



Knowledge discovery computing for management

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With the convergence of technology that enables different technologies to interoperate as a whole, large data have been accumulated in various areas, including daily life, industry, and environment. To analyze such massive data, knowledge discovery computing has become very active. The knowledge discovered from big-data, as a tool to support human decision-making, is applicable to diverse fields. Knowledge consists of various forms, such as relation, clustering, classification, and rules of data variables. In today's management, knowledge is used for efficient decision-making. Additionally, managers search for deeper information through knowledge discovery computing. In people's everyday life, knowledge management technology is applied to healthcare, interactive system, recommendation, artificial intelligence system, and behavior rules. In industries, knowledge-based management is applied to new product manufacturing, the lifecycle of a machine, machine to machine, and customer management. In the environment, knowledge-based management is applied to the weather forecast, traffic information, virus information, and risk management. As such, the

management system of discovering and applying knowledge has been researched and applied in various areas. Accordingly, research on the discovery and application of new knowledge has been conducted in the government, business, and academy circles. With a lapse of time, new time-series data continue to be generated. In the circumstance where knowledge is changed and is expanded, it is necessary to develop Knowledge Discovery Computing in order to detect knowledge changes and expansions accordingly. Since knowledge also has multiple types according to users' requirements, it is necessary to achieve efficient knowledge search and management through Knowledge Discovery Computing.

The special issue, published in March of 2020, is aimed at researchers and practitioners to share and discuss research outcomes and solutions of the knowledge discovery computing for management. There have been various studies and solutions to discover new knowledge and apply it to management through the cooperation of global research and development teams. By sharing knowledge, it is possible to create new added value and to open the venue of discussing knowledge discovery computing for management in order to improve the quality of human life.

The paper by Chung and Jung [1] proposed the knowledge-based dynamic cluster model using CNN (Convolutional Neural Network). Beyond the conventional knowledge-based healthcare, it is capable of expanding static data and knowledge with the use of ontology-based context knowledge. In order to analyze knowledge-based static data and dynamic data and activate the optimized medical service management for users whose conditions are changed, the proposed method makes use of CNN deep learning to generate inferred knowledge which can be used to obtain large-high-quality information and expand knowledge.

The paper by Lee et al. [2] proposed the memory attention and encoding temporal utterances method for managing the improved knowledge by integrating fault detection functions in an interactive system. The proposed method is aimed at improving the human-machine interaction used in the circles of academia and industry. To create knowledge

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and solve the problem that requires large text data and labels, the method encodes data with the use of the LSTM (Long Short Term Memory) based on End-to-End interactive analysis function. Based on the encoding results and word2vec results, the knowledge base is created. User conversation is saved in memory, and the most appropriate answer is made from the knowledge base.

The paper by Park et al. [3] analyzed the accessibility and validity mechanism in the policy measurement method in order for the knowledge-based technology management of ICT firms. In the mechanism, AHP (Analytic Hierarchy Process) analysis is conducted on ICT experts' responses, and the dynamic structure of accessibility mechanism is searched for with the use of causal loop diagram (CLD) for system dynamics methodology. The developing system is capable of integrating causal relations in cognition map and controlling the status change of variables in the inventory flow diagram. In diverse simulations, the knowledge generated with the uses of AHP analysis and CLD is used to support the decision-making of information non-disclosure or the execution point of policy.

The paper by Lee and Cho [4] studied the knowledge representation technology for computational thinking based on knowledge discovery computing. In order to help learners on how to efficiently represent and manage knowledge with computers, just as computational thinking, it generates knowledge on the basis of the understanding of software education. Based on Pattern, Automation, Abstraction, and Algorithm, the correlation of the problem requiring computational thinking is analyzed with the use of students' understanding. The problem-solving capacity for academic outcomes made by regression analysis, factor analysis, and modeling is applied to draw computational thinking based knowledge. Correlation coefficient and clustering results are used for knowledge and thereby are applied as a decision-making tool for delivering the appropriate information to learners.

The paper by Kim and Chung [5] developed the knowledge-based hybrid decision-making model for the nutrition management of individual users. By using dietary nutrition

ontology, it infers users' personalized health status and recommends their positive food products. In addition, the method makes use of users' food preferences and dietary nutrition similarity in order to generate and expand knowledge of food products whose nutrition structures are similar to those of users' preferred food products. Based on the inferred results of ontology and user preference, it recommends the nutrients essential for individual users.

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