

Patients' Mind Cultivation Ontology

As A Basis for Medical Care Communication

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In regard to medical care, there exist many complicated problems due to the diversity of viewpoints. Stakeholders who involved in medical care did great efforts to solve this problem. The issue becomes more crucial when medical staff intend to offer high quality service to meet various needs of patients.

We argue that the aspect of the knowledge-based service science is necessary to establish the methodology that improves the quality of the medical service. Yoshikawa, a pioneer in the service science field, proposed a service model; its idea is that the cooperation of knowledge-base activities among the involved stakeholders promotes the generation of new service knowledge and its refinement, eventually promotes the social evolution. The model is a spiral loop chain that consists of four service stakeholders' processes, that is, the design, the offer, the receipt, and the evaluation concerned by the designer, the donor, the recipient, and evaluators respectively. The model advocates the service knowledge will be created, expanded and refined while the knowledge circulates within the spiral loop chain.

Based on this model and concerned with improving service quality, our research aims to support the knowledge sharing and circulations among stakeholders by means of cultivating the abilities of patients, the recipients of service, to recognize medical service correctly and evaluate it appropriately. In practice, however, such kind of cultivation is difficult, because it is time-consuming process to promote the change of recipients' values, and there are many uncertainties in the process. In our research, we call such activity "cultivation", and call the

necessary knowledge to perform the activity “cultivation knowledge”.

The feature of medical service compared with other services is that medical staff must try to mention the unpleasantness about illness and treatment to patients as acceptable-easily as possible, since the explanation of unpleasantness is the inevitable course of treatment. Therefore, the medical staff should be capable of apprehending patients’ inside thoughts and providing them with appropriate measures dependently. Although some of patients have serious illness, the medical staff should understand and treat them without universally true principles and theories. The medical staff will be able to use the cultivation knowledge, which is the experience knowledge and practice knowledge on the spot. However such knowledge is hard to obtain and generalize due to human being heavily depending on their surroundings. Hence, in our research we employ the approach of ontological engineering to organize and generalize such uncertain knowledge that is person-dependent and structure-complicated. We construct the Cultivation Ontology, which includes the concept related to patients’ psychology process to promote the representation and organization of the practical knowledge of medical staff.

In the Cultivation Ontology, cultivation activity, as a kind of special communication activity, is used to catch the inside change of patients and lead it to a desired direction. We use the roll concept as a meta-concept to explain it clearly. This ontology is a stimulus that supplies cultivation knowledge from the expression of medical staff’s experience and practice knowledge. In a word, it becomes possible to find an effective communication method, a kind of practice knowledge, in inquiring to medical staff when it is conditioned on communications of patients’ characteristics, psychological condition, and feature of medical practice based on the ontology.

Finally, to evaluate the effectiveness of Cultivation Ontology on the practical medical treatment, we interview the medical professionals in the Miyazaki University hospital and a certain folk hospital. The result indicates that Cultivation Ontology is useful to knowledge sharing and cultivation in medical care service. Especially, they affirmatively show a strong expectation in the utility of Cultivation Ontology as a base of the acquisition of practice knowledge.