

**Social Capital and Knowledge Integration in Digitally Enabled Teams  
Supplement**

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## Structural Capital Calculation

The calculation of structural capital was composed of two sub-dimensions: The network intensity and decentralization scores. The intensity measurement used team member  $i$ 's perception of his interaction with team member  $j$  and team member  $j$ 's perception of his interaction with team member  $i$ . In short, each team member rated their level of interaction with every other team member on all four questions (listed in Table 1). Team member  $i$ 's perception of team member  $j$  on question  $k$ , was represented by  $f_{ijk}$  and team member's  $j$ 's perception of team member  $i$ , on question  $k$ , was represented by  $f_{jik}$ . The level of interaction ranged from 1 to 7, each score was divided by seven (to simplify the score) yielding a tie strength value ranging from 0 to 1. The scores were aggregated across all four network items (see table 2, for network items), producing an average tie value between members  $i$  and  $j$ ,  $f_{ij} = (\sum_{k=1,4} f_{ijk}/4)$  and between  $j$  and  $i$ ,  $f_{ji} = (\sum_{k=1,4} f_{jik}/4)$ . The team intensity ( $I_L$ ) score was derived from the following summary measure of tie intensity<sup>1</sup> between all team members.

$$I_L = (\sum_{i=1, m} \sum_{j=1, m} f_{ij}) / m(m-1) \quad (\text{where } i \neq j)$$

$I_L$  is the summary intensity score for team  $L$ ,  $f_{ij}$  is the average intensity between team members  $i$  and  $j$ , and  $m$  is the total number of team members.

The second sub-dimension was network de-centralization. It was calculated by first determining the degree of centralization within the network. The network centralization score was determined by the variability in each member's centrality scores. Therefore, the first step was to determine the degree of centrality of each team member. Each of the two interaction scores for each pair of relationships within the team was averaged together. This was accomplished by symmetrizing the matrix of intensity scores then averaging the tie strength reported by  $i$  and by  $j$ , ( $f_{ij}$

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<sup>1</sup> As noted in Rulke and Galaskiewicz (2000), the intensity score used here is similar to most measures of density.

+  $f_{ji}$ )/2. The next step, as seen below, was to add up the row entries for the symmetrized matrix and divide it by the number of members in the team less one,  $m-1$  (diagonals are ignored).

$$C_{D,i} = \sum_{j=1, m} f_{ij} / m-1 \quad (\text{where } i \neq j) \quad (2)$$

Once the centrality score for each team member was calculated,  $C_{D,i}$ , Freeman's (1979) network centralization index was computed to determine a centralization score for the entire network, as seen below.

$$C_L = (\sum_{i=1, m} [C_{D,i}^* - C_{D,i}]) / [(m-1)(m-2)]$$

$C_L$  is the network centralization score for team L,  $C_{D,i}$  is the centrality of member  $i$ ,  $C_{D,i}^*$  is the highest value of  $C_{D,i}$  and  $m$  is the number of team members. When the centrality scores are the same the index has a value of 0. However, on the other extreme, if one team member has strong ties to every other team member but other team members are only tied to that one particular team member the centrality index will be 1.

Finally, the network centralization score was subtracted from 1 to yield the decentralized score. The structural capital score  $S_L$  was the product of the decentralization score and intensity score indicated in equation (4) below.

$$S_L = I_L * (1 - C_L) \quad (4)$$

## Cognitive Capital Calculation

Each team member completed an individual grid after making an individual decision on the first task but before team discussion began. The grid form is shown below. The grids of each team were analyzed separately to produce one score for each team. Each team member's grid was used as input into the team analysis.

### Individual Team Member Grid

From a scale of 1 to 7 (**with 1 being the lowest and 7 the highest**) list the level of importance you placed when making your decision.

| Decision Criteria             | Level of importance |
|-------------------------------|---------------------|
| SAT Math                      |                     |
| SAT Verbal                    |                     |
| GPA Overall                   |                     |
| Letter of Recommendation      |                     |
| Extracurricular Activities    |                     |
| Home Town Type                |                     |
| Parents Academic Background   |                     |
| Parents Alumni Status         |                     |
| Required Coursework Completed |                     |
| Academic GPA                  |                     |
| Grade Trend                   |                     |
| Rank in School                |                     |
| High School Quality           |                     |
| School in State               |                     |
| College Credit Courses        |                     |

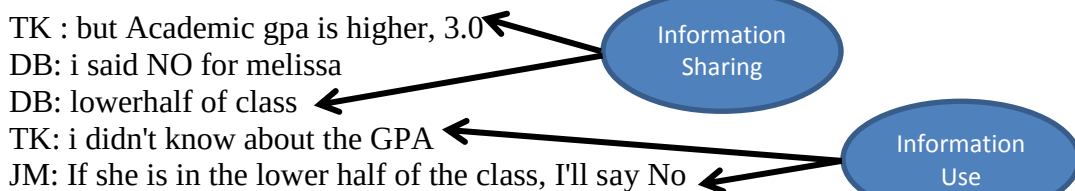
## Information Sharing and Use Calculation

The discussions of each team were content-analyzed to produce an information sharing score and an information use score for each task. First, the discussion was examined to code whether each piece of unique information (i.e., information known only to one subject) was mentioned or not mentioned in the discussion (i.e., a zero-one coding; a 1 if mentioned one or more times, a zero if it was never mentioned). We then counted the number of unique pieces of information mentioned in the discussion to produce the team's information sharing score, the total number of pieces of unique information mentioned.

The information use score was determined in a similar manner. The discussion was examined to code whether or not each piece of unique information was mentioned by a different team member than the person who originally contributed it (i.e., a zero-one coding; a 1 if mentioned one or more times, a zero if it was never mentioned). We then counted the number of unique pieces of information mentioned in the discussion to produce the team's information use score, the total number of pieces of unique information mentioned by someone other than the original contributor.

### Examples of Information Sharing and Use

Example 1 is an example of information sharing and use through STM (chat) interactions. Example 1 would be coded as two units of unique information shared (academic gpa, class standing) and two units of unique information used (refers to academic GPA and class standing)



Example 2 is an example of information sharing and use through face-to-face interactions. Example 2 would be coded as two units of unique information shared (class standing and grade trend) and one unit of unique information used (refers to grade trend)

