The historical transition of the concept of "Environment" in architectural terms
-Through the chronological analysis of the Architectural Institute of Japan magazine
Journal of Architecture and Building Science-

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1. Background and Purpose of Research

The word that we use daily can sometimes be interpreted differently by various groups of people. Therefore, the term "Environment" has been understood in various ways. In the field of architecture, "environment" has various meanings in the disciplines such as architectural planning, architectural structure, and environmental engineering, which is difficult to give a clear definition. Nowadays, in Japanese architectural field, "environment" is an essential concept that should be understood equally by different researchers and practitioners. The purpose of this study is to understand the concept of the term "environment" in the Japanese architectural field in each period. Hence, in this research, the social, historical background and the trend of architecture are used to understand the term "Environment" based on chronological analysis method.

2. Scope and Method of Research

An architectural journal *Journal of Architecture and Building Science* (1887-2018), which is regularly published and considered the oldest regarding architecture disciplines in Japan, reflects the social issues of each period. A total of 1,795 articles related to "Environment" were extracted and analyzed in this research. Using KH Coder[i], these articles titles are analyzed under the co-occurrence network in each period (①1887-1945, ②1946-1959, ③-⑧every 10 years since the 1960s, a total of 8 periods). Figure 1 shows a network diagram summarizing all periods. Based on the diagrams, the contents of articles in *Journal of Architecture and Building Science* are analyzed at each period.
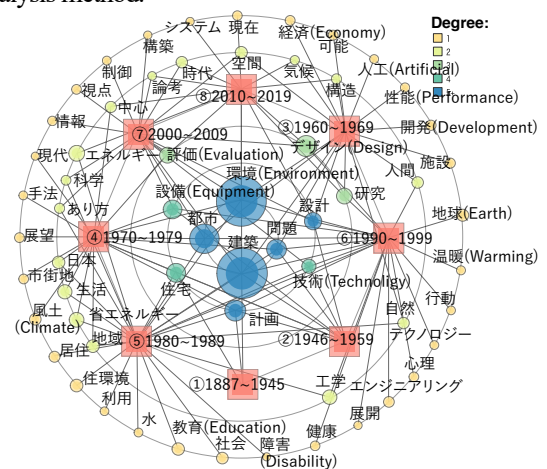
Figure 1. Co-occurrence network for all periods

3. Analysis results

As a result of analyzing the article titles that co-occur with the term "Environment", the trends based on 8 periods of "environment" are showed as follows: ①1887-1945:The term "environment" was seldom used in "Architectural Magazines" before the World War Two. ②1946-1959: Articles on environmental engineering have been developed from "Equipment" (28 articles), "Principles" (15 articles), and "Technology" (6 articles). ③1960s: With the growth of the "Economy", "Artificial" (23 articles), "Performance" (23 articles), and "Development" (20 articles) are used. ④1970s: In addition to "Energy", characteristics such as "Climate" (73) can be seen as a reaction to urban growth with pollution. ⑤1980s: The co-occurring words are the most diverse, with connections to other fields such as "Education" (40 articles) and "Disability" (33 articles). ⑥1990s: "Earth" (47 articles), "Warming" (32 articles), terms related to global environmental issues begin to increase. ⑦2000s: There is a shift to concrete measures by architecture such as "Design" (49 articles). ⑧2010s: "Evaluation" (39 articles) of architecture has begun for global environmental issues such as "Climate change".

4. Discussion and Summary

Following the evolution of the concept of "environment", it was confirmed that there were a variety of changes in the architecture fields. The discussion expanded from indoor space to cities and the earth and from physical environment to psychological environment. From the result of the co-occurrence analysis, the term "Environment" had been discussed more all-around in *Journal of Architecture and Building Science* in 21st century. In terms of period, the discussion of "Environment" are transformed from the conceptual ideas in 1980s to practical design strategy in 21st century. According to the research result, in view of the more and more prosperous discussion about "Environment" in the future, the wide spread understanding of the definition of "Environment" is crucial for the architectural discipline.

i) Koichi Higuchi, *Quantitative Analysis of Text Type Data* -Deep Discrimination and Integration of Two Approaches- (Theory and Method), Japan Society for Mathematical Sociology, 19 (1): 101-115, 2004