

# On Challenges Faced by Ayurveda industry in India and Studying the Possible Hierarchical Interrelationships amongst them using ISM Methodology

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## ABSTRACT

Present research has two fold aspects. First half deals with the exploration of various challenges faced by Ayurveda industry in India and second half deals with studying the hierarchical inter-relationships amongst these challenges with the help of Interpretive Structural Modelling [ISM] methodology.

## Keywords

Ayurveda industry; hierarchichal inert-relationships; Interpretive structural modelling

## 1. INTRODUCTION

Ayurveda introduces itself as a 5000-year-old science. There is no or little change in the form of Ayurveda as it is being practiced. Efforts are being made to update the age-old scientific wisdom in various aspects by focusing on its pharmacologic and therapeutic potential. However, a new proprietary drug completely neglects the age old fundamental Ayurvedic concepts including *Agni* (digestive fire), *Tridosha* (three bio-humors), *Dhatu* (tissues) and all these leading to the formation of *Mala* (excretory products) in normal physiological manner, and these levels when disturbed leads to disorders (*vyadhi*). Many new diseases are identified, explained and introduced in modern science. Scientists are able to research upon the causation and formation of diseases up to the DNA level. In Ayurveda, we need to consider the fundamental principles to form the *Samprapti* (pathophysiology) and then formulate the treatment protocol including *Shodhana* (purification procedures) or *Shamana* (medicinal management).

At first, the amplification of the fundamental principles of Ayurveda by integrating modern investigation tools to formulate the pathogenesis from an Ayurvedic aspect is needed. For example, electro myelography and nerve conduction studies can be useful to ascertain the diagnosis of a disease that is related to *Mamsa Dhatu* (muscular tissue), which may be *Mamsagata*

*Vata*, *Mamsavritta Vata*, etc., in Ayurveda and muscular dystrophy in modern medicine. Similarly, these tests can be useful to assess the efficacy of Ayurvedic procedures such as *Shashtika Shali Sweda* and *Pinda Sweda* (types of fomentation using red rice cooked in milk). This will provide the objective data. But merely prescribing some drugs based on modern researches without diagnosing the *Awastha* (status) of *Dosha*, level of *Dhatu*, and *Aama* status as per Ayurveda would be of partial benefit. Therefore, it is of utmost importance to standardize the fundamental diagnostic principles, integrating it with the modern investigative tools and utilizing it for attaining an analytical perspective.

*The Indian Ayurveda industry is expected to reach US \$8.0 billion by 2022 . The size of the global Ayurveda market is expected to reach US\$9.7 billion by 2022, at a CAGR of 16.2%. While in India the industry is forecast to rise three-fold from US\$2.5 billion in 2015 to US\$8.0 billion by 2022.*

The research article is arranged as follows : Section 2 deals with literature review . Section3 deals with challenges faced by Ayurveda industry.

## 2. LITERATURE REVIEW [ 1-33]

The annual production of medicinal and aromatic plant's raw material is worth about Rs 200 crores (Narogi *et al.*, 2011). According to some estimates, the domestic sales of Ayurvedic formulations are growing at an annual rate of 20 percent while the international market for medicinal plant-based products is estimated to be growing at 7 percent per annum (Sawant *et al.*, 2013). In India, the reliance on Ayurvedic medicines is heavy only in certain states like Kerala, Gujarat, Rajasthan, UP etc. Many Ayurvedic companies are not only manufacturing pharmaceutical products but are also in manufacturing of nutri-ceuticals products and FMCG like soaps, shampoos, toothpaste, toothpowder using traditional herbal ingredients in the composition of these products (Vaijyanthi, Roy & Roy, 2012). OTC increased market value of Ayurvedic products (Sharma, Chaudhary & Lamba, 2014). Ayurvedic system of treatment is effective at the primary health care level only (Sharma, 2006). At the same time the respondents stressed on having more of Ayurvedic doctors in the locality (Subramanium & Veenkatesha, 2011).

## 3. CHALLENGES FACED BY BAMBOOREATE BUILDING [ 1-8]

### 3.1 Some of the major challenges in the Ayurveda Industry are:

**3.1.1 Standardization [STD]:** For Ayurveda to become a mainstream life science, validation of Ayurvedic principles (by using modern guidelines) will make it more acceptable to society. Ayurveda faces a crisis in standardising its medicines with respect to **branding and consistency and the wide range of big and small retailers at the regional and national levels.**

**3.1.2 Lack of awareness [LOA]:** It is necessary to create awareness about ayurvedic products and services. As, players face a challenge in creating awareness of the differences between Ayurvedic, organic and natural

products and services. Lastly lack of publication awareness and documentation in Ayurveda is one more concern thus making it difficult to prove the efficacy of Ayurvedic medicines.

**3.1.3 Lack of basic infrastructural facilities [LIF]:**

There is a huge market potential for Ayurveda globally, but it has not been tapped effectively. There seems to be a mismatch between the rate of growth of demand for services. Lack of basic infrastructural facilities and the availability of high-quality medicines reduces the growth opportunities for Ayurveda.

**3.1.4 Lack of Procurement of raw materials [LPRM]:**

Procurement and development of raw materials need to be improved without any lacunae in the quality and fundamental methods of Ayurveda. Today, farming practices have drastically deviated from age-old traditional ways, with an increase in the use of pesticides, herbicides and insecticides that are often seen as solutions to safeguard and increase productivity.

**3.1.5 Slow incorporation of Technology [SIT]:** Use of technology is playing a significant role in the modern era of medical Ayurvedic practice, and is creating many avenues for prevention of 'overtreatment'. It has accelerated diagnoses and enhanced effective treatment strategies. Lack of or slow incorporation of technology may pose a challenge to Ayurveda.

**3.1.6 Maintenance of uniformity [MoU]:** Ayurvedic medicines were prepared by the physician based on the need of patients in earlier days but in the present day when people want to buy ready medicaments from the market it becomes essential to maintain uniformity in the manufacturing process.

**3.1.7 Imbalance in drug action [IDA]:** Ayurveda believes in the use of the drug as a whole where every single ingredient of the drug has a specific role to play in the drug action [6]. A drug can act through any of its properties and any of these properties can dominate.

**3.1.8 Improper identification of raw drug [IIRD]:** Toxicity, in Ayurvedic formulation may be a result of, reasons like improper identification of raw drug, adulteration or substitution improper processing method and so on. Animal models designed based on modern pharmacology may not match with the pharmacodynamics and pharmacokinetics of Ayurveda.

**3.1.9 Complex ayurvedic treatments [CAT]:**

Ayurveda and other traditional medical systems often prescribe complex treatments consisting of a combination of drugs, diet, detoxification procedures, lifestyle changes, and yoga practices, customized to the needs of individual patients [8]. Thus, making it difficult to match with modern concepts of research.

**3.1.10 Detailed issues of quality [DIQ] :** Various issues of Quality in Ayurvedic system of medicine consists of explanation for origin or proof of concept ; Availability of Original texts written in Pre-Sanskrit grammar style ; Objective to measure Doshas or proof of

existence ; Provide data about rigorous proof of safety and efficacy by modern standards of clinical trial ; Provide high quality pharmaceutical standards to assure consistent quality of preparations; Provide teaching hospital and research activities ; Proper integration and linkage to Modern Technology ; Participation in National Health Programme.

**3.1.11 Well-disciplined training [WDT]:** Also well-disciplined training in areas like focal scopes of research, genetic counselling, lifestyle disorders, preventive and social health care, immunology, drug and alcohol abuse related emergency care and other social health issues concurrently evident in the society according to situations.

**3.1.12 Globalization and /or modernization[GI]:** With rapid increase of globalization, the industrial clusters have proved to have a key role in adding towards the global development of a country. The new era has witnessed modernization with globalization [26] and this was the most obvious and noticeable development in raising the marginal status of domestic & external marketing sources.

**3.1.13 Improper Documentation [PDoc] :** Another major throughput of suggestion will be developing proper tools of documentation in areas of research, practice and case recording, for better standardization of Ayurveda diagnostics and treatment protocols to an extent.

**3.1.14 Lack of minimum standards of requirement [MSR] :** Another major challenges faces by the Ayurveda educational sector are lack of minimum standards of requirements in terms of infrastructure, skilled teaching faculties, documentation, pragmatic training and even job opportunities.

**3.1.15 Strict implementation norms [ SIN] :** Thus strict implementation norms should be laid out while granting approvals for Ayurveda educational sectors in terms of minimum standards of requirement and compulsory norms on NABH accreditation processes towards better globalization of Ayurveda.

**3.1.16 Unbiased screening of eligible candidates [USEC] :** Moreover unbiased screening of eligible categories of students and lectures on merit basis, limiting or exclusively debarring the management and NRI quotas from academic topography should be carried out to maintain the dignity and essence of science.

**3.1.17 Preservative overload [PO] :** Another harmful challenge would probably be the preservative overload, in order to sustain a longer shelf life thereby meeting consumer demands. Thus, on considering this rapid loss of medicinal plants, it's the need of the hour for a SWOT analysis, so as to measure the needs to be taken under stringent basis, to tackle the crisis by incorporating government, various health sectors and stake holders.

**3.1.18 Scarcity of herbal drugs [SHD] :** Scarcity of herbal drugs could even cripple the status of production,

adversely affecting the business as well as the quality of end products. This may even lead to the non-availability of good quality and quantity of raw materials at the right time, un-necessary price hike which definitely affects the total sale of the small and medium scale industrial firms.

3.1.19 Lack of proper guidelines on training and development [PGTD] : The Ayurveda and its related resources are highly important in providing the health care needs for the majority of humans and livestock population in our country. Medicinal plants could be used as a sources of revenue for farmers, proper guidelines of training on conservation, utilization and development of medicinal plants and marketing with the farmers **across the state through proper centers will have a positive impact over the crisis.**

3.1.20 Diet and lifestyle guidelines [DLG]: Āyurveda with its holistic approach encompassing various diet and lifestyle guidelines and comparatively reduced side effects has attracted a large population realizing its benefits, all over the world .This has even paved various platforms of international collaborations in fields of research, practice and even developing interests in areas of curriculum based teachings.

#### 4. INTERPRETIVE STRUCTURAL MODELLING METHODOLOGY

The various steps involved in ISM [9] are : *Identification of elements* which are relevant to the decision maker’s problems and issues. Thereafter , establishing *the contextual relationship* between elements with respect to which pairs of elements will be examine. After that , development of *a self-interaction matrix (SSIM)* which provides the pairwise relationship between two variables i.e. *i and j*. It establishes relationship of “Lead to” between criteria. It uses the four symbols for the type of relation that exists between two sub-variables under consideration: V for the relation from *i to j* but not in both directions; A for the relation from *j to i* but not in both directions; X for both direction relations from *i to j* and *j to i*; and O if the relation between the variables does not appear valid. Using SSIM matrix, initial reachability matrix can be formed,

it has all values in binary form. From the reachability matrix, the reachability set and antecedent set for each criterion is found (Warfield (1974)). Then the intersection of these sets is derived for all elements. The element for which the reachability and intersection sets are the same is the top-level element. The whole process of partitioning is based on establishing the precedence relationships and arranging the elements in a topological order. Then the reachability matrix is converted into the canonical matrix format by arranging the elements according to their levels. After that , factors are classified in various categories like autonomous, dependent, driver and linkage. Finally, *Development of Diagraph/ ISM from the canonical matrix form.*

#### 5. CASE EXAMPLE

14 challenges listed in section 2 viz. Thirteen major challenges discussed above in section 2 viz. **Standardization [STD]; Lack of awareness [LOA]; Lack of basic infrastructural facilities [LIF]; lack of Procurement of raw materials [LPRM]; Slow incorporation of technology [SIOT];** lack of Maintenance of uniformity [LMoU]; Imbalance in drug action [IDA]; Improper identification of raw drug [IIRD]; Complex ayurvedic treatments [CAT]; Overall governance and regulations [OGR]; Detailed issues of quality [DIQ];Lack of Well-disciplined training [WDT]; Globalization and /or modernization [GI]; Socio-economic progress [SEP] ; Im Proper Documentation [PDoc] ; Lack of minimum standards of requirement [MSR] ; Strict implementation norms [ SIN] ; Unbiased screening of eligible candidates [USEC]; Preservative overloading [PO]; Scarcity of herbal drugs [SHD]; Proper guidelines on training and development [PGTD] ; Diet and lifestyle guidelines [DLG] are studied with the help of ISM methodology for the possible hierarchichal interrelationships amongst them .

##### 5.1 Construction of Structural self- interaction Matrix (SSIM)

This matrix gives the pair-wise relationship between two variables i.e. *i and j* based on VAXO. SSIM has been presented below in Fig 1.

##### 5.2 Construction of Initial Reachability Matrix and final reachability matrix

The SSIM has been converted in to a binary matrix called the Initial Reachability Matrix shown in fig. 2 by substituting V, A, X, O by 1 or 0 as per the case. After incorporating the transitivity, the final reachability matrix is shown below in the Fig 3.

S. No.	Barriers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		STD	LOA	LIF	PRM	SIT	LMoU	IDA	IIRD	CAT	OGR	WDT	GI	PD	MSR	SIN	USEC	PO	SHD	PGTD	DLG
1	STD	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	LOA		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	LIF			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	PRM				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	SIT					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	LMoU						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	IDA							1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	IIRD								1	1	1	1	1	1	1	1	1	1	1	1	1
9	CAT									1	1	1	1	1	1	1	1	1	1	1	1
10	OGR										1	1	1	1	1	1	1	1	1	1	1

11	WD T													V	V	V	V	A	V	V	V	V
12	GI													V	V	V	A	V	V	V	V	V
13	PDO C													V	V	A	V	V	V	V	V	V
14	MSR													V	A	V	V	V	V	V	V	V
15	SIN													V	A	V	V	V	V	V	V	V
16	USE C													V	V	V	V	V	V	V	V	V
17	PO													V	V	V	V	V	V	V	V	V
18	SHD													V	V	V	V	V	V	V	V	V
19	PGT D													V	V	V	V	V	V	V	V	V
20	DLG													V	V	V	V	V	V	V	V	V

Fig 1: SSIM matrix for pair wise relationship amongst barriers

Similarly, as per ISM methodology, we have to create initial reachability matrix and final reachability matrix to complete the process. Thereafter, a diagraph could be drawn.

S. No.	Barriers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
		STD	LOA	LIF	PRM	SIT	LMoU	IDA	IIRD	CAT	OGR	WDT	GI	PDc	MSR	SIN	USEC	PO	SHD	PGTD	DLG	
1	STD	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	LOA	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1
3	LIF	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
4	PRM	1	0	0	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1
5	SIT	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
V	LMOU	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
7	IDA	1	0	0	0	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1
8	IIRD	1	0	0	0	0	1	0	1	0	1	1	1	1	1	0	1	1	1	1	1	1
9	CAT	1	0	0	0	0	1	0	0	1	0	1	1	1	1	0	1	1	1	1	1	1
10	OGR	1	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
11	WD T	1	0	0	0	0	1	0	0	0	0	1	1	1	1	0	1	1	1	1	1	1
12	GI	1	0	0	0	0	1	0	0	0	0	0	1	1	1	0	1	1	1	1	1	1
13	PDO C	1	0	0	0	0	1	0	0	0	0	0	0	1	1	0	1	1	1	1	1	1
14	MSR	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1
15	SIN	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1
16	USE C	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	PO	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
18	SHD	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
19	PGT D	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
20	DLG	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

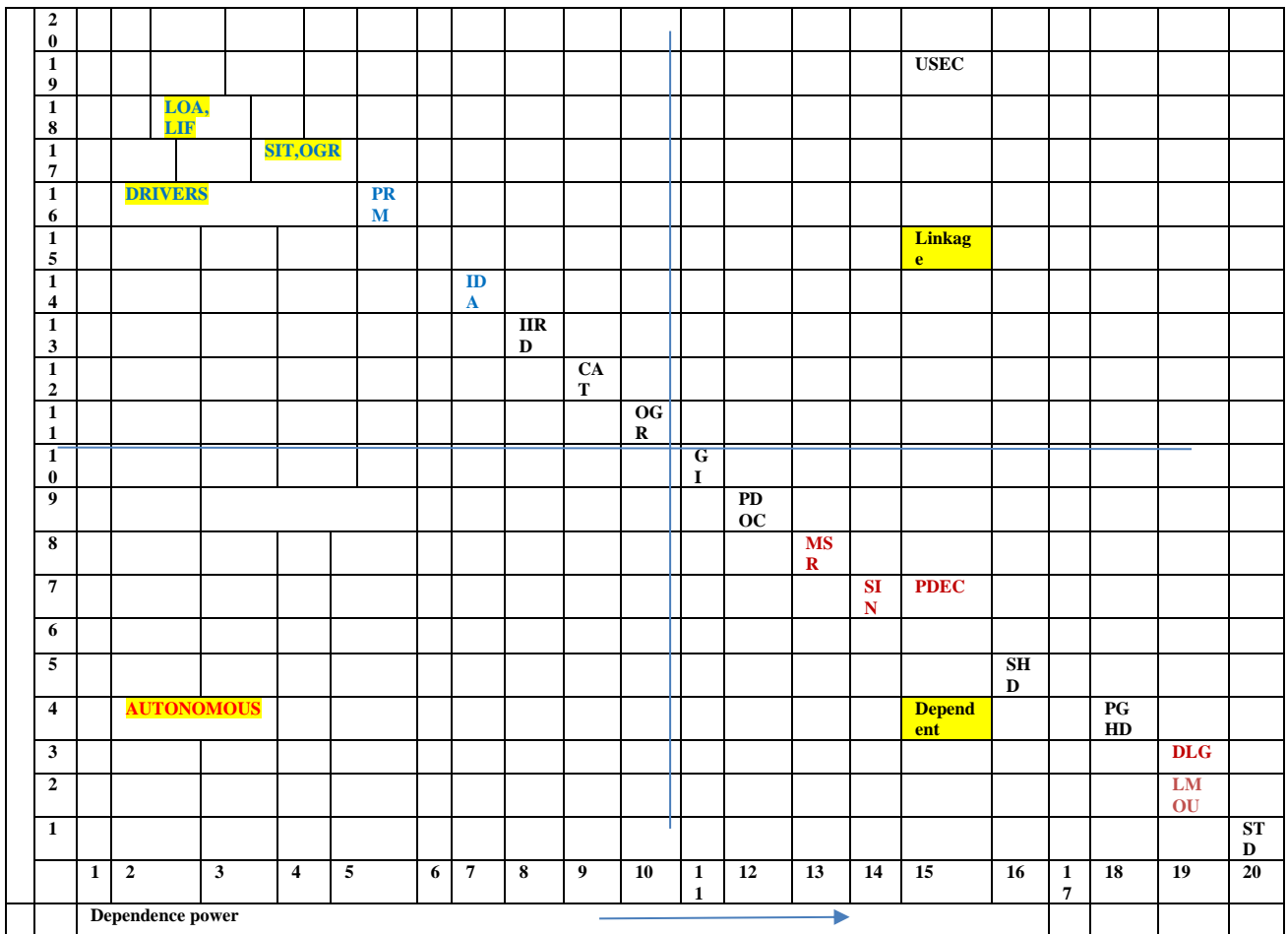
Fig 2: IRM matrix for pair wise relationship amongst challenges faced by Ayurveda industry in India

S. No.	Barriers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
		STD	LOA	LIF	PRM	SIT	LMoU	IDA	IIRD	CAT	OGR	WDT	GI	PDc	MSR	SIN	USEC	PO	SHD	PGTD	DLG	D.P
1	STD	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2	LOA	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	18
3	LIF	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	18
4	PRM	1	0	0	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	16
5	SIT	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17
V	LMOU	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2
7	IDA	1	0	0	0	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	14

8	IIRD	1	0	0	0	0	1	0	1	1	0	1	1	1	1	1	0	1	1	1	1	13
9	CAT	1	0	0	0	0	1	0	0	1	0	1	1	1	1	1	0	1	1	1	1	12
10	OGR	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	17
11	WDT	1	0	0	0	0	1	0	0	0	0	1	1	1	1	1	0	1	1	1	1	11
12	GI	1	0	0	0	0	1	0	0	0	0	0	1	1	1	1	0	1	1	1	1	10
13	PDOC	1	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	1	1	1	1	9
14	MSR	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	1	1	1	8
15	SIN	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1	1	1	7
16	USEC	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19
17	PO	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	6
18	SHD	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	5
19	PGTD	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	4
20	DLG	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3
	De.P	20	3	3	5	4	19	7	8	9	4	10	11	12	13	14	18	15	16	18	19	

Fig 3: FRM matrix for pair wise relationship amongst challenges faced by Ayurveda industry in India

#### 4.4. Driving power – Dependence diagram



D.P : Driving power ; De.P : Dependence power

#### 6. CONCLUSION

The present research highlights the hierarchical inter-relationships amongst the various challenges faced by Ayurveda industry in India with the help of Interpretive Structural Modelling Methodology.

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