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Ancient Wisdom meets Artificial Intelligence: A Literature Survey

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Abstract: ***A revolutionary advancement is taking place in global healthcare, blending the ancient wisdom of Ayurveda with modern technology. Ayurveda is a science of life with a holistic approach to human health and personalised medicine. Ayurved is eternal and has no end. It is one of the oldest medical systems which consists of thousands of medical concepts and Formulations.***

सोद्यमायुर्वेदः शश्वतो निर्दिश्यते अनादित्वात् **(चरक संहिता सूत्रस्थान-30/27)**

Ayurveda has become a global health practice due to its holistic approach to wellness, which has been long revered beyond India. Its method and effect on chronic diseases like arthritis, diabetes, Allergies are gaining popularity in western countries. Despite the popularity of Ayurveda, scientific validation has hindered its broader application.

AI plays a role in bridging this gap by offering a solution.

Keywords: Artificial Intelligence, Ayurveda, Chronic disease, Holistic wellness

I. INTRODUCTION

Since ancient times, Ayurveda the science of life is utilized for maintaining physical, mental and overall well-being. It deals with the knowledge (Veda) of life (Ayur). Ayurveda was first mentioned in ancient scholastic text from the Indian vedic period. During this period Ayurveda prospered and its teachings were utilized for the benefit of human health in all aspect.

The science which describes the favourable or unfavourable, happy or unhappy measures for a span of life.

हिताहितं सुखं दुःखं आयुः तस्य हिताहितं।
मानं च तच्च यत्रोक्तं आयुर्वेदः स उच्यते।। **(चरक संहिता-(I) सूत्रस्थान-1/41)**

Ayurveda is one of the most prevalent disciplines with wellbeing and efficiency. A person is healthy whose *doshas*, the basic elements and functional energy *(Agni*) stream as per one's natural constitution or *prakriti*.

समदोषः समाग्निश्च समधातु मलःक्रियाः प्रसन्नात्मेन्द्रियमनः स्वस्थ इति अभिधीयते **(सुश्रुत संहिता ,सूत्रस्थान ,15/48)**

Ayurveda incorporates various diet lifestyle regimes, massages and medicinal herbs that can help you attain optimum health. *Panchakarma* is to balance the doshas and give stable mental health improving mental clarity and mood swings.

तद् दुःखसंयोगा व्याध्या उच्यन्ते **(सुश्रुत संहिता ,सूत्रस्थान ,1/31)**

With increasing demand of Ayurvedic medicine and acceptance of Ayurveda in the entire globe, there is requirement of modernization and implementation of Advance technology in Ayurveda.

Modern Technology such as Artificial Intelligence can be used to strengthen health system with its varied range of application specifically focusing on need of population, health care providers and industry towards empowering the patients and achieving the vision of health for all.

Any technology or machinery can reduce the mental and physical burden from human shoulders.

Artificial Intelligence can be used to combine engineering principle in Ancient Medicine system to keep upfront in international standard of quality and selling in the global market. Artificial Intelligence can be used to reduce the challenges faced during drug manufacturing of Ayurvedic Medicine. AI's impact on Ayurveda goes beyond research and into the commercial realm. Thanks to cutting-edge computational techniques, AI tools are unravelling the complexities of Ayurveda formulations. They play an important role in identifying the bioactive compounds found in the Ayurvedic plant, connecting them to particular biochemical pathways and therapeutic advantages. This process plays an important role in creating new products and determining the optimal dosages, improving both the effectiveness and safety of traditional Ayurvedic therapies.

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Artificial Intelligence (AI) has the capability to transform Ayurveda by making computers and machines intelligent in this traditional system of medicine. AI models can help predict patterns and create robust computer models to help doctors perform Ayurvedic diagnosis.

Plants have medicinal benefits and are natural alternatives to treat diseases. Herb identification is one of the most important aspects of Ayurveda product manufacturing. Traditional methods based on human expertise are subjective, time consuming, and prone to mistakes. This presents major challenges for the industry. Standardised protocols for herb identification add to the problem, resulting in variations in product quality, trustworthiness, and efficacy. Fortunately, AI powered solutions offer an exciting opportunity to transform this process.

II. SCOPE OF AI IN AYURVEDA

AI in Ayurveda can help identify herbs by analysing huge amounts of data and recognising complex patterns. Here are some of the important ways AI can help Ayurveda product manufacturing.

With the help of deep learning models, organisations and researchers in the Ayurvedic field can train algorithms to analyse various images of various plants, herbs and their parts in real time, including leaves and flowers, roots and stems. With vast databases, such AI systems can differentiate different herbs, including closely related herbs, improving efficiency and reducing the risk of incorrect identification resulting in adulteration.

AI-driven technology can assist in the growth of herbs and medicinal plants through the analysis of soil information, tracking crop development, forecasting weather conditions, and enhancing the irrigation and fertilization of soil. AI-driven platforms can also detect and diagnose plant illnesses, propose remedies, and enhance the overall yield and quality of crops. This presents significant opportunities for ethical and sustainable procurement, stringent quality assurance procedures, and thorough research and development to guarantee the effectiveness and reliability of Ayurvedic products.

The utilization of Digital Ledger offers a promising solution for herb identification by establishing a secure and decentralized database dedicated to herb-related data. This advancement is poised to elevate transparency, traceability, and operational efficiency throughout the supply chain. Through Digital Ledger integration, stakeholders can easily access real-time information concerning the origin, quality, and legitimacy of herbs, thereby mitigating the risks associated with fraudulent practices and ensuring the safety and efficacy of Ayurvedic products.

Artificial Intelligence (AI) can be used to analyse spectral information and chemical profile of herbs. AI algorithms can be used to identify specific chemical markers found in herbs using technologies such as infrared spectroscopy. This allows manufacturers to verify raw material authenticity and quality, ensuring consistent product formulations and avoiding false products.

Analytic algorithms have the capability to analyse extensive textual data found in Ayurvedic texts, research papers, and clinical trials. By doing so, they can extract valuable information regarding the properties, characteristics, and traditional uses of herbs. This knowledge base enables AI systems to provide manufacturers with comprehensive insights, assisting them in making well-informed decisions when selecting and formulating herbs.

By utilizing machine learning methods, artificial intelligence has the capability to link the characteristics of herbs to specific health issues or illnesses. This enables the discovery of possible herb mixtures and amounts that are customized to tackle particular health problems. Consequently, producers are able to develop precise Ayurvedic blends for different ailments, thereby improving the efficiency of their goods.

III.ASSISTANCES AND INFLUENCE

Manufacturers of Ayurvedic products can benefit greatly from integrating artificial intelligence into their processes for identifying herbs. Ayurvedic manufacturers can guarantee the safety of their products by employing accurate techniques for identifying herbs. These methods assist in identifying any adulteration and prevent the use of unsuitable or potentially hazardous ingredients. AI-powered systems have the potential to ensure accurate identification of herbs, thereby minimizing the chances of human errors and subjective interpretations. Additionally, these systems can help in reducing discrepancies in product quality.AI technology enhances and expedites the herb identification process, leading to significant time savings and reduced operational costs commonly linked with manual identification methods.

AI's extensive data analysis capabilities provide Ayurvedic product manufacturers with the ability to innovate and personalize their products through the discovery of novel herb combinations, formulations, and dosage recommendations. The collaboration between AI and Ayurveda has the potential to transform the industry, ushering in a new era of accuracy, uniformity, and efficacy in the manufacturing of Ayurvedic products.

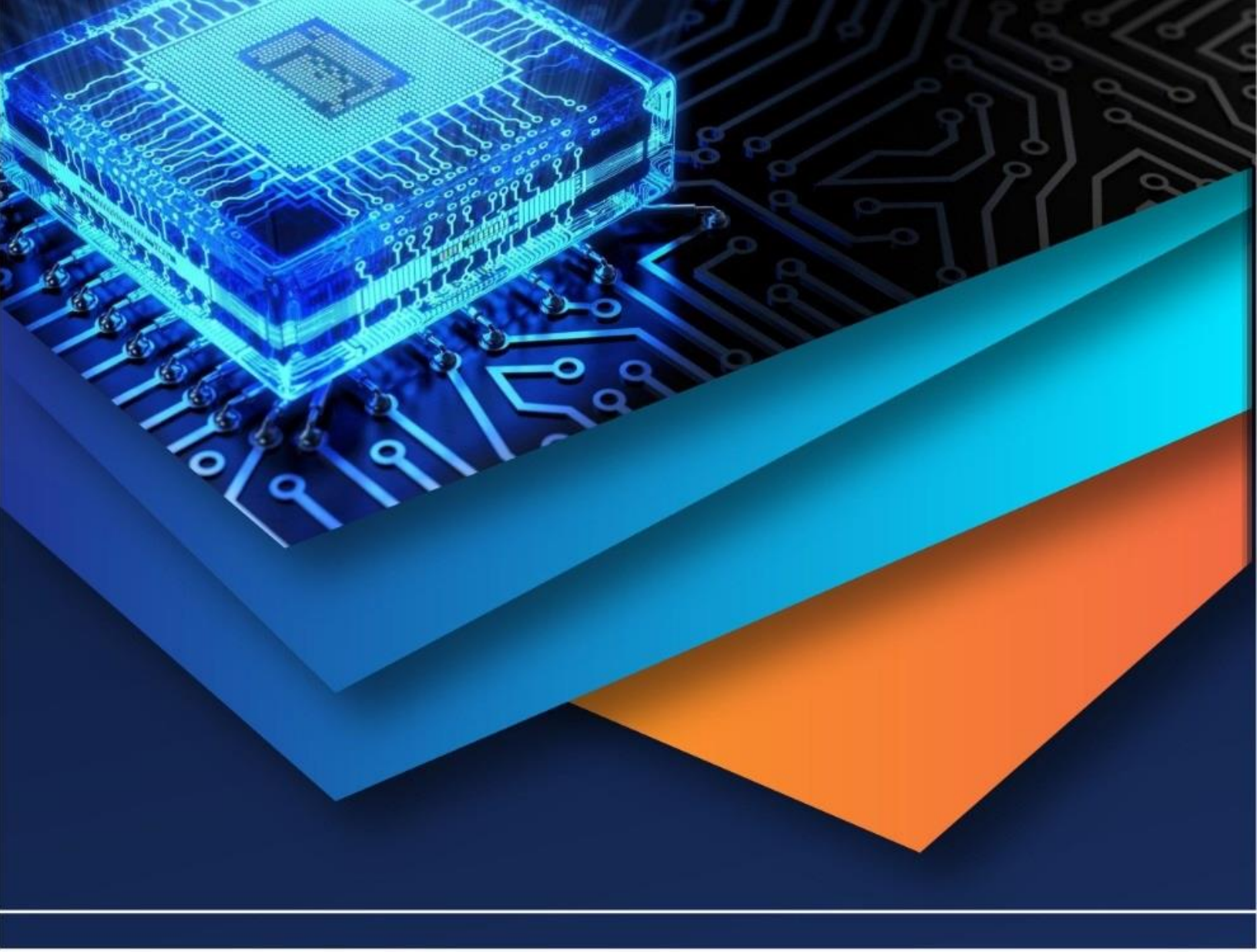
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IV. WAY FORWARD

AI technology can help Ayurveda tremendously by giving practitioners tools to enhance patient care, diagnosis, and therapy. AI technology can help Ayurveda increase patient access to care, enhance treatment efficacy, and give patients more individualized care. To protect patients' safety and wellbeing, it is crucial to remember that the application of AI in Ayurveda should be guided by moral principles and relevant laws.

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