A Clinical History Recording Management Scheme on the Multimedia Telemedicine

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Abstract—The paper's suggestion is about hereditary facts between family members. Diagnosing patients from the point of patients temporary conditions, and so performing primitive examinations and treatments, can lead not only to frequent wrong diagnoses, and to huge medical expenses and times to the patients, but even to critical situation of patients or taking lives away.

As a means to cut these cases down to a minimum, sharing medical treatment information between family members is suggested. This approach makes possible understanding physical constitution and environment between family members, and can result in bringing a faster treatment effect if some family member suffers from a similar disease. This approach, since a participation in a family membership effectuates all of family members, can minimize the membership fees, thus enabling inter-family health care on a home doctor basis.

Index Terms—Telemedicine, Information sharing, Family member, Database, A Clinical History Recording, Management Scheme, e-business.

I. INTRODUCTION

As demands for online-based patient care services are expanding, some Internet-based health services have undergone development. Patient medical history system for Internet-based distance health care is a part of e-business and catching the attention of many hospitals that are clamoring to incorporate online and offline services in order to offer a variety of services to clients and to expand client base. This distance medical care services combines online counseling with offline diagnosis and treatment. In general, the system ushers online clients into offline diagnosis. This system brings patients, doctors and pharmacists together online and allows them to interact in the process of diagnosis, prescription and dispensing to the effect of increasing efficiency of medical services and rendering the medical services more user-friendly. Some distance patient care connected with the system in a large-scale hospitals or government's health department is heading for the comprehensive portal medical services.[1,2]

This distance health care system must build a medical portal site and expand client base to be successful in e-business. However, studies or discussion on business and medical aspects of distance health care is just scratching the surface, while no online medical system has gone deep into the essence of the medical practices. To enhance e-business aspect of Internet-based distance health care system, efficient membership management, content services and more advanced patient care and diagnosis solutions intertwining online and offline activities are crucial tasks to service providers.[3,4]

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II. A CLINICAL HISTORY RECORDING MANAGEMENT

The present off-line medical treatment system has many issues that need to be resolved. First issue will be patients distrust in hospitals and medical doctors. This has been brought forth by doctor wrong diagnoses made often, and also by their business-oriented and unkind attitudes, resulting in an inefficient medical treatment. Adding to that, patients have been encountering upon difficulties, in that they must be at a designated time at hospital, costing them considerable expenses for transportations due to time and space restraints. You may have experienced, sometimes, five to six hours waiting and only for five to six minutes treatment at most.

To make things worse further, you may have been given even no treatment unless you are on time as arranged. As a possible way to resolve most of the issues mentioned, an Internet-based remote medical treatment system is applicable beyond time and space restraints. Currently, studies on remote medical systems are underway to develop systems for a resolution of these issues.[5,6]

The figure 1 displayed protocols on the fee-based medical services connecting online, offline services, doctors and patient care at hospitals. First of all, clients' regular or irregular counseling with doctors via Internet is (A-1), doctors' corporation or questions and answers to follow up on the first counseling is (A-2), recording medical history is (A-3) and sharing medical records of family members is (A-4).

On offline level, patient care is (B-1), questions & answers, doctors' corporation, keeping a record of medical history, sharing medical records of family members is (B-2), (B-3) and (B-4), respectively. For emergency services, patient care takes place in (C-1), (C-2) and (C-3) level. Patients care by doctors who are not in the system goes through (D-1), (D-2), (D-3), (D-4) and (D-5). In-patients take (E-1) and (E-2) steps. The system allows doctors to corporate and to share documents and view family members' medical history, when members is subject to emergency care and admitted to hospitals, put

under the care of doctors who are not registered with the system. This open information flow ensures effective treatment, by reducing erroneous diagnosis and introducing timely, precise and low-cost treatment.

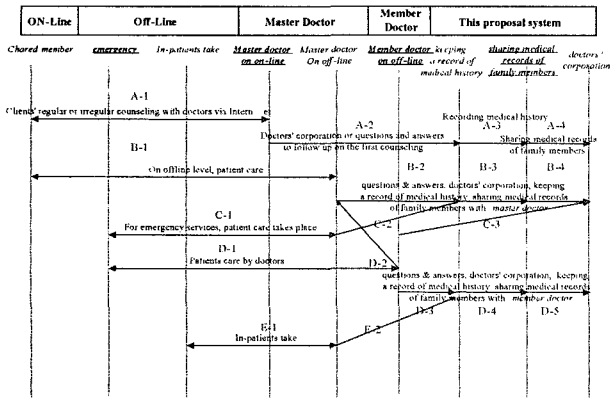

Fig. 1 Protocols that connect fee-based medical services

III. THE MEDICAL RECORD ALGORITHM

The medical record algorithms keep a log of counseling and patient care information for doctors to refer to before making diagnosis and treatment on a come-back patient. The figure 2 showed algorithms and the table 1 is are the knowledge frame to for information.

Clients (patients) may view the recording of counseling and answers from their doctors as well as the results of treatment (RN).

```
P_Insert_Module(RN)
  { if( RN == "" ) {
        P1 = Write_Module();
        return P1; }
    else {
        Show(RN);
        PN = Write_Module();
        RPN = RN + PN;
        return RPN;
    } }
  D_Insert_Module(PN, RN)
  { if( RN == "" ) {
        Show(PN);
        D1 = Write_Module();
        R = PN + D1;
        return R; }
    else {
        Show(PN, RN);
         DN = Write_Module();
        RDN = RD + DN;
        R = PN + RDN;
       return R; } }
```

Fig. 2 Algorithms that connect doctor – patient information

To fulfill the objective of the system-efficient patient care, results of treatment (Rn) completed by doctors will serve as reference material: It goes into the archive of specialists to be used for corporation between doctors or by other doctors seeing patients with similar medical problems.

Writing RN includes description of decease, details of treatment, period of treatment other facts worth recording.

Specialists may view all the information about patients with medical problems they are specialized in. Information on the archives is for viewing only. No modification is allowed. Modification is permissible for a certain period during a treatment period.

Table 1. Knowledge Framework interconnecting database between doctors and patients

	T1	T2	T3	.....	TN
Patient	P1	RP2=R1+P2	RP3=R2+P3	.....	RPN=RN-1+PN
Doctor	D1	RD2=R1+D2	RD3=R2+D3	.....	RDN=RN-1+DN
Result	R1=P1+D1	R2=RP2+RD2	R3=RP3+RD3	.....	RN=RPN+RDN

* The comment of table 1

- T1: First disease in a relevant medical field until a temporary treatment is completed.
- P1: A patients first consultations.
- D1: Diagnosis relative to first disease by a primary doctor
- R1: Relevant treatment results, where the combined results of P1+D1 are included.
- RP2=R1+P2: Doctors consultations relative to 2nd patient disease, where the results of previous disease, and the consultations relative to present disease are included.
- RD2=R1+D2: Primary doctors treatments relative to 2nd disease, where the results of previous disorder, and the diagnosis and treatment relative to present disease are included.
- R2=RP2+RD2: Treatment results relative to 2nd patient disease, where the consultations and treatments with a patient are arranged as final.

IV. SHARING TREATMENT INFORMATION BETWEEN FAMILY MEMBERS

The existing treatment types have had a limited interconnection between individual patients on a temporary basis.

Interconnections have been only possible in part, using the treatment charts stored in the relevant hospitals. The information is not in a digitized form; thereby its use was still very limited.

Besides, an unequal diagnosis is made even with the same disease of a patient, dependent upon the hospital where the patent is treated. This undesirable results, mainly generated from a point either a hospital overly trusts in its diagnosis types, or tends not to provide a patient information to others, the damages of which are eventually shifted to the patients themselves.

While avoiding such an undesirable situation, and also

facilitating to acquire medical treatment activities at a faster speed, the method of sharing medical treatment information between doctors and patients, as stated in the previous chapter, serves the basic objectives of providing a faster diagnosis and treatment for the patients.

Based on the past information of consultations and treatments between doctors and patients, secondly suggested is to facilitate inter-doctoral cooperation treatments, and also to share medical expertise and know-how among many doctors for patients faster treatments.[7,8]

The final suggestion is about hereditary facts between family members. Diagnosing patients from the point of patients temporary conditions, and so performing primitive examinations and treatments, can lead not only to frequent wrong diagnoses, and to huge medical expenses and times to the patients, but even to critical situation of patients or taking lives away. As a means to cut these cases down to a minimum, sharing medical treatment information between family members is suggested. This approach makes possible understanding physical constitution and environment between family members, and can result in bringing a faster treatment effect if some family member suffers from a similar disease.

This approach, since a participation in a family membership effectuates all of family members, can minimize the membership fees, thus enabling inter-family health care on a home doctor_ basis. The family membership is made applicable for members ranging from parents, children or family members in ones wife home or on ones mother side from a master membership viewpoint. The masters membership fee is twice the fee of general membership, and the rest of the family becomes members at no additional membership fees. Moreover, since receiving medical treatments to a pay member in cyberspace applies as fixed rate of around say the low cost per each treatment, members can get medical consultations and treatments at a much lower price. Also, as this applies to each doctor membership, all of the family members can receive each professional consultation and treatment of each respective field of doctors. For example, a family has a membership of 4 departments of internal, surgery, dermatology, and pediatrics, then each member can receive each departments medical benefits, once its respective primary doctor of these four fields is decided. The range of a family, from a membership participant viewpoint, is limited to wife, children, parents, brothers and sisters, parents in ones wife home, and brothers and sisters in ones wife home. When an application is made for a membership, all of its own family information is entered. The rest of family members can also receive membership benefits in cyberspace, by entering family identification issued already, and its own population registration number. This system enables not only sharing inter-family member information between family members, but cutting the membership fees down as well, makes it possible to get regular family medical cares under home doctor_ system. From the primary doctors viewpoint, they can secure more off-line pay memberships, so the system is mutually beneficial.

V. CONCLUSION

This paper's suggestion is about hereditary facts between family members. Diagnosing patients from the point of patients temporary conditions, and so performing primitive examinations and treatments, can lead not only to frequent wrong diagnoses, and to huge medical expenses and times to the patients, but even to critical situation of patients or taking lives away.

The following suggested define is completed care report for the family medical history.

$$Rn = \bigcup_{1}^{j} Pnj + \bigcup_{1}^{i} Dn^{i} : (j=1,2,...,j), (i=1,2,...,i), (n=1,2,..,n)$$

The Rn(completed care report) integrates comprehensive patients reports ranging from patient P^2 to P^j including P^1 (oneself) with the doctors' care reports up to the care No. no by i number of doctors (D^1=doctor in charge, $D^{2,3,...i}$=doctors on corporation program.)

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