Cluster Analysis of Care Assessment Data and Supporting for Care Planning

Kaoru Eto¹, Tatsunori Matsui², Minoru Mukuda¹, and Yasuo Kabasawa¹

¹Faculty of Engineering, Nippon Institute of Technology, Japan
²Faculty of Human Sciences, Waseda University, Japan
{eto,mukuda,kabasawa}@nit.ac.jp, matsui-t@waseda.jp

Abstract

Sharing know-how information for appropriately grasping care needs is an important factor to improve the quality of care service. Our know-how information sharing method highlights the differences between beginners and more skillful persons and brings them to the attention of the former. When a skillful person is given assessment data, first she roughly observes them based on a certain pattern that reflects her experience and then gradually notices the details. In this paper, we promote awareness by showing beginners this process. We classified assessment data using cluster analysis. With our results, which were verified by skillful persons, we verified that they basically agreed with the skillful person's classification pattern. Therefore, a skillful person's data observation process can be presented to beginners.

1. Introduction

Sharing know-how information for precisely grasping care needs is an important factor to improve the quality of care service. Our know-how information sharing method highlights the differences between beginners and more skillful persons and brings them to the attention of the former, because we believe that know-how information is included in such awareness. Our know-how information sharing system for the care planning process maps on a two-dimensional space the similarities among documents with which a skillful person interprets the results of care assessment data and brings the differences from skillful persons to the attention of beginners [1]. This study supports care planning by showing to beginners a skillful person's process during which she observes assessment data. When a skillful person observes assessment data, first she roughly observes them based on certain experience patterns and gradually notices the details. We promoted awareness by showing this process to beginners. We chose assessment data that resembled the assessment data made by users from model examples and displayed them.

2. Assessment Data

In care planning using the Kanai Original Modern Instrument (KOMI) Chart, a care client's assessment result is visualized as a chart with which a client's condition can be easily grasped. There are three main charts, the KOMI Radar Chart, and two different aspects of the KOMI Chart: cognition and behavior.

As shown in Fig. 1, the KOMI Radar Chart, which is designed to represent the physical condition of the client from the viewpoint of caring, has 16 checkpoints. Each checkpoint has a scale to reflect the level of that particular condition. The shape that appears by connecting the level makers on each scale of the radar chart illustrates the client’s current life and represents the range of the client’s capabilities.

3. Cluster Analysis Results

The cluster analysis results of the KOMI Radar Chart are shown in Fig. 2. Each radar chart is a sample of each cluster’s center. In each cluster, the feature appears clearly.
The verification result of the cluster analysis result by skillful persons is shown below.

1. The number of classification patterns and clusters illustrated by skillful persons were approximately consistent.
2. The features of the classification pattern and each cluster illustrated by skillful persons were approximately consistent.
3. The tacit knowledge, as indicated by a skillful person's classification pattern, was converted to explicit knowledge.

4. Display of Assessment Data

An example of using this system is shown in Fig. 3. On the left-hand side of the big window in the middle, the distance of the data of a user's radar chart and the radar chart of the example of the cluster's center is calculated, and the number is displayed sequentially from the cluster nearest to a user's data. The document of each cluster’s feature is displayed in the center of the big middle window. Users can learn about the cluster nearest their radar chart and its features. On the right of the middle window, the case number in the cluster nearest a user's radar chart is displayed sequentially. In the two lower right windows, the left shows a user's radar chart, and the right shows the radar chart of the example nearest a user's radar chart.

5. Conclusion and Future Work

The assessment data of a model example were classified using cluster analysis. We confirmed that this classification result was approximately consistent with a skillful person's classification pattern. Therefore, the process in which a skillful person's data are observed can be shown to a beginner using these clusters instead of a skillful person's classification pattern. We think that this function can support care planning from skillful persons. As future works, we will evaluate the function’s effectiveness by analysis of the experiment data in hospitals and nursing colleges.

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7. References