The Value of Weak vs. Strong Ties between Individuals and Projects for New Product Review

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Abstract

This study extends the concept of weak and strong ties to the relationship between an individual and a project, in the context of a formal review process. Using data collected from a project at a research and development laboratory, several hypotheses relating the utility of feedback from reviewers to differing strengths of ties to the project are tested. Results indicate that (1) the value of feedback from stronger ties is higher than from weaker ties; (2) weaker ties generate more unique input; and (3) weaker ties generate a greater amount of non-useful feedback. Implications for practice and future research are discussed.

1. Introduction

The ability to convert creative concepts into new products is critical for companies. Successful new product development (NPD) projects are credited with improving performance, increasing innovation and extending the life of organizations [3].

Innovation, however, is risky business. Detecting flaws and identifying problems early is critical for project success. As the level of innovation increases, however, it becomes increasingly difficult to evaluate projects due to novelty and a lack of direct experience. Despite these challenges, companies need a way to evaluate designs and identify potential problems. Given a lack of direct experience, companies often must rely on the judgment of others [17], which may be impacted by the degree to which they understand the context [12].

Formal review processes are a popular mechanism for applying the combined knowledge and experience of a group toward evaluating projects [7]. In a formal review, a group of people with experience in relevant domains independently assesses a project and the product being produced. They address areas such as the quality of the design, potential problems or risk areas, errors and omissions, and sufficiency of resources to complete the project.

Providing a project with a large volume of disconnected feedback, however, limits the potential usefulness of the reviewer contributions. As indicated by Grant [11], firms that can integrate individual's specialized knowledge can gain a competitive advantage. Therefore, it's not enough to just assemble a multi-disciplinary review board; an organization must also support the integration of this expertise in order to gain a competitive advantage.

As projects increase in complexity, reviews become more challenging to perform due to the difficulties of understanding the project in total, the variety of disciplines that must be addressed, and limited time in which to disrupt progress on the project to conduct the review. The quality of the review depends on having the "requisite variety" [2] of knowledge on the review board, i.e., being able to address everything from detailed technical issues across multiple disciplines, to an integrated, strategic assessment of the project relative to organizational goals.

Reviews provide an institutionally driven, formal approach to knowledge sharing. Bringing the right skills and expertise together to provide feedback enables an individual project to benefit from the organization's knowledge. Bringing too many people together or the wrong mix of skills can result in overwhelming the project team or providing non-constructive feedback. The question therefore is how to assemble a review board that has the requisite variety of experience while maintaining the capability to integrate the knowledge productively and ensure relevance to the project?

This research turns to social network theory and the concept of weak and strong ties to address the question of review participation for knowledge sharing. This paper first identifies key concepts and results from the social networks literature to postulate

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application of weak and strong tie effects for formal reviews. I then test these literature-based hypotheses using data from a major peer review effort for a new product at an R&D laboratory. Finally, based on the support indicated for the three hypotheses, I discuss implications for theory and practice.

2. Strong and weak ties in knowledge sharing

Social network research investigates phenomena that arise from networks of interpersonal relationships [10]. Network features of structure (e.g., closure and structural holes) as well as tie content (e.g., shared beliefs, abilities) affect the behavior of social networks [1].

A prominent feature of social networks is that they facilitate the transfer of information [1][5][9][10][13]. Granovetter [9] proposed that the flow of information in a network is influenced by the strength of interpersonal ties, defined as a combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services (p. 1362) between nodes. Rather than devising a precise measure, he recommended a qualitative assessment of ties as weak, strong, or absent.

Subsequent researchers have built on Granovetter's [9] strength of weak ties theory. Strong ties have been shown to provide resources, contextualized advice, and access to trusted sources; weak ties enable access to a volume and diversity of information not immediately available to the individual [5]. Studies indicate that weak ties are useful for job search [9], access to technical advice [5], innovation [20], and new product development [13].

Research on strong and weak ties has expanded from looking only at interpersonal relationships. Hansen [13], for example, extended the concept to address knowledge sharing across organization subunits in a multiunit organization, specifically between project teams. Analogous to results at the interpersonal level, he found that "weak inter-unit ties help a project team search for useful knowledge … but impede the transfer of complex knowledge which tend to require a strong tie…" (p. 44).

2.1. Strong and Weak Ties Applied to Formal Review Boards

Social network research tends to focus on informal networks and interpersonal relationships. Therefore, applying social network research to formal review processes and work-based networks requires extrapolating previous results to a new environment.

Formal review processes bring together groups of experts to provide feedback to projects [21]. These reviewers generally represent the interests of both the organization and the project. From an organizational perspective, reviews lend confidence that the project is proceeding acceptably and that there are no major problems lurking around waiting for the most inopportune moment to surface. The project similarly benefits from having external experts identify potential or latent problems, sanity check assumptions, and recommend improvements.

Projects are often conducted by teams who "see themselves and who are seen by others as an intact social entity embedded in one or more larger social systems, and who manager their relationships across boundaries" (p. 241) [4]. There is a clear boundary between the project as an organizational entity and individuals who are part of the larger organization but not members of the project team. Therefore, relationships can exist between the project and the individuals serving as reviewers which are neither interpersonal nor organizational, but which nonetheless constitutes a "tie." These relationships do not involve the reviewer "identifying" [14][19] with the project, because both the reviewer and the project see the reviewer as an external party.

The strength of the individual-project tie can be viewed as the degree of involvement the individual has with the project. The individual reviewer's involvement, however, is mediated by the review board structure, which can serve as a "local bridge" [10] between two otherwise unconnected entities. By definition, these relationships are considered weak ties.

Independent reviewers are chosen to provide unbiased feedback to the project. By being removed from the history of the project, independent reviewers have the potential to take a fresh look, and see things that those more closely involved with the project may overlook due to familiarity [16].

In addition, reviewers not closely associated with the project bring a separate set of experiences and the ability to apply different knowledge. Selecting reviewers who have weak ties to the project should then lead to greater independence, and the ability to identify more issues, leading to the first hypothesis:

H1: *Weak ties will generate more unique feedback than strong ties.*

Strong ties have been shown to be more useful for the transfer of complex knowledge in new product development projects. In a study of new product

development tasks and minimizing completion time, Hansen [13] found that the transfer of complex knowledge required a strong tie between two individuals, and that weak ties tend to slow down transfer.

Cross and Sproull [6] suggest that strong ties probably provide information and guidance that help shape how recipients think about problems. Their research further suggests that sources for problem reformulation benefited from strong ties, who did not have to be problem domain experts. These strong tie sources were valued for "their ability to point out important dimensions of problems and consequences of potential actions" (p. 458).

Selecting reviewers who have strong ties to the project should therefore enable the transfer of more-complex knowledge, and lead to feedback which is more relevant, and therefore of greater utility. This leads to the second hypothesis:

H2: *The utility of feedback from stronger ties will be greater than from weaker ties.*

Weak ties have been shown to facilitate the transfer of explicit knowledge – that which is easily identifiable [13]. This type of knowledge is generally less contextualized. Weak ties therefore, have a greater potential to produce inputs that are less specific to the project, or alternatively, to increase non-useful inputs as well as useful inputs [5]. Therefore, feedback from weak ties can lead to extraneous feedback that doesn't add value to the project team. This leads to the third hypothesis:

H3: *The feedback obtained from weaker ties will include more non-useful feedback than from stronger ties.*

3. Method

This study was conducted at a major R&D laboratory during the review of the design concept for a major new product. Data was collected during the review process and was facilitated by the use of a new web-based knowledge management system designed to support formal reviews. The organization's review of the new product proposal was conducted using a multi-tiered review structure. The top level was the *review board*, formed from upper managers who would have technical and programmatic responsibility for implementation of the proposed project if it were selected. The review board had the responsibility to provide an integrated feedback package to the project team. The review board then selected a set of mid-level managers to serve as *review captains*. The captains were responsible for coordinating inputs from different technical disciplines and were often technical experts in their own right. Finally, a group of *individual reviewers* were assembled from experts in the relevant scientific, technical, and professional disciplines across the Laboratory.

The review itself covered the overall concept, product design, and management approach for the proposed project. Data collected during the review process was used to test the hypotheses presented in the previous section. The following sections describe the data source and data collection.

3.1. Data Source

The goal of the new product proposal evaluated in this study was to obtain external funding for development of the product. The new product proposal underwent a formal review process that lasted two weeks and involved 49 individuals as board members, review captains, and individual reviewers.

Individual reviewers were selected from throughout the organization based on relevant expertise in technical, management, and customer-related disciplines. Individual reviewers were grouped into teams by discipline, with each team led by a team captain. Each reviewer, including the team captains and review board members, independently evaluated the product proposal and submitted feedback in the form of review item discrepancies (RIDs).

Individual reviewers routed their feedback to the team captain in the appropriate review discipline. These disciplines consisted of two management areas, four technical areas, two customer-related areas, and one editorial area (although reviewers were strongly discouraged from submitting feedback that was strictly editorial). The team captains consolidated feedback from all the inputs received in their area. They were responsible for grouping related feedback and checking that inputs were appropriately categorized. Minimal changes were made to the individual reviewer inputs. The team captains then submitted their consolidated input to the top-level review board.

The review board then developed the integrated feedback package. They further consolidated inputs by grouping related items, removing redundancies, reconciling contradictory feedback, assigning priorities, and organizing the feedback.

This consolidated feedback was then given to the project team. The project team reviewed the

feedback, and decided whether they would (a) (b) decline the feedback (for example, because it didn't make sense or it addressed something that was no longer applicable). The team then met with the review board to resolve any questions and reach concurrence on feedback they decided to decline.

Table 1 summarizes (a) the feedback given by individual reviewers, and (b) the breakdown of RIDs released to the team, the consolidated input, based on importance and team acceptance.

Table 1a Individual Reviewer Input

563	Total individual RIDs generated
67	Rejected by review board
496	Incorporated into feedback

Reviewers submitted a total of 563 individual RIDs to the review process. Of those, the board deleted 67, and the remaining 496 were consolidated into the final package of 268 RIDs that were released to the team. Of the 268 RIDs, 12 were deemed critical (most important), 50 (major), 203 (minor), and 3 (other, least important). The team declined 21 RIDs, one major and twenty minor RIDs with concurrence from the review board.

Table 1b Consolidated Input

Importance	Accept	Decline
Critical	12	0
Major	49	1
Minor	183	20
Other	3	0
Subtotal	247	21
Total	268	

3.2. Data Collection

The unit of analysis for this study was the individual. Each reviewer was categorized based on the strength of his or her tie to the project (the independent variable). Each input provided by each individual reviewer was evaluated for its utility to the project team (the dependent variables) based on how it was evaluated first by the review board and then by the project team. The author assessed the value of the independent variable based on the assigned roles (Board, Captain, Individual Reviewer) for each person. The factors used to calculate the dependent variables were based on the review data. Scoring values were reviewed with a representative of the review board for reasonableness.

Independent Variable. The independent variable is the *strength of the tie* between the *individual* and the *project*. Following Hansen [13], Cross & Sproull [6], and Levin & Cross [20], tie strength was based on work characteristics rather than affective or other relational factors. However, rather than measuring tie strength using a survey instrument, it is operationalized based on the hierarchical position of the individual in the review structures. Those at the Board level (N=5) were assigned "strong ties", those at the Captain level (N=8) were assigned "medium ties", and those at the Individual Reviewer level (N=36) were assigned "weak ties."

This choice is consistent with the work characteristics and nature of the involvement of people assigned to each role. The weak tie reviewers were all assigned to other efforts, in many cases analogous projects. Most weak tie reviewers had narrow but deep technical expertise in disciplines relevant to the project, and were requested to review the project from the perspective of their area of expertise. These individual reviewers had no formal relationship with the project under review and serving as a reviewer was as an additional duty. They were involved for the shortest amount of time: the period during which they read the product proposal and provided their feedback. Individual reviewers generally had no direct contact with either the project team or the review board.

Conversely, the strong tie reviewers had on-going relationships with the project. In many cases, these were managers who would have implementation responsibility should the project be selected. Other strong tie reviewers were responsible for regularly assessing the project on behalf of the organization and facilitating project activities. Strong tie reviewers were part of the organizational decision making process that instigated the project, and therefore had a long-term view of both the project details and the organizational considerations for pursing the project. This group, therefore, had both an intimate and on-going relationship with the project beyond the boundaries of the review cycle and a vested interest in its success, justifying a strong tie designation [10].

The medium tie group consisted primarily of mid-level managers who had formal working relationships with both board members and domain experts outside the context of the review. During the review, they were responsible for the logistics of assembling the inputs in their discipline areas, and also making sense [22] of the collection of inputs and communicating

the breadth and depth of problems to the review board. Medium tie reviewers generally had strong work relationships with the review board members as part of their regular jobs. They had a combination of technical expertise and managerial involvement that placed them between the other two groups. Because their role shared some, but not all characteristics with both the weak and strong tie groups, I chose to create a third intermediate category to represent the team captains.

Dependent Variables. The dependent variables are based on calculations of the utility of the input provided by each reviewer, and the uniqueness of contribution based on strong, medium, and weak ties. The following factors were used in the calculations of utility:

N_k The number of individual inputs (N) submitted by each reviewer (k)

V_i The value (V) of the consolidated input (i = 1 to 268) to the project team. V = 2 if the RID was accepted, 1 if it was rejected, and 0 otherwise.

R_i The number of individual inputs (R) that were consolidated to create this RID (i)

C_i The assigned importance (C) of the RID (i). C = 10 for critical, 5 for major, 2 for minor, 1 for other, and 0 if the RID was not released.

Utility was assessed by calculating the contribution of each individual RID, given that several RIDs may have been combined to create a single input to the team. Each RID was assumed to contribute equally. Incremental utility (u) for each input (i) from each individual reviewer (k) was calculated as:

$$u_{ki} = C_i * V_i / R_i$$

Gross Utility (U_{Gk}) was calculated as the sum of the incremental utilities (u_{ki}) for reviewer k. Gross utility represents the overall positive contribution made by that individual reviewer.

$$U_{Gk} - \text{Sum}\,[u_{ki}]\ (i=1, N_k)$$

Normalized Utility (U_{Nk}) was calculated by averaging the incremental utility across all of the inputs generated by that reviewer, including those that were deleted by the review board. Normalized utility accounts for the inputs made that did not contribute to the value of the review.

$$U_{Nk} - U_{Gk} / N_k$$

Unique Contribution for each RID released to the project team was based on whether reviewers with different strength ties contributed to it. Values were assigned based on whether input was consolidated from only weak, only strong, or only medium ties, or some combination thereof. Unique contribution was measured as a simple frequency.

4. Data Analysis and Results

The descriptive statistics for the complete data set are given in Table 2. The table provides the minimum, maximum, mean and standard deviation for the number of RIDs submitted by each reviewer, the gross and normalized utility measures for each reviewer, and the number of RIDs per reviewer that were deleted at the review board level or declined by the project team.

Table 2. Descriptive statistics per Reviewer

	Min	Max	Mean	Std.D
Number of RIDS	2	80	11.49	14.02
Gross Utility	1.67	189.60	30.03	34.39
Normalized Utility	.83	11.42	2.98	1.82
Number Deleted	0	13	1.37	2.55
Number Declined	0	3	.43	.76

4.1. Uniqueness of Inputs

To test the first hypothesis, the number of RIDs attributable uniquely to strong, medium, and weak ties were compared. As shown in Table 3, the number of RIDs attributable to weak ties only is three times greater than to strong ties and seven times greater than medium ties. This provides strong support for Hypothesis 1.

Table 3. Degree of Coverage based on Strength of Ties

Degree of Coverage	# of RIDs
Weak Only	159
Medium Only	20
Strong Only	50
Weak & Medium	7
Weak & Strong	23
Medium & Strong	3
Weak, Med, & Strong	6
Total	268

4.2. Contribution from Strong Ties

To compare the utility of the three groups with differing tie-strengths and to test Hypothesis 2, an ANOVA with Duncan's Multiple Range Test was run on the Gross Utility variable. The results are presented in Tables 4 and 5.

The ANOVA indicates that the model is highly significant at a Pr > F of 0.0012, indicating that there are significant differences between the groups. The Duncan's analysis identifies two separate groups, consisting of (A) Strong tie and (B) Weak and Medium ties, indicating that differences between the strong tie group and either medium or weak tie groups are significant.

The Duncan's analysis did not, however, identify significant differences between the medium and weak tie groups. In addition, the mean for gross utility of the strong tie group is much larger than for the weak or medium tie groups, providing strong support for Hypothesis 2.

4.3. Contribution from Weak Ties to Extraneous Information

To test Hypothesis 3, an ANOVA with Duncan's Multiple Range Test was run on the Normalized Utility variable. Because the calculation for the

Table 4. ANOVA Results for Gross Utility

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	14418.26832	7209.13416	7.83	0.0012
Error	46	42361.72545	920.90708		
Corrected Total	48	56779.99378			

Table 5. Duncan's Analysis for Gross Utility

Duncan Grouping	Mean	N	Strength of Ties
A	79.87	5	Strong
B	26.10	36	Weak
B			
B	16.59	8	Medium

Table 6. ANOVA Results for Normalized Utility

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	28.1458699	14.0729349	4.98	0.0110
Error	46	130.0088261	2.8262788		
Corrected Total	48	158.1546960			

Table 7. Duncan's Analysis for Normalized Utility

Duncan Grouping	Mean	N	Strength of Ties
A	5.1137	5	Strong
B	3.2774	8	Medium
B			
B	2.6196	36	Weak

normalized utility variable includes zero values includes rejected inputs, it effectively discounts the overall utility value for a reviewer to account for both valuable and non-valuable input. The results of the analyses are shown in Tables 5 and 6.

The ANOVA indicates that the model is significant at a Pr >F of 0.0110, which is still highly significant, although less so than for Gross Utility. The Duncan's analysis once again indicates significant differences between the strong tie group and either of the other two groups, with no significant difference between the medium and weak tie groups.

The order of the medium and weak tie groups, however, is reversed. The weak tie group shows less utility when the impact of non-useful feedback is incorporated, thus supporting Hypothesis 3.

5. Discussion

All three hypotheses were supported, thereby indicating that there are significant differences in the utility of feedback provided by reviewers with weaker versus stronger ties.

As predicted, reviewers with stronger ties to the project provided feedback that had higher utility. The greater usefulness of input from these reviewers may have been due to their ability to identify the issues most relevant to the project team, based on their prior, intimate knowledge about the project and the organizational issues relating to the project. The feedback provided by these reviewers was generally more strategic in nature, and had a broader impact to the project. Therefore this feedback could have been viewed as more complex (as suggested by Hansen [13]) or resulted in problem reformulation (as suggested by Cross & Sproull [5]), which have both been shown to benefit from strong ties.

As indicated by the support for Hypothesis 2, the diversity of expertise available via weak tie reviewers enabled them to provide a much broader range of feedback. The weak tie reviewers identified significantly more issues than either of the two other groups of reviewers. The most obvious explanation is that strong tie reviewers didn't have the broad expertise available from the totality of the weak tie reviewers. However, the closeness of the strong tie reviewers to the project may have blinded them to some problems, or they may have self-edited their feedback to focus only on those areas that they considered most important.

The greater volume of input from the weak tie reviewers, however, came with a cost as indicated by the support for Hypothesis 3. Feedback that was rejected at the board level or declined by the team indicates extraneous information that required time and attention from the review board or the project team. This "noise" in the system could have negatively impacted either the board or the project team from focusing on more important issues.

Finally, the resulting analysis showed that there was a dichotomy between reviewers corresponding to the classical strong-weak classification. The original decision to place the medium tie reviewers into a separate group proved to be misplaced. Despite their organizational insights, future responsibilities, and hierarchical position, the Team Captains provided input that made them appear similar to the weak tie group, with whom they share technical expertise, rather than the strong tie group, where the similarity is in management function.

The grouping of weak and medium tie reviewers suggests that the characteristic that distinguishes strong and weak ties in this setting is day-to-day close interaction with the project. This finding is consistent with three of Granovetter's [9] dimensions that contribute to the strength of ties: the amount of time, the emotional intensity, and intimacy. The fourth dimension, reciprocal services, applies indirectly because project team members are expected to serve as reviewers for future projects. While the current reviewers don't expect reciprocal services from this project team, they will receive reciprocal services through the organization.

In summary, the results indicate that there is value in having a mix of strong ties and weak ties participants in the review process. The feedback received from each group was assessed as valuable and relevant by the project. The optimal composition of the reviewers, however, is an open question. However, as stated by Krackhardt & Hanson [18], "What matters is the fit, whether networks are in sync with company goals" (p. 110). Therefore, the optimal membership for a review may depend on the company's goal for that review cycle or project.

6. Implications

The primary research contribution of this effort is to extend the concept of strong and weak ties to relationships between an individual and a project. Results were obtained for project-individual relationships that exhibit similar characteristics to those found in dyadic interpersonal relationships and project-to-project relationships.

In addition, this research identifies a new area for network research. While most social network research focuses on *informal* networks, this research investigates a network of expertise *formally* assembled to support an organizational activity. Although there is a hierarchical component to the

way in which reviewers were organized, the hierarchy itself was loosely enforced, temporary in nature (lasted for two weeks), and existed only to handle the large volume of knowledge shared during the review process. This research, therefore, suggests that the concept of weak and strong ties has applicability to formal as well as informal networks.

Finally, this study contributes to social network research by explicitly addressing the utility of feedback received. While most social network research looks at the value of networks and weak ties to support searching for information, this research specifically addresses the value of weak ties for the proactive transfer of information. One could argue that the information providers are responding to a request from the organization on behalf of the project, thereby establishing a proxy "search" situation. But that doesn't diminish the fact the team is receiving information that they did not seek. This research shows that even in a proxy search situation, the utility of strong tie feedback is higher than weak tie feedback. This is somewhat surprising given that each participant in the review process was selected because they were viewed to have relevant knowledge.

The statistical strength of the results presented here, however, should be tempered by the limitations of the sample. The data was collected from a single review cycle for one project in one organization. Characteristics of the project, particularly the complexity [8] may impact the generalizability of the results. Less complex projects may be more easily understood by reviewers and therefore benefit less from strong tie reviewers.

Organization-specific factors may also impact the effectiveness of strong vs. weak ties, including the review process used, the nature of the feedback expected from the review board, and the type of product (in this case, a design concept for a new product) being reviewed. In addition, this organization has a long-standing tradition of using formal reviews to assess risk, identify problems, and provide help to projects. Therefore cultural factors related to sharing information may have influenced reviewer participation in ways not accounted for in this study.

The unique composition of this particular set of reviewers may also have contributed to the results. All reviewers were either recognized technical experts or highly experienced managers. Most reviewers had previous experience as both reviewers and project team members. While the specific process used for this review was modified from previous efforts, the roles and nature of feedback remained similar. Therefore, the familiarity and comfort of participants with the review process and their role in it may have influenced performance. Further investigation is warranted based on a variety of projects, reviewer composition, and organizational environments.

The set of reviewers used for this project consisted of a large number of weak tie reviewers and significantly less medium and strong tie reviewers. Both the overall size of the review board and the distribution of reviewers into tie-based categories may have had an impact on the results. For example, the results don't indicate how having fewer weak tie reviewers or more strong tie reviewers would impact the overall utility to the team. The complementary contributions of weak and strong ties strongly suggest that there is an optimal configuration for a review board based on balancing the contributions and overhead of strong and weak ties. Future research is needed to understand what constitutes an optimal configuration of reviewers, and the factors that influence it.

Finally, reviewers were grouped according to strong, medium, and weak ties, but results only distinguished between strong and the combined group of medium and weak ties. While the Duncan's analysis indicated a potential trend, the results were not significant, which could be due to either a construct factor or a power issue due to the relatively small size of the different groups.

There are multiple dimensions one could use to define what constitutes a strong vs. a weak tie. For this study, the strength of ties was based on the hierarchical position within the review structure. The strong tie group had prior, detailed knowledge in about both the project and the organizational issues related to the project. The medium tie group had only summary knowledge, and the weak tie group had little-to-no prior knowledge, but experience in relevant disciplines and analogous projects. Future research is needed to understand what distinguishes strong from weak ties between an individual and a project.

Additional research is also warranted regarding the value of feedback. The utility function used in this study considered all feedback to be of either positive or zero value. The weak tie research [5], however, indicates that there can be negative value from information shared if it constitutes "noise" or a distraction to the receiver.

The utility function did not include a penalty for inputs that were deemed not relevant (either deleted by the board or rejected by the team). This could be remedied by incorporating a negative value for inputs that were rejected.

For practice, this research challenges the conventional wisdom that recommends selecting reviewers based on their independence from the project. Counter to common belief, this research shows that there is significant value in the feedback received from reviewers that have strong connections to the project, without being part of the project team. In contrast to the broad, detailed knowledge available through weak ties, strong tie reviewers can provide benefits to the project because of their intimate, although potentially biased, feedback. This research therefore provides evidence to support the benefits of including both strong and weak tie participants in the review process for a new product project team. There is, however, a penalty associated with over-use of weak tie reviewers in terms of generating a larger volume of non-useful feedback.

Including strong tie reviewers may be particularly important for more-complex projects where a blind review may not reveal deeper problems. Feedback that integrates across multiple areas, with a high degree of contextualization requires more than a passing familiarity with the project. Feedback that goes a step further and considers not just the project, but its relationship with and potential impact on the organization, as a whole, requires in-depth knowledge of both the organization and the project. This level of combinative expertise may be particularly difficult to find in an organization. Practitioners are therefore advised to identify potential reviewers based not just on their technical expertise, but on their ability to balance constraints across multiple areas.

7. Conclusion

The value of both strong and weak ties for individuals has been the subject of research for over thirty years. This research attempts to broaden the concept of value from strong and weak ties to include the relationship between an individual and an organizational entity, specifically, a project. Given the increasing complexity of many engineering, information systems, and research projects [8][15], understanding how to mobilize organizational resources to assess project performance and the quality of the product produced is a critical issue for organizations, particularly for innovative projects. This research provides a step towards understanding how strong and weak tie participants contribute to the value in project reviews.

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