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Effects of Significance Recognition of Consulting Projects on Technical Impact, Project Management Capability and Corporate Image: Focusing on Government-supported Technical Consulting for Smes and Startups

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Abstract: This research was carried out to identify significance recognition of consulting projects on technical impact, project management capability and corporate image in government-supported technical consulting for SMEs (Small and Medium-sized Enterprises) and startups and suggest policy implications. The SMEs and startups who benefited from government-supported technical consulting were selected to identify the effect of significance recognition of consulting projects and a survey was progressed for about a month from April 2015. Finally, 311 questionnaires excluding the questionnaires with missing values were used. For data processing in this research, SPSS Ver. 22 and AMOS Ver. 22 as statistical programs were used. The empirical results showed that the significance recognition of consulting projects had a positive (+) effect on technical impact and project management capability as consulting performance and that significance recognition had a positive (+) effect on corporate image. In the affecting relationship between technical impact and project management capability, technical impact had a positive (+) effect on project management capability. Finally, technical impact had a positive (+) effect on corporate image but project management capability did not have a meaningful effect on corporate image. This presents that there is no direct relationship between project management capability and corporate image in technical consulting. The conclusion was drawn that the significance recognition of consulting projects in SMEs and startups had a positive (+) effect on corporate image by the medium of technical impact. This research suggests that the attitude of SMEs and startups who participate in consulting, i.e., significance recognition of consulting projects is an important factor to enhance consulting performance and corporate image. Through improving SMEs and startup's significance recognition and reinforcing the government's support, it will be expected to contribute to increasing the effectiveness against the investment in consulting support policy.

Key word: Significance recognition, technical impact, project management capability, consulting performance, corporate image, improving

INTRODUCTION

Over 99% of the entire domestic enterprises are SMEs and startups and the number of employees working in these enterprises occupies 88% of the entire employees (Do-Sung, 2015). This suggests that the majority of the enterprises are SMEs and startups and as such enterprises are forming the backbone of the national economy and this is why with the inauguration of the new government, 'the Small and Medium Business Administration' which is the vice-minister level has been promoted to 'Ministry of SMEs and Startups (MSS)' which is the minister level in governmental organization setup. This is because the influence of SMEs and startups on the future national economy is important. So, government has continuously promoted the consulting diffusion policies targeting SMEs and startups in order to foster them and reinforce their competitiveness. The preceding researches related to consulting projects have been conducted focusing on consultant's skills, knowledge and attitude and the government-led researches on consulting projects were very insufficient in terms of amount of research. Also, the interests in consulting project by SMEs and startups, who are the targets of governmental support are considered to act as a major factor for successful consulting.

This research made an empirical analysis of the SMEs and startups which experienced government-supported technical consulting and aimed to offer suggestions for government-supported consulting projects after finding the impact of significance recognition of consulting on technical impact, project management capability as well as consulting performance and corporate image in SMEs and startups.

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MATERIALS AND METHODS

Theoretical review

Significance recognition: Song said that to conduct consulting, executive's intention and interest in the advance preparation and execution stages is important for consulting performance (Keo-Young, 2015) and Chang-Ho, (2014) maintained that corporate participation is the factor that influences consulting performance and the top management's interest is important, (Schaffer, 2002) presented a project design to meet the motivation of customers as one of the key successful factors for consulting projects.

Technical impact: For consulting performance, skills and knowledge as enterprise's core capabilities should be increased and its establishment should be fortified and it is also important to fortify creativity through large scale research and development investment (Yung-Ho, 2016). Yoo and Yang (2009) made an empirical analysis of the relationship between technical innovation activities, economic aptitude and mechanical aptitude and then found that technical innovation activities had a positive effect on mechanical aptitude. And Thornhill, (2006) said that management innovation, product innovation and process innovation are the concepts that make up innovation and such innovation has a positive relationship with consulting performance.

Project management capability: This research used technical impact and project management capability as variable concepts that constitute consulting performance, as the definition of the concept of consulting performance is varied. About the project management capability, Hong-Joo (2009) demanded that consulting performance measurement variables should be divided into efficiency and effectiveness and business outcomes improvements should be seen as measurement factors for effectiveness. Schaffer said that for consulting projects to be regarded as successful, customers have to obtain measurable improvements by applying consultant's solutions and continue to keep up the improvement measures.

Corporate image: About corporate image, Hyun-Mi (2008) told that corporate image is an emotional inclination that the public have toward a corporate, Dowling (2001) defined that corporate image is the image of a corporate reflected into the minds of customers and information on the tangible parts of a corporate is one of the customer's internal attitude that are associated with customer's intangible emotional factors (Barich and Kotler, 1991) said that corporate image is premised on the corporate as object of image and is the image of the whole rather than some aspects of a corporate and also something that has directivity like attitude.

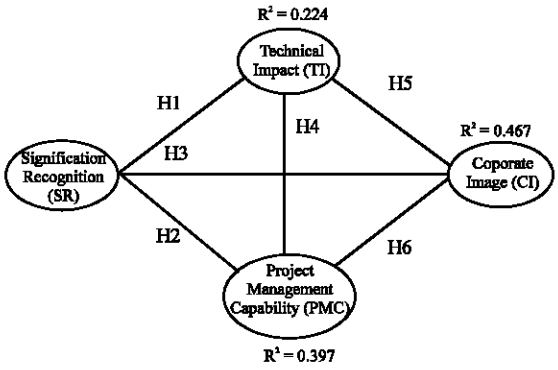

Fig. 1: Research model

Proposed work

Research model: To identify the effect of significance recognition of consulting projects on technical impact, project management capability and corporate image, this research set up the research model as shown in Fig. 1.

Research hypotheses

The relationship between significance recognition and consulting performance and corporate image: To look at the preceding researches, corporate commitment quality had a positive effect on consulting performance quality (Ju-Hwan, 2016), consulting performance were influenced by consulting environment (Yung-Ho, 2016), intention of execution (Jeoung *et al*., 2015), corporate trust (Shin *et al*., 2015), consulting understanding (Myoung-Kyu, 2014), perceived value (In-Su, 2014). And customer preparation and participation had a positive effect on consulting performance (McLachlin, 1999).

Following hypotheses are formulated to identify the effect of significance recognition of consulting projects on consulting performance and corporate image, based on the previous researches mentioned above.

- H_1: significance recognition will have a positive (+) effect on technical impact
- H_2: significance recognition will have a positive (+) effect on project management capability
- H_3: significance recognition will have a positive (+) effect on corporate image

The relationship between technical impact and project management capability: To look at the preceding researches, technical impact in corporate had a positive effect on project management capability as consulting performance (Sung-Kyoo Kim, 2007).

Following hypotheses are formulated to identify the effect of technical impact on project management performance, based on the previous researches mentioned above.

- H_4: technical impact will have a positive (+) effect on project management capability

The relationship between consulting performance and corporate image: As consulting performance, technical impact had a positive effect on corporate image (Dowling, 2001) and project management capability in corporate social responsibility activity had a positive effect on corporate image as outcomes of consulting (Hyun-Mi, 2008).

Following hypotheses are formulated to identify the effect of consulting performance on corporate image, based on the previous researches mentioned above.

- H_5: technical impact will have a positive (+) effect on corporate image
- H_6: project management capability will have a positive (+) effect on corporate image

Research methods

Populations and sample selection: To check the effect of significance recognition of consulting projects on corporate image in SMEs and startups, the SMEs and startups who experienced government-supported technical consulting were selected as subjects of this research and a survey was progressed for about a month from April 2015. Finally, 320 copies were collected and 311 questionnaires excluding the questionnaires with missing values were used for our analysis. SPSS Ver. 22 and AMOS Ver. 22 were used as statistical programs for data processing in this research.

Definition of variables and measurement: The significance recognition of consulting projects was made to be composed of four questions by referring the items provided by Keo-Young (2015), Chang-HO (2014), and McLachlin (1999). The technical impact was constituted by four questions referring to the items presented by Young-Ho (2016), Jimenez-Jimenez and Sanz-Valle (2011) and Sung-Kyoo (2007). The project management capability was constituted by four questions referring to the items presented by Tae-Yong (2014), Hong-joo (2009) and Schaffer (2002). The corporate image was constituted by one question referring to the items presented by Bae (2008), Barich and Kotler (1991).

Table 1: Composition of survey

Measurement variables	No. of questions	Preceding studies
Significance recognition	4	Song, Choi McLachlin, 1999
Technical impact	4	Lee, 2016 Jimenez-Jimenez and Sanz-Valle; Kim
Project management capability	4	Jeoung *et al.*,2015; Kwak Schaffer, 2002
Corporate image	1	Bae Barich and Kotler, 1991
Total	13	

Survey questionnaire was made to be composed of 13 questions in total. In scoring the variable related survey questionnaire items, on a 5-point scale point 1 means 'It is not at all' and point 5 'It is very so' and the summary are shown in Table 1.

RESULTS AND DISCUSSION

Data characteristics: The general characteristics of this research were presented in Table 2. When it comes to business duration, 11-20 years occupied the largest percentage of 48.9% and when it comes to technology life cycle, the companies which were in the growth step occupied the largest percentage of 39.9%. In the capital, the companies which had <500 million won occupied the highest percentage of 49.5% which suggested that the companies are small and medium-sized ones.

Validity and reliability analysis: Validity and reliability were analyzed, prior to hypothesis testing. To check the validity, exploratory factor analysis was carried out in the first step. To simplify factor extraction and factor loading, principle component analysis and Varimax rotation were used and these methods were based on factor loading 0.4 or higher and eigenvalue 1.0 or higher. Like the theoretical structure in the preceding researches, four variables were extracted. The variables were named as significance recognition, technical impact, project management capability and corporate image. And reliability analysis was conducted for each variable. As a result, there were no factors that inhibited the confidence level, so, all items were used for this analysis. As Cronbach's α reliability for each variable was placed within the range of 0.816~0.886, it appeared that confidence level (Cronbach's α>0.8) was satisfiable as shown in Table 3.

Measurement model analysis: To check the goodness of fit, validity and reliability of measurement model, we

Table 2: The Characteristics of data

Categories	Frequencies	Percentage
Business duration (Years)		
10≤	10	3.2
11~20	152	48.9
21~30	93	29.9
31~40	27	8.7
41 years or more	29	9.3
Total	311	100.0
Technology life cycle		
Development step	23	7.4
Introduction step	47	15.1
Growth step	124	39.9
Maturity step	87	28.0
Decline step	10	3.2
Others	20	6.4
Total	311	100.0
Capital (BW)		
0.5≤	154	49.5
0.51~1	53	17.0
1.1~5	78	25.1
5.1~10	13	4.2
10.1≥	13	4.2
Total	311	100.0

Table 3: Exploratory factor analysis and reliability

MV	SR	TI	PMC	CI	Cα
SR1	0.757				
SR2	0.752				
SR3	0.877				
SR4	0.863				0.886
TI1		0.728			
TI2		0.773			
TI3		0.788			0.816
TI4		0.737			
PMC1			0.701		
PMC2			0.868		
PMC3			0.827		0.838
PMC4			0.702		
CI				746.000	-
EV	3.106	2.622	2.739	1.016	
V (%)	23.892	20.168	21.069	7.813	
AV (%)	23.892	44.060	65.128	72.941	

Ref.1) SR : Significance Recognition, Ref.2) TI : Technical Impact, Ref.3) PMC : Project Management Capability,Ref.4) CI : Corporate Image, Ref.5) Ca : Cronbach's a, Ref.6) EV : Eigen Value, Ref.7) V% : Variance %, Ref.8) AV% : Accumulation Variance (%)

conducted measurement model analysis. To estimate the goodness of fit suggested in the final questions, removal was executed based on SMC value, the degree that the measurement value accounted for the latent value. Finally, significance recognition 4, project management capability 4 and technical impact 3 were removed before analysis. As a result, it was showed that t-value from the relational test between latent variables and measurement value excessed 1.965 and SMC value showed 0.4 or higher which suggested that latent variables accounted for variation in the measurement variables well. Also, CMIN/DF was 1.715, GFI 0.969, AGFI 0.943, CFI 0.951, NFI 0.963, IFI 0.984, TLI 0.976, RMR 0.025, RMSEA 0.048 which presented that measurement model was appropriated as shown in Table 4.

Table 4: Goodness of fit of measurement model

Measure	SLFV	SE	t-value	p-values	CR	AVE	SMC
SR	0.801	-	-	-			0.641
1	0.881	0.070	16.206	***	0.894	0.738	0.777
2	758	0.074	13.993	***			0.574
3							
TI							
1	0.774	-	-	-			0.598
2	0.785	0.092	11.777	***	0.845	0.646	0.617
4	0.652	0.097	10.353	***			0.426
PMC							
1	0.719	-	-	-			0.517
2	0.823	0.088	12.644	***	0.865	0.682	0.678
3	0.822	0.085	12.638	***			0.676
CI	1.000	-	-	-	1.000	1.000	1.000
1							

Goodness of fit of measurement model <Initial model>Chi-Square = 150.169, df = 60, p = 0.000, CMIN/DF = 2.503, RMR = 0.031, GFI = 0.931, AGFI = 0.895, NFI = 0.927, IFI = 0.955, TLI = 0.940 CFI = 0.954, RMSEA = 0.070 <Final model> Chi-Square = 51.445, df = 30, p = 0.009, CMIN/DF = 1.715, RMR = 0.025, GFI = 0.969, AGF I= 0.943, NFI = 0.963, IFI = 0.984, TLI = 0.976 CFI=.984, RMSEA=.048 Ref.1) SLFV : Standardized Loading Factor Values Ref.2) SE : Standard Error Ref.3) CR : Critical Ratio, Ref.4) AVE : Average Variance Extracted, Ref.5) SMC : Squared Multiple Correlation

Table 5: Goodness of fit of research model

Variables	Reference value	Measured value
Chi-square	-	51.445
df	-	30.000
p-values	<0.050	0.009
CMIN/DF	<3.000	1.715
GFI	>0.900	0.969
AGFI		
NFI	>0.800	-
>0.90	0.943	-
0.963		
IFI	>0.900	0.984
TLI	>0.900	0.976
CFI	>0.900	0.984
RMR	<0.050	0.025
RMSEA	<0.080	0.048

Research model analysis: We conducted its goodness of fit as a structural equation model to estimate our research model. As a result, Table 5 shows how all the goodness of fit measures for our research model meet the reference values. And Table 6 shows structural path coefficients of our research model.

Hypothesis testing: After the research model analysis the results of the path coefficient analysis for specific hypothesis testing was estimated to be appropriate are shown in Fig. 2. It appeared that the significance recognition of consulting projects had a positive effect on technical impact (standardized coefficient $\alpha = 0.474$, $p = 0.000$) and had a positive effect on project management capability (standardized coefficient $\alpha = 0.203$, $p = 0.003$), and also had a positive effect on corporate image (standardized coefficient $\alpha = 0.656$, $p = 0.000$). As consulting performance, technical impact had a positive

Table 6: Structural path coefficients of research model

Structural path	ß	t-values	p-values
SR_TI	0.474	6.792	***
SR_PMC	0.208	3.000	0.003
SR_CI	0.656	10.181	***
TI_PMC	0.504	6.236	***
TI_CI	0.148	2.046	0.041
PMC_CI	-0.119	-1.732	0.083

*** p<0.001

Table 7: The results of hypothesis testing

Hypothesis	Hypothesis to be tested	Results
H_1	Significance recognition will have a positive (+) effect on technical impact	Accept
H_2	Significance recognition will have a positive (+) effect on project management capability	Accept
H_3	Significance recognition will have a positive (+) effect on corporate image	Accept
H_4	Technical impact will have a positive (+) effect on project management capability	Accept
H_5	Technical impact will have a positive (+) effect on corporate image	Accept
H_6	Project management capability will have a positive (+) effect on corporate image	Reject

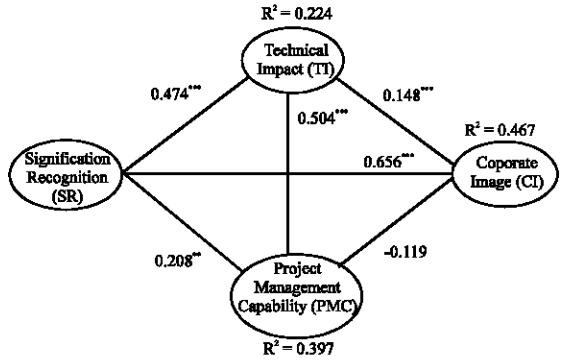

Fig. 2: The structural path

effect on project management capability (standardized coefficient α = 0.504, p = 0.000), technical impact had a positive effect on corporate image (standardized coefficient α = 0.148, p = 0.041) but project management capability did not have a significant effect on corporate image (standardized coefficient α = -0.119, p = 0.083). Finally, the results of hypothesis testing on our research are showed in Table 7.

CONCLUSION

Results and implications: This research was carried out to check the effect of significance recognition of consulting projects on corporate image as well as technical impact and project management capability as consulting performance from the customer perspective in SMEs and startups which experienced government-supported technical consulting projects. The results of this research are as follows. It was found that the significance recognition of consulting project had a positive (+) effect on technical impact and project management capability as consulting performance and significance recognition had a positive (+) effect on corporate image. And in the influencing relationship between technical impact and project management capability as consulting performance, technical impact had a positive (+) effect on project management capability. Finally, technical impact had a positive (+) effect on corporate image but project management capability did not have a meaningful influence on corporate image. This presents that there is no direct relationship between project management capability and corporate image in technical consulting. The findings from this research suggest that in government's consulting support programs the SMEs and startup's significance recognition of consulting project is expected to lead to activation of consulting support projects and reinforcement of competitiveness in SMEs and startups.

RECOMMENDATIONS

This research has the limitations, and suggests the directivity for future research. First, given the multiformity of characteristics of SMEs and startups, more significant policy implications could be suggested if reflecting various factors such joint research, listing and technology life cycle. Second, there is a need to conduct a research on various types of business because the types of business of the domestic SMEs and startups selected as parent groups are limited.

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