

# Cultural Informatics

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The Indira Gandhi National Center for the Arts, New Delhi, India

Arkalgud Ramaprasad  
Professor Emeritus of Information and Decision Sciences  
University of Illinois at Chicago  
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# Agenda

- An ontological framework of cultural informatics
- Leapfrogging the heritage and antiquity laws of India
- CrossWalk for education
- The state-of-the-research
- Roadmap for the future

# Acknowledgements

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- Vijeth Acharya – MPP Student, National Law School of India University
- Swati Singh – MPP Student, National Law School of India University

# Making the 'elephant' visible ...

Envisioning a complex problem and a roadmap for its solution.

# An Ontological Framework of Cultural Informatics

Informatics						
Structure	Functions	Semiotics		Cultural Heritage Artifacts	Stakeholders	Outcomes
Architecture	Acquire/Collect	Data	[to]	Tangible	Government	Investigate
Infrastructure	Create/Edit/Delete	Information	[+]	Archaeological	International	Document
Systems	Organize/Arrange	Knowledge	[about]	Prehistorical	Central	Preserve
Services	Index/Describe/Represent			Historical	State	Manage
Policies	Store/Preserve/Sustain			Literary	Local	Visualize
Processes	Secure/Authenticate			Artistic	Academics/Students	Educate
People	Retrieve			Scientific	Libraries/Archives	Communicate
	Process			Intangible	Public	Access
	Distribute			Oral	Museums/galleries	Assess
				Performance	Artists/Artisans	Plan
				Social	Auction houses	Publicize
				Knowledge & Practice	Enforcement agency	Contextualize
				Traditional Craftsmanship	Art dealers	Enjoy
					Religious institutions	
					Civil Society/NGO	
					Activists	
					UNESCO	

# Ontological Meta-Analysis and Synthesis

- Ramaprasad, A., & Syn, T. (2015). Ontological Meta-Analysis and Synthesis. *Communications of the Association for Information Systems*, 37, 138-153.
- Ramaprasad, A., & Syn, T. (2014). Design Thinking and Evaluation Using an Ontology. In M. Helfert, B. Donnellan, & J. Kenneally (Eds.), *Design Science: Perspectives from Europe* (Vol. 447, pp. 63-74). Switzerland: Springer International Publishing.
- Yaco, S., Rizvi, S., & Ramaprasad, A. (Forthcoming). Cultural Heritage Curriculum Crosswalk: Using Metadata to Connect to Curriculum. In C. Fuchs & C. M. Angel (Eds.), *Organization, Representation, and Description through the Digital Age: Information in Libraries, Archives, and Museums*: DeGruyter.
- Ramaprasad, A., Win, K. T., Syn, T., Beydoun, G., & Dawson, L. (2016). Australia's National Health Programs: An Ontological Mapping. *Australasian Journal of Information Systems*, 20, 1-21. doi:10.3127/ajis.v20i0.1335
- Sastry, N. K. B., Madhumitha, M., Ramaprasad, A., & Syn, T. (forthcoming). National Healthcare Programs and Policies in India: An Ontological Analysis. *International Journal of Community Medicine and Public Health*.
- Ramaprasad, A., Singai, C. B., Hasan, T., Syn, T., & Thirumalai, M. (2016). India's National Higher Education Policies since Independence: An Ontological Analysis. *Journal of Educational Planning and Administration*, 30(1), 5-24.
- Other papers on healthcare, mHealth, eGovernment, eCommerce, higher education, etc.

# Cultural Heritage Artifacts\*

## – The Objects of Study

### Cultural Heritage Artifacts

#### Tangible

Archaeological

Prehistorical

Historical

Literary

Artistic

Scientific

#### Intangible

Oral

Performance

Social

Knowledge & Practice

Traditional Craftsmanship

\*Source: [http://portal.unesco.org/en/ev.php-URL\\_ID=13039&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/en/ev.php-URL_ID=13039&URL_DO=DO_TOPIC&URL_SECTION=201.html)

# Informatics + Cultural Heritage Artifacts

Informatics				Cultural Heritage Artifacts			
Structure		Functions	Semiotics				
Architecture	[to]	Acquire/Collect	[+]	Data	[about]	Tangible	[CHA]
Infrastructure		Create/Edit/Delete		Information		Archaeological	
Systems		Organize/Arrange		Knowledge		Prehistorical	
Services		Index/Describe/Represent				Historical	
Policies		Store/Preserve/Sustain				Literary	
Processes		Secure/Authenticate				Artistic	
People		Retrieve				Scientific	
		Process				Intangible	
		Distribute				Oral	
						Performance	
						Social	
						Knowledge & Practice	
						Traditional Craftsmanship	

- Architecture to acquire/collect data about tangible-archaeological CHA.
- Policies to store/preserve/sustain knowledge about intangible-oral CHA.
- People to secure/authenticate information about intangible knowledge and practice.



# The Stakeholders in Cultural Informatics

Informatics					
Structure	Functions	Semiotics	Cultural Heritage Artifacts	Stakeholders	
Architecture	[to] Acquire/Collect	[+] Data	[about] Tangible	[CHA for] Government	
Infrastructure	Create/Edit/Delete	Information	Archaeological	International	
Systems	Organize/Arrange	Knowledge	Prehistorical	Central	
Services	Index/Describe/Represent		Historical	State	
Policies	Store/Preserve/Sustain		Literary	Local	
Processes	Secure/Authenticate		Artistic	Academics/Students	
People	Retrieve		Scientific	Libraries/Archives	
	Process		Intangible	Public	
	Distribute		Oral	Museums/galleries	
			Performance	Artists/Artisans	
			Social	Auction houses	
			Knowledge & Practice	Enforcement agency	
			Traditional Craftsmanship	Art dealers	
				Religious institutions	
				Civil Society/NGO	
				Activists	
				UNESCO	

- Architecture to acquire/collect data about tangible-archaeological CHA for government-state.
- Policies to store/preserve/sustain knowledge about intangible-oral CHA for museums/galleries.
- People to secure/authenticate information about intangible knowledge and practice for academics/students.

## Stakeholders

- Government
  - International
  - Central
  - State
  - Local
- Academics/Students
- Libraries/Archives
- Public
- Museums/galleries
- Artists/Artisans
- Auction houses
- Enforcement agency
- Art dealers
- Religious institutions
- Civil Society/NGO
- Activists
- UNESCO

# The Outcomes of Cultural Informatics

Informatics					
Structure	Functions	Semiotics	Cultural Heritage Artifacts	Stakeholders	Outcomes
Architecture	[to] Acquire/Collect	[±] Data	[about] Tangible	[CHA for] Government	[to] Investigate
Infrastructure	Create/Edit/Delete	Information	Archaeological	International	Document
Systems	Organize/Arrange	Knowledge	Prehistorical	Central	Preserve
Services	Index/Describe/Represent		Historical	State	Manage
Policies	Store/Preserve/Sustain		Literary	Local	Visualize
Processes	Secure/Authenticate		Artistic	Academics/Students	Educate
People	Retrieve		Scientific	Libraries/Archives	Communicate
	Process		Intangible	Public	Access
	Distribute		Oral	Museums/galleries	Assess
			Performance	Artists/Artisans	Plan
			Social	Auction houses	Publicize
			Knowledge & Practice	Enforcement agency	Contextualize
			Traditional Craftsmanship	Art dealers	Enjoy
				Religious institutions	
				Civil Society/NGO	
				Activists	
				UNESCO	

## Outcomes

Investigate  
 Document  
 Preserve  
 Manage  
 Visualize  
 Educate  
 Communicate  
 Access  
 Assess  
 Plan  
 Publicize  
 Contextualize  
 Enjoy

[cultural heritage]

- Architecture to acquire/collect data about tangible-archaeological CHA for government-state to preserve cultural heritage.
- Policies to store/preserve/sustain knowledge about intangible-oral CHA for museums/galleries to publicize cultural heritage.
- People to secure/authenticate information about intangible knowledge and practice for academics/students to investigate cultural heritage.

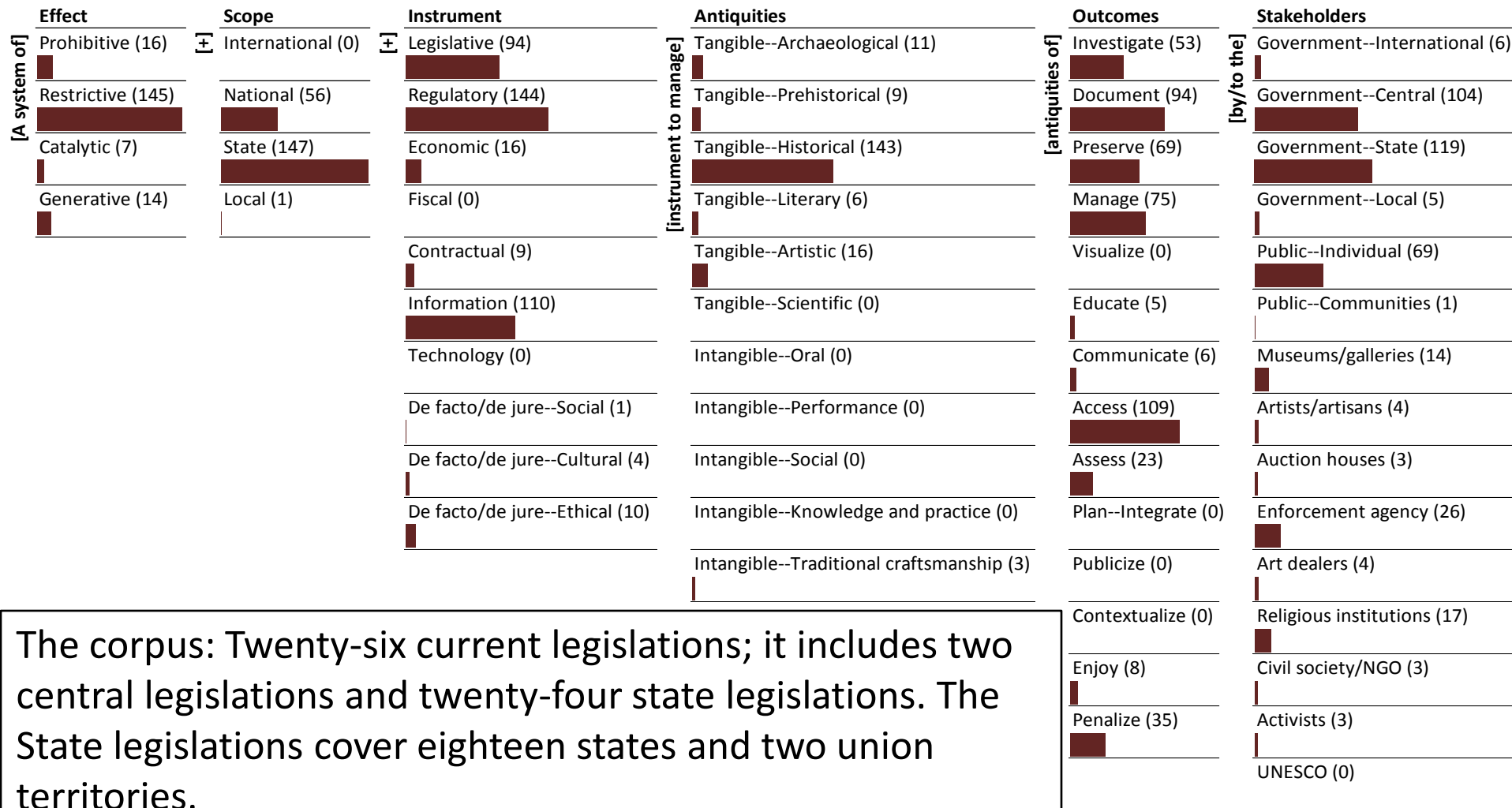
# The Components of Cultural Informatics

- Architecture to acquire/collect data about tangible-archaeological CHA for government-state to preserve cultural heritage.
- Policies to store/preserve/sustain knowledge about intangible-oral CHA for museums/galleries to publicize cultural heritage.
- People to secure/authenticate information about intangible knowledge and practice for academics to investigate cultural heritage.
- ...and 99,789 ( $7*9*3*11*16*3 - 3$ ) other such components.

# The 'Bright', 'Light', and 'Blind/Blank' Components

- Some components may be addressed frequently in research, policy, education, and practice; some infrequently, and others not at all. We will call them the 'bright', 'light', and 'blind/blank' components
- The 'bright' components may be important or easy
- The 'light' components may be unimportant or difficult
- The 'blind' components may have been overlooked
- The 'blank' components may be infeasible

# Antiquity Laws of India – An Opportunity to Leapfrog





The corpus: Twenty-six current legislations; it includes two central legislations and twenty-four state legislations. The State legislations cover eighteen states and two union territories.

Ramaprasad, A., Dixit, C., Rawat, P., Swati, & Acharya, V. (2016 ). Leapfrogging India’s Antiquated Antiquities Laws: A Digital Strategy *Proceedings of International Conference on Culture & Computer Science*. Windhoek, Namibia.

# Cultural Heritage Artifacts, Outcomes, Stakeholders

## Antiquities






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- Tangible 
  - Archaeological (11)
  - Prehistorical (9)
  - Historical (143) 
  - Literary (6)
  - Artistic (16)
  - Scientific (0)
- Intangible
  - Oral (0)
  - Performance (0)
  - Social (0)
  - Knowledge & Practice (0)
  - Traditional Craftsmanship (3)

[antiquities to]

## Outcomes

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- Investigate (53) 
- Document (94) 
- Preserve (69) 
- Manage (75) 
- Visualize (0)
- Educate (5)
- Communicate (6)
- Access (109) 
- Assess (23)
- Plan
  - Integrate (0)
- Publicize (0)
- Contextualize (0)
- Enjoy (8)
- Penalize (35)

[by/to the]

## Stakeholders

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- Government
  - International (6)
  - Central (104) 
  - State (119) 
  - Local (5)
- Public
  - Individual (69)
  - Communities (1)
  - Museums/galleries (14)
  - Artists/Artisans (4)
  - Auction houses (3)
  - Enforcement agency (26)
  - Art dealers (4)
  - Religious institutions (17)
  - Civil Society/NGO (3)
  - Activists (3)
  - UNESCO (0)

# Effect, Scope, Instrument

	<u>Effect</u>		<u>Scope</u>		<u>Instrument</u>	
<b>[A system of]</b>	Prohibitive (16)	[+]	International (0)	[+]	Legislative (94)	<b>[instrument to manage]</b>
	Restrictive (145) ←		National (56)		Regulatory (144) ←	
	Catalytic (7)		State (147) ←		Economic (16)	
	Generative (14)		Local (1)		Fiscal (0)	
					Contractual (9)	
					Information (110) ←	
					Technology (0)	
					De Facto/De Jure	
					Social (1)	
					Cultural (4)	
					Ethical (10)	

# Illustrative Issues – The Opportunity to Leapfrog

- Generative international legislative instrument to manage tangible historical antiquities to preserve by the central government. This is a lacuna at present. Current laws lack guidelines/procedures to retrieve stolen/smuggled artifacts and return them to India.
- Restrictive national regulatory instrument to manage tangible historical cultural artifacts to investigate by the central government. Regulatory instruments that deal specifically with investigating tangible historical antiquities that are absent. As a consequence the recovery rate during 2010-2014 was only about 28%.
- Catalytic national information instrument to manage tangible historical antiquities to publicize to the public. There is currently a lack of information dissemination of antiquities to the public. It has been recognized but not corrected.



# Cultural Heritage and CrossWalk Ontology

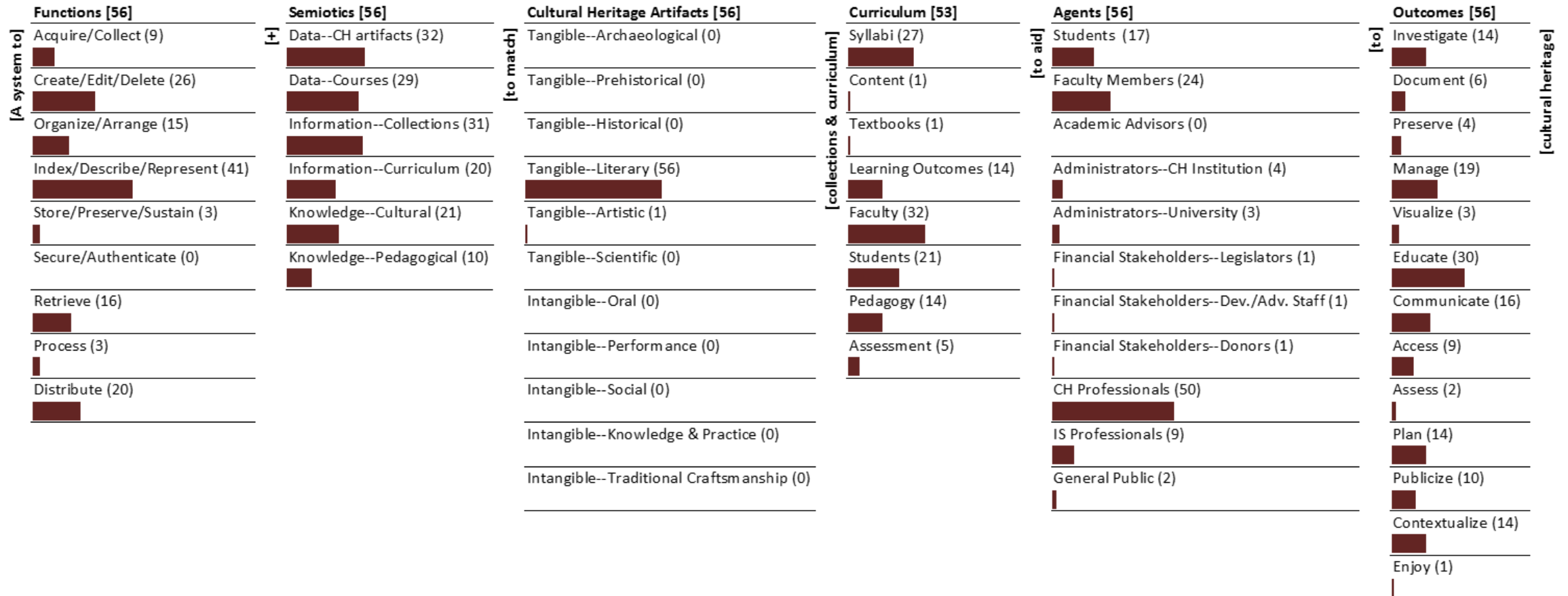
	<u>Functions</u>	<u>Semiotics</u>	<u>Cultural Heritage</u>	<u>Curriculum</u>	<u>Agents</u>	<u>Outcomes</u>
[A system to]	Acquire/Collect	[+] Data	[to match] Tangible	[collections & curriculum]	[to aid] Students	[to] Investigate
	Create/Edit/Delete	CH <sup>1</sup>	Archaeological		Faculty Members	Document
	Organize/Arrange	Courses	Prehistorical		Academic Advisors	Preserve
	Index/Describe/Represent	Information	Historical		Administrators	Manage
	Store/Preserve/Sustain	Collections	Literary		CH Institution	Visualize
	Secure/Authenticate	Curriculum	Artistic		University	Educate
	Retrieve	Knowledge	Scientific		Financial Stakeholders	Communicate
	Process	Cultural	Intangible		Legislators	Access
	Distribute	Pedagogical	Oral		Dev./Adv. Staff	Assess
		Performance	Donors	Plan		
		Social	CH <sup>1</sup> Professionals	Publicize		
		Knowledge & Practice	IS <sup>2</sup> Professionals	Contextualize		
		Traditional Craftsmanship	General Public	Enjoy		

<sup>1</sup>CH = Cultural Heritage; <sup>2</sup> IS = Information Systems

Yaco, S., Rizvi, S., & Ramaprasad, A. (forthcoming). Cultural Heritage Curriculum Crosswalk: Using Metadata to Connect to Curriculum In C. Fuchs & C. M. Angel (Eds.), *Organization, Representation, and Description through the Digital Age: Information in Libraries, Archives, and Museums*: DeGruyter.

Yaco, S., Ramaprasad, A., & Rizvi, S. (first revision under review). Cultural Heritage Curriculum Crosswalk: An Ontological Framework, *Journal on Computing and Cultural Heritage*.

# Cultural Heritage and Curriculum CrossWalk Ontological Review



Yaco, S., Ramaprasad, A., and Syn, T. (in progress)

# Envisioning the Semiotics of Cultural Heritage Artifacts

<u>Functions</u>	<b>Semiotics</b>	<u>Cultural Heritage Artifacts</u>	<u>Outcomes</u>
Acquire/Collect	<div style="border: 2px solid red; padding: 5px;">                     Data                      Information                      Knowledge                 </div> [about]	Tangible	Investigate
Create/Edit/Delete		Archaeological	Document
Organize/Arrange		Prehistorical	Preserve
Index/Describe/Represent		Historical	Manage
Store/Preserve/Sustain		Literary	Visualize
Secure/Authenticate		Artistic	Educate
Retrieve		Scientific	Communicate
Process		Intangible	Access
Distribute		Oral	Assess
		Performance	Plan
	Social	Publicize	
	Knowledge & Practice	Contextualize	
	Traditional Craftsmanship	Enjoy	

Yaco, S., Ramaprasad, A., & Rizvi, S. (2016). Envisioning the Semiotics of Cultural Heritage Artifacts *Proceedings of International Conference on Culture & Computer Science*. Windhoek, Namibia.

# Why the Ontological Approach?

## Traditional

- Linear – individual components
- Simplistic – few dimensions
- Selective – select elements of a dimension
- Skewed – biased elements of a dimension (for example, Tangible Artifacts)
- Natural language
- Invisible ‘elephant’

## Ontological

- Combinatorial – all possible components/fragments (dyads, triads, tetrads, pentads)
- Systemic – all significant dimensions
- Systematic – taxonomy of elements of a dimension
- Symmetric – balanced elements of a dimension (for example, Cultural Heritage Artifacts, Outcomes)
- Structured natural language
- Visible ‘elephant’

# Working Group on Art and Culture for 12th Five Year Plan (2012 - 17)

"There is severe dearth of managers for cultural resources and institutions. The technical expertise at the lower and the middle level has to be supplemented with managerial knowledge and expertise as one grows up to take higher level managerial positions in cultural institutions. Moreover, a large number of institutions and organizations are carrying out research and training in their respective technical area. However, an integrated approach to research in narrow technical fields are important in their own right, the need for research at macro-level by looking at the culture sector in its totality and its linkages with other social and economic sectors is equally important. There is a need to develop centers of excellence for research and training in inter-disciplinary areas in an integrated manner so as to produce capable managers and researchers for cultural resources and institutions. There is a shortage of cultural managers, which needed to be made available through a suitable scheme and courses."

Source: Jha, P., Vikas, O., & Rathore, R.S. "Evolving NSQF Compliant Program on Cultural Informatics." University News, AIU, V. 54, No. 05, Feb 2016 Special Issue on Role of Higher Education in Transforming India

# Thrust Areas for 12th Five Year Plan (2012 - 17)

- Maintenance and conservation
- Strengthening performing arts
- Capacity building
- Development of cultural and creative industries

Source: Jha, P., Vikas, O., & Rathore, R.S. "Evolving NSQF Compliant Program on Cultural Informatics." University News, AIU, V. 54, No. 05, Feb 2016 Special Issue on Role of Higher Education in Transforming India

# AICTE Priorities

- Knowledge Heritage: a Model of Sanskrit Studies
- Intangible Cultural Heritage
- Museum Techniques
- Conservation
- Traditional Design
- Archaeology
- *Expressive Culture*

Source: Jha, P., Vikas, O., & Rathore, R.S. “Evolving NSQF Compliant Program on Cultural Informatics.” University News, AIU, V. 54, No. 05, Feb 2016 Special Issue on Role of Higher Education in Transforming India

# Ver más allá ... con una ontología

To see beyond ... with an ontology



# Roadmap for the Future – An Opportunity

- Discovering the ‘bright’, ‘light’, and ‘blind/blank’ components in research, policy, education, practice, and need. Assessing the:
  - State-of-the-research in India and the world
  - State-of-the-policy in India and the world
  - State-of-the-education in India and the world
  - State-of-the-practice in India and the world
  - State-of-the-need in India and the world
- Discovering the gaps between research, policy, education, practice, and need
- Correcting the gaps in and between research, policy, education, practice, and need
- Developing an evidence-based roadmap for the future

# A Proposal

- For ontological meta-analysis and synthesis of research, policy, education, and practice on cultural informatics
- Email: [prasad@uic.edu](mailto:prasad@uic.edu)
- Skype: [arkalgud.ramaprasad](https://www.skype.com/people/arkalgud.ramaprasad)