



TOWARDS SEMANTIC NETWORK OF PHILOSOPHY TERMINOLOGIES FOR LEARNING IN UNIVERSITY IN VIETNAM

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Abstract

Semantic network is so far an effective way for knowledge representation, especially if the matter deals with complexity of terminologies and concepts, which are not standalone, but connected by various relations. One among these fields of knowledge is philosophy, and one fact that the study students of university always face with difficulties when address the system of terminologies and concepts of philosophy. In practice, various tools are using by teachers for helping students understand philosophy terminologies and concepts, i.e. using mindmap tools. In this paper, we suggest a use of semantic network as a tool for representation of key terminologies in philosophy of Marxism that have been teaching in Vietnamese universities. For this purpose, the authors of the paper carefully investigate all materials of appropriate learning; make a selection and classification for setting up of terminologies; build a semantic network of these terminologies for a conceptional model. An effort is providing to design one software system with semantic updating, selecting and representing. These results are under the project "Studying and building semantic network of concepts in philosophy discipline for teaching and researching activities" ID: QG.18.46, in a University of Social Sciences and Humanities of Hanoi National University.

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1. A Context of Learning Philosophy in Marxism and Some Suggestions

The reality of teaching and learning philosophy of basic principles of Marxism at universities and colleges today, has been still have many limitations. It has not created excitement for students as well as not reached the goals of learning and studying the subject.

Nowadays, when universities and colleges have completely shifted to credit-based training, self-study has become mandatory requirements for students. However, with the characteristics of Marxist Philosophy, which contains a lot of theoretical contents and high abstractions and generalizations, it is very difficult to self-study. Therefore, even if applying that modern form of training with the motto "learner-centered", the students themselves cannot become the center of the process of acquiring knowledge, leading to the decreased learning spirit.

To partially revoke the passion of the learner for the subject, and to make the students' learning activities become active, it is necessary to have innovation of teachers in the teaching process to first make those abstract knowledges more specific, intuitive, easier to grasp, and then can encourage students to actively participate in expressing their constructive ideas.

In fact, teachers have sought to map knowledge contents to visual representation, aka mindmap schemas, but have only done it manually. This manual method has some limitations. It can be applied to a single piece of knowledge, but it will be difficult to apply to the overall knowledge of the subject. Therefore, the reception of knowledge of students is still unavoidably fragmented. It is also difficult for us to see the multidimensional relationship between the contents through these knowledge maps. Therefore, it has not promoted the efficiency of the students' deductive powers. To overcome these limitations, we have an idea to build a semantic network for Philosophy of Marxism and Leninism.

The terms semantic network and semantic data model are used to describe special types of data models specified by networks, where the nodes represent concepts that reflect the object of the objective world. The arcs that connect nodes are the relationship between those concepts. This way is good. Firstly, it provides an approach similar to the way humans restore and retrieve information, so learners will be able to access knowledge in an easier, natural way. Secondly, it is highly intuitive, so it is easy for learners to understand. Thirdly, the semantic network is very flexible. Users can add point nodes and related visual signifiers to supplement the necessary knowledge. And so, when using the semantic network, the learners themselves can show their active role in capturing, designing and supplementing new knowledge. Fourthly, the linkages between point nodes in the semantic network are very diverse, so it will show learners the multi-dimensional relationship between the concepts presented. Thereby, learners have a more comprehensive view of the knowledge that they are approaching.

Thus, by establishing semantic network for Marxist Philosophy module, it will lead to a change in the presentation and interaction of knowledge in this module, thereby

making learners more interested in, more active in acquiring knowledge, improving the efficacy of learning, philosophical research and many other related sciences.

2. Semantic Network and Philosophy Terminologies of Marxism

In term of semantic network classification, as per John F. Sowa [1], there are six most popular versions:

- **Definitional networks:** The definition network emphasizes subtypes or the relationship between a conceptual type and a newly defined subtype.
- **Assertional networks:** Assertional networks are designed to assert statements. Some affirmative networks are proposed as models of conceptual structures that are the basis of natural linguistic semantics.
- **Implicational networks:** Implicational networks use semantics as the main relationship to connect nodes.
- **Executable networks:** Executable networks include a number of mechanisms, such as markup or associated procedures, that can make inferences or search for models and links.
- **Learning networks:** Learning networks are built or expanded by gathering knowledge from examples. New knowledge can change the old network by adding and removing nodes, associative arcs or by changing numerical values, weights, links between nodes and arcs.
- **Hybrid networks:** combining two previous network techniques, either in a single or separate network, but interacting closely with the system.

Based on this classification, we are building the key terminologies and concepts by the tree model, comprising of 6 levels.

First level has 3 fields:

- Basic concepts of philosophy;
- Dialectics;
- Socio-economic form.

In a second level, there are 2 items for the first field: Ontology and Epistemology; there are 2 items in the second field: Dialectical Materialism and Dialectical Idealism and there are 2 items in the third field: structure and movement process.

This is a representation of this tree and illustrated in following picture using mind map tool.

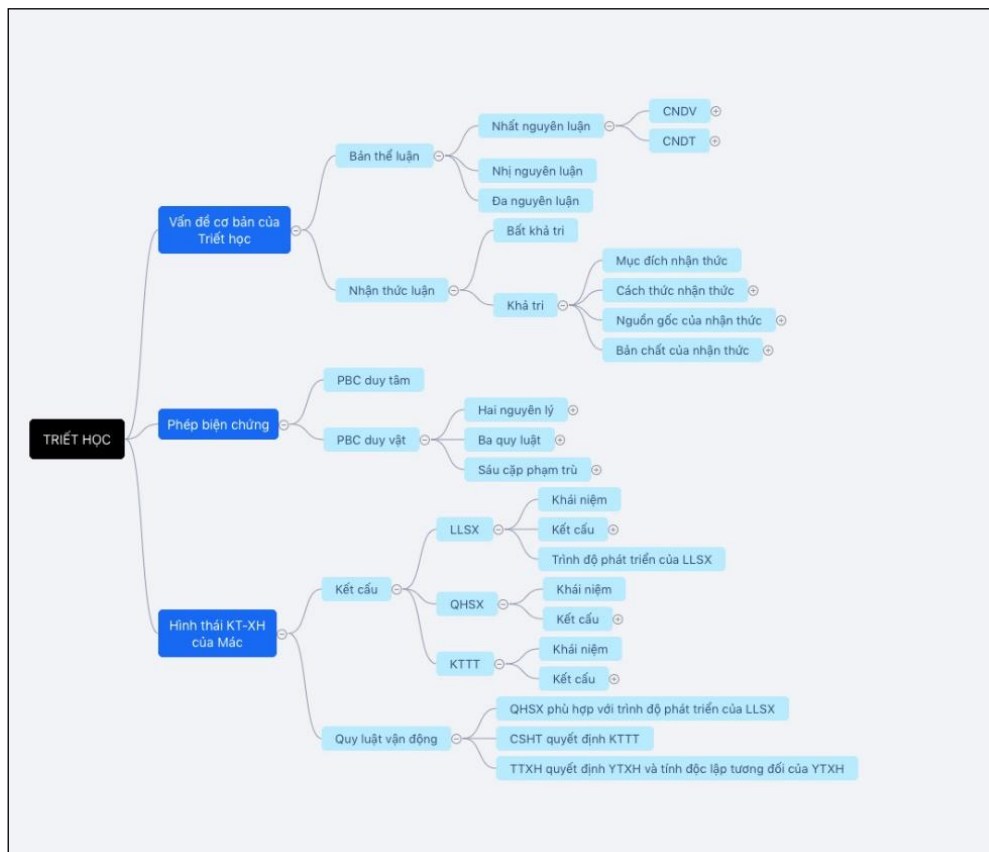


Figure 1: The semantic tree of concepts in Marxist philosophy using Mindmap tool

3. The Design of Semantic Network Software for Data Updating, Processing and Representing Concepts and Terminologies of Philosophy's in Marxism

The software for the semantic network is a tool that provides input, update, process; and representing data is terminologies in Marxist philosophy. The software comprises into 3 connected components:

- Data module;
- Viewing module;
- Web interface.

The Data module is a database management tool with semantic content, using standard XML languages for importing semantic contents into a database with a form of Triples: Subject-Predicate-Object. Here, Subject and Object are concepts or terminologies, connected by relationship as Predicate [2]

Traditionally, the edges (also called “arcs” or “associative links”) of semantic networks have been labeled with relations, such as IS-A-KIND-OF or IS-A-PART-OF [3]. Fully labeled in such a way, the semantic network becomes equivalent to an ontology, a formal structure for representing domain knowledge, in this case it is the Marxist philosophy.

The Data module has three functions for freely input this ontology of the Marxist philosophy, in terms of triples, concepts and relations, appropriately. In a result, there

are those catalogues designed for databases. The first is designed for concepts and terminologies, the second is for relations and the third is for the triples. These catalogues are organised in databases with CRUD (Create, Read, Update and Delete) functions.

The following Figure 2 is a program interface of adding statements in form of Triples.

Thêm mệnh đề
Một mệnh đề được mô tả theo hình sau:

Subject — Predicate — Object

Vui lòng nhập chủ thể (subject), chọn mối liên hệ (Predicate) và nhập khách thể (object):

Chủ thể: Mối liên hệ: Khách thể:

Figure 2: User Interface for Input Triples

In this interface, users can choose given Predicate from a list-down catalogue including the noted relations. After the input of one statement, the input subject and object of this triple will be added into appropriate catalogues, and these stored as databases for semantic querying.

Semantic queries allow queries and analysis to be linked and contextual. Semantic queries allow extracting information with clear and implicit origin based on syntax, semantic and structure information contained in the data. They are designed to provide accurate results (which can be special selections of a single information) or to answer more extensive and fuzzy questions through a combination of sample comparisons and numerical reasoning.

For example, if we set up the triples in following statements:

S1: “Triết học” – là- (is-a) “Philosophia”

S2: “Triết học” –là- (is-a) “Dárshana (ẤnĐộ)”

S3: “Sophia” –là một phần của (is-a-part-of) “Philosophia”

S4: “Philo” –là một phần của- (is-a-part-of) “Philosophia”

S5: “Sophia” -bắt đầu bởi- (has origin by) “Thông thái”

The querying of concept “Triết học” is processing by all semantic associations of given concepts and relations.

The viewing module is a software that allows the display of results based on semantic search and query with the following visual content and forms:

- List of concepts and conceptual descriptions;
- List of related concepts in semantics from query and search;
- Graphs of concepts and associations according to relationships;
- List of resources on the web related to the concept of query and search.

For more visual representation of association of concepts/terminologies, we are designing a software that enable users to click to any concept/terminology in a graph to

add more related items with this concept. A Figure 3 is an illustration of this software and results of the search of a concept “triết học”.

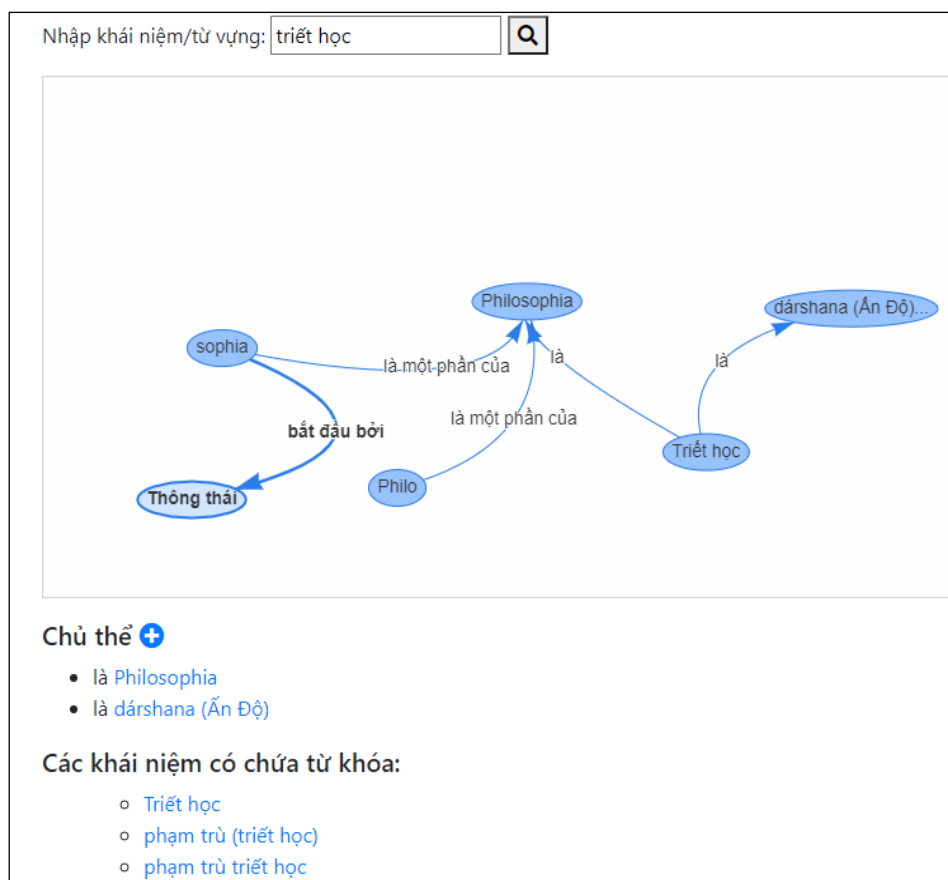


Figure 3: Visual picture of searching and representing philosophy concepts/terminologies with associations

The Web interface module processes results from the lower layer; the software module manages the semantic database and provides results to other web applications. This module is a software based on portal technology that provides access point for exploiting information from semantic network to users. This portal provides user administration, content management, provides connections to different semantic networks such as Wikipedia, Worldnet.

4. Apply Semantic Network in Teaching and Initial Results

We conducted an initial pedagogical experiment with three (03) classes, with 175 students of the Marxist-Leninist philosophy module at the University of Social Sciences and Humanities of the Vietnam National University, in order to evaluate the results of the application of semantic network tools in teaching a field where students are very difficult to learn and do not have much interest in learning. The content of the Marxist-Leninist philosophical module being taught to university students in Vietnam consists of three chapters. Semantic networks are applied to the teaching and learning process for one of

these three chapters. During the teaching process, we have designed guiding questions for each specific content of knowledge and instructed students to use the semantic network to find answers to those questions and learn by themselves. broader, deeper knowledge content through the system of references that we have selected and linked in the semantic network. After pedagogical experiment, we surveyed 100 students of these 3 classes with a survey including 5 questions with 31 criteria, the rating scale includes 5 levels of consent respectively on a scale of 1 to 5 points: totally disagree, disagree, neutral, agree, totally agree.

Question 1 on the approach to the semantic network of philosophy, there are 4 criteria.

Question 2 on how to use the semantic network in teaching and learning Marxist-Leninist philosophy, there are 4 criteria.

Question 3 on the knowledge contained in the semantic network and the effect of using the semantic network in studying Marxist-Leninist philosophy, includes 13 criteria.

Question 4 on the level and effectiveness of using the semantic network in studying Marxist-Leninist philosophy, includes 7 criteria.

Question 5 on the further development of the semantic network, includes 2 criteria.

Results of the initial statistical processing from 100 questionnaires showed:

For the first question, 100% of the students agreed that they had been introduced and had a certain understanding of the semantic network before using it as well as instructed to use the semantic network in a specific way. 96% of students agree that the semantic network is easy to use and 98% of the students claim that the semantic network is easy to access.

For the second question, 100% of students confirmed that: lecturers instructed to use the semantic network for each specific content of the subject; the teacher asks questions and instructs students to use the semantic network to find answers to those questions; For each content, the lecturer gives keywords so that students can look up all the related content on the semantic network. 89% of students agree that the keywords that teachers provide help them search for knowledge contents effectively.

With the third question: the knowledge content contained in the semantic network is highly appreciated by the majority of students: firstly, knowledge in the semantic network is consistent with the subject outline (92%); second, these knowledge is designed into a network of concepts (100%); third, the logic of this conceptual network is agreed by 89% of students; 87% of students agree that concepts in the semantic network are explained briefly, explicitly and easily to understand; 100% of students agree that in the semantic network contains many online links to other reference sources, of which 88% of students think that online links are introduced in the semantic network are trustworthy; 90% of the students said that the reference resources in the semantic network had high professional value; 55% of students agree that the resources provided in the semantic network are relatively diversified, the remaining 45% are wondering. The students highly agreed that using the semantic network helped them understand the knowledge of

Marxist-Leninist philosophy easily (86%); help them easily remember the knowledge of Marxist-Leninist philosophy (85%). They also agreed that, using the semantic network, especially the materials provided on the semantic network, helps them prepare for the practice/ presentation/ discussion... more effectively (93%) and using the semantic network can replace going to the traditional library to find reference materials, help save time of studying the subject (84%).

With the fourth question, the results are as follows: 97% of students always use semantic network when instructed by lecturers; 65% of students use the semantic network to dig deeper into the subject's knowledge. 98% of students agree that using the semantic network is appropriate with the current trend of technology application in teaching and learning; 81% of students said that the study of Marxist-Leninist philosophical contents with the semantic network more effectively than the contents without using the semantic network; when using the semantic network to study Marxist-Leninist philosophy, students are more self-conscious in learning (83%); 89% of students agree that using the semantic network makes it easy to answer the questions asked by lecturers. The majority of students also agree that using the semantic network makes it easier to understand the contents that lecturers require students to learn by themselves (79%).

With the last question, 87% of students really want the semantic network to be built with all the remaining contents of Marxist-Leninist philosophy; 81% of students would like the semantic network built for many other sciences.

The above investigation results show that the application of the semantic network in teaching and learning Marxist-Leninist philosophy has brought about very positive results. The semantic network is considered by students to be easy to access and use. The method of using the semantic network that instructors instructed students to use helps them to easily access and learn the knowledge contents required by the teacher. The knowledge of Marxist-Leninist philosophy linked to diagrams in the semantic network, explained briefly and explicitly, thus helping students to study this subject more effectively and interestingly. Reference resources linked to the semantic network are appreciated for quality, but still a large part of students still wonder about the abundance of these documents. We also note that the source of references that we link to the semantic network is not really diversified, because we are subject to the copyright regulations of the research works, so we cannot integrate many documents into this system. We hope that Vietnam National University will cooperate and link online with more libraries so that the semantic network is allowed to access the online database of different libraries. In that way, semantic network will be more effective when officially put into use. However, the semantic network that we are putting to use in the test has helped students learn more effectively and most of them want the semantic network to be developed further, not only for the remaining contents of the Marxist-Leninist philosophical module but also for many other sciences.

5. Conclusion

The knowledge management is a field that has wide applications in teaching and researching. Using the model of semantic networks to build the software for entering, updating, storing, searching, processing and visualizing the philosophy's terminologies and concepts is an effective way to support learning process of the Marxism's lecturing at university. The results of our projects, partially described in this paper, are proving this hypothesis. This is only a first step of building the semantic network of Marxist philosophy and need further study to make it completely implemented in practice.

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Conflict of Interest

The authors declare no conflicts of interest.

Authors' Contribution

All authors contributed equally to the conception and writing of the manuscript.

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previous research interests are in the areas of philosophy, thought of Vietnamese Confucianism in the Ly - Tran dynasties and teaching methods.

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