

Study on the Classification of Network

Shoichi Kaneko

Faculty of Management Information, Yamanashi Gakuin University
2-4-5 Sakaori, Kofu city, Yamanashi, Japan
shoichi@ygu.ac.jp

Takaaki Kawanaka

Institute for Innovation in International Engineering Education, Graduate School of Engineering
The University of Tokyo
7-3-1 Hongo, Bunkyo-ku, Tokyo, Japan
t-kawanaka@t-adm.t.u-tokyo.ac.jp

Nyunho Jung

Faculty of Business, Aichi Shukutoku University
23, Sakuragaoka, Chikusa-ku, Nagoya-city, Aichi Prefecture, Japan
decembristking@hotmail.com

Hiroshi Yamashita

Department of Commerce, Meiji University
1-1 Kanda-Surugadai, Chiyoda-ku, Tokyo, Japan
hyamas@meiji.ac.jp

Masanobu Matsumaru

Mechanical and Industrial Engineering Department, Kanagawa University
3-27-1 Rokkakubashi, Kanagawa-ku, Yokohama-shi, Kanagawa, Japan
mxk00065@nifty.com

Abstract

While globalization and informatization progress, information networks typified by the Internet gets attention. Therefore, the term network is often conscious of strong linkage with information. However, a network is diverse and ambiguous concept that includes not only relation to information but also relation to people, organizations, systems, and the like. Focusing on "network" studies, many researchers are studying from both aspects of social science and natural science. The former are research fields such as interorganizational relations, network organization, communication network, and so on. The latter are research fields such as information networks, information communication networks, graph theory and probability theory, and so on.

Regarding "network" having such diverse and ambiguous meaning, the authors are studying "Network study based on the management information approach". We are examining the diverse and ambiguous features of the network from both formal theory and semantics. In other words, the social scientific approach and the engineering approach are positioned as semantic approaches and formal approaches, respectively.

In this report, we introduce classification criteria of network proposed by us. That is, we show the classification criteria of "network - like network" and "network - unlike network" according to natural approach, especially graph theoretical approach with respect to the meaning of the network in the research field of social science. In addition, we will introduce the standardized concatenation density for quantifying their connectivity.

Keywords

Network, Social science approach, Natural science approach, Classification criteria of network, Standardized concatenation density.

Biographies

Shoichi Kaneko is currently Professor in Faculty of Management Information, Yamanashi Gakuin University, Japan. He earned Bachelor Degree of Engineering in Faculty of Science and Engineering from Waseda University, Japan, Master Degree of Engineering in Master course Graduate school of Science and Engineering from Waseda University. His research interests are mainly focused on Human Resource Management, Management Quality Science and Information Management. He is member of Japan Association for Management Systems, Japan Industrial Management Association, Japan Academy of Management, Association for the Study of Industrial Management (Japan).

Nyunho Jung is currently a part-time lecturer, and was former Associate Professor in Department of Business, Aichi Shukutoku University, Japan. He earned Master Degree of Commerce and Doctor of Commerce from Meiji University. His research interests are mainly focused on Innovation Management, Human Resource Management, Management Quality Science and Behavior Science.

Takaaki Kawanaka is currently a lecturer in Institute for Innovation in International Engineering Education, Graduate School of Engineering, the University of Tokyo, Japan. He earned Bachelor Degree of Engineering in Faculty of Science and Engineering from Waseda University, Japan, Master Degree of Engineering in Master course Graduate school of Science and Engineering from Waseda University and Doctor Degree of Engineering in Doctor course Graduate school of Engineering from the University of Tokyo, Japan. His research interests are mainly focused on Industrial Engineering, Management Modeling and Information Security Management. He is member of Japan Association for Management Systems, Japan Industrial Management Association, Japan Society of Security Management and Information Processing Society of Japan.

Hiroshi Yamashita is currently Professor in Department of Commerce, Meiji University, Japan. He earned Bachelor Degree of Engineering in Faculty of Science and Engineering from Waseda University, Japan, Master Degree of Engineering in Master course Graduate school of Science and Engineering from Waseda University, Doctor Degree of Engineering in Doctor course Graduate school of Science and Engineering from Waseda University and Doctor of Commerce from Meiji University. His research interests are mainly focused on Human Resource Management, Management Quality Science and Management Modeling. He is member of Japan Association for Management Systems, Japan Association for Communication, Information and Society, Association for the Study of Industrial Management (Japan), Japan Society of Human Resource Management, Japan Logistics Society, Japan Society of Business Ethics, Japan Industrial Management Association, and Japan Academy of Management.

Masanobu Matsumaru is currently a part-time lecturer, and was former professor in Department of Industrial Engineering and Management Faculty of Engineering, Kanagawa University, Japan. He earned Bachelor of Engineering in Faculty of Science and Engineering from Waseda University, Japan, Master of Engineering in Master Course Graduate school of Science and Engineering from Waseda University and Doctor of Engineering from Tokai University. He has published journal and conference papers. Dr. Matsumaru research interests include development of scientific and engineering management technology to solve the management problems in manufacturing. Research field is management engineering. Research Overview is the development of scientific and engineering management technology to solve the management problems in manufacturing. Research Subjects are management quality and cost reduction in manufacturing, development of business management techniques and modeling in supply chain.