An Adaptive Network Model of Cultural Integration in Corporate Merger

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In the business world, it is frequently observed that two organizations are merged into one organization for various reasons. After-merger performance may not attain an expected level, though, due to dissonance of the corporate cultures between the pre-merger firms. Management scholars have studied such cases and reported that integration of corporate cultures is critical for after-merger performance. However, earlier literature mostly focused only on macroscopic (i.e., firm-level or top executive-level) cultural integration, neglecting the fact that corporate cultures reside in individual perceptions and are transmitted from individual to individual through social ties.

To study how individual social ties and network structure in a merged organization promote or demote cultural integration, we developed a simple agent-based network model of cultural integration processes. The organizational network is represented as an adaptive network whose node state (i.e., cultural state of individuals) and topology (i.e., trust/influence level of each social tie) co-evolve with each other simultaneously. In our model, a cultural state of a node is represented in a very simplified form as a vector in an *m*-dimensional continuous space. The network is initially configured so that there are two communities that represent two pre-merger

firms, each of which receive cultural states that are distant from that of the other. Links (social ties) are asymmetric to represent directions of information flow, and are distributed so that there are more within-firm connections than between-firm connections. Nodes receive information from their neighbors (preferably from trusted ones) and move their cultural states a little toward their neighbors' if their cultural states are close enough. In the meantime, the link weights also change so that links between nodes with similar cultural states are encouraged (and those between nodes with dissimilar cultural states discouraged). We measured several network metrics during the simulation, including number of connected components, size of the largest connected component, characteristic path length, mean difference of cultural states between two pre-merger firms, and organizational stresses defined as the sum of cultural differences over all the links (weighted by either link weights or link betweenness).

We explored two experimental parameters that determine initial link distributions. One is "within-firm concentration", i.e., how concentrated the information sources of within-firm social ties are on a small number of key individuals. Variation of this parameter changes the network topology of a pre-merger firm from random (i.e., flat organization with no clear leadership) to star-shaped (i.e., central control with very clear one-man leadership). Another parameter is "between-firm concentration", i.e., how concentrated the between-firm links are on information sources of each firm. Variation of this parameter changes the place of information channels between the two pre-merger firms from CEO-level to site worker-level. Model implementation and Monte Carlo simulations were conducted in Python using the NetworkX module. Results illustrating the effects of these two parameters on the outcome of corporate merger will be reported.