

ネットワークセントリック健康管理のオントロジーモデル

Network-Centric Healthcare Ontology Model

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Abstract: According to the Health Promotion Law executed from 2008, it would be discussed critically more sophisticated robust healthcare database and data mining between healthcare providers and clients in the aspect of asymmetry in healthcare. We propose an innovative concept of Network-Centric-Healthcare ontology model using shared situation awareness and self-synchronization.

1. Introduction

Traditional theory of public health is losing its effectiveness in Japan [7]. One of the biggest reasons is that occasions for the nation to do public health policy, such as quarantining patients of typhoid or tuberculosis, are decreasing [8]. Public health study, which began in UK during the 18th century, seems to have moved the emphasis to the prevention of lifestyle disease, as the effectuation of the health improvement law.

Especially, most impressive feature in the healthcare during the 19th and 20th century [23] is that the modern schools have become an “institution to grow children.” [2] It should be noted that this process involves the movement of enclosing females within the household work [11]. Our paper proposes the analysis methodology of NCO Ontology and consequently explains how to find the relationship between the children and family. We are going to describe that the spread of health science should become an important factor in the lifestyle.

2. Relationship between NCO and Healthcare Ontology

In general, ontology technology is identified as a shared tool for knowledge sharing or accumulation of intellectual property and its utilization, which supply the common recognition within each level in the society. Our

discussion is based on the viewpoint that it makes considerable influence on the structure of the personality how their human intelligence grew [31]. Application of Network-Centric Operation (NCO) technology to the health science is assessed [35]. The essence of NCO technology was structurally sorted out by Command & Control Research Program (CCRP). Most important among them is the “Power to the Edge”(PTE) [34]. Analysis of the PTE content is outside the scope of our paper. Following change is proposed (Figure 1):

- (a) Interoperable Agility: Quickly communicating the information
- (b) Shared Situation Awareness: Sharing information and make the people find what to do, instead of giving order.
- (c) Self-synchronization: Executing what to do on the basis of mutual trust.
- (d) Lesser Stovepipe organization: Avoid bureaucracy and activate the organization
- (e) Social Domain: implementing “the Eyes” of ICT to the social system.
- (f) Cognitive Domain: Situation awareness as the Affordance
- (g) Information Domain: Information seized as Cross-Media
- (h) Physical Domain: Articulating the Covert & Overt surveillance by RFID.

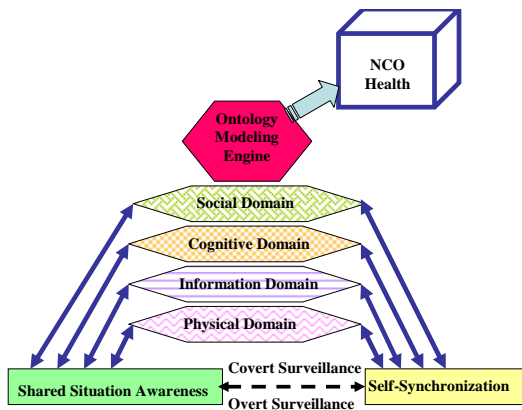


Figure 1: Changes caused by “Power to the Edge”

3. Health management system from mother-child notebook to care notebook

In what lifestyle do people growing in the industrial society follow the program from the birth to death? What context does each life leave in the society for the subsequent generation to utilize? In addition, is there a technique of data-mining utilizing the accumulated data? -So far there is no answer from the aspect of social engineering, or the social health science [27]. We would have to look for the way other than the current Western medicine [14]. Just supplying remedies after labeling the patient as specific disease [7][16] would not lead to the health management based on the human nature. We can find the appropriate countermeasure to the health problem only after identifying patients as members of social life, and identifying their DNA information [32]. It is necessary to identify the constitution of the patients in executing the countermeasure [24]. This process requires self-synchronization as training of objectively observing the body [34]. Main feature of human beings as creatures is the function of the brain and nerve system. However, the nerve systems are influenced by the disorder of health. The influence would remain for the rest of life. For example, if a person is attacked by cerebral bleeding on account of hypertension, they would need long rehabilitation. It would be impossible to restore the original condition. It is because finished nerve system cannot properly operate in the internal bleeding. Generally nerve cells actively grow for about 1 year after the birth. But the growth stops shortly after the year 1. The number of nerve cells is finalized in the year 2. Afterwards nerve fibers expand, axial fiber and dendrite grow, and synapse is formed. Therefore nerve fiber of

human beings until the 2 years old. Brain is structured by developing nerve fibers. Therefore the record of growth written on the mother-child notebook [24] is utilized in considering their elderly care by restructuring this very basic of the physiology into the NCO ontology [12][22](Figure 2).

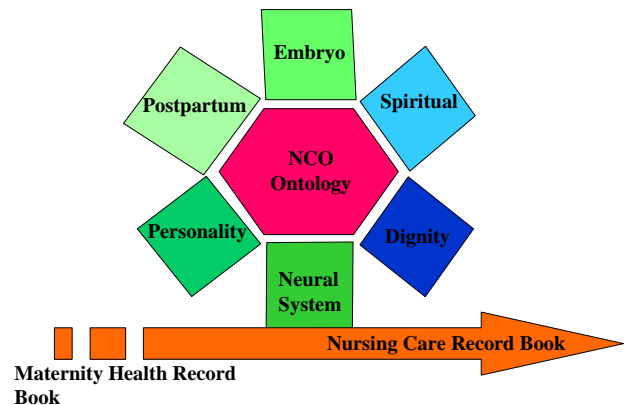


Figure 2: NCO Ontology

4. Ontology of Health management data from the aspect of resource anthropology

Topics of health or health management are so familiar to us that it is frequently used in the usual conversation like the climate matter. People living in the 21st century put the health data into the process of ontology as information of the “resource.” Their quality is versatile, from the TV information variety program to the academic reports. People are tossed about by this wrong popular health information. Biggest reason for the error is that gene information is biased from the others living in the same area of life. They are not stored in structural way. The main issue of our research is how we can store, manage, share, and apply them to personalized health management system.

The personality is greatly influenced by the environment factor. Human beings come out as a person with individuality before memorizing lots of things [4]. The ownership of health data which they have cannot be appropriately analyzed by the logic along which the 19th century anthropology discussed the human right [6]. Conscription system, where the nation manages the life of healthy people, is practiced in the majority of developed countries. Here the new science looking at human beings as “resource” of the society is necessary for the management and storage of health data [31]. For example, organ transplant system quickly matches the

compatibility and removes it from the dead person supply it to the patient who need it. It should be noted that the organ to be transplanted must be “alive.” The transplant should be performed while the cells and tissues are alive. The proposal of our paper is described in Figure 3. The bio-metabolic data of people be made commons of the community [17]. The guideline for the process of reaching to the agreement is necessary. It should consider the local characteristic of the area. Maximum of the group size is assumed 500 thousand. Precise upper limit and the methodology to work out the value is the issue for the future study. The methodology of changing the behavior reasonably to acquire good result should be also developed. Agent simulation technology or ontology technology would need well-structured discussion.

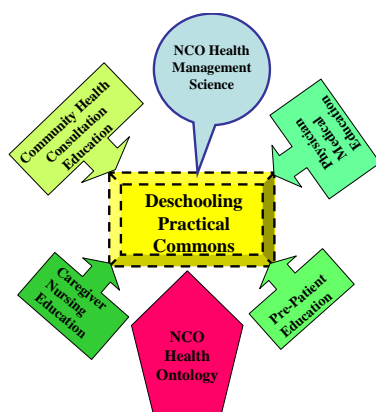


Figure 3: NCO Health Ontology for the interoperability of healthcare sciences

Health science is increasing its importance these days [13]. However, although current health science emphasizes the interoperability among medicine, nursing, and caring, each field exist only as a stovepipe technology. The basic concept avoiding the barrier between each stovepipe is the NCO Health Ontology [5] (Figure 3). These technology would not be taught in schools [3] but in the de-schooling practice program scattered in local area [32][33]. It is by maintaining the interoperability that commons for the area is established [29].

5. Conclusion and the Way Forward

NCO [35] and the high-performance processing technology of data-mining and data-warehousing are necessary in establishing health management science. The necessity of ontology technology [5] for the creature of context and image memorization was discussed in the paper. Not all of NCO basic technology is necessary in

health management science, but ontology is one of basic factors. In addition, science should be developed based on the perception that health data of a specific person is not one-off but the commons of the area. Health is not receiving medical care but a matter of management. It should be managed / maintained by keeping healthy behavior found by NCO ontology. The data should be stored permanently and be utilized as the “storage of social life.” Therefore the society where we do not have to depend on the current medicine which just labels the symptom is about to begin.

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