

# Research on the Curriculum System Design of Principles of Management Based on Knowledge Graph

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**Abstract:** The article mainly introduces the construction of knowledge graphs in the course of Principles of Management, elaborates on the design goals and scope, technical means and processes of knowledge graphs in the course, and explores the effectiveness of knowledge graph construction in the teaching practice reform of Principles of Management. Practice has shown that the construction of a knowledge graph for the course "Principles of Management" can be an effective way to improve the quality of course teaching.

**Keywords:** Knowledge Graph; "Principles of Management"; Reform Practice

## 1. Introduction

Through years of teaching practice, it has been found that students face a series of obvious and urgent problems when constructing the knowledge system of "Principles of Management", which to some extent weaken the effectiveness and applicability of the knowledge system. The knowledge system of the course "Principles of Management" is a rigorous and rich disciplinary system, with multiple significant features. Firstly, it demonstrates a high degree of systematical. The Principles of Management connect various aspects of management, such as organizational design, leadership behavior, decision-making processes, control mechanisms, etc., in a logically rigorous manner, forming a complete theoretical framework. Secondly, the knowledge system of the course "Principles of Management" demonstrates a wide range of comprehensiveness. It is not limited to the management discipline itself, but integrates knowledge from multiple disciplines such as economics, psychology, sociology, and a

wealth of management practice experience. Furthermore, the knowledge system of the course "Principles of Management" has a distinct scientific nature. It is based on scientific research methods and data analysis, and therefore has objectivity and variability. In addition, the knowledge system of the course "Principles of Management" also has strong practicality. It is not only at the theoretical level, but also closely linked to management practice. Through the analysis and discussion of practical management cases, learners will be able to master a series of practical management tools and skills, thereby better responding to challenges and problems in practical work.

Knowledge graph is a method of representing and organizing knowledge, which displays complex knowledge domains through data mining, information processing, knowledge measurement, and graphic drawing, revealing the dynamic development laws of knowledge domains, and providing practical and valuable references for disciplinary research. The knowledge graph can comprehensively sort out the knowledge points of the "Principles of Management" course, provide a visual display of the knowledge structure, and thus achieve the organic organization, in-depth exploration, and comprehensive utilization of knowledge. This can not only help students better understand the knowledge system and improve learning effectiveness, but also assist teachers in curriculum construction, textbook construction, and teaching reform, thereby improving teaching ability.

## 2. Design Objectives and Scope of Knowledge Graph for the Course of Principles of Management

The design of a knowledge graph for the course "Principles of Management" aims to build a

rich, clear, and relational knowledge system by systematically integrating course content, showcasing the relationships between knowledge points, combining cases and practical experience, and providing learning resources and tools. This knowledge graph will promote deep learning for students, improve learning efficiency, and become an important tool for assisting teaching and self-learning.

### 2.1 Design Objectives

When designing the knowledge graph of the course "Principles of Management", the design goal is not only to simply stack knowledge points together, but also to build a knowledge system with rich content, clear hierarchy, and clear relationships. I hope that through this knowledge graph, students can gain a deep and comprehensive understanding of the course "Principles of Management", and can clearly grasp the internal connections between various knowledge points, forming a complete knowledge framework.

Firstly, we are committed to systematically integrating every knowledge point, theory, and model in the course. This integration process requires in-depth research and analysis of each knowledge point, understanding its position and role in the entire management theory system, and then presenting it in an appropriate way in the knowledge graph. Through such integration, students can see the connections and intersections between various knowledge points on a clear knowledge map, forming a complete and coherent knowledge network.

Secondly, it is hoped that the design of knowledge graphs can promote deep learning among students. Not only do we need to provide information about the knowledge points themselves, but we also need to reveal the logical relationships and deep structures behind these knowledge points. Encourage students to explore and analyze the knowledge graph, deeply understand the internal logic and laws of the Principles of Management, and form their own opinions and viewpoints.

In addition, we also hope to improve students' learning efficiency through the design of knowledge graphs. Traditional learning methods may require students to search for the necessary information in a large number of books and materials, which is inefficient. With a knowledge graph, students can quickly locate the required knowledge points and master

relevant knowledge and skills. At the same time, knowledge graphs can also provide rich learning resources and tools, such as online tests, discussion areas, etc., to help students better understand and master the course content.

Finally, it is expected that this knowledge graph can become an important tool for assisting teaching and self-learning. Teachers can use it for classroom teaching to guide students to deeply understand the course content; Students can also use it for self-learning, independent exploration, and discovering the mysteries of knowledge. For both teachers and students, this knowledge graph will be a valuable teaching and learning resource.

### 2.2 Design Scope

Firstly, the basic concepts, principles, and theories of Management Principles, including the definition, purpose, process, and methods of management, are the foundation for constructing the entire knowledge system and for students to further learn.

Secondly, the development and evolution of management theory, such as from classical management theory to modern management theory, from Taylor's scientific management to Drucker's goal management, have had a profound impact on management practice. Systematically introducing the core viewpoints and contributions of these theories can help students understand the development process and trends of management theory.

In addition, management models and methods are indispensable tools and weapons in management practice. Introduce some commonly used management models and methods, such as SWOT analysis, Five Forces model, Balanced Scorecard, etc., and explain in detail their scope of application and usage methods, guiding students to learn and apply these models and methods, which can help improve their ability to solve practical problems.

Finally, management is a highly practical discipline, and only by combining theory with practice can one truly grasp the essence of management. Selecting typical management cases and practical experiences for in-depth analysis and discussion can help students apply theoretical knowledge to practice and improve their practical abilities.

### 3. Basic Construction of Knowledge Graph for the Course of Principles of Management

The basic architecture of the knowledge graph for the course "Principles of Management" can be constructed from multiple dimensions, mainly including logical architecture and technical architecture. Through in-depth analysis of the basic architecture of the knowledge graph in the course of Principles of Management, it can be seen that this is a complex system with multiple levels and dimensions. It not only involves the storage and management of data, but also involves multiple aspects such as knowledge representation, fusion, and inference.

#### 3.1 Logical Architecture

The logical architecture of the knowledge graph in the course "Principles of Management" presents a pyramid like structure, with a robust bottom composed of a data layer responsible for storing massive, multi-source management data. These data are not only structured, but also include semi-structured and unstructured content, ensuring the breadth and depth of the knowledge graph. These data are extracted into a series of precise and accurate facts through efficient information extraction techniques, providing a solid foundation for knowledge graphs. The pattern layer located at the top of the logical architecture is a highly abstract and generalized level. This layer utilizes advanced ontology libraries to systematically manage knowledge, abstracting concepts, attributes, and relationships into standardized forms, thereby constructing a clear and coherent hierarchical system of knowledge concepts. This level not only facilitates the organization and management of knowledge, but also provides strong support for subsequent knowledge reasoning and application.

#### 3.2 Technical Architecture

In the process of constructing the knowledge graph of the course "Principles of Management", the role of technology cannot be ignored. Firstly, information extraction technology accurately extracts knowledge facts related to management from both original and third-party databases through natural language processing, machine learning, and other technological means, ensuring the accuracy and completeness of knowledge. Secondly,

knowledge representation technology transforms these facts into computer-understandable forms, such as graph models, vector models, etc., enabling knowledge to be effectively stored and queried. The key to this step is how to transform complex management knowledge into a form that computers can understand, while maintaining the semantic and structural information of the knowledge. Then, knowledge fusion technology integrates and disambiguates knowledge from different data sources through methods such as data cleaning, entity alignment, and relationship extraction, achieving the unity and standardization of knowledge. This step is crucial for eliminating knowledge conflicts and contradictions, and improving the quality and reliability of knowledge graphs. Finally, knowledge reasoning techniques further explore and enrich the implicit knowledge in the knowledge graph. Through methods such as logical reasoning, rule-based reasoning, and model-based reasoning, new knowledge associations and patterns can be discovered, thereby expanding and deepening the application value of knowledge graphs.

### 4. Knowledge Graph Techniques and Processes for the Course of Principles of Management

The design techniques and processes of the knowledge graph for the course "Principles of Management" are a highly comprehensive and technically demanding task. To ensure the quality and effectiveness of the knowledge graph, it is necessary to carefully plan and implement the entire process.

In the requirements analysis stage, it is necessary to have a deep and comprehensive understanding of the core objectives of the course and the actual needs of students. This involves a detailed analysis of student learning expectations, teacher teaching objectives, and core course content. Through these analyses, the scope, main functions, and target users of the knowledge graph can be clearly defined, providing a solid basis for subsequent data collection and processing.

Entering the stage of data collection and processing, advanced technological means will be used to rigorously extract and organize data closely related to the Principles of Management. This includes using web scraping technology to

collect relevant textbooks, teaching videos, and online resources from the internet, while utilizing natural language processing and information extraction techniques to accurately extract entities, attributes, and their relationships from these data. This stage requires not only precision in technical operations, but also a deep understanding of the principles of management in the field.

In the knowledge modeling phase, a clear and logically rigorous knowledge graph model will be constructed. This requires a rigorous definition of the representation of entities, attributes, and their relationships based on the collected data, and a clear understanding of their logical relationships. Meanwhile, considering the complexity and uncertainty of data, it is necessary to develop scientifically effective processing rules to ensure the accuracy and reliability of the knowledge graph.

Subsequently, based on the results of knowledge modeling, a knowledge graph will be constructed using professional technical means. This may involve using graph databases for data storage and querying, and utilizing visualization techniques to display the structure and relationships of graphs. At this stage, a quality assessment of the knowledge graph will also be conducted to ensure the completeness and accuracy of its information.

Finally, in the application stage of knowledge graph, it is necessary to apply the constructed knowledge graph to various scenarios such as intelligent question answering, recommendation systems, and decision support according to actual needs. The selection of these application scenarios needs to be based on actual needs and implemented using appropriate technical means to fully leverage the practical value of knowledge graphs. For example, using intelligent question answering systems to help students quickly locate the required knowledge points; Using recommendation systems to provide personalized teaching resources and plans for teachers; Using decision support systems to assist enterprise managers in making more scientific and reasonable decisions.

## **5. Teaching Practice and Feedback of Knowledge Graph in the Course of Principles of Management**

### **5.1 Application Evaluation and Feedback for Teachers**

**Significantly improving teaching effectiveness:** The application of knowledge graph technology in the course of "Principles of Management" has brought revolutionary changes to teaching. Through knowledge graphs, complex knowledge systems are presented in an intuitive and visual way, which helps students better understand and remember. For example, when teaching the development process of management, teachers can use knowledge graphs to display the relationships between different historical periods and events, so that students can clearly see the development of history. This teaching method not only enhances students' interest in learning, but also enhances their learning effectiveness.

**Assisted teaching design to achieve personalized teaching:** Knowledge graph technology provides valuable teaching suggestions for teachers by analyzing students' learning trajectories and interest preferences. This means that teachers can tailor teaching content and methods to students based on their needs and abilities. For example, based on the difficulty level of each chapter in the "Principles of Management" course, a knowledge graph can be used to provide more targeted coaching materials and recommend extended resources in related fields. This personalized teaching method helps to improve students' learning enthusiasm and participation.

**Greatly expanding teaching resources:** Knowledge graph technology represents various entities and their relationships as nodes and edges, forming a vast knowledge network. This provides teachers with abundant teaching resources, enabling them to explore more teaching materials and cases from it. For example, when teaching the course "Decision Making and Decision Process", teachers can use knowledge graphs to display the connections and intersections between different knowledge points, helping students better understand the overall framework of the content. In addition, teachers can also encourage students to explore knowledge graphs on their own, discover new knowledge and interests, and cultivate their self-learning abilities.

**Significantly enhance student engagement and learning interest:** Through knowledge graph technology, teachers can design more

interactive and interesting teaching activities. For example, when teaching the content of "organizational culture", knowledge graphs can be used to organize knowledge competitions or mind maps can be used to create competitions, allowing students to learn and grow in competition. This teaching method can not only stimulate students' interest and enthusiasm in learning, but also improve their participation and learning effectiveness. In addition, by combining with other technologies such as virtual reality and augmented reality, a more diverse teaching environment and experience can be created, making teaching more vivid and interesting.

### 5.2 Application Evaluation and Feedback for Students

Strong organizational and understanding abilities. Many students have highly praised the organization and understanding ability of knowledge graph technology. They believe that knowledge graphs present complex knowledge systems in an intuitive and easily understandable form through graphical means, which enables them to quickly grasp the key points and concepts of the course. For example, when studying the development of management and other disciplines that require a large amount of factual knowledge, a knowledge graph can clearly display the causal relationship and development context between historical events or scientific discoveries, helping students build a complete knowledge framework.

Efficient learning experience. In addition, students generally believe that knowledge graph technology greatly improves their learning efficiency. Traditional learning methods may require a lot of time to search and organize information, while knowledge graphs can help them quickly find the necessary information through intelligent search and recommendation, saving learning time. Meanwhile, knowledge graphs can also provide personalized learning suggestions and resource recommendations based on students' learning progress and interests, making learning more efficient and targeted.

Challenges and reservations. However, despite the many conveniences brought by knowledge graph technology, there are still some students who hold reservations about it. Some students

believe that the learning curve of knowledge graph technology is steep and requires some time and effort to master. They may be concerned that they may not be able to adapt well to this new learning method during the learning process. In addition, some students also express concerns about the accuracy and reliability of knowledge graphs. If the data in the knowledge graph is inaccurate or from unreliable sources, it may mislead students and lead to deviations in their understanding of the course content.

### 6. Conclusion

Knowledge graph, as an important component of artificial intelligence technology, has undergone a systematic and technological transformation in traditional education, but it has also given new vitality to curriculum and teaching. The construction of knowledge graphs in the course of Principles of Management has positive progressive significance. This article analyzes the design goals and scope of creating knowledge graphs in the course, analyzes relevant technical means and processes, and explores the effectiveness of knowledge graph construction in the reform of teaching practice in the course of Principles of Management. Practice has shown that the construction of a knowledge graph for the course "Principles of Management" is one of the effective ways to improve the quality of course teaching.

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