



Research on the Influence of Trust on Knowledge Sharing in Online Community of Engineering Projects

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Abstract. Trust is an important driving force to promote interaction among project online community members and increase information flow and knowledge sharing in online community. In order to improve the knowledge sharing relationship between project organizations, this paper divides trust in online communities into three types: technical trust, economic trust and emotional trust. Through theoretical and literature analysis, a hypothesis model is established, and regression equation is used to verify the hypothesis. It is found that technical trust, economic trust and emotional trust all significantly affect the knowledge sharing behavior of learners in online communities.

Keywords: Engineering project; Online communities; Knowledge sharing; Technology trust; Economic trust; Emotional trust

1 Introduction

The concept of online community was first put forward by RHEINGOLD^[1], who defined it as "a social collection formed by a group of people who mainly use computers to conduct public discussions and care for each other". Project online community/group is the most important form of mobile communication, and the establishment of project work groups (online communities) has become a "prescribed action" in the process of online project implementation. These planning Spaces have become an indispensable place for project team collaboration and community organization (communication, collaboration, knowledge sharing), constituting a new context for knowledge sharing. In the engineering project environment, the trust factor may be a very important factor affecting the knowledge sharing of individuals. Existing studies rarely distinguish the types of trust, but study the relationship between trust and knowledge sharing in the form of a whole. In the studies that make distinctions, more attention is paid to the interpersonal trust level, rather than the impact of trust on knowledge sharing from the perspective of dynamic development.

2 Presentation of Problem

Knowledge sharing is an important way for engineering project teams to obtain unique, valuable and key resources. Only through continuous knowledge sharing among participants can knowledge and technology be updated and accumulated to achieve project success. However, due to the one-off nature of the project and the temporary and loose nature of the organization, real team members often show low willingness to share knowledge in the project online community, and the atmosphere of sharing knowledge problems in the project online community is not strong, and even "tense" and "cold", forming a typical collective action dilemma. As a result, many knowledge and technologies cannot be disseminated and accumulated in a timely and effective manner, which is not conducive to the knowledge accumulation and technological innovation of engineering projects^[2].

3 Research Design

3.1 Research Hypothesis

Based on the combing and analysis of relevant research contents, this study intends to introduce the framework of social learning theory to elaborate the relationship between trust and knowledge sharing^[3]. Among them, social environment factors include technical trust, economic trust and emotional trust, personal factor is knowledge sharing experience, and behavioral factor is knowledge sharing. Based on the review and analysis of the above literatures, this study proposes the following hypotheses:

Hypothesis H1: Technology trust has a significant impact on the knowledge sharing behavior of learners in project online communities.

Hypothesis H2: Economic trust has a significant influence on the knowledge sharing behavior of learners in project online communities.

Hypothesis H3: Emotional trust significantly influences the knowledge sharing behavior of learners in project online communities.

3.2 Research Tool Design

This study uses the questionnaire survey method to carry out research. The participants in this questionnaire held various positions within their respective projects, including project manager, construction worker, quality inspector, technician, cost auditor, material officer, etc. Among them, the majority were construction workers and technicians, which aligns with the actual project situation. The first section of the questionnaire focuses on personal information statistics and consists of three questions regarding gender, major field of study, and education level. The second section constitutes the main part of the questionnaire and comprises five variables with a total of 20 questions. To ensure the reliability and validity of this study, all scales used are derived from well-established measures that have been adapted to suit the specific context and environment of this research^[4]. Table 1 presents the sources for each item included in

the questionnaire. A 7-point Likert scale was employed for measurement purposes where respondents indicate their agreement or disagreement on a scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Table 1. Sources of measurement problems

Measured variable	Item quantity	Sources
Knowledge sharing	5	Wang Guohua (2017)
Technology trust	3	Ni Guodong (2015,2017)
Economic trust	3	Zhang Weiwei(2020)
Emotional trust	6	Deng Hui(2022)

3.3 Questionnaire Distribution and Sample Statistics

The present study considers trust and knowledge sharing as fundamental variables within online communities, constructs a hypothesis model through theoretical deduction, and employs a questionnaire survey to validate the hypothesis and investigate the relationship between these two factors^[5]. The actual research data were collected using the questionnaire distribution method on the "Questionnaire Star" platform. A total of 275 questionnaires met the inclusion criteria, with 230 valid questionnaires obtained after data cleaning.

4 Data Analysis

4.1 Reliability and Validity Analysis

The reliability and validity of the research are directly linked to the accuracy and scientific rigor of the research findings. Cronbach's α coefficient was utilized to assess the study's reliability^[6], revealing an overall reliability score of 0.942, indicating a high level of dependability in this study. The measurement questionnaire items employed in this research were sourced from well-established questionnaires with strong recognition and thus possess high content validity.

4.2 Trust and Knowledge Sharing in Online Learning Communities

In order to clearly and effectively describe the basic situation of variables in each dimension, it is necessary to conduct standardized processing of variables and measurement items, and obtain the description and analysis table of each major variable, as shown in Table 2. Among them, knowledge sharing has a higher score ($t=5.620000$), indicating that online learners have a higher willingness to share knowledge or a more frequent behavior of sharing knowledge in the process of online learning, and the standard deviation is small ($SD=0.9429768$), and the standardized data is closer to the mean. Among the three types of trust, the score of affective trust was higher ($t=5.628261$) and the standard deviation was lower ($SD=0.9837833$), indicating that learners had a higher perception of affective trust in the process of online learning. The

mean value of economic trust was the lowest ($t=5.269565$), and the standard deviation was higher ($SD=1.0731568$), indicating that online learners' perception of economic trust was low, and there was a possibility of polarization. The mean value of technology trust was higher ($t=5.500000$), but the standard deviation was the highest ($SD=1.1109049$), indicating that online learners' perception of technology trust showed great differentiation.

Table 2. Basic situation of trust and knowledge sharing in project online community

	N	Mini- mum	Max- imum	Mea n	Standard deviation	Cronbach's α coefficient
Knowledge sharing	230	2.000 0	7.000	5.62 0000	0.9429768	0.901
Emotional trust	230	1.000 0	7.000	5.62 8261	0.9837383	0.901
Economic trust	230	1.000 0	7.000	5.26 9565	1.0731568	0.833
Technology trust	230	1.000 0	7.000	5.50 0000	1.1109049	0.896

4.3 Regression Path Coefficient Analysis

The concept of regression path coefficient holds significant importance in regression analysis as it quantifies the impact of independent variables on dependent variables^[7]. In regression analysis, our primary objective is to establish the relationship between the independent and dependent variables, enabling us to predict or explain changes in the dependent variable. Additionally, this helps determine correlations and predictive relationships among unknown variables, thereby enhancing accuracy. However, there may arise certain challenges while analyzing variable correlations such as non-linearity in their relationship or high multicollinearity which can potentially affect the precision of regression analysis. This study focuses on trust and knowledge sharing within online communities as core variables and establishes four influential paths based on theoretical deduction. Furthermore, a questionnaire is employed to validate these hypotheses and explore the relationship between these two factors.

The data were standardized and separate regression equations were established based on the research hypotheses^[8]. Table 3 presents a summary of the regression equations corresponding to each hypothesis. The model established in this study exhibits a high degree of fit, as indicated by the high R^2 coefficient and Sig. value below 0.01. During collinear diagnostic analysis, all assumed eigenvalues were found to be less than 10, and the variance expansion coefficient was also less than 10, confirming the absence of multicollinearity issues. Hypothesis testing revealed significant predictive effects of emotional trust ($\beta=0.737$, $t=16.474$, $p=0.000$), economic trust ($\beta=0.604$, $t=11.451$, $p=0.000$), and technical trust ($\beta=0.460$, $t=7.830$, $p=0.002$) on knowledge sharing. The impact of emotional trust is particularly noteworthy while technical trust has a weaker influence overall. Trust significantly affects knowledge sharing ($\beta = 0.748$, $t=17.031$, $p = 0.000$), and vice versa.

Table 3. Path coefficient test

Path	Regression coefficient		t	Model fit degree		Collinear statistics	
	Non-standardized	Standardization		R ²	Sig.	Variance expansion coefficient	Eigenvalue
Emotional Trust → Knowledge sharing	0.707	0.737	16.474**	0.543	0.000	2.195	0.015
Economic Trust → Knowledge Sharing	0.531	0.604	11.451**	0.365	0.000	1.639	0.020
Technology Trust → Knowledge sharing	0.391	0.460	7.830**	0.212	0.000	1.263	0.014
Trust → Knowledge sharing	0.840	0.748	17.031**	0.560	0.000	1.000	0.012

5 Conclusion

The influence of trust on knowledge sharing behavior in engineering project online community is essentially the reflection of individual behavior in different environmental factors^[9]. Emotional trust is determined by empathy, common interests and values generated during the interaction of project members. As an emotional bond, emotional trust is the most important influencing factor in corporate culture and plays a guiding role in the knowledge sharing behavior of project members. In essence, economic trust is a mutually beneficial relationship. The interaction between members in online communities is generally based on mutual benefit^[10]. Project members are more interested in what they can get, which may be economic benefits, reputation, project achievements, etc., which bring motivation to the knowledge sharing behavior of project members. Technology trust is essentially the availability of internal system tools in enterprises, but due to the characteristics of engineering projects, there are many uncontrollable factors in online communities, making members in online communities in many uncertain factors. Among them, project members' perception of system factors will lead to basic value judgments, such as whether the internal system tools are easy to use, whether personal privacy can be protected, and whether certain behaviors need to be held accountable, which will directly affect the willingness of members in online communities to share knowledge. Therefore, these three types of trust as predictive variables can well predict the occurrence of knowledge sharing behavior among project members in online communities.

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