



ON FACTORS AFFECTING TRUST IN PROJECT MANAGEMENT

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Abstract The article investigates the factors affecting a trust in project management. The factors influencing trust in program and project management classified as either a cognitive-based or an affect-based are defined and analyzed in both manufacturing and service sectors based on survey data collected from project managers of various industries and service sectors firms in USA and abroad. The article analyzes the trust affecting factors in both vertical such as supervisor-subordinate and horizontal such as peer-to-peer type of dependency among project management processes participants. The article follows two previously published articles by author on trust in project management.

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1. INTRODUCTION

The last few decades brought an increased interest in the concept of trust by researchers in many disciplines that include the behavioral-, social-, organizational sciences as well as psychology and business. Predominantly academic but also industry initiated research explores trust and its effects on human interactions, interpersonal cooperation, and the value and efficiency of various organizational structures (Blau, 1964; Bleicher, 1991; Blomqvist, 1997; Fox, 1975; Grudzewski, Hejduk & Sankowska, 2008; Grudzewski, Hejduk, Sankowska & Wantuchowicz, 2008; Hartman, 1999; Lewicki & Bunker, 1996; Lewis & Wiegert, 1985; McAllister, 1995; Mintzberg, 1979, 1980; Meyerson Weick & Kramer, 1996; Noorderhaven, 1992; Rousseau, Sitkin, Burt & Camerer, 1998; Rotter, 1967). For an extensive review of trust concept as it applies to various disciplines, especially to

program and project management, a reader is referred to McAllister (1995), Pinto, Slevin and English (2009), Robert (2015), Smyth, Gustafsson and Gansaku, 2010; and Gapinski (2017). Growing complexity of projects in many sectors of the economy forced inevitably business management theorists and practioners alike to look at the trust issue and its affecting factors to improve an effectiveness of project management processes (Henry, 2012; MvAllister, 1995; Meyerson, Weick & Kramer, 1996; Pietro, 2012; Robert, 2015).

Few researches proposed trust models supported by empirical analyses (McAllister, 1995; Robert, 2015). Gapinski (2017a,b) proposed a model, which took into consideration the type of business relationship between interacting parties either horizontal such as peer-to-peer or vertical such as supervisor-subordinate as it applies to program and project management.

2. TRUST MODEL AND ITS AFFECTING FACTORS

In the proposed trust model depicted in Fig. 1 (Gapinski, 2017a,b), trust is affected by cognitive-based factors (CBT) and affect-based factors (ABT) resulting in cumulative trust (CT). The model enhances the model of McAllister (1995) by taking into account the type of dependency either vertical or horizontal among project management participants. In the model (Fig. 1) the cognitive-based trust (CBT) affecting factors are: competence, responsibility, reliability, organizational formalization, and organizational culture, and factors affecting affect-based trust (ABT) are based on citizenship behavior, integrity, and cultural affinity. The contributions of cognitive-based trust and affect-based trust to cumulative trust (CT) are depicted by a continuous arrow in case of dominant vertical dependence (DVD), and by a dashed arrow for dominant horizontal dependence (DHD) both pointing to cumulative trust (CT) (Fig. 1). Thus, overall trust is the result of the sum of unequal contributions

by cognitive-based and affect-based factors depending on formal either vertical or horizontal organizational dependency (Gapinski, 2017a,b).

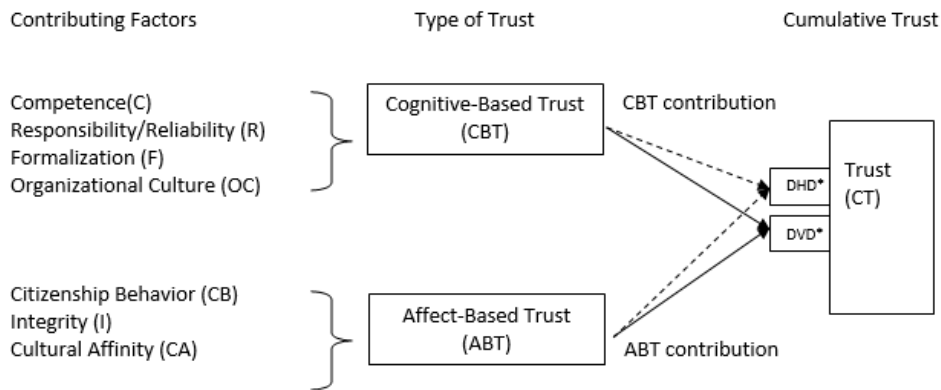


Fig. 1 Trust model in program/project management (Gapinski , 2017a,b)

Here: * DVD = dominant vertical dependence; DHD = dominant horizontal dependence

One can express the Cumulative Trust (CT) and its value based on contributions of CBT and ABT as (Gapinski, 2017b):

CBT = f(C, R, F, OC); real-valued f function dependent on C, R, F, OC factors

ABT = g(CB, I, CA); real-valued g function dependent on CB, I, CA factors

$$CT = CBT + ABT$$

The equation (1) which is applicable in all cases takes a following more specific form when investigating trust in business relation when relationship has vertical or horizontal dominant dependence:

$$CT = CBT_D + ABT_D$$

where subscript D denotes dominant dependence either vertical (D = V), or horizontal (D = H). It is assumed that $CBT_D = \beta_D CT$ where coefficient β_D is a CBT_D contribution towards CT and $ABT_D = \Psi_D CT$ where Ψ_D represents the ABT_D contribution towards CT. Since $\beta_D + \Psi_D = 100\%$ (in percent) for D = V or D = H, we have $\Psi_D = 100\% - \beta_D$.

The model in Fig. 1 (Gapinski, 2017b) allowed to formulate various hypotheses and test them based on analysis of the collected data. For detailed information on formulated and tested hypotheses a reader is referred to Gapinski (2017a,b).

In next section the factors affecting trust and their significance will be analyzed using empirical data.

3. ANALYSIS OF THE ROLE OF INDIVIDUAL CONTRIBUTING FACTORS IN COGNITIVE-BASED AND AFFECT-BASED TRUSTS

The analysis and assessment of the significance of contributions of individual factors to cognitive-based and affect-based trusts as perceived or actual and desired or ideal by project manager questionnaire respondents is the subject of this section.

The purpose of the empirical analysis was to establish the significance of the individual factors affecting trust. In the case of cognitive-based trust (CBT) the attributes under investigation were: competence, responsibility, reliability, organizational formalization, and organizational culture, and in the case of affect-based trust (ABT) the attributes under considerations were: citizenship behavior, integrity, and cultural affinity. To establish the importance and the contributions of the affecting factors to trust the questionnaire titled Trust in Project/Program Management (see Appendix) was disseminated among various managers in industry and service sectors. The responders were asked to assess the actual importance of CBT and ABT attributes as contributing factors to trust in their respective organizations. The responders were also asked to assess the desired or expected importance in an ideal situation of these attributes for building a trust within their organizational entity. An interesting question arises which may prompt another study, namely: does/can and to what extent the agreement or disagreement between the actual and desired assessment of importance of trust affecting factors determines the overall success of the organization in the marketplace?

The following results were obtained based on survey assessment of cognitive-based trust (CBT) and affect-based trust (ABT) attributes as perceived (actual) and desired degree of importance in eyes of the respondents (Tab. 1–2). Namely, the respondents were asked to assess the actual contribution of CBT and ABT attributes to trust within the organization using a scale from 1 (strongly disagree) to 7 (strongly agree) and to assess importance of these attributes using a scale of 1–4 for four CBT attributes and a scale 1–3 for three attributes of ABT.

In dominant vertical dependence (Tab. 1) the respondents assessed the actual significance of CBT attributes such as competence, responsibility/reliability, formalized structure and organizational culture with mean values of 5.5, 6, 5.1, and 5.1 respectively. Thus, they assigned the highest importance to the responsibility and reliability attributes to be followed by competence, formalized structure and organizational culture. As far as ABT attributes are concerned the respondents assessed integrity with the highest mean value of 6 followed by citizenship and cultural affinity with mean values of 5.5, and 5.4 respectively. Furthermore for vertical dependence it seems to be a match between perceived actual importance

and desired importance of these attributing factors for both CBT and ABT cases. Namely, for CBT contributing factors, the assessment means were: 5.5, 6, 5.1, 5.1 vs. 2.7, 3.1, 2.3, 3, respectively (see Table 1 Actual vs Desired Mean Values). For ABT contributing factors the assessment means were: 5.5, 6, 5.4 vs. 2.2, 2.9, 1.8, respectively (Tab. 1 Actual vs Desired Mean Values). Also, respondents assigned a little bit higher value to the desired importance of organizational culture (3; scale 1–4) than to the actual organizational culture assessment (5.1; scale 1–7).

Table 1 Dominant Vertical Dependence. Assessment of CBT and ABT Attributes: Actual and Desired Importance. Actual = A, Desired = Dd

CBT Attributes								
	Competence		Responsibility Reliability		Formalized Structure		Organizational Culture	
	A	Dd	A	Dd	A	Dd	A	Dd
Scale	1-7	1-4	1-7	1-4	1-7	1-4	1-7	1-4
Mean	5.5	2.7	6.0	3.1	5.1	2.3	5.1	3.0
Median	6.0	3.0	6.0	3.0	5.5	2.5	6.0	3.0
Mode	6.0	3.0	6.0	3.0	6.0	1.0	6.0	4.0
Range	5.0	3.0	2.0	2.0	5.0	3.0	6.0	3.0
Min	2.0	1.0	5.0	2.0	2.0	1.0	1.0	1.0
Max	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0
ABT Attributes								
	Citizenship		Integrity		Cultural Affinity			
	A	Dd	A	Dd	A	Dd	A	Dd
Scale	1-7	1-3	1-7	1-3	1-7	1-3	1-7	1-3
Mean	5.5	2.2	6.0	2.9	5.4	1.8		
Median	6.0	2.0	6.0	3.0	5.5	2.0		
Mode	7.0	3.0	6.0	3.0	5.0	1.0		
Range	5.0	2.0	3.0	3.0	4.0	3.0		
Min	2.0	1.0	4.0	1.0	3.0	1.0		
Max	7.0	3.0	7.0	4.0	7.0	4.0		

In lateral dependence (Tab. 2) the mean values assigned to CBT contributing factors such as competence, responsibility/reliability, formalized structure and organizational culture were as follows: 5.5, 5.7, 5.7, and 5.5 respectively. In this case respondents assigned the highest value equally to the responsibility/reliability (5.7) and formalized structure (5.7) attributes within organization. It is quite understandable that in the case of lateral dependence the respondents placed higher importance to formalized structure (5.7) and organizational culture (5.5) compared to vertical relationship (5.1, 5.1, respectively) in order to ensure that the needed organizational framework attains the desired effectiveness of the project management operations. It seems that respondents assigned higher importance to these factors to compensate for perceived deficiencies of less formal horizontal dependence. This last finding seems to confirm the result reported by Hopej-Kaminska, Hopej and

Kaminski (2014), who noted that formalization and standardization tend to increase institutional trust.

The formalized structure factor offers the most drastic difference between the actually perceived (5.7) and desired (2.3) importance among CBT factors. The explanation may lie in the fact that the most respondents felt comfortable and satisfied with current organizational structure as conducive for creating trust and did not feel a desire to change it.

Table 2 Dominant Lateral Dependence. Assessment of CBT and ABT Attributes: Actual and Desired Importance. Actual = A, Desired = Dd

CBT Attributes								
	Competence		Responsibility Reliability		Formalized Structure		Organizational Culture	
	A	Dd	A	Dd	A	Dd	A	Dd
Scale	1-7	1-4	1-7	1-4	1-7	1-4	1-7	1-4
Mean	5.5	3.2	5.7	3.0	5.7	2.3	5.5	3.0
Median	6.0	4.0	6.0	3.0	6.0	2.0	6.0	3.0
Mode	7.0	4.0	6.0	3.0	7.0	1.0	6.0	4.0
Range	4.0	3.0	4.0	3.0	5.0	3.0	3.0	3.0
Min	3.0	1.0	3.0	2.0	2.0	1.0	4.0	1.0
Max	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0
ABT Attributes								
	Citizenship		Integrity		Cultural Affinity			
	A	Dd	A	Dd	A	Dd		
Scale	1-7	1-3	1-7	1-3	1-7	1-3		
Mean	5.3	2.6	5.1	2.7	4.8	1.8		
Median	6.0	3.0	5.0	3.0	5.0	2.0		
Mode	6.0	3.0	5.0	3.0	5.0	1.0		
Range	5.0	3.0	5.0	3.0	6.0	2.0		
Min	2.0	1.0	2.0	1.0	1.0	1.0		
Max	7.0	4.0	7.0	4.0	7.0	3.0		

With respect to ABT attributes, the respondents assessed citizenship with highest mean value of 5.3, followed by integrity and cultural affinity with values of 5.1, and 4.8 respectively. Thus, while in vertical dependence the respondents assigned the highest importance to integrity (6) of co-workers, in the lateral relationship the citizenship (5.3), which encompasses good interpersonal and social skills, was viewed as more important factor. While in case of lateral dependence the importance of attributes as actually perceived was matched by the desired with respect to most CBT factors, in the case of ABT the desired integrity factor was assigned a little higher value (2.7), than citizenship skills (2.6), which indicated the inversion of the importance priority of actual perceived factors of integrity and citizenship, 5.1 vs. 5.3 respectively (Tab. 2). In both scenarios (DVD and DHD) responders

placed importance of cultural affinity below citizenship and integrity as a contributing factor in developing trust.

Additionally, the data analysis (Gapinski, 2017b) shows much larger spread or range of ABT contribution than of CBT in the eyes of responders, 80 vis-à-vis 40 in percent, respectively, indicating more susceptibility of ABT attributes to individual assessment driven by individual lateral work-based relations.

4. CONCLUSION

The article described and analyzed the factors affecting trust in project management. The subject of the analysis is the trust model introduced by author in predeceasing articles. The model with its affecting factors presented here takes into account organizational dependencies, whether vertical or lateral as dominant one which affect trust as perceived by parties in an organization. The article investigates the degree of importance of individual contributing factors and their respective impact on overall trust. The anonymous questionnaires collected from numerous project managers representing various industries and service sectors were analyzed and allowed to draw conclusions applicable to project management processes. Thus, the paper together with two previously published articles by author on trust in project management enhances the prior model reported in the literature and brings new understanding on how the type of business relationship affects trust in project management interactions.

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APPENDIX

Trust in Project/Program Management

Penn State University-Fayette

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Questionnaire

Please fill out each form for one type of dependence if present.

(Type of Dominant Type of Activities' Dependency: Vertical: Supervisor-Subordinate or Lateral: Peer-to-Peer)

What type is your company/organization (manufacturing, material engineering, service, IT, utility, etc.)?

Type of project work (design, manufacturing, software development, mining industry, healthcare, services, etc.):

Company size: (small, medium, large)

Characterize your activities and responsibilities:

Activity Type:	Yes	No
Project Management		
Project work		
Program Management		
Program work		
Intra-organizational (within organization)		
Inter-organizational (collaboration with external organization/entity)		
Collaboration Type:	Blank	Blank
Collaboration has mostly vertical dependence (supervisor-subordinate)		
Explain shortly the dependence:	If vertical, are you a supervisor? Are you a subordinate?	
Collaboration has mostly lateral (horizontal, peer-to-peer) dependence		
Explain shortly the dependence:	If lateral, are you a supervisor? Are you a subordinate?	

Note:

CBT: cognitive-based trust is based on your belief in other party competence, responsibility & reliability, formalized structure (promoting trust), organizational culture (promoting trust)

ABT: affect-based trust is based on belief that other party brings good citizenship, integrity and cultural affinity in work relations.

Evaluate:

1. Assess using scale from 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neutral), 5 (somewhat agree), 6 (agree), to 7 (strongly agree) the actual (Actual Grade) Cognitive-Based Trust (CBT) and Affect-Based Trust (ABT) attributes within your immediate organization (such as project team, or collaboration with other group on peer-to-peer basis);
2. Assess importance (Importance Scale) of each attribute using scale from 1(lowest) – 4(highest) for CBT or 1(lowest) – 3(highest) for ABT.

Trust & Attributes	Actual Grade: 1(lowest)-7(highest)	Importance Scale: 1(lowest)-4(highest); use each digit only once below
Cognitive-Based Trust (CBT):		
I believe that the other party is competent (competence)		
I believe that the other party performs duty responsibly and reliably (responsibility & reliability)		
I believe that our immediate organization (project group, etc.) has an efficient formalized structure conducive to institutional trust (formalized structure)		
I believe that our organizational culture is conducive to reaching our goals (organizational culture)		
Affect-Based Trust (ABT):	Blank	Scale 1(low)-3 (high); Use each digit only once below
I feel that the other party brings good citizenship characteristics to the table (citizenship)		
I feel that the other party has professional & ethical integrity and it looks for my interests (integrity)		
I feel cultural affinity to other co-workers (cultural affinity)		

BIOGRAPHICAL NOTES

Andrzej J. Gapinski Associate Professor of Engineering at The Pennsylvania State University, Pennsylvania, USA. Dr. A. Gapinski received his Ph.D. in Electrical Engineering from Texas Tech University, Lubbock, Texas, USA in 1988. He obtained his Master Degree in Electronics, Institute of Technical Cybernetics, Wroclaw University of Science and Technology, Wroclaw, Poland in 1978. He also holds an International Business Certificate (Podyplomowe Studium Handlu Zorganizowanego, SGH) from Warsaw School of Economics, Warsaw, Poland. His research interests are in control & system theory, information science and technology, project management, manufacturing processes and pedagogy. He has over 50 refereed publications in various journals and conference proceedings. He consults for industrial and manufacturing firms in the area of industrial control and manufacturing processes.