

SWOT analysis and Complex Network analysis to enhance governance in universities by collaboration between academic and administrative faculty

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Abstract—This article examines the improvement in collaboration between faculty and staff at the Kobe Tokiwa University using SWOT analysis and complex network analysis. The Kobe Tokiwa University established the Research Cooperative Division (RCD). RCD has faculty and staff, and two members that are both faculty and staff. In the last decade, the Japanese Government and Ministry of Education, Culture, Sports, Science and Technology (MEXT) highlighted the importance of collaborative work between faculty and staff to improve governance at universities. We focus on collaborative work between faculty and staff and identify strengths and weaknesses of our university using a SWOT analysis and complex network analysis.

Keywords—*SWOT analysis Complex network analysis; collaboration between faculty and staff*

I. INTRODUCTION

In the last decade, the circumstances at universities in Japan have changed significantly. The Ministry of Education, Culture, Sports, Science and Technology, MEXT, announced a reform plan for universities [1]. According to the report, universities play an important role in the rapidly declining birth rate, decreasing size of the local community, increasing borderlessness of globalization for Japanese universities in the world, and so on. Particularly in the past half-decade, many recommendations and reports point out the importance of enhancement of universities [2]. As a result, MEXT strengthens the president's governance at universities.

To increase governance at universities, we focused on collaborative work between faculty and staff. Because of the rapidly declining birth rate, a dwindling number of students enter universities, which in turn promotes a decline in scholastic achievement. This situation increases the workload for both faculty and staff, and decreases available time to study new skills and knowledge.

In these situations, collaborative work between faculty and staff is able to enhance governance at the university. As long as ten years ago, in 1995, a report of the Council for Universities pointed to the importance of collaborative work between faculty and staff at universities.

However, until now there has been obvious differentiation between faculty and staff at universities [3]. Moreover, positions of faculty did not equal those of staff at universities. From the staffs' perspective, they checked and the work such as teaching and research of faculty. From the opposite perspective, the faculty requires non-academic support. This means that the staff supports both students and faculty.

In the late 1990s, the trends of the time were changing. The Japan Association of University Administrative Management was established in 1997 to produce professional university administrative management staff. A report of the Council for Universities in 2000 highlighted the importance of advancing professional university administrative management staff to positions that are equal to those of faculty and staff at universities.

However, this remains unrealized in Japanese universities. In 2008, the Kobe Tokiwa University was opened in Japan. At the time, Tadashi Nakamura, Director-General of University Cooperation, established the Research Cooperative Division, RCD, as a means of collaboration between faculty and staff. He was good at planning. The primary objective of the RCD was to support research and education for the faculty and employed five staff members. Two members held both faculty and staff positions, and three were only staff members. Two years later in 2010, the two faculty and staff members left the RCD and became faculty members only.

The staff room of the RCD was a meeting place for both faculty and staff. In 2015, seven members decided to collaborate with respect to research for the university. Four members were faculty and three members were staff. Two of the four members were faculty, as noted before. The four faculty members focused on the primary themes as follows: one on bioinformatics, two on education, and one on nursing. Two staff belonged to the RCD, and one staff member was the Director-General: University Cooperation.

We carefully thought about the theme for this article. This article deals with the identification of strengths and weaknesses of our university in using SWOT analysis and complex networks theory.

II. RELATED WORKS

SWOT analysis is a tool used to not only evaluate the Strengths, Weaknesses, Opportunities, and Threats of a company, but also as part of a strategic planning process. SWOT analysis was developed as part of the Harvard Business Policy in the 1960s.

The complex networks field analyzes features of huge and complex networks. In 1998, Watts et al. revealed “small-world” networks [4].

III. RESULT AND DISCUSSION

We performed a SWOT analysis. First, the researchers, five faculty members and two staff members, discussed and identified the Strengths, Weaknesses, Opportunities, and Threats of our university. Finally, we identified 120 items about them. We classified these items into six categories, from A to F. Category A relates to institution;, B to students and faculty and staff;, C to the resource and institutional management system of learning and teaching;, D to extracurricular education;, E to et cetera; and F to is purpose. Finally, Category A has 24 items, B has 16, C has 35, D has 12, E has 11, and F has 22.

Using these data, we created a matrix-vector of 120 by 120 items. When two items have a relationship, a value of 1 is assigned to the corresponding matrix element; otherwise, a value of zero is assigned. This matrix-vector is known as an adjacency matrix. Next we transformed the adjacency matrix to an adjacency list using the igraph library [5] of R [6].

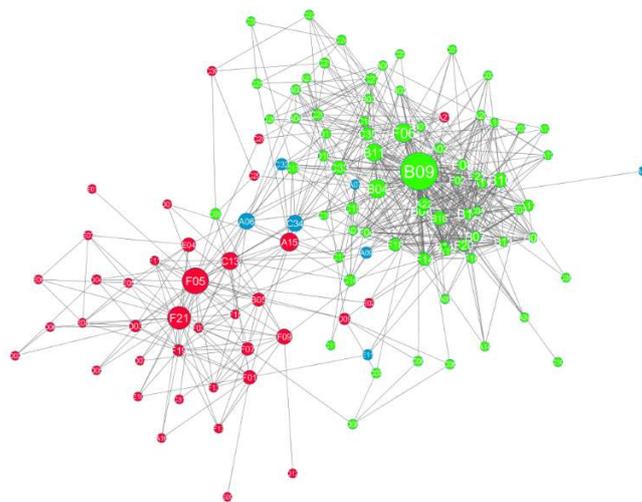


Figure 1: Visualization of networks

Finally we visualized the network data using cytoscape [7] (Figure 1). The size of a node depended on the number of edges that connected to the node. The biggest node is B09; for this item faculty and staff did not have improvement awareness.

Future work will include the calculation of many indices of a complex network, such as the clustering coefficient, as well as the analysis of the features of this network.

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