
1	Regression	228.515	9	25.391	1348.291	**0.000**
	Residual	16.685	886	0.019		
	Total	245.200	895			
a. Dependent variable: EMS						

Coefficients[a]								
Model		Unstandardised coefficients		Standardised coefficients	t	Sig.	Collinearity statistics	
		B	Std. error	Beta			Tolerance	**VIF**
1	(Constant)	0.716	0.030		23.510	0.000		
	PS31	0.137	0.008	**0.239**	17.421	0.000	0.407	2.455
	SE12	0.031	0.007	**0.056**	4.469	0.000	0.496	2.018

	PS23	0.092	0.005	**0.230**	18.819	0.000	0.516	1.938
	SO21	-0.016	0.008	**-0.025**	-2.061	0.040	0.521	1.918
	PS33	0.100	0.006	**0.180**	17.555	0.000	0.732	1.366
	ES32	0.118	0.009	**0.208**	12.471	0.000	0.277	3.607
	SE32	0.080	0.009	**0.140**	9.076	0.000	0.324	3.087
	SE33	0.116	0.008	**0.185**	13.614	0.000	0.415	2.408
	ES31	0.111	0.007	**0.177**	14.785	0.000	0.538	1.860

Source: Authors' research (2017)

As in table.5, R^2 = 0.932, so the independent variables can help explain 93,2% the fluctuation of value of the dependent variable of EMS. This is a very good level of R^2 to show that the following regression equation is reliable. Moreover, Sig. = 0.000 (<0.05), then we can reject the null hypothesis (H_0: : $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = \beta_9 = 0$) to prove that there exist a linear relationship between the independent variables and EMS. And, all of the VIF are below 10 that assures us of the non-existence of the multicollinearity. Therefore, the equation is formed as below:

EMS = 0,239∗**PS31** + 0,056∗**SA12** + 0,230∗**PS23** — 0,025∗**SO21** + 0,18∗**PS33** + 0,208∗**ES32** + 0,14∗**SA32** + 0,185∗**SA33** + 0,177∗**ES31**

From this regression equation, an idea of new model of employee motivation can be proposed primitively as in Fig.1.

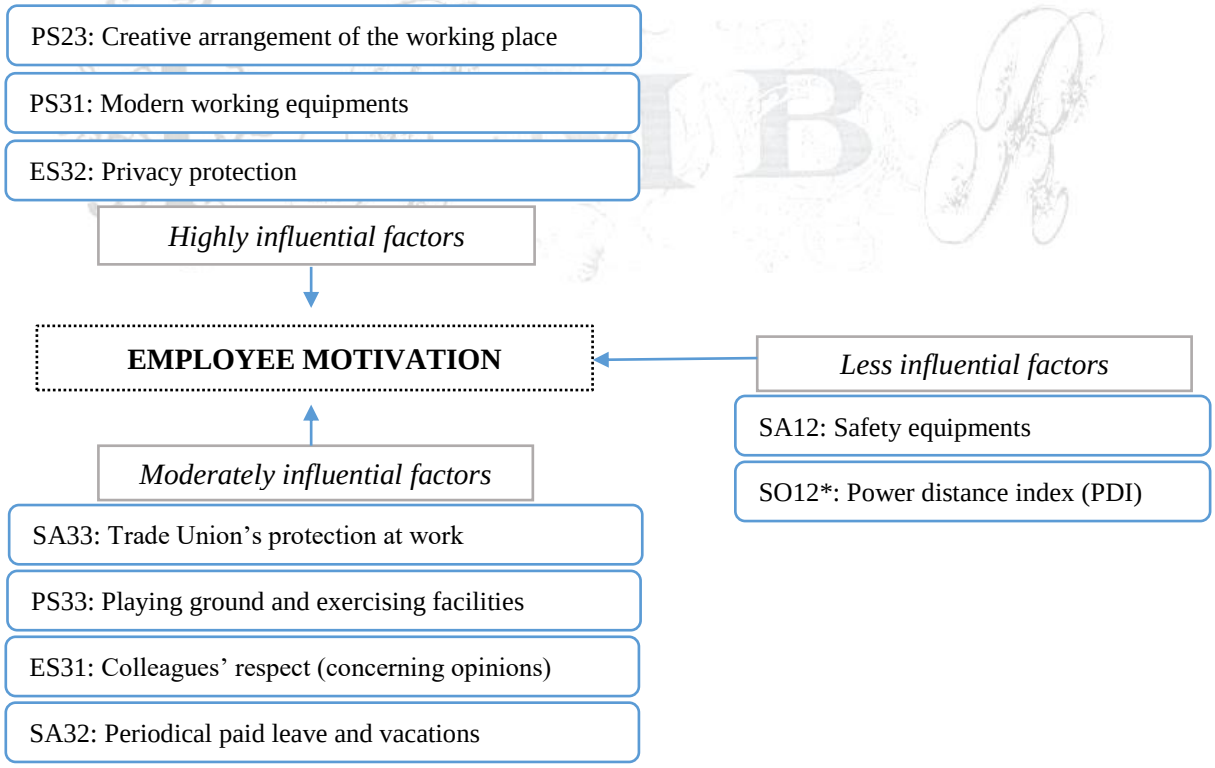

Figure 1. Proposed model of employee motivation for Vietnam SOCs
*. having a reverse relationship with motivation
Source: Authors' research (2017)

Conclusion

As can be seen in the Fig.6, the determinants of the Vietnamese SOCs' employee motivation should be divided into 3 groups: highly influential factors (with weight of 0.2 and above), moderately influential factors (with weight of 0.1-0.2) and less influential factors (with weight of less than 0.1) to show the level of importance of the corresponding work that the SOCs' management need to take to stimulate their employees working spirit. Noteworthily, the proposed model has not mentioned any of the self-actualisation motivational scheme that the management should deploy, partly because this range of factors is not really important to the SOCs' labourers at large. The major focus in the motivating scheme of their should be spent on the first two stages of Maslow's hierarchy of needs (PS23, PS31, SA33, PS33, SA32 and SA12). However, the management here also should bear in mind that the higher the PDI is the lower the motivational state that the employees may have to pursue establishing an open working environment with collaboration and harmony between them and their subordinates.

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