Abstract

Recently, a lot of effort has been put in to development of industrial cluster in order to limit further decline of the regional economy in Japan. Creation of inter-organizational network is one of the most important issues in development of industrial cluster.

In this research, a questionnaire survey about connections between businesses is conducted in Tokyo's Ota Ward, which is a model area of building up industrial accumulation in Japan. Data was collected from small manufacturers (machi-koba) in Ota Ward and a network indicating transaction and collaboration relationship between these manufacturers was built. To investigate characteristics of the inter-organizational network of this area, as well as the influence of inter-organizational network on its consisting members, social network analysis is applied. Social network analysis is an analysis approach to clarify structural characteristics of a network and characteristics of each actor in a network, and then examine whether those characteristics influence on other kind of phenomena of network.

First, characteristic path length and clustering coefficient was chosen as indices to express a structural characteristic of the network. Based on these indices, one can find out whether the network has characteristics of "Small-world". Generally, a network with the characteristic of Small-world is an effective network in spreading information. Then, we focused on the relationship between Centrality of a business in the network and its other characteristics such as number of employee and satisfaction degree in acquisition of information. Degree-centrality, Betweenness-centrality and Closeness-centrality of each business was calculated. Based on which, characteristics of businesses with different centrality was studied.

As a result of data collection, a connected network which consisted of 218 companies was built. The analysis results shows that: (1) This network does not completely satisfy the characteristic of "Small-world", but it can perform a smooth communication or with low cost; (2) Closeness-centrality of a business in this network is positively correlated with the number of its employees; (3) Degree-centrality and closeness-centrality of a business in this network is positively correlated to its satisfaction degree in acquisition of information.

In this research, a graph indicating the actual condition of the inter-organizational network among small manufacturers in Ota Ward has been built, based on which, the structural characteristics of the network was analyzed. As a future work, the improvement of the analysis technique and the acquisition of an exhaustive data are given.