

Text Analysis to the Preambles of the 4th Medium-term Goals / Plans of National University Corporations

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Abstract

Text analysis of the preambles of the 4th Medium-term goals and plans of the National University Corporations were conducted. From the co-occurrence analysis, the differences between the three priority support frameworks were visualized. This research result made it easy to understand the assessment items and key performance indicators (KPI) of the main parts.

Keywords: KH Coder, Medium-term Goal, Medium-term Plan, Text Analysis, University Evaluation.

1 Introduction

As part of a practical study on data-based university evaluation, this study conducts a text analysis of the preambles to the national university corporations' 4th medium-term goals and plans. The research question is visualizing the differences according to the priority support frameworks.

On March 30, 2022, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) released the 4th medium-term goals and plans of national university corporations and inter-university research institute corporations [1]. National universities were corporatized in 2004 and have published medium-term goals and plans every six years. On June 16, 2015, before the 3rd phase of the academic year 2016, the MEXT formulated the National University Management Strategy. It established three priority support programs for universities to promote functional enhancement based on a vision for the future[2]. The framework is as follows,

- 1) Respond to regional needs, promoting human resource development and research
- 2) In each field, promoting the formation of excellent education, research centers, and networks
- 3) In rank with the world's top universities, promoting excellence in education and research.

In this study, we categorize the above priority support frameworks as 1) Regional-contribution type, 2) Field-specific type, and 3) World-class type. National universities choose themselves

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from one of the three types. Furthermore, in the 4th medium-term goals and plans, new corporation systems with multiple universities within a single corporation were created. Within this new corporation, their mission may have more than one type. Therefore, this study will focus on three types and three new ones. In addition, this study will analyze the preambles of the medium-term goals and plans.

2 Previous Studies

Private universities are obliged to formulate medium-term plans under the revised Private School Law of 2020. Before this, Shinoda et al. published "Toward the Establishment and Strengthening of a Medium- to Long-term Management System" by the Association of Private Universities of Japan[3]. In addition, Morozumi et al. conducted a survey of the presidents of private universities regarding their medium-term plans [4]. There are some other studies on private universities. For example, the study of the management and KPI/OKR[5] and the feature analysis of documents and metadata assignment [6]. However, there are fewer previous studies than the study on the national universities.

For public universities, the situation is the same. The Local Incorporated Administrative Agency Law has made it mandatory for public universities to formulate medium-term plans, at the same time for national universities. There are some prior studies; those are studies on the public university corporation management policies focusing on operating subsidies[7], studies on the regional contribution activities of public universities[8], and studies on the medium-term plans of universities that converted from private ones[9].

There are comparatively many prior studies for national universities. These are text studies for the medium-term plans of liberal arts education and student support [10]. There are studies of quantitative analysis on the indicators of medium-term plans [11] and studies of a quantitative and qualitative analysis of the indicators of the medium-term plan of Kobe University [12]. Furthermore, a study attempted to classify medium-term plan documents into the five components of a logic model using text mining techniques [13]. However, except last one, previous studies focused on some parts of the goals and plans. No studies use text analysis to empirically analyze the medium-term goals and plans from the viewpoint of three priority support frameworks.

3 Data and Research Methods

3.1 Data

The data are the 4th medium-term goals and plans of national universities published on the website of the MEXT (Table 1). The details of the medium-term goals and plans differ from university to university, but the composition is almost the same. Firstly, in the preamble, the mission statement of the university corporation related to the following evaluation items is explained. Secondly, attached are assessment indicators, there are items that are improving the quality of education and research, improving the efficiency of management operations, financial content, self-evaluation, and other essential items on management operations.

Table 1 is the list of university corporations used in the analysis. There are 75 universities and three university organization systems. Universities are categorized into three types according to the support frameworks. Each university system is categorized as an individual type because they contain multiple universities. There are also four graduate schools and four inter-university research institute corporations. These are omitted because they have no undergraduate programs.

Table 1: List of the National Universities Used in the Analysis

ID	University (Japanese)	University (English)	Type	ID	University (Japanese)	University (English)	Type
1	北海道大学	Hokkaido University	3	40	浜松医科大学	Hamamatsu University School of Medicine	1
2	北海道教育大学	Hokkaido University of Education	1	41	愛知教育大学	Aichi University of Education	1
3	室蘭工業大学	Muroran Institute of Technology	1	42	名古屋工業大学	Nagoya Institute of Technology	1
4	旭川医科大学	Asahikawa Medical University	1	43	豊橋技術科学大学	Toyohashi University of Technology	1
5	弘前大学	Hirosaki University	1	44	三重大学	Mie University	1
6	岩手大学	Iwate University	1	45	滋賀大学	Shiga University	1
7	東北大学	Tohoku University	3	46	滋賀医科大学	Shiga University of Medical Science	1
8	宮城教育大学	Miyagi University of Education	1	47	京都大学	Kyoto University	3
9	秋田大学	Akita University	1	48	京都教育大学	Kyoto University of Education	1
10	山形大学	Yamagata University	1	49	京都工芸繊維大学	Kyoto Institute of Technology	1
11	福島大学	Fukushima University	1	50	大阪大学	Osaka University	3
12	茨城大学	Ibaraki University	1	51	大阪教育大学	Osaka Kyoiku University	1
13	筑波大学	University of Tsukuba	3	52	兵庫教育大学	Hyogo University of Teacher Education	1
14	筑波技術大学	Tsukuba University of Technology	2	53	神戸大学	Kobe University	3
15	宇都宮大学	Utsunomiya University	1	54	和歌山大学	Wakayama University	1
16	群馬大学	Gunma University	1	55	鳥取大学	Tottori University	1
17	埼玉大学	Saitama University	1	56	島根大学	Shimane University	1
18	千葉大学	Chiba University	3	57	岡山大学	Okayama University	3
19	東京大学	The University of Tokyo	3	58	広島大学	Hiroshima University	3
20	東京医科歯科大学	Tokyo Medical and Dental University	2	59	山口大学	Yamaguchi University	1
21	東京外国語大学	Tokyo University of Foreign Studies	2	60	徳島大学	Tokushima University	1
22	東京学芸大学	Tokyo Gakugei University	2	61	鳴門教育大学	Naruto University of Education	1
23	東京農工大学	Tokyo University of Agriculture and Technology	3	62	香川大学	Kagawa University	1
24	東京芸術大学	Tokyo University of the Arts	2	63	愛媛大学	Ehime University	1
25	東京工業大学	Tokyo Institute of Technology	3	64	高知大学	Kochi University	1
26	東京海洋大学	Tokyo University of Marine Science and Technology	2	65	福岡教育大学	University of Teacher Education Fukuoka	1
27	お茶の水女子大学	Ochanomizu University	2	66	九州大学	Kyushu University	3
28	電気通信大学	The University of Electro-Communications	2	67	九州工業大学	Kyushu Institute of Technology	2
29	一橋大学	Hitotsubashi University	3	68	佐賀大学	Saga University	1
30	横浜国立大学	Yokohama National University	1	69	長崎大学	Nagasaki University	1
31	新潟大学	Niigata University	1	70	熊本大学	Kumamoto University	1
32	新潟技術科学大学	Nagaoka University of Technology	1	71	大分大学	Oita University	1
33	上越教育大学	Joetsu University of Education	1	72	宮崎大学	University of Miyazaki	1
34	富山大学	University of Toyama	1	73	鹿児島大学	Kagoshima University	1
35	金沢大学	Kanazawa University	3	74	鹿児島体育大学	National Institute of Fitness and Sports in Kanoya	2
36	福井大学	University of Fukui	1	75	琉球大学	University of the Ryukyus	1
37	山梨大学	University of Yamanashi	1	76	東海国立大学機構	Tokai National Higher Education and Research System	4
38	信州大学	Shinshu University	1	77	北海道国立大学機構	Hokkaido National Higher Education and Research System	5
39	静岡大学	Shizuoka University	1	78	奈良国立大学機構	Nara National Institute Of Higher Education And Research	6

Source: Author made with reference to MEXT website, "4th Medium-term Goals / Medium-term Plans"

Note: Type Column means 1. Regional-contribution type, 2. Field-specific type, 3. World-class type, 4 to 6. University system

Table 2: List of the 60 Most Frequent Words

Extracted words	English Translation	Freq	Extracted words	English Translation	Freq	Extracted words	English Translation	Freq
研究	Research	598	知	Knowledge	112	環境	Environment	79
社会	Society	577	創造	Creation	111	活動	Activities	78
教育	Education	575	養成	Training	110	成果	Outcomes	77
地域	Region	420	分野	Field	105	向ける	Turn	75
大学	University	368	教員	Teacher	104	新た	New	73
推進	Promotion	215	構築	Construction	104	イノベーション	Innovation	71
人材	Human Resources	199	科学	Science	102	基盤	Foundation	71
貢献	Contribution	188	拠点	Base	102	文化	Culture	71
世界	World	183	解決	Solution	100	高度	Advanced	70
育成	Nurturing	169	中期	Medium-term	99	創出	Generation	68
本学	This University	166	専門	Specialty	98	学生	Student	67
連携	Cooperation	160	医療	Medical Care	89	期間	Period	65
課題	Task	152	実践	Practice	89	経営	Management	63
目標	Goal	151	技術	Technology	88	支援	Support	62
多様	Diversity	147	持続	Sustain	85	理念	Philosophy	62
国際	International	134	行う	Conduct	82	活用	Utilize	61
実現	Realization	130	産業	Industry	82	機関	Institution	60
発展	Development	123	学校	School	81	国立	National	60
強化	Enhancement	114	取り組む	Work on	81	改革	Reform	59
目指す	Aim	113	未来	Future	81	基本	Basic	59

3.2 Research Method

This study uses the KH Coder. The author of KH Coder proposes a two-step approach [14] [15]. In this study, we mechanically draw the whole picture as the first stage. First, we make a list of frequently occurring words from the preamble of the medium-term goals/plans. Next, we visualize the differences in the type of university corporations from co-occurrence network analysis. This first step enables more sophisticated analysis through coding.

3.3 Words Extract

Table 2 shows a list of the top 60 words with the highest frequency of occurrence created from the preambles of the medium-term plan of the 75 universities and the three education and research systems. The first column is the Japanese extracted word, the second column is the English translation of the extracted word, and the third column is the number of occurrences. The word that appears most often is "Research." It is 598 appearances. Then, "Society" 577 times, "Education" 575 times, "Region" 420 times, and so on. The 60th extracted word is "Basic," and the number of occurrences is 59. In this study, we created this list mechanically in order of frequency.

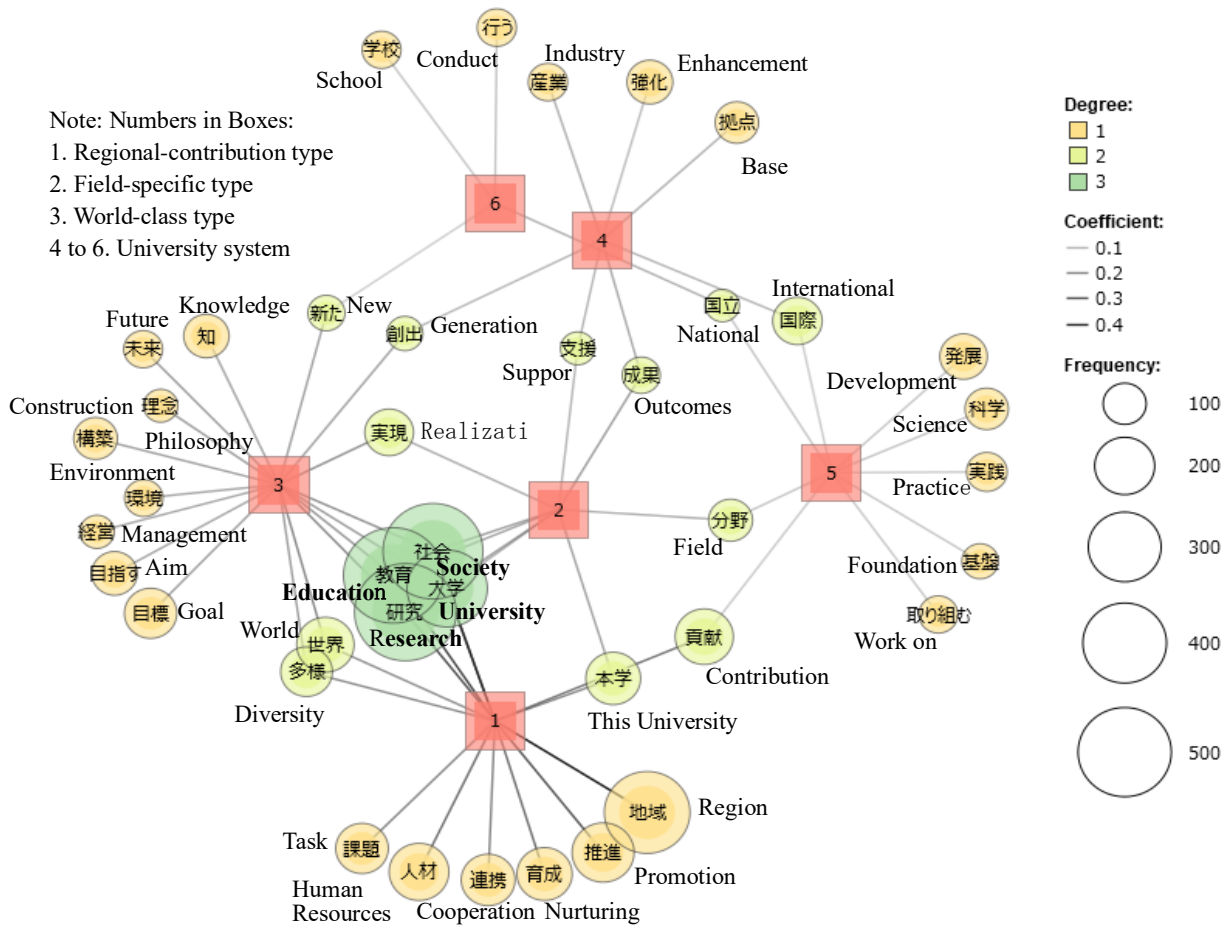


Figure 1: Co-occurrence network of frequently occurring words (External Variables: Type)

3.4 Co-occurrence Network

Figure 1 shows the co-occurrence relation of the extracted words within the preambles. It visualizes the characteristics of the medium-term plan for each university type. We use the Jaccard coefficient to measure the co-occurrence relation. The higher the coefficient, the darker the line is. Two lines draw if an extracted word has a large co-occurrence relation with two types. The more frequently an extracted word is, the larger the circle is. The extracted words do not draw if the co-occurrence relation is small. The rectangles in the figure are the external variables: types of university corporations, 1. Regional-contribution type, 2. Field-specific type, 3. World-class type and from type 4 to 6 are each university system.

From the co-occurrence relations, the characteristics of each type are as follows. As a whole of the preambles, these four words: "Education," "Research," "Society," and "University," are many. For type 1, these words: "Region," "Human Resources," "Nurturing," and "Cooperation" are many. For type 2, these words: "Field," "Realization," "Support," and "Outcomes" are many. Moreover, for type 3, the words: "Aim," "Construction," "Future," "Goal," and "Knowledge" are many. The co-occurrence network analysis could visualize the differences in the preambles between the types of university corporations.

4 Conclusion

From the co-occurrence relations, the characteristics of each type are as follows. Firstly, in the preambles, there is a common core made from the four words: "Education," "Research," "Society," and "University." And the word "World" and "Diversity" are also important in the World-class and Regional-contribution types. For the Regional-contribution type, these words: "Region," "Human Resources," "Nurturing," and "Cooperation" are characteristic. For the Field-specific type, the words: "Field," "Realization," "Support," and "Outcomes" are characteristic. They share characteristic words with other types. For the World-class type, there are characteristic words: "Aim," "Construction," "Future," "Goal," and "Knowledge." The co-occurrence network analysis could visualize the differences in the preambles between the types of university corporations.

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