Ebhaarati.org

Making Bhaaratiya Vijnan Come Alive

Dr. Sai Susarla, Dean MIT School of Vedic Sciences, Pune

An Initiative of

VEDAVAAPI.ORG
INDIA'S TRADITIONAL KNOWLEDGE IN THE PALM OF YOUR HAND

KKSU Ramtek, Association of Sanskrit Universities

IIT Bombay

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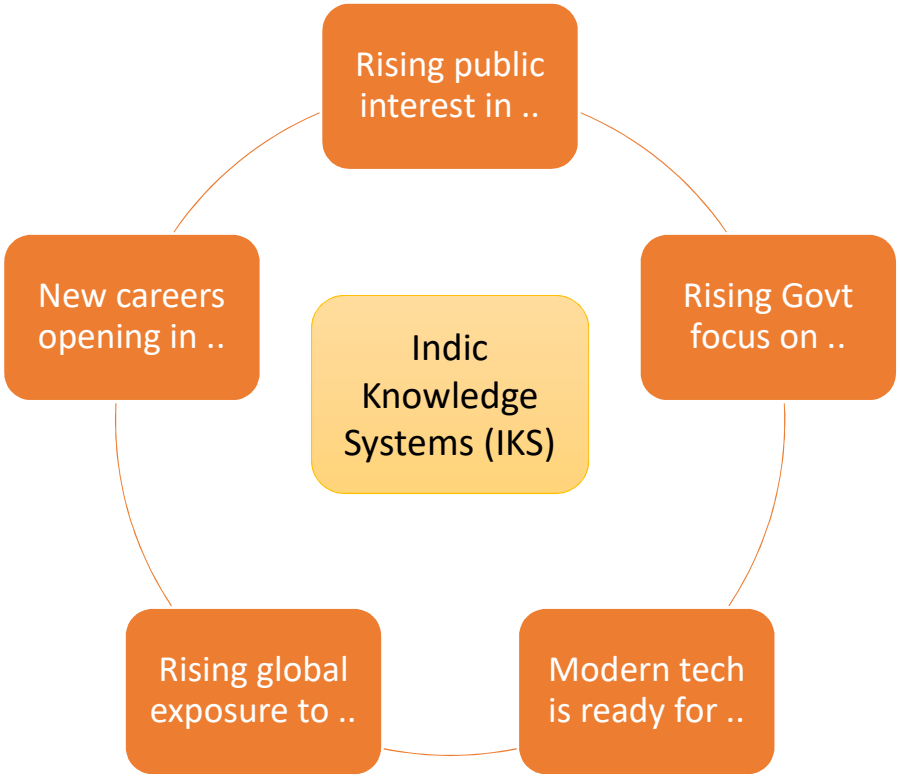
INDIC ACADEMY

It’s a Great time for Young Sanskrit Scholars!



Tectonic Shift in Sanskrit Studies

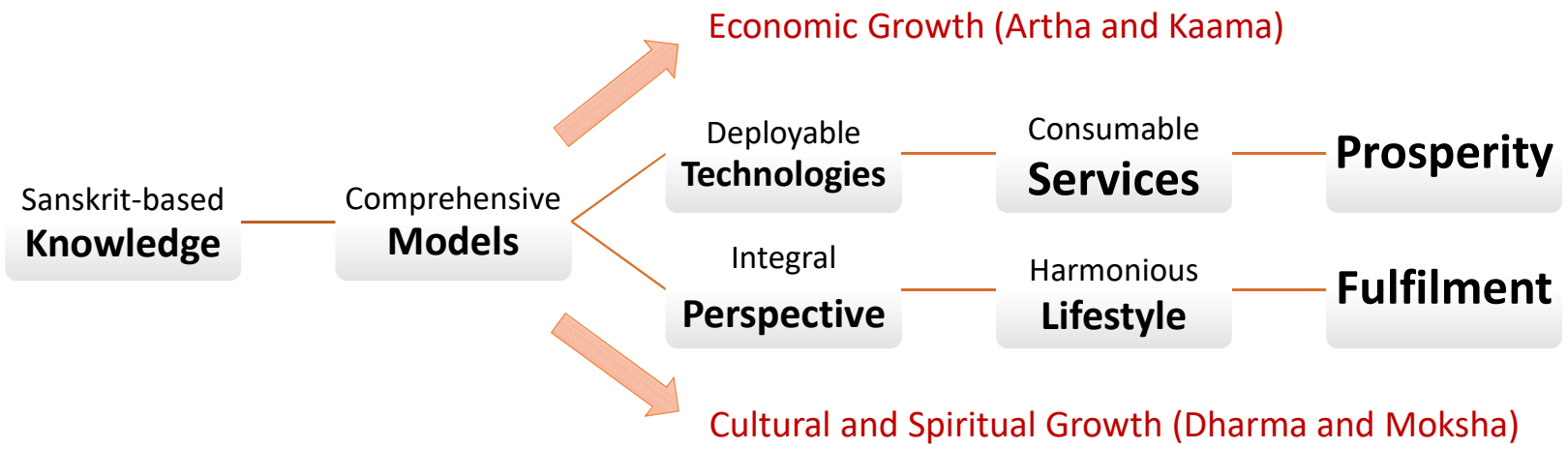
- Focus on Bhaaratiiya Vijnaan – Science & Technology through Sanskrit
- Becoming multi-disciplinary across Indic and western realms
- Focus on How to make it relevant and useful today
- Shift from Preservation mode -> Manifestation mode
- Emerging scope for IKS-enabled Enterprises
- Surge in online, on-demand education
- Needs lots of fresh thinking, energy and enthusiasm – Perfect for Youth

Implications for Sanskrit Scholars

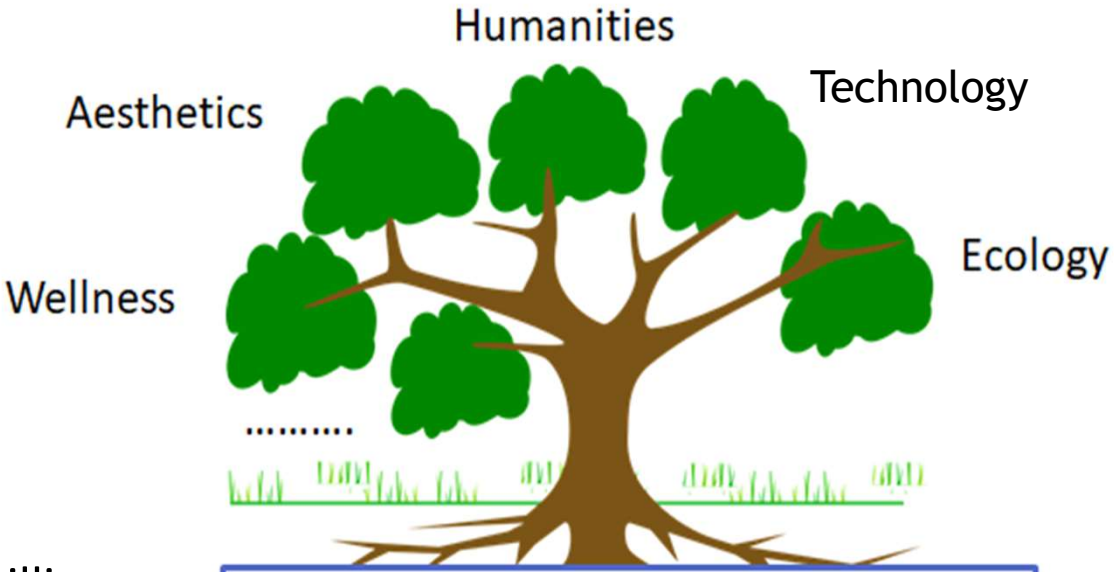
New Opportunities:

- Online teaching to non-traditional seekers
- New Knowledge Base creation
  - Manuscript deciphering,
  - Grammar editing,
  - shaabda bodha,
  - Concept mapping and Inter-linking of texts
  - Indic Models for contemporary disciplines
- Applying your shaastric knowledge for current problems in:
  - Jurisprudence, Ayurveda, Ecology, Governance, Psychology, Aesthetics, …

Transforming Indic Knowledge into Impact



Ancient India's Knowledge Heritage



5+ million manuscripts (10 PB), **5 times the rest of the world**

Handwritten in 30+ Archaic scripts, 80% in Sanskrit

E-Bharati: Charter

Make India's Heritage Knowledge …

- Accessible
  - Create a long-term online archive of Indic books and manuscripts with content search facility for scholars
- Intelligible
  - Transform flat Indic texts into concept maps with topical indexes and summaries for novice readers
- Deployable
  - Extract rule bases from Indic knowledge for professionals to build value-add services for masses

E-Bharati Online Platform

Make Bhaaratiiya Vijnaan come alive

Converse with Indic books as if with a scholar

- "Give me an example of upama alankaara" (akin to the new Google Books)
- "Pull all properties of herb `X' from Ayurvedic texts"

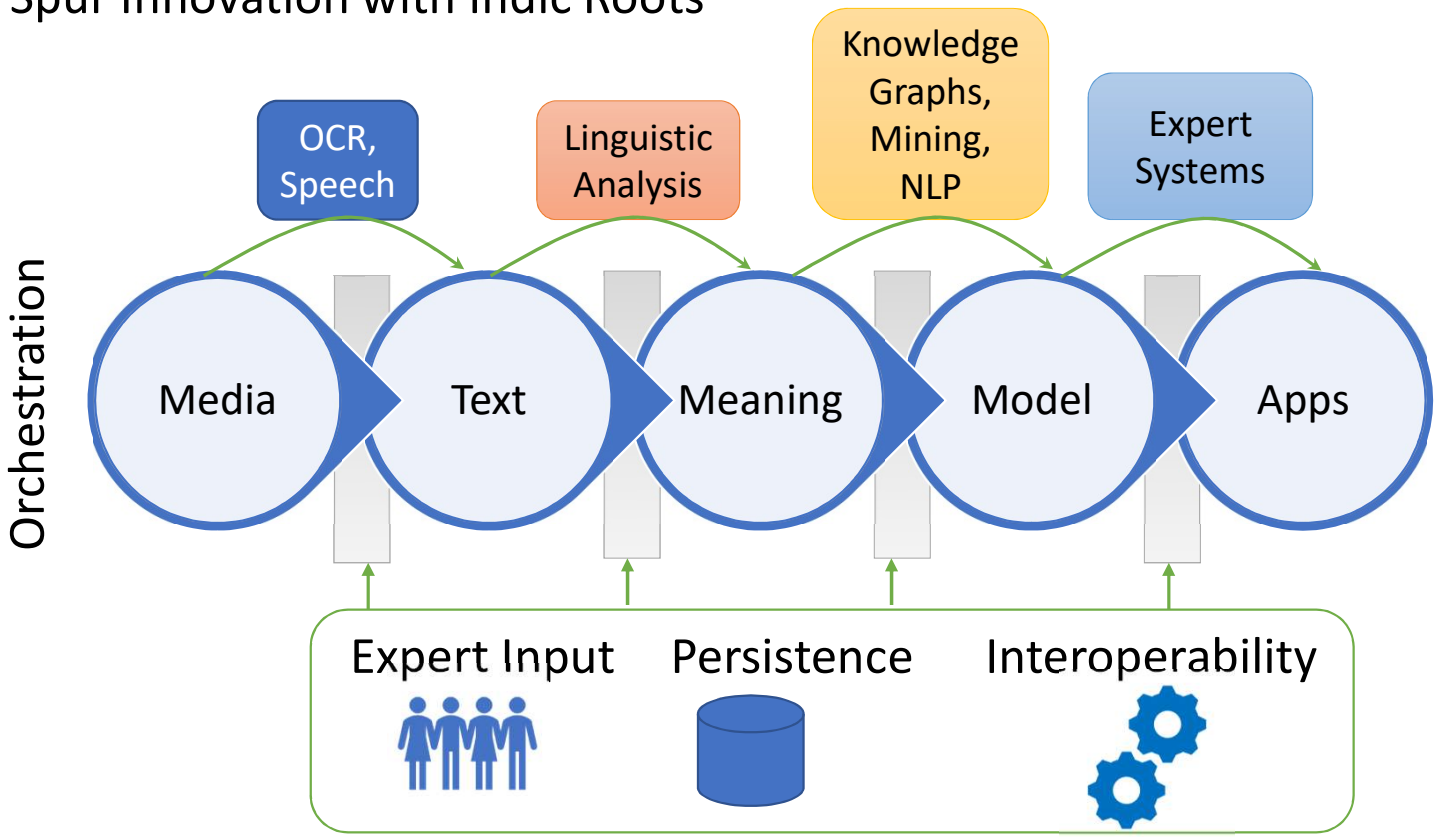
Build applications on Indic knowledge

- E.g., Ayurvedic text mining assistant
- E.g., Vaastu compliance checker for buildings
- E.g., Ethics compliance evaluator for robotics

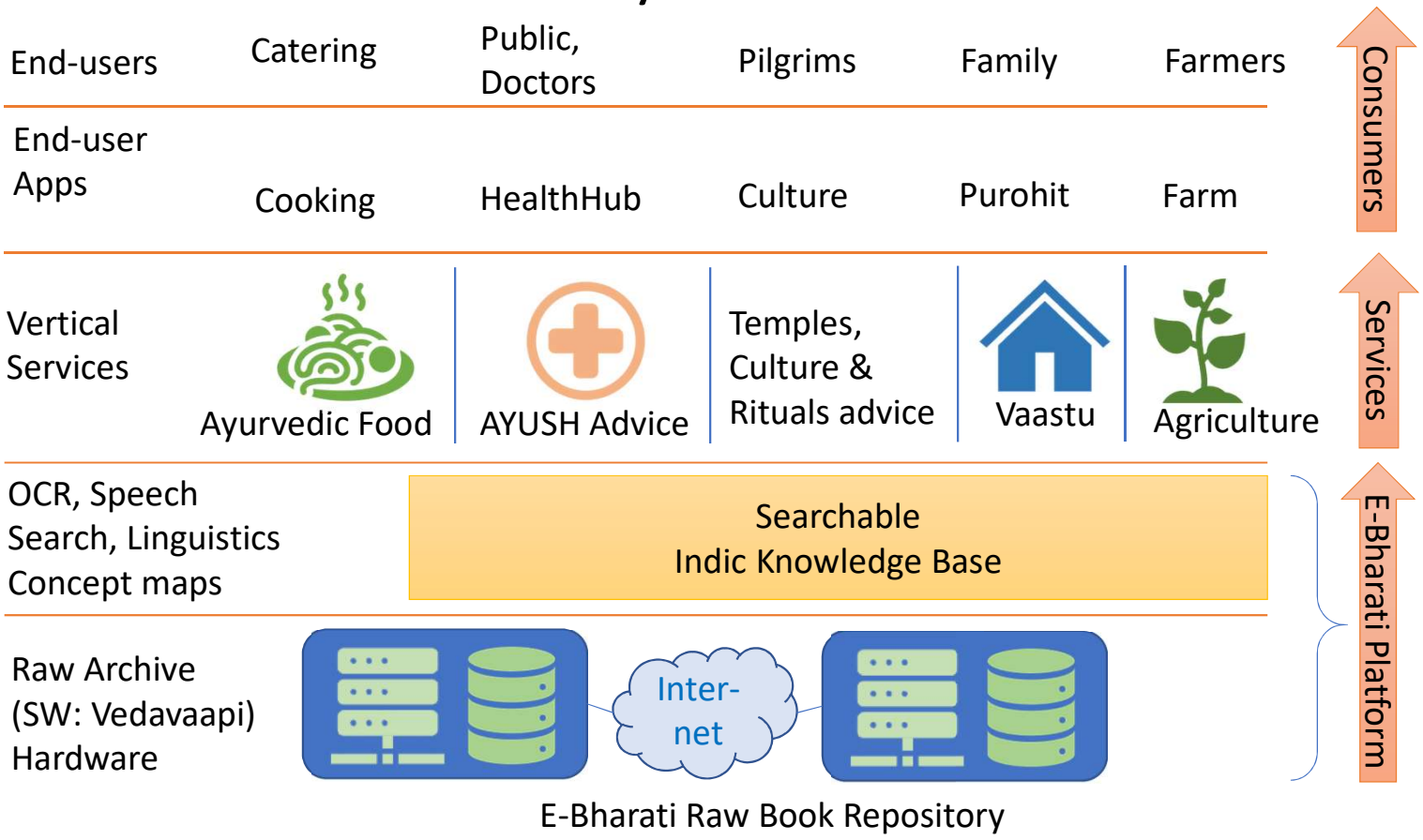
Use community-sourcing and Human-assisted AI

E-Bharati: Raw Books to Apps

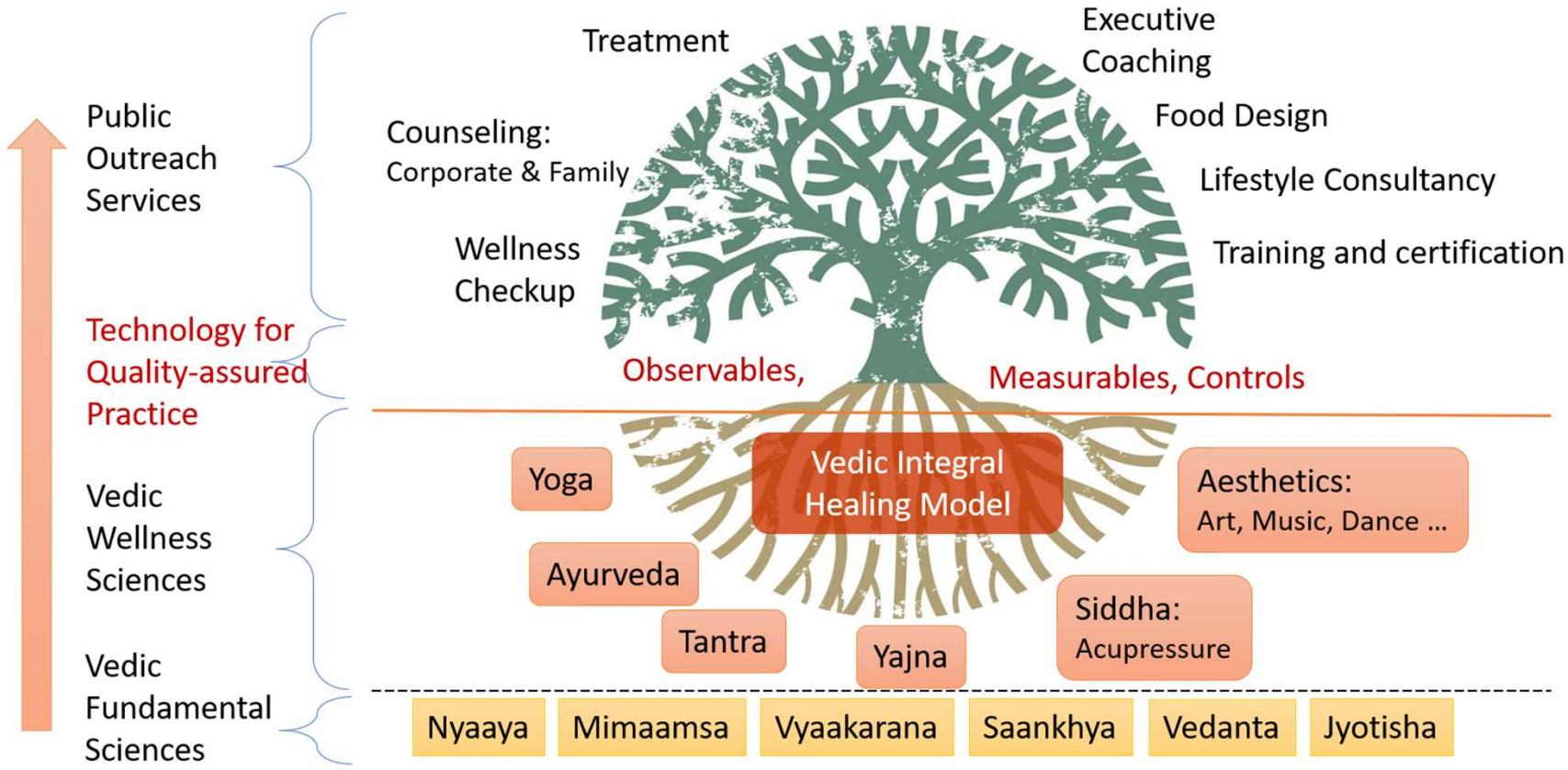
Spur Innovation with Indic Roots



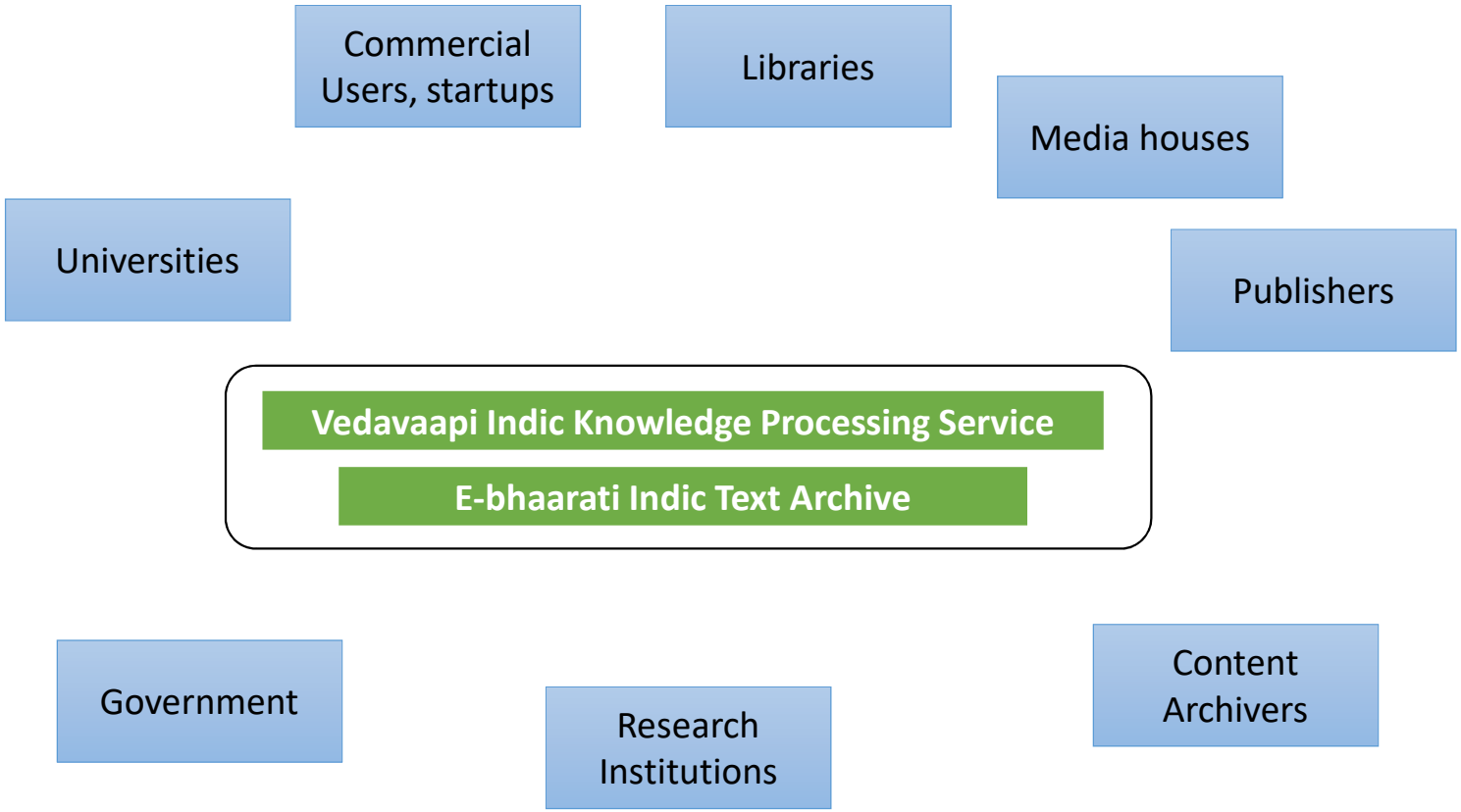
IKS-based Value Ecosystem



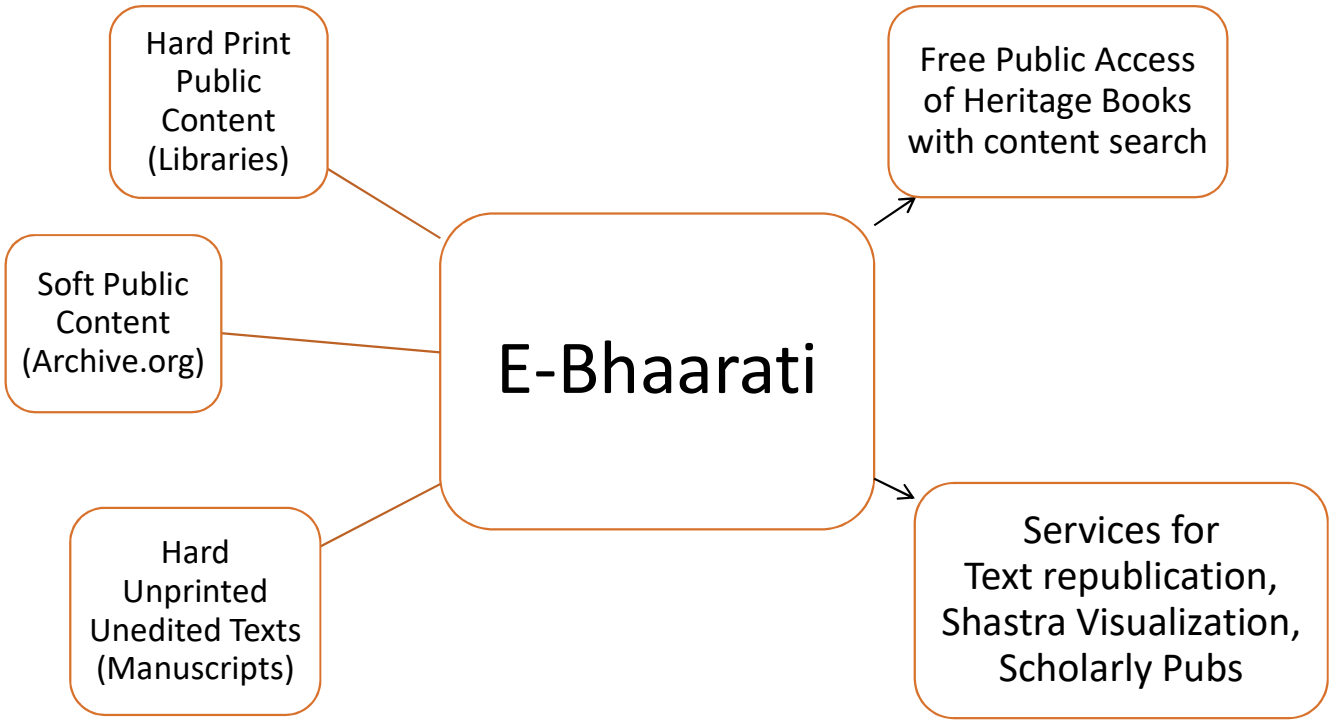
Example: Bhaaratiya Approach to Wellness



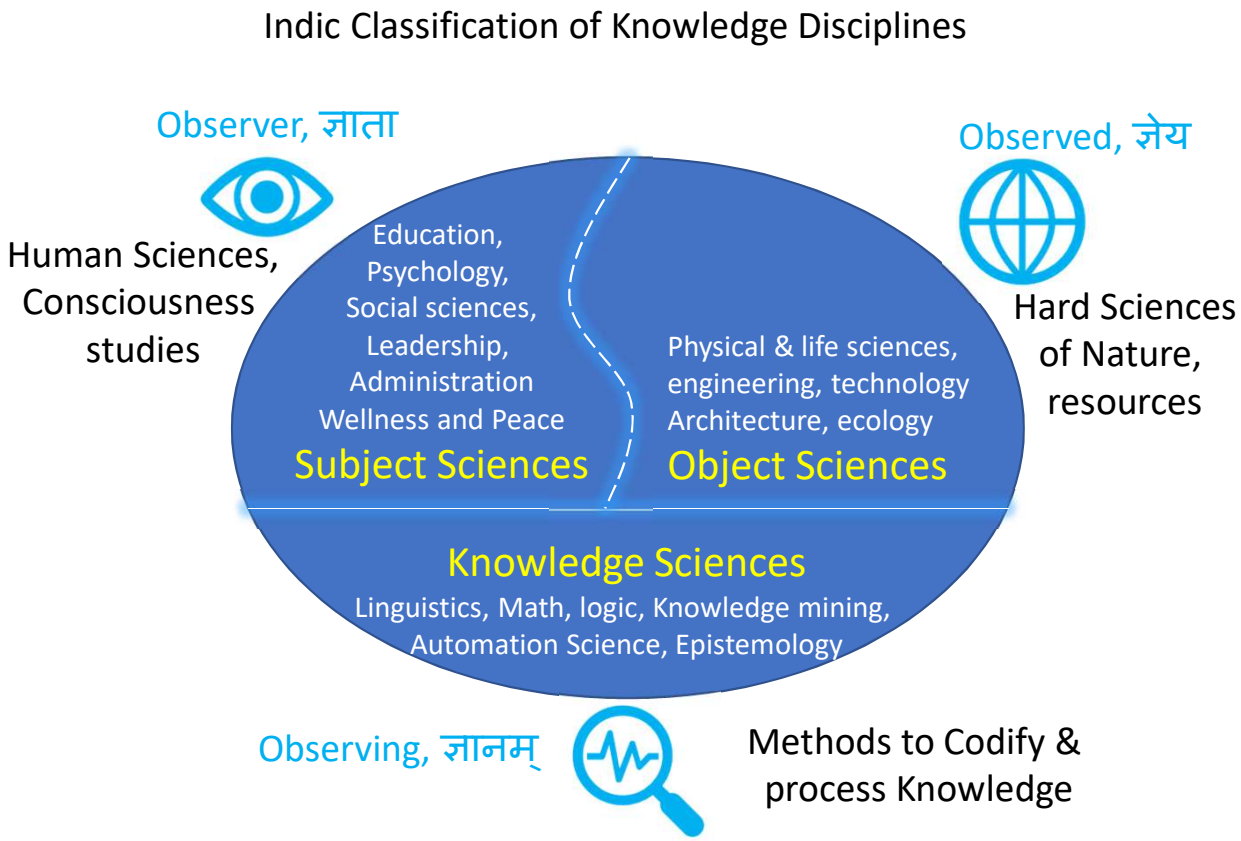
Bhaaratiya Vijnan Ecosystem



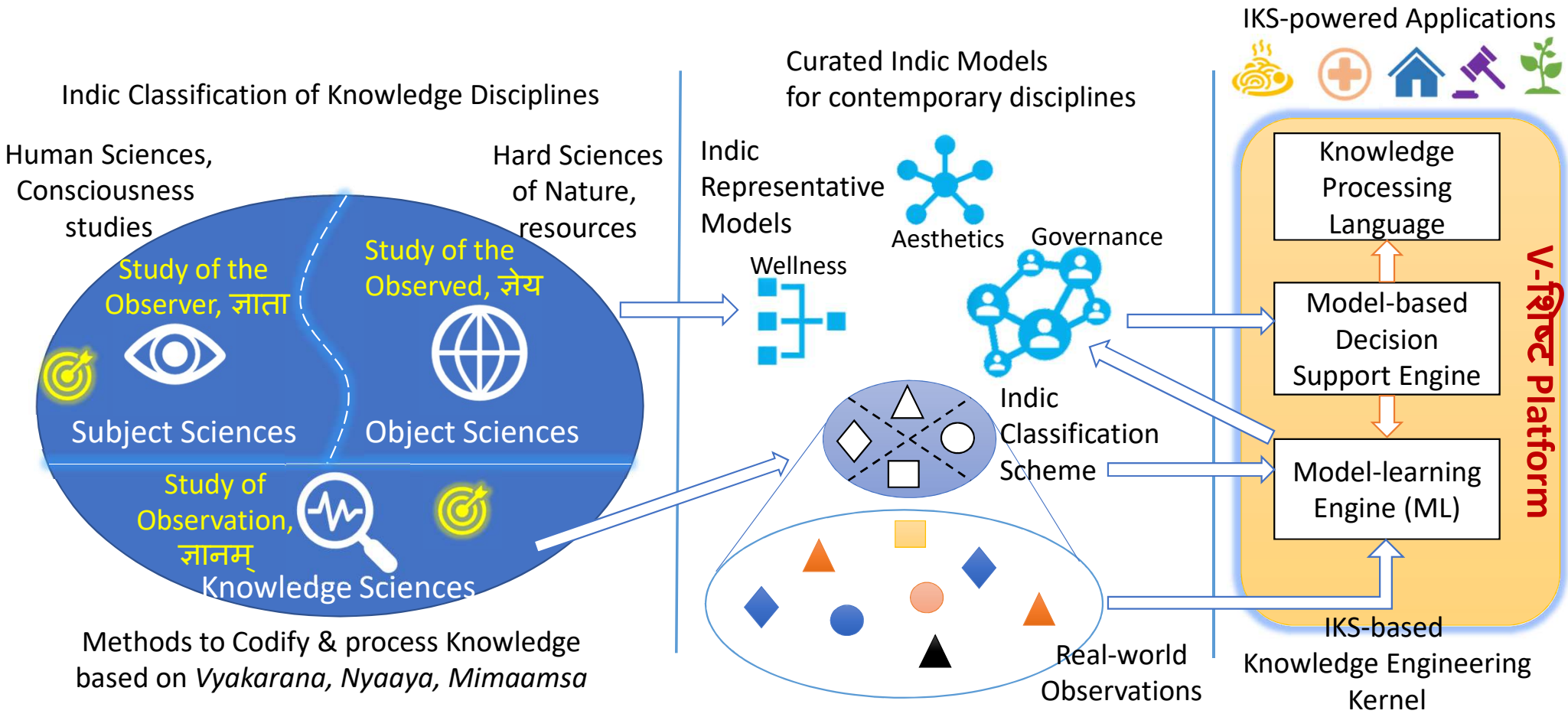
E-Bhaarati Book Bank Features



Indic Classification of Knowledge Disciplines



Tapping into IKS for Modern Applications



Contemporary Disciplines and Indic Models

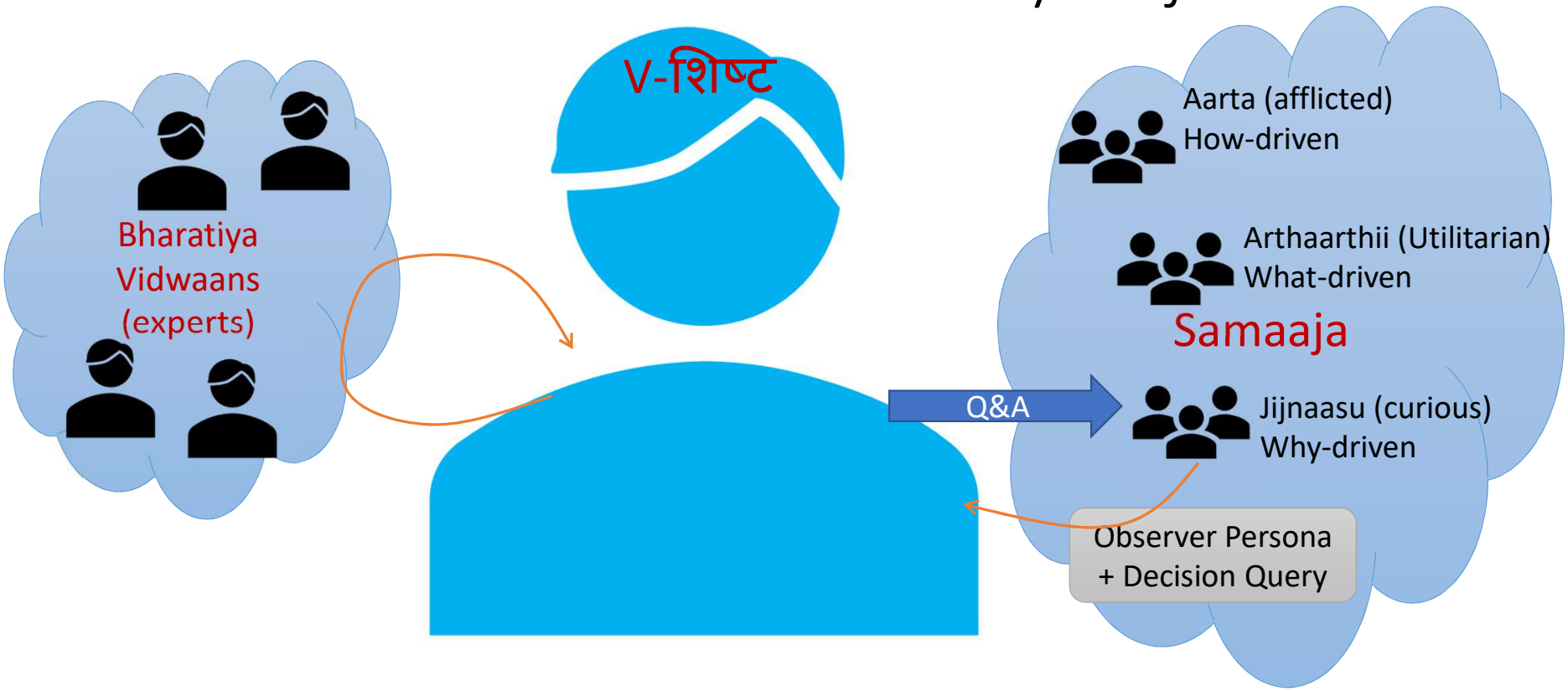
Discipline	Subject Matter	Indic Model
Ethics, Law and Governance	Code of conduct for Harmonious living	Dharma shaastras and smritis
Psychology	Human Behavior: motives, triggers	4 purushaarthas, 5 koshas, 3 gunas
Sociology	How humans function in groups	4 Varnas and 4 aashramas
Wellness	Wellbeing	Ayurveda, Yoga, Siddha models
Cosmology	Matter, life, consciousness	Nyaaya-vaisheshika, Sankhya models
Cognition, Linguistics	Study of verbal communication	Universal model of language
Economics	Skill development and education	64 professions Kalaa, vidyaa, darshana, shaastra
Aesthetics	Beauty – creation and appreciation	Naatyashaastra's 3-layered model of emotional communication
Sound	Sound, its properties and effects	Mantra shaastra

Example Applications of Indic Models

- Ethics: Does given behaviour conform to Japanese ethics?
- Wellness: Personalized food design based on Person's type
- Jurisprudence: Soundness of a judgement based on given set of laws
- Medical Treatment: Available cures for given ailment symptoms and Patient's Prakriti
- Art as Therapy: Prescription of Music to treat specific ailment
- Psychology: Will given person be able to fit into given corporate role?
- Sociology: Are two given persons / orgs compatible with each other?
- Architecture: Does given building plan comply with Vaastu / Feng Shui?

V-शिष्ट

Authentic Consultant on Bharatiya Vijnan



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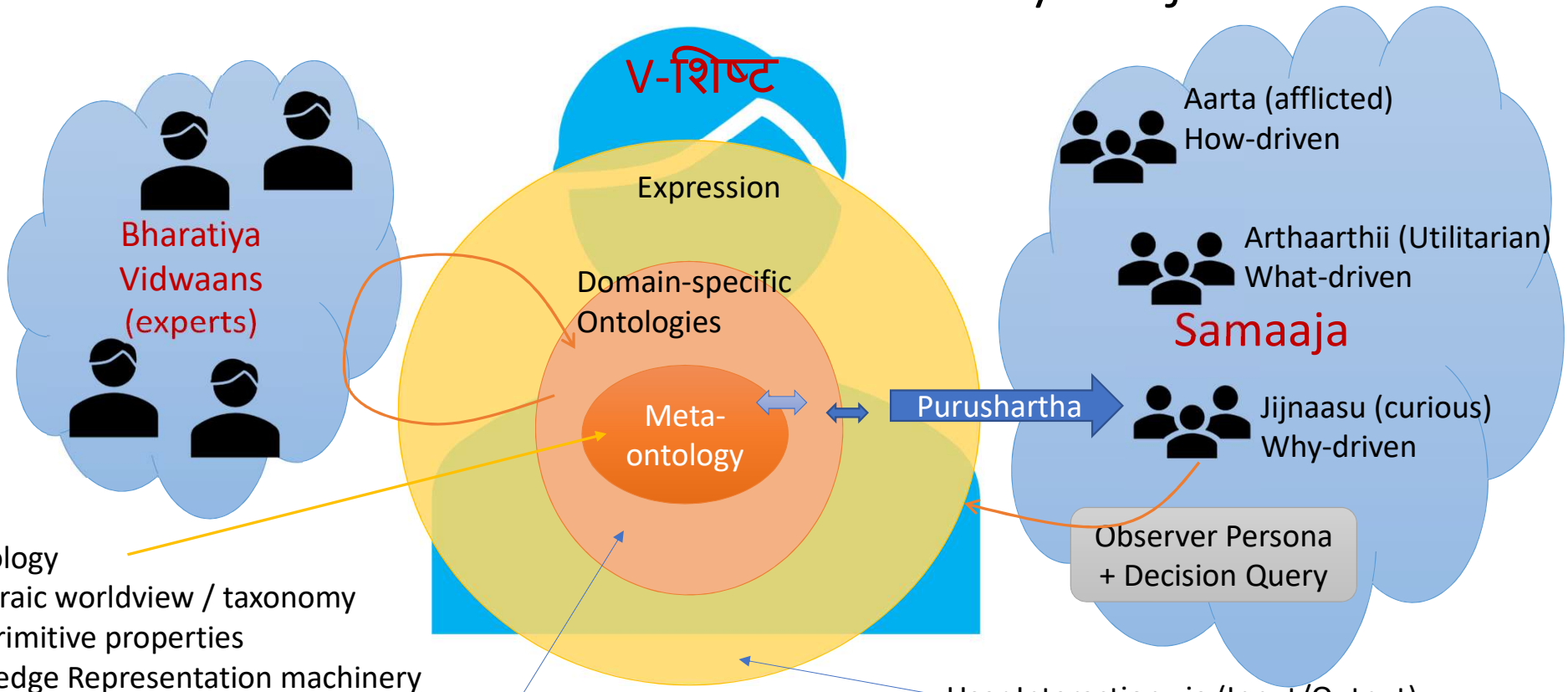
Authentic Consultant on Bharatiya Vijnan



Base ontology
- Shaastraic worldview / taxonomy
  - Primitive properties
- Knowledge Representation machinery
  - Entities, relations
- Inference machinery
  - Pramaana-based Operators

Shaastra-specific ontologies & models (Ayur, Aesthetics, Governance, ..)

User Interaction via (Input/Output)
- Natural Indic languages
  - Text, speech
- Knowledge Map APIs

Shaastra Maps

Making Indic Texts Intelligible

By Blending Computer Science with
Indic Knowledge Sciences

Shaastra Maps: Why?

Indic Texts are difficult for novice readers:

- Exposition style too detailed for first reading
- Hard to locate definition of a term
- Hard to find an example of a concept
- Hard to parse long compounds and sandhis
- Hard to cross-reference across multiple texts
- Cannot learn from prior readers' experience
- Deep experts hard to obtain nearby

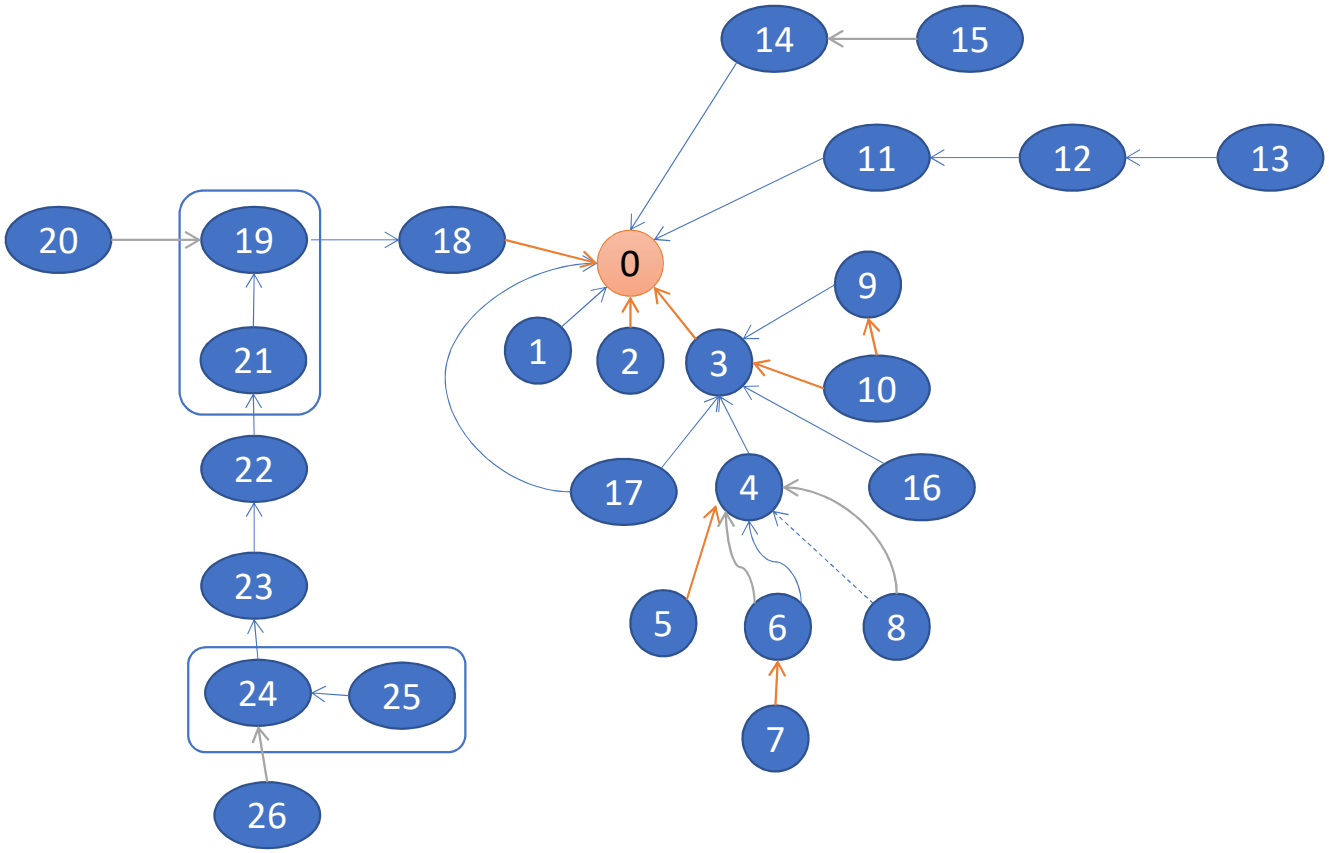
Difficulty of Reading Indic Texts

श्रीहयास्यं हृदि ध्यात्वा गुरुणां चरणौ तथा ।
आलोकेन तु बालेभ्यः योज्यते तर्कसंग्रहः ॥

चिकीर्षितस्य ग्रन्थस्य निर्विघ्नपरिसमाप्तिप्रचयगमनाद्मर्थमिष्टदेवतानम-स्कारादिगर्भं मङ्गलमाचरति--निधायेत्यादि । विश्वेशः=काशीक्षेत्राधिनाथो विश्वनाथः। देवं विश्वनाथं हृदि निधाय=ध्यात्वेत्यर्थः । 'निधानं निक्षेप' इत्यर्थमादाय, हृदये विश्वनाथस्य निधानासंभवात् निधानं नाम वृत्तित्वप्रकारकाहार्यज्ञानमिति केचन वदन्ति । आहार्यज्ञानं नाम बलात्कारेण संपाद्मानं ज्ञानम्, आरोपात्मकम् । बहिः देवालये विद्मानायाः विश्वनाथार्चामूर्तेः हृदये निधानासंभवाभिप्रायेण तथाभिप्रयन्ति ते । अर्चामूर्तिर्नाम, बाह्यपूजाया आलम्बनीभूता स्थूला मूर्तिः । परन्त्वस्य अतिस्थूलदृष्टित्वात्, निधाय=ध्यात्वा इत्येव वरम् । परमात्मनो ध्यानस्य हृदयमुत्तमं स्थानमिति ध्यानरहस्यविदः । अतः 'विश्वनाथं हृदि ध्यात्वे'ति स्वरसम् । विश्वेशमित्यत्र द्वितीयाया विशयत्वमर्थः । प्रकृत्यर्थस्याधेयतासंबन्धेनान्वयः । विषयता निरूपकतासंबन्धेन 'ल्यप्'प्रकृत्यर्थध्यानेऽन्वयः। निधायेति 'ल्यप्'प्रत्ययस्य उत्तरकालिकत्वमर्थः । तस्य चाश्रयतासंबन्धेन धात्वर्थ कृतावन्वयः । तथा च विश्वनाथनिष्ठविषयतानिरूपकहृदधिकरणकध्यानोत्तरकालिकी कृतिः इति वाक्यबोधः ॥

अथ विद्मागुरूणां वन्दनमाह--विधायेत्यादिना । वन्दनं नाम स्वावधिकोत्कृष्टत्वप्रकारकज्ञानानुकूलव्यापार इति संप्रदायः । 'स्वस्मात् उत्कृष्टः गुरुः' इति ज्ञानात्किल शिष्यो गुरुं वन्दते । उत्कृष्टः उत्कर्षस्याश्रयः । अत्र उत्कर्षस्य पूर्वावधिः स्वात्मा, उत्तरावधिः गुरुः । अतः स्वावधिकोत्कृष्टत्वप्रकारकज्ञाने उत्कृष्टत्वं प्रकारः, गुरुः विशेष्यः । यदा शिष्यः गुरुं वन्दते, तदा पार्श्वस्थाः पश्यन्ति, अस्य नन्तुः, नम्ये गुरौ उत्कृष्टत्वज्ञानं वर्तते, अतो वन्दत इति । अतः परेषामयं शिष्यः, स्वावधिकोत्कृष्टत्वप्रकारकं ज्ञानं जनयति । अतश्च परेषां तादृशज्ञान-प्रयोजको भवति शिष्यस्य वन्दनम् । एतेन 'गुरुं प्रकाशयेद्धीमान्' इति शास्त्रार्थः सूचितः । वस्तुतः वन्दनक्रियादृष्ट्यैव कारकापेक्षायाः स्वरसत्वात्, स्वावधिकोत्कृष्टत्व-प्रकारज्ञाननिष्ठानुकूलत्वनिरूपकं वन्दनम्--इत्येव स्वरसम् । अतः 'स्वावधिकोत्कृष्टत्व-प्रकारकस्य ज्ञानस्यानुकूलः=प्रयोजकः व्यापारः' इत्यर्थापेक्षया, स्वावधिकोत्कृष्टत्व-प्रकारकज्ञानम् अनुकूलम् यत्रेति समासेन, तादृशज्ञानस्य प्रयोजकत्वं लभ्यत इति निर्वाह्यम् । 'तादृशज्ञानानुकूलिव्यापारः' इति वा स्यात् । ज्ञानस्यानुकूली=प्रयोज्यः । ज्ञानमित्यत्र षष्ठ्याः निरूपितत्वमर्थः। अनुकूलित्वं प्रयोज्यत्वम् । तथा च स्वाव-धिकोत्कृष्टत्वप्रकारकज्ञानप्रयोज्यव्यापारो वन्दनमिति स्वरसम् । 'वन्दनं विधाय' इत्यत्रापि, ल्यपः उत्तरकालिकत्वमर्थः । 'गुरुवन्दनोत्तरकालिकी कृतिः' इति वाक्यार्थः ॥

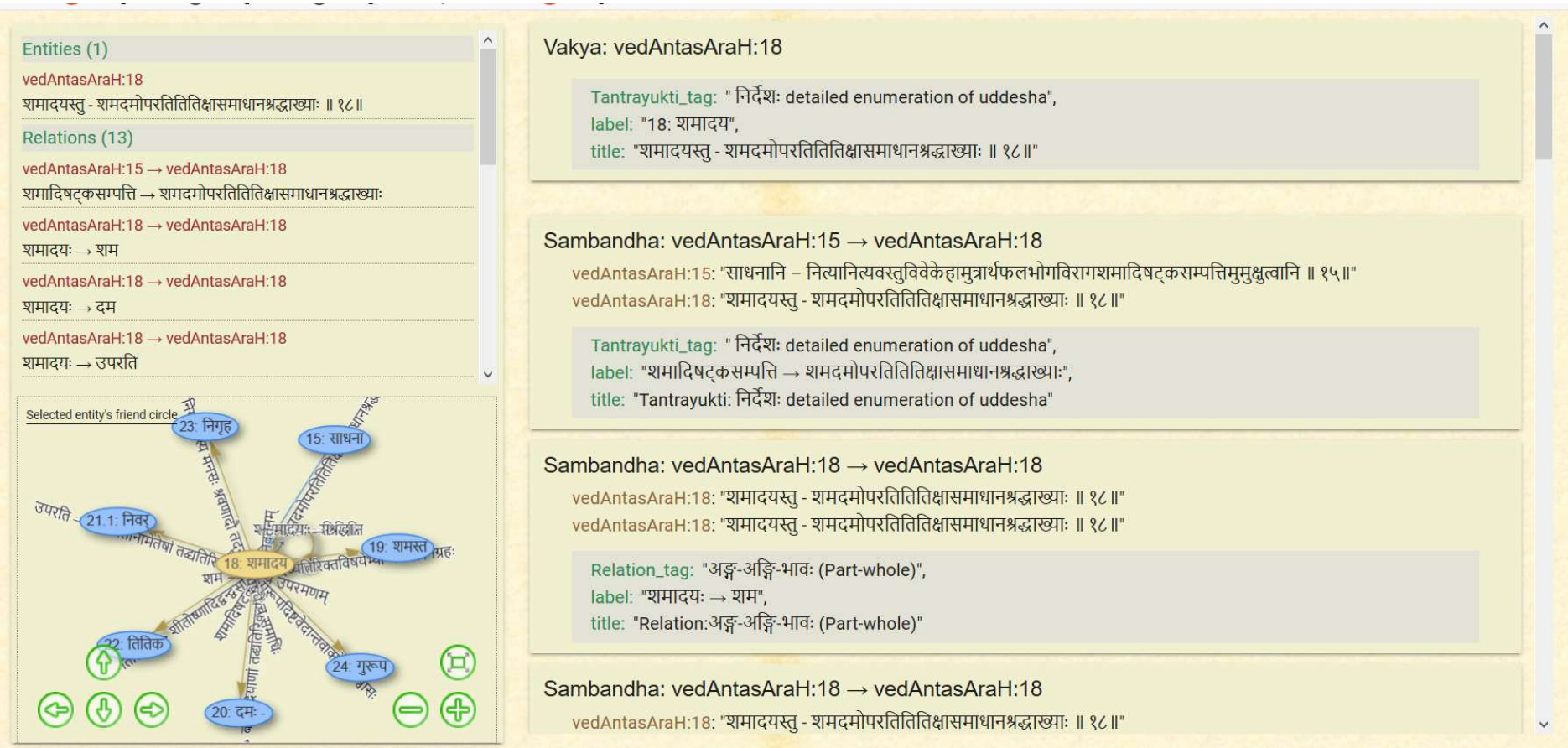
Shaastra Map of Tarka Sangraha Text



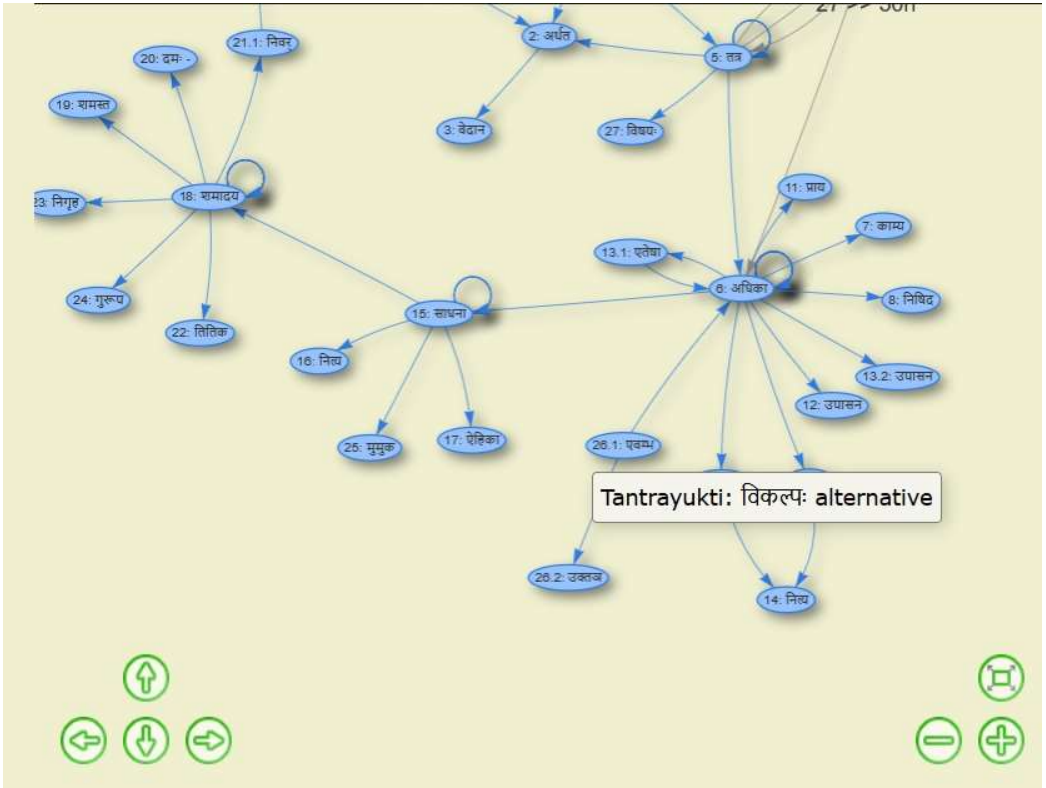
Approach:
Exploit the inherent structure of Shaastras

- Common methodology / language of exposition across all shaastras (Vedic sciences)
  - Paribhaasha (terminology) a subset of loka-bhaasha,
  - Modeling Paradigm (Nyaaya-vaisheshika)
  - Model description language (tantra yukti, mimamsa)
- Highly inter-connected and inter-woven
  - एकं शास्त्रम् अधीयानो न गच्छेत् शास्त्र-निर्णयम्
- Hundreds of shaastras on most subjects of human interest

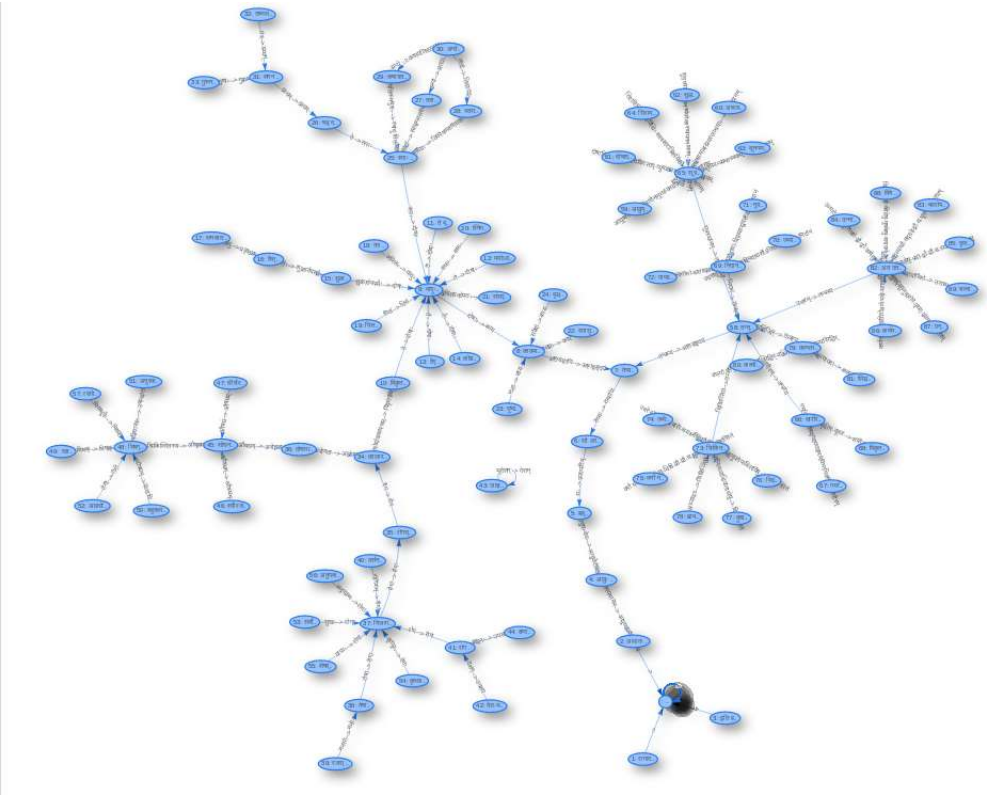
Vedanta Saara: Shaastra Map



Vedaanta Saara: Concept Hierarchy



Ashtanga Hrdaya (Ayurveda): Map



Linkages in Indic Shaastra Texts

- Sentence-level: (40 वाक्य-स्तरे – तन्त्र-युक्तयः)
- Logical-level (34 न्याय-सम्बन्ध-स्तरे)
- Section-level (13 अधिकरण-स्तरे)
- Commentary-level (6 व्याख्यान-स्तरे)
- Gist-level (6 तात्पर्य-स्तरे)
- Concept-level (3 विषय-स्तरे)
- Treatise-level (4 ग्रन्थ-स्तरे)

Shaastra Maps: Applications

- E-reader for Shaastra Texts
  - Drill-down view of concepts
  - Curated expert comments
- Semantic Search of Indic Content
  - Cross-referencing queries to facilitate research
- Indic knowledge mining tools
  - Auto-Glossary of Technical Terms
  - Rule inference from encyclopaedic texts
    - Herbal databases, Brhat samhita, Charaka Samhita

How can you Contribute?

- Attend our online skill training courses / Workshops on
  - How to identify Tantrayuktis in shaastra texts
  - Discourse Analysis from Mimaamsa Perspective
  - How to identify Padaartha sambandhas
  - How to Prepare Concept Maps
- Participate in E-bhaaratii yajna:
  - Concept mapping of 10 shaastras, 5 granthas in each in 3 years
    - Ayurveda, Jyotisha
  - Text conversion of 100 unpublished books in 3 years
    - From Ancient scripts to modern scripts
  - Dig into shaastras to develop new Indic models of Wellness, Governance

Summary

- Bharat's native intellectual tradition was key to both prosperity and culture for millennia
  - by constantly re-manifesting its core Vedic insights for changing times
- World needs revival of Indic scientific thought as practical models
  - to augment contemporary knowledge for inclusive prosperity AND fulfilment.
- Special opportunity for Indic knowledge sciences, aesthetics and human sciences
  - to offer insights for knowledge-driven innovation and inclusive development.
  - to create new employment for traditional crafts and wellness professionals.
- Need widespread skill development backed by Indic scientific principles
  - in psychology, farming, governance, town planning, design and architecture.

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