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Sains Humanika

Reflective –Formative Measurement Model of Social Factors and Willlingness To Share Knowledge

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Abstract

This paper aims to investigate the convergent and construct validity between reflective and formative measurement model. The difference assessment presents a different result of the validity. This paper analysed the reflective construct followed by formative measurement of second-order constructs (i.e., social factors and willingness to share knowledge) using SmartPLS. The data were collected from 150 of the knowledge worker in the ICT industry which registered in a MSC Company. The finding confirmed the indicator and construct examined in the model were valid and reliable. Furthermore, details of discriminant validity, collinearity, tolerance, and variance influence factor were also further discussed. The implication of this finding are brought to fore.

Keywords: Reflective measurement model; formative measurement model; social factors; willingness to share knowledge

Abstrak

Kajian ini bertujuan untuk menyiasat kesahihan antara model pengukuran reflektif dan formatif. Penilaian pengurkuran memberikan hasil yang berbeza dari kesahihannya. Kertas kerja ini bertujuan untuk menganalisis konstruk reflektif dan pengukuran formatif bagi mengkaji hubungan antara faktor sosial dan ketersediaan untuk berkongsi pengetahuan dengan menggunakan perisian *SmartPLS*. Data dikumpulkan daripada 150 pekerja pengetahuan dalam industri ICT yang didaftarkan di sebuah Syarikat MSC. Dapatan kajian menunjukkan penunjuk dan pembinaan yang diuji dalam model itu adalah sah dan dipercayai. Tambahan lagi, butiran kesahihan diskriminasi, kepelbagaian, toleransi, dan faktor pengaruh varians juga dibincangkan. Implikasi dari penemuan ini juga dinyatakan.

Kata kunci: Model pengukuran reflektif; model pengukuran formatif; faktor sosial; ketersediaan perkongsi pengetahuan

1.0 INTRODUCTION

Willingness to share knowledge initially is a social psychological element that influences the effectiveness of the knowledge sharing process. Cummings (2003) suggested that a knowledge sharing process is a communication and interaction between the knowledge creator and knowledge recipient. The process involves knowledge dissemination, transfer, and delivery with a meaningful knowledge to a recipient, thus, enabling the recipient to use and apply the knowledge within their work context (Zaid, Zainuddin, & Abdallah, 2013). In the middle of the process, relational context acts as a bridge to connect the knowledge creator and knowledge recipient (Cumming, 2003). Relational context can be formed into an interpersonal relationship. A good interpersonal relationship probably has a high tendency for an individual to willingly share knowledge. On the other hand, people are not willing to share knowledge if there is a weak interpersonal relationship.

The weakness of interpersonal relationship is caused by lack of communication and interaction to share knowledge (Alvani, Elyasi & Vakili, 2013). There are many factors that caused a weak interpersonal relationship. The differences in experience level and demographic factors limit them to share knowledge (Boer, Berends & Baalen, 2011). In addition, the differences between power and authority levels caused them not to communicate well when sharing knowledge. It shows that people who are of higher ranks communicate and share knowledge less due to fear of status fade or exemption (Menon, Thomson & Choi, 2006), while lower ranking people communicate less due to the lack of power and low self-esteem to share knowledge. Furthermore, a lack of commitment in a relationship drives people to have a weak interpersonal relationship (Lin, 2007) since there is no empathy and only to fulfil self-interest rather than to fulfil the needs of others. Similarly, lack of rewards results in a weak interpersonal relationship because everyone expects to have something in return that is consistent with their contribution (Elham, Rosman & Nik, 2012). Cummings' Model of Knowledge Sharing Process suggested that the relational context refers to the duration and quality of the experience, but it is not adequate to complete the sharing process. It is the need to

manage and control individual behaviour in a relation (Loebbecke, van Fenema, & Powell, 2016; Boer, Berends & Baalen, 2011; Lin, Wu, & Lu, 2012). A good behaviour in a relation promotes the relationship into a positive feeling and action, as well as feelings of comfort, convenience, appreciation, and security to share knowledge (Noorderhaven & Harzing, 2008). However, when there is an absence of good behaviour in a relation, people are constrained to interact and communicate (Baron & Markman, 2000, Syed & Khalid, 2013, Zaid, et.al, 2013). This result changes an individual behaviour to not share knowledge with others. Therefore, this studied aimed to investigate the construct and content validity of the social factor and willingness to share knowledge among 150 of the knowledge worker in the ICT industry which registered under MSC Company in Malaysia.

■2.0 LITERATURE REVIEW

Relational Model Theory

The relational models theory (RMT) believed that people are fundamentally sociable (Fiske, 1992). This model can explain an individual behaviour in an interpersonal relationship such as developing a relationship, understanding a relationship, and evaluating a relationship (Haslam & Fiske, 1999). This model can describe the relationship between two persons for a general context. The RMT believed that people who have a good relationship could encourage good behaviour which can lead to a positive course of action. Therefore, a good and close interpersonal relationship could direct an individual to perform a positive social act such as kindness, tolerant, commitment, and trust. In the recent studies, RMT was applied to recognise a social and organisational psychology context (Vodosek, 2009) such as the knowledge sharing context at organisational and individual levels (Baalen, Dalen, & Malsen, 2013). This study assumed that RMT is relevant and significant to explore the studies of individual behaviour in the relational context (). Initially, RMT provides a dynamic and comprehensive component of relational factors that can be used as a guide for social behaviour studies (McGraw & Tetlock, 2005). The fundamental of RMT used to this study to explain the determinants of social factors towards willingness to share knowledge.

Social Factors

Social factors are defined as specific interpersonal agreement of a relationship between two persons or more in a specific social situations and believed that one's social factors affect one's behavior (Triandis, 1980) such as mutual trust, loyalty, respect and obligation openness, social relationship (Friesl, Sackmann, & Kremser, 2011) and social interaction (Alvani, Elyasi & Vakili, 2013, Hoegl, Parboteeah, & Munson 2003, Sun, 2006). More than that, people seek for an opportunity to interact and communicate with each other, build trustworthy, engage to social cohesion (Sun & Liu, 2007) and collaboration with group members (Kumaraswamy & Chitale, 2012). In other words, the social factors refer to a social psychology element which concentrates on a relationship between an individual or social environment (Hollander & Howard, 2000). In knowledge sharing context, when an individual makes the decision to share knowledge with another co-worker, they usually take into consideration their interpersonal relationships and social environment (Hollander & Howard, 2000). This has been proven by several researchers who done the studied on social factors and knowledge sharing behaviour. Alvani et al., (2013) and Bartol & Srivastava, (2002) claimed people in organizations were willing to share knowledge and engage to each other for sharing and exchange knowledge together. Hence, people maintain several social factors in an interpersonal relationship, as to feel enjoyment, satisfaction, and bond in a relationship (Bouty, 2000, Levin & Cross, 2004).

■3.0 CONCEPTUAL FRAMEWORK

The conceptual framework developed based on the relational model theory as exhibited in Figure 1 explained social cohesion, social power (legitimate power, coercive power, referent power, and expert power), affective commitment, interpersonal trust, rewards (extrinsic & intrinsic reward) as independent variables and willingness to share knowledge as dependent variable.

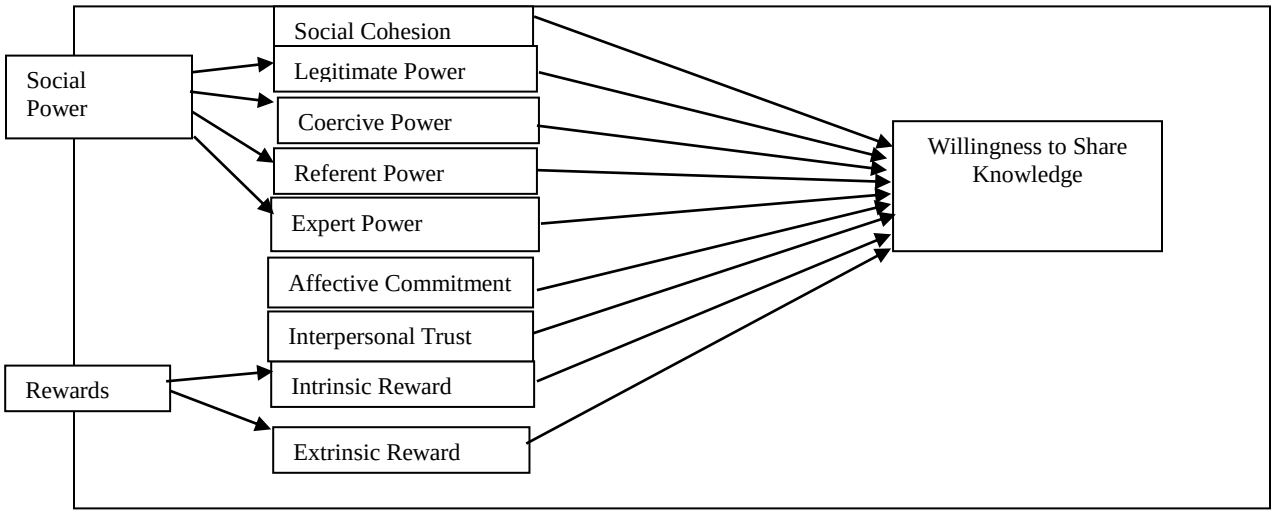

Figure 1 Conceptual framework of social factors and willingness to share knowledge

■4.0 METHODOLOGY

The population of this studied were more than 2000 of knowledge worker and application of G-Power applied to determine the appropriate sample size for this study. A G-Power analysis is a statistical power analysis was applied to validate the implications of a sample size in order to test a relationship between two variables (Akter, D'ambra & Ray, 2011). There were several components necessarily need to consider such as effect size (Medium, 0.15), desired power (0.95), number of predictors (4), error score and significant level (0.05). Result found 150 of sample size were appropriate to use in further analysis. The 150 of knowledge worker were selected from several companies if ICT industry that registered with MSC Company in Malaysia. The items measurement for social cohesion adapted from the Group Environment Questionnaire (GEQ) by Widmeyer et al (1985) and reviewed by Lee, Hung and Chen (2012). Then, the items measurement of power is categorized into two components which are formal power and personal power. The items adapted from the studies of Hinkin and Schriesheim (1989) and Raven, Schwarzwald, and Koslowsk (1998). Furthermore, there are eight items to measure the affective commitment which particularly emphasizes on the affective commitment towards knowledge sharing behaviour adapted from Kim, Choi, Qualls, & Han, (2008) and Yen, (2009). In addition, four items of extrinsic rewards were adapted from the study of Hargadon (1998) and four items of intrinsic reward derived from Wasko and Faraj (2000). Finally, seven items of willingness to share knowledge adapted from Hooff and Hendrix (2004). All items were used five Likert scales, 1= strongly disagree and 5= strongly agree.

■5.0 RESULTS AND DISCUSSION

Reflective measurement model identifies by adding or drop the items do not change the conceptual meaning of the construct (Rossiter, 2002). Additional, the direction of causality in the reflective model flows from the construct to the indicator (Edwards & Bagozzi, 2000). Therefore, the convergent and discriminant validity had conducted to measure the reflective measurement consist of the reliability and validity of the items. In PLS, the values of the loading factors required to be greater than 0.5 and above 0.70 (Hair, Andersen & Tatham 2010). Then, the calculation of values composite reliability with the cut off 0.5 and average variance extracted values should be greater than 0.7 (Hair et al, 2010). As depicted in Table 1, the social cohesion consisted of seven items and each of the items loading indicates there were greater than 0.5 and above 0.70. The items of SC3 was deleted due to the lower factor loading.

Next, there were 16 items of social power which that presented legitimate power, coercive power, referent power and expert power. The result of PLS revealed that all the 16 items tested indicate had high factor loading which was above 0.7. On the other hand, there were only two items of affective commitment which are item AC3 and item AC7 decided to delete. After deleted those items, there were five items remained used in the further analysis. In the meantime, extrinsic and intrinsic rewards present as the first order of reward. The result found that two items of extrinsic rewards such as ER3 and ER4 and intrinsic rewards IR5 and IR6 have been deleted. For a contract of willingness to share knowledge, the seven items were tested and the result revealed that the factor loading of all of the items were greater than 0.50 and above of 0.70. Based on the measurement model analysis, as shown in Figure 2 there were only 44 items were usable for structural model analysis.

Table 1 Convergent validity result

Constructs		Item Loading	Factors Loading	Constructs	Item Loading	Factors Loading
	Legitimate Power		0.786		AC1	0.733
			0.767		AC2	0.262
Legitimate Power		SC4	0.672	Affective Commitment	AC4	0.835
		SC5	0.753		AC5	0.854
		SC6	0.833		AC6	0.876
		SC7	0.706			
		SP1	0.847	Rewards	ER1	0.96
		SP2	0.925		ER2	0.961
		SP3	0.915		IR7	0.955
		SP4	0.784		IR8	0.957
		SP5	0.961		WTSK1	0.876
Coercive Power		SP7	0.603		WTSK2	0.886
		SP8	0.696		WTSK3	0.882
		SP9	0.884	Willingness to Share Knowledge	WTSK4	0.829
Referent Power		SP10	0.936		WTSK5	0.664
		SP11	0.932		WTSK6	0.596
		SP12	0.922		WTSK7	0.663
		SP13	0.926		IPT1	0.856
		SP14	0.922		IPT2	0.833
		SP15	0.849	Interpersonal Trust	IPT3	0.872
Expert Power		SP16	0.873		IPT4	0.881
					IPT5	0.881
					IPT6	0.864

Composite Reliability and Average Variance Extracted

From the assessment of factors loadings, the composite reliability (CR) were measured to access the reliability after the item deleted. According to Hair et al. (2014), the acceptable values of composite reliability is higher than 0.70 and average variance extracted also must higher than 0.50. If the assumption met, the result indicates that the items of the model tested were high in internal consistency reliability and validate to the studied. As showed in Table 2, the reflective construct found their values of composite reliability were higher than 0.5 as social cohesion (CR=0.873), affective commitment (CR= 0.917), interpersonal trust (0.923) and willingness to share knowledge (0.913). Each of the average variance extracted of the reflective constructs meets the threshold values as greater than 0.50 and this confirmed the existence of convergent validity. The finding of legitimate power (CR=0.925), coercive power (CR=0.822), referent power (CR=0.956) and expert power (CR=0.94). Additional to rewards found the first order of extrinsic rewards (CR= 0.984) and intrinsic rewards (CR=0.977). Concluded with the composite reliability assessment, all the indicators were high internal consistency in which the values were greater than 0.7 and above. The result confirmed the 44 items tested were reliable to the model. Furthermore, the AVE values for social cohesion (AVE=0.574), legitimate power (AVE=0.756), coercive power (AVE=0.545, referent power (AVE=0.844), expert power (AVE=0.798), affective commitment (AVE=0.690), extrinsic reward (AVE=0.969), intrinsic rewards (AVE=0.955), willingness to share knowledge (AVE=0.606) and interpersonal trust (AVE=0.649) indicates that the AVE values of the constructs as in the model were greater than 0.50 and this resulted confirmed the result of convergent validity of this studied.

Table 2 Composite reliability and average variance extracted analysis

Constructs	Composite Reliability	Average Variance Extracted (AVE)
Social Cohesion	0.873	0.574
Legitimate Power	0.925	0.756
Coercive Power	0.822	0.545
Referent Power	0.956	0.844
Expert Power	0.94	0.798
Affective Commitment	0.917	0.69
Extrinsic Reward	0.984	0.969
Intrinsic Reward	0.977	0.955
Interpersonal Trust	0.923	0.649
Willingness to Share Knowledge	0.913	0.606

Discriminant Validity: Fornell-Lacker Analysis and Heterotrait-Monotrait Ration (HTMT)

Further analysis was an assessment of discriminant validity. A traditional Fornell and Larcker criterion assessment used to calculate the cross-loadings between others construct (Fornell & Larcker, 1981). The assumption underlying discriminant validity, if the single loading of the indicator is greater for their own latent variable than for the other latent variable in the model, the result interpreted the model is well differentiated with respect to the other constructs. The result of discriminant validity have shown in Table 3 indicates the cross-loadings of the construct and the other construct meet the assumption of the values is greater than another construct. All items loading in reflective model found the values were in the range of 0.70 to 0.95. Thus, this result means there was no item loaded higher on the construct that was not intended to measure.This result also supported by the analysis of Heterotrait-Monotrait Ratio (HTMT) as indicates in table 4 which was referred to an average of the heterotrait-heteromethod correlations. HTMT is using as a criterion involves comparing it to a predefined threshold. If the value of the HTMT is higher than this threshold, one can conclude that there is a lack of discriminant validity. The exact threshold level of the HTMT a threshold of 0.85 (Clark & Watson, 1995; Kline, 2011), whereas others propose a value of 0.90 (Gold, Malhotra, & Segars 2001; Teo, Wei, & Benbasat 2003). So that, in this study used the notations HTMT.85 and HTMT.90 in order to distinguish between these two absolute thresholds for the HTMT. Hence, the finding as in Table 4 indicates the all HTMT values passed the HTMT.90 (Gold et al., 2001) and the HTMT.85, so the result can concluded to discriminant validity has been ascertained.

Table 3 Fornell Larcker Result

Constructs	1	2	3	4	5	6	7	8	9	10	11	12
1.Affective Commitment	**0.831**											
2. Coercive Power	0.196	**0.739**										
3. Expert Power	0.335	0.031	**0.893**									
4. Extrinsic Reward	-0.062	0.06	0.199	**0.985**								
5.Interpersonal Trust	0.736	0.293	0.362	0.026	**0.865**							
6. Intrinsic Reward	0.667	0.102	0.234	-0.125	0.598	**0.977**						
7. Legitimate Power	0.271	0.349	0.428	0.475	0.293	0.181	**0.870**					
8. Referent Power	0.404	0.199	0.617	0.42	0.388	0.224	0.523	**0.919**				
9. Rewards	0.646	0.083	0.177	-0.344	0.561	0.815	0.065	0.118	**0.835**			
10.Social Cohesion	0.664	0.161	0.396	0.078	0.625	0.435	0.262	0.436	0.394	**0.783**		
11. Social Power	0.424	0.313	0.721	0.428	0.444	0.264	0.77	0.882	0.154	0.453	**0.645**	
12.Willingness To Share Knowledge	0.725	0.124	0.2	-0.145	0.598	0.742	0.19	0.203	0.725	0.542	0.248	**0.805**

Table 4 Heterotrait-Monotrait Ratio (HTMT) Result

Constructs	1	2	3	4	5	6	7	8	9	10	11
1.Affective Commitment											
2. Coercive Power	0.211										
3. Expert Power	0.377	0.168									
4. Extrinsic Reward	0.069	0.121	0.212								
5.Interpersonal Trust_	0.807	0.275	0.389	0.051							
6. Intrinsic Reward	0.724	0.07	0.249	0.129	0.631						
7. Legitimate Power	0.302	0.232	0.472	0.517	0.315	0.194					
8. Referent Power	0.444	0.134	0.664	0.441	0.415	0.238	0.571				
9. Rewards	0.608	0.147	0.355	0.902	0.523	0.904	0.55	0.525			
10.Social Cohesion	0.76	0.115	0.452	0.089	0.698	0.479	0.304	0.495	0.436		
11. Social Power	0.475	0.571	0.850	0.459	0.493	0.268	0.847	0.835	0.563	0.491	
12.Willingness to Share Knowledge	0.758	0.153	0.223	0.146	0.627	0.746	0.195	0.206	0.685	0.585	0.274

Formative Measurement Model

A formative measurement of social power (legitimate power, coercive power, referent power & expert power) and rewards (extrinsic and intrinsic rewards). The finding revealed the outer weight values of legitimate (0.337), referent power (0.447) and expert power (0.392) showed there were positive and the significance was less than 0.05 towards social power except for coercive power (0.095). Coercive power found there was not significance however, this study decided to remain as in the model due to the conceptualizing of the previous theory on social power. In addition, the variance inflation factors (VIF) and tolerance value used to measure the collinearity of the formative constructs. The result found there is no issues on collinearity as VIF values and tolerance values were meet the threshold which tolerance values should be were greater than 0.2 and VIF values should be less than values of 5. On the other hand, the rewards revealed that extrinsic were negative (-0.225) and there was non-significant relationship towards rewards. The indicators not be deleted and remain as in the model due to the conceptualizing of the previous theory on rewards. Further to confirm the collinearity problem, the VIF values was 1.631 and tolerance was 0.631 explained there was no issue of collinearity. While intrinsic rewards found the outer weight was 0.947 and highly significant towards rewards. There was no issue on collinearity as the tolerance values were greater than 0.2 and VIF values were less than values of 5 as depicted in Table 5.

Table 5: Formative measurement model

Second Order Constructs	Constructs	Outer Weight	T-Values	VIF Values	Tolerance Values	Significance (p<0.05)
Social Power	Legitimate Power	0.337	12.16	1.729	.578	Yes
	Coercive Power	0.095	1.797	1.093	.915	No
	Referent Power	0.447	19.21	2.198	.455	Yes
	Expert Power	0.392	12.05	1.818	.550	Yes
Rewards	Extrinsic Rewards	-0.225	1.481	1.631	.613	No
	Intrinsic Rewards	0.947	17.497	1.126	.888	No

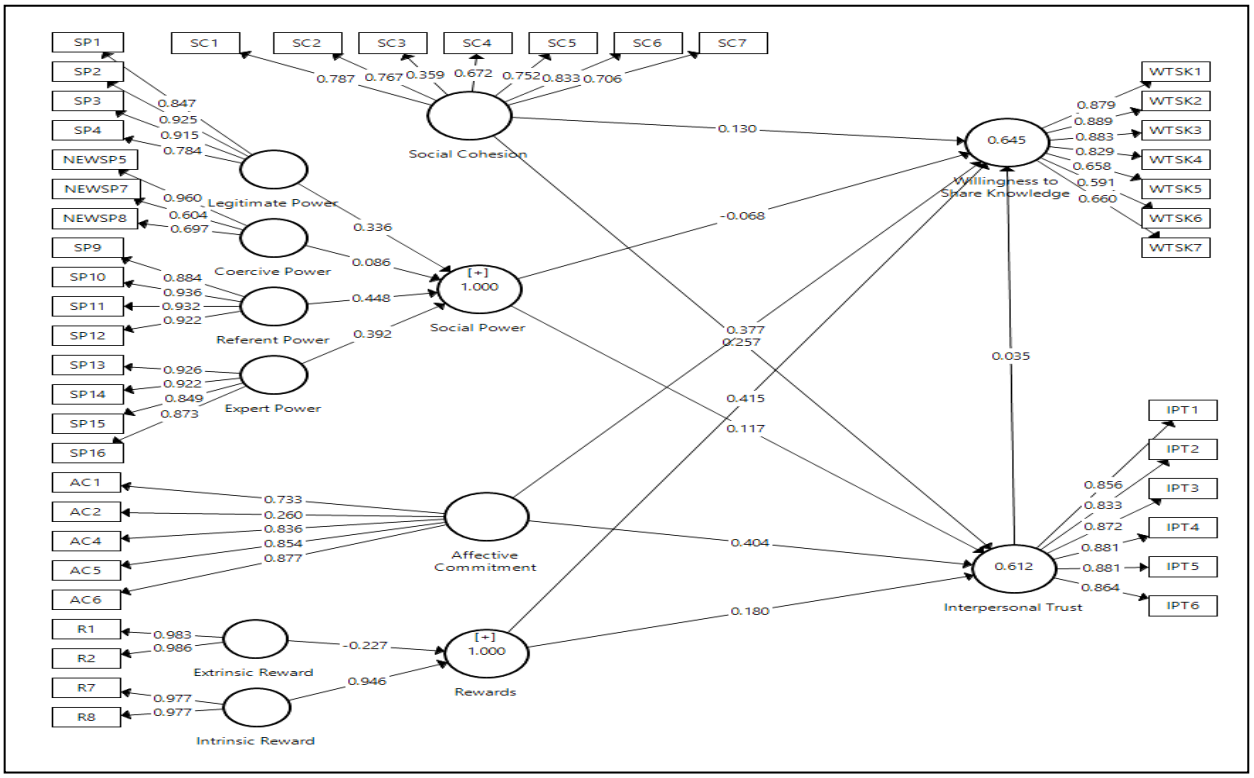

Figure 2 Measurement model of social factors and willingness to share knowledge

■6.0 CONCLUSION

The objective of this paper is to establish that rigorous assessment of construct validity between formative versus reflective construct. A reflective measurement model commonly assesses the factor loading of the indicators that can be adding or deleted if the loading was not meet the cut-off values. The deleted item remains to explain the fundamental concept of the construct and does not change any meaning. The reflective measurement model assessment included of composite reliability, average variance extracted and discriminant validity showed the causal relationship of the construct to indicators. In a different view of a formative measurement model, the construct assesses by measure the outer weight values and significance of the outer weight. Then the study should decide to remain or delete when the values do not meet the assumption. In future research this study suggest to extend the analysis of the structural analysis mode. The finding concluded social cohesion, social power, affective commitment, extrinsic and intrinsic rewards of social factors were presented as reflective indicators and the assessment to the items used had confirmed the convergent and construct validity of the indicators to this studied were valid and reliable. For social power and rewards presented as second-order formative construct and the assessment remain the coercive power with justification the construct in the model had supported by the previous studied.

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