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## Role of Information Technology in Ayurveda in the Digital Age

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### Abstract

*The present practice of Ayurveda emphasizes on traditional way. The globalisation, patent, intellectual property rights issues and biopiracy are becoming major challenges in the indigenous traditional medical system like Ayurveda. So there is going to be crises and challenges in the Ayurveda system. In order to promote as a global medicine and equip Ayurveda to meet the global healthcare needs of the 21<sup>st</sup> century, there is an urgent need to modernise the ancient system in pace with the development of science and technology. So considering all these facts, Ayurveda is needed to restructure in the global context to meet the rising demands of a cyber society with the application of information and communication technology.*

**Keywords :** Digital Library, Medical Information System, Ayurveda System

### 0. Ayurveda

Ayurveda, the ancient science of life and health, is a unique heritage of India. Ayurveda is made up of two Sanskrit words: "Ayu" which means life and "Veda" means the knowledge. Thus "Ayurveda" in totality means 'Science of life'. It incorporates all aspects of life whether physical, psychological, spiritual or social. What is beneficial and what is harmful to life, what is happy life and what is sorrowful life; all these four questions and life span allied issues are elaborately and emphatically discussed in Ayurveda (Gupta, 1919). According to the ancient Ayurvedic scholar Charaka, "Ayu" is comprised of four essential parts. These are the combination of the mind, body, senses and the soul.

### 1. Basic Philosophy of Health, Disease and Treatment in Ayurveda

As per Ayurveda, 'Health' is a state of equilibrium of normal functions of doshas, dhatus, malas and agni with delighted body, mind and soul. It means that when Doshas-Dhatus-Malas and Agni are constantly in a state of functional equilibrium, then the health is maintained. Otherwise distortion of the equilibrium results into diseases (Dash, 1980). Erratic lifestyle is believed to be one of the basic causes behind the failure of mechanism of maintaining equilibrium. Treatment either with or without drugs and application of specific rules of diet, activity and mental status as described, disease wise, brings back the state of equilibrium i.e. health.

Fifty sixth world health assembly of WHO held in March 2003 at Geneva has mentioned that in India 65% of the population in rural areas use Ayurveda and medicinal plants to help to meet their primary healthcare needs (Sharma, 2003). In spite of its glorious past of over 5000 years as a global Medicare system, the influence of Ayurveda among the foreign public began after the Alma Ata declaration of WHO in 1980 recognised Ayurveda as an alternative system of medicine (Patel, 2000). This is because of its holistic approach and as the most user and environment - friendly system of medicine. With the changing concepts of health and disease and shifting scenario of health needs of the present times, there has been an amazing arousal of worldwide interest in Ayurveda which is likely to be accelerated with the growing trends of information technology, economic globalization and industrial activism.

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## 2. Present Problems

After the Industrial Revolution, the rate of growth in science and technology was very fast, resulting in the inventions of computers, which are having the capacity to memorise and analyze millions of data in a nanosecond. But in practice unfortunately even 50 per cent of the available data doesn't appear to be utilized by the present day Ayurveda practitioners, perhaps with very few exceptions. Hence there is an urgent need to link computer technology and Ayurveda so that it could be utilized for present practical applications of diagnosis and treatment (Shajahan, 1998). In the present era of competition and globalisation every branch of science is trying to retain its identity in the globe by reorienting and developing itself according to the need by conducting various kinds of research. Ayurveda is also trying to prove its identity by searching newer remedies to overcome the disease for which there is no answer in modern medical science. With the growing institutionalisation of education in Ayurveda in the present century, need has been felt to launch research and development in order to update it in terms of its understanding and application to the present day need of people. The globalisation, patent, intellectual property rights issues and biopiracy are becoming a major problem in the indigenous traditional medical system like Ayurveda (Ramachandran, 2002). So there is going to be crises and challenges in the Ayurveda system. At present Ayurveda medicines are not cost-effective. Ayurveda treatment is individual based and drug production is a time consuming process. The Ayurveda medicines cannot be prepared in bulk quantity in a very short time and supplied immediately as in the case of Allopathy medicine. Another important point in Ayurveda medicine is its way of treatment. Many practitioners still resort to the traditional ways to diagnose the disease (Mathew, 1998). The rules and regulations of this sector are quite old and totally incapable to support the industry in modern developments. This system, which has proven in India for hundreds of years, has kindled the interest of the entire world and they look at it as an alternative holistic global health care system. But Ayurveda is not yet equipped to meet the challenges of the cyber society. So considering all these facts, Ayurveda needs a restructuring in the global context to meet the rising demands of a cyber society.

## 3. Computer based Ayurveda Practice

The potential for Information technology to help medical practitioners to perform the complex information management tasks of patient care has long been recognised. Many promising systems that incorporate advanced information technology have been developed for clinical use, with regular improvements in availability, speed, and ease to use (Gorman, 1995). The computerized Ayurveda studies have identified several important factors that affect the current and future role of computers and information technology in Ayurveda treatment. These factors include advances in information science, biotechnology and computer hardware and software, changes in the background of Ayurveda professionals, changes in the medicolegal climate and changing strategies for healthcare. At present there are few interactive Ayurveda softwares available for the diagnosis and treatment by the Ayurveda practitioners. The major computer based Ayurveda packages are:

## 4. Body Tune (Computerized Ayurvedic Medicare.CAM)

Body Tune, developed in 1983 is an interactive Computerized Ayurvedic Medicare software concept contributing to Ayurveda in three basic interrelated ways. It detects and communicates data about the physical conditions. It interprets that data, and actively assists in assessment and accurate diagnosis. It helps to organize the diagnostic method in a classical way envisaged by Indian Sages of Ayurveda. CAM was clinically tested by Gujarat Ayurveda University in 1993 developed by Dr. M.A. Shajahan. Its efficiency has been tested in patients and found correct. This software was particularly meant for determination of Tridosha (Vata, Pitta, Kapha) aspects only, not for any specific disease. This was the first attempt ever made in bringing computers in the field of Ayurveda (Shajahan, 1993). Its second and third versions came in 1988 and 1990 respectively.

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Salient Features of CAM are :

- ✍ Dosh assessment : Give the signs and symptoms , after examining the persons to body tune. It will give all Doshas of body.
- ✍ Formulary: To view and search medicinal plants with its Ayurvedic properties, family, Latin Names etc. with photographs
- ✍ Rasa Guna relation: provide information about intensity and variations of rasa a and gunas
- ✍ Climatology : To know the relation of Tridoshas with climates
- ✍ Sodhana Schedule: Give awareness about various sodhana in different seasons to tune the body towards the Universe
- ✍ Weights & Measures: provide metric equivalents of classical units
- ✍ Calendar: Facility for marking schedules or appointments
- ✍ Calculator: Utility for mathematical operations
- ✍ Print:: To print case sheet or result request sheets

## 5. PRAKES

Prakes is an expert system for the estimation of Prakrti (body constitution) developed by CIRA (Center for Informatics Research Advancement, Kerala) in 1987. It was aimed at building a system to estimate the Prakrti of a person.

## 6. PRAKRTI Determination and Health Guidance by Computer

This is an expert system designed and developed by Chaitanya Consultancy, Pune in 1989. It gives users Prakrti, health advice regarding diet, instructions about daily activities, likely illness and measures for its prevention.

## 7. PILEX

This software is intended to diagnose the piles, its prognosis, complications and treatments. It was developed in Basic language in Gujarat Ayurveda University, Jamnagar.Gujarat in 1990.

## 8. MADHAVA: Ayurvedic Diagnostic System

Centre for Development of Advanced Computing, Pune has developed this diagnostics expert system based on Ayurvedic System of Medicine to diagnose a wide variety of disease in 1991. This system is developed to aid physicians in cases when the necessary information for a precise diagnosis is unavailable.

The system is capable of on – line learning as well as updating, thereby providing a scope for upgrading the system. In this system, the physician would conduct an interactive dialogue about the patient by providing information and responding to the questions generated by the system. The output of the system is a list of possible diagnosis with a certainty greater than a predefined level. The system acts as an advisor, and the physicians have the final responsibility about diagnosis of the disease as well as administration of the medicine and treatment.

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## 9. RASEX

This package was developed by Government Ayurveda College, Trivandrum, CIRA, and ER & DC, Trivandrum in 1992. In this package an attempt has been made to correlate the pharmacological properties with that of therapeutic properties with the help of computer. A database was created after collecting, organizing and storing all the pharmacological and therapeutic properties of single rasa drug using DBase III plus. A list of drugs, which conforms to the physician's specifications is collected and displayed.

## 10. Role of Information Technology in Ayurveda

The process of restructuring of Ayurveda for the modernization and globalisation, the application of Information and Communication Technology (ICT) is very much required. This complex process of application of IT in the treatment and production of Ayurveda medicine needs to be studied in detail with sound theoretical and methodological foundations. However this question of developing theories and methodology poses a great challenge to Ayurveda practitioners and information technologists at international level (Nair, 2003). In this age to meet the healthcare demands of the world community, the interactions between Ayurvedic medicine and Allopathic medicine is essential. For the smooth interactions between them, application of ICT in Ayurveda is quite essential. The latest technological aids used for diagnosis and treatment in modern medicine should be used in the Ayurveda medicine also. The standardisation and production of quality drugs are important in view of export market also. There is a quantum jump of Indian Ayurvedic medicines, plants and products in international market during the couple of years which shows a tremendous growth rate. The U. S spends around \$30 billion on alternate medicines every year. Consumers in Europe, too spends 13 billion Euros annually on herbal medicines. The global Ayurveda industry is estimated to be worth \$62 billion annually. These mind-boggling figures justify the economics of applying the ICT on Ayurveda in its treatment, drug production and online product sales. The recent developments in the practice of modern medicine give more importance to ICT (Thomas, 2003). Therefore Ayurveda should adopt their way for its growth. The ICT revolutionises the healthcare system through new thresholds of information connectivity and higher bandwidth. These technologies have enormous capability to enable reliable storage, retrieval, transfer of the communication elements viz. text, images, audio and visual data.

The goal of Ayurveda is to improve the quality of life by preventing, and treating disease and chronic illness. The current system of treatment concentrates on three-dimensional approach, which consists of three basic elements of healthcare. They are patients, doctors, and drug vendors and suppliers (Srinivasan, 2004). The present practice involves the interaction between the patient and the doctor. There are few new major components which can be adopted in the healthcare systems of Ayurveda are Consultant Information System, Drug Information System, Patients Information System, Knowledge base in digital format and Information and Communication Technology. The above systems help to connect distant resources to work as a part of the system (Ram Mohan 1998). Therefore the revalidation and modernisation of Ayurveda can be possible through the application of ICT and research in both fundamental and applied aspects of Ayurveda

## 11. Conclusion

Ayurveda is the most suitable system of medicine in which Information Technology can be applied, provided both the IT experts and Ayurveda experts have very clear idea about the potentiality of both systems. The fear of Ayurveda practitioners is that if we alter the traditionality, the system will perish. So they are reluctant to apply new technologies in the Ayurvedic system. To change their mindset, they must realise that Ayurveda has global chance in this century as the most useful alternate system of medicine with vast opportunities. The adoption of ICT in Ayurveda will enhance the interactions between Ayurveda and modern medicine. So the need for modernization of Ayurveda with the application of ICT is essential to meet the challenges of future healthcare needs of a cyber society. It is a new area where the application of ICT is more evident with regards to the modern Allopathy medicine.

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