

EIAH Data Model

Semantic Interoperability between Distributed Digital Repositories

Emad Khazraee Saeed Moadeli Azade Sanjari Shadi Shakeri





Introduction to EIAH

- Goals and objective
- Entry and Document
- •EIAH Information Architectur
- · EIAH Information Architecture
- EIAH Cake
- EIAH Information Architecture
- Standards and Policies
- Information Pool
-
- DSnace
-
- FIAH Ontology
- The Mediator Lave
- The integrator perc
- Ivietadata iviode
- Application Profile
- · Semantic Portal
- Distributed Repositories
- · OAL-PMH
- · The Current Implementation
- Future Works

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EIAH Data Model

Introduction to EIAH

EIAH

- Founded at 2007
- Nonprofit Organization
- Head director of the project: Mohammad Beheshti the Former head of Iranian Cultural Heritage Organization

Sponsors

- The Iranian Academy of Art
- Iran Cultural Heritage, Handicrafts & Tourism Organization
- The Iranian Ministry of Housing and Urban Development

Partners

- National Library & Archive of Iran
- Polytechnic University of Iran
- Shahid Beheshti University of Iran



Introduction to EIAH

Goals and objectives

- Entry and Documen
- -EIAH Information Architecture
- · FIAH Information Architecture
- · FIAH Cake
- EIAH Information Architecture
- Standards and Policies
- Information Pool
- · Illiottilation For
- Denne
- - - -
- FIAH Ontology
- The Mediator Leve
- Metadata Model
- Application Profile
- · Semantic Portal
- Distributed Repositorie:
- · OAL-PMH
- The Current Implementation
- Future Work:

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Goals and objectives

EIAH Goals

- Increasing the quantity and improve the quality of information on Iranian culture
- Facilitating the recovery of vernacular identity
- Presenting the joint heritage of the countries in the region for further interaction and focusing on cultural unity

Objectives

- Providing varied types of resources
- Providing eligible and accurate resources
- Providing accessible resources



Introduction to FIAH

Goals and objective:

Entry and Document

- EIAH Information Architecture
 Objectives
- EIAH Information Architecture
- FIAH Cake
- EIAH Information Architecture
- Standards and Policies
- Information Dool
- · Illiottilation Foc
- DSpace
- Marta
- FIAH Ontology
- The Mediator Level
- The Integrator pever
- Metadata Model
- Anniloskina Donfil
- · Semantic Portal
- · Distributed Repositories
- · OALPMH
- · The Current Implementation
- Future Works

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Entry and Document

Two Core Concepts in EIAH Information Architecture

- Entry
 - Every topic or concept in domain which information accumulates around it (Terms, Monuments,...)
- Document
 - Any kind of resources which provides information regarding history of Iranian architecture (Text, Photo,...)



·FIAH Information Architecture Objectives

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EIAH Information Architecture Objectives

Three Main Objectives

- Facilitate the access to the resources and documents
- The ability to represent the conceptual relations between topics of Iranian architecture domain
- The ability to represent and develop relations between topics and resources



Introduction to FIAH

- Goals and objectives
- Entry and Documen
- •EIAH Information Architecture
- Objectives

· EIAH Information Architecture

- EIAH Cake
- EIAH Information Architecture
- Standards and Policies
- . Information Pool
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- . DSnace
- FIAHOUNTE
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- the Mediator Cever
- -controlled vocabular
- Metadata Model
- Application Profile
- Semantic Portal
- Distributed Repositories
- OAL-PMH
- The Current Implementation
- Future Work:

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EIAH Information Architecture

Three-layer architecture

- Information pool
- Ontology knowledge representation level
- The mediator level

Foundation layer

Standards and policies

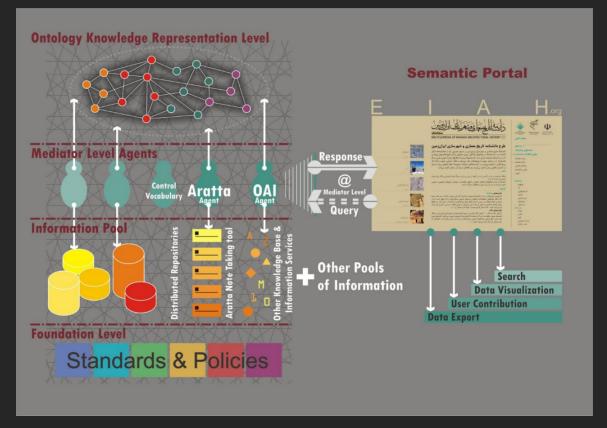


EIAH Cake

- Introduction to EIAH
- · Goals and objectives
- Entry and Document
- -EIAH Information Architecture
- · FIAH Information Architecture
- · EIAH Cake
- EIAH Information Architecture
- Standards and Policie
- . Information Dool
- · Illiotillation For
- Denne
- ·Aratta
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- EIAH OIItology
- The Mediator Leve
- Controlled Vocabulary
- Metadata Model
- Application Profile
- Semantic Portal
- Distributed Repositorie
- The Current Implementation
- Future Works



EIAH Data Model





· EIAH Information Architecture

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Semantic Interoperability between Distributed Digital Repositories

EIAH Information Architecture

Three Layer Architecture

- Service-oriented architecture
- Distinct components and services
- Semantic enabled.
- **Modularity**



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- Entry and Documen
- •EIAH Information Architecture
- · EIAH Information Architecture
- EIAH Cake
- · FIAH Information Architecture

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- DSpace
- Ontology
- FIAH Ontology
- ·The Mediator Level
- -Controlled Vocabular
- Metadata Model
- Application Profile
- · Semantic Portal
- Distributed Repositories
- · OAL-PMH
- · The Current Implementation
- Future Works

Standards and Policies

A Foundation Layer

All processes and work-flows in this project must follow open and international standards and guidelines, so all the products in different phases of the project could be homogenized and optimized. These guidelines are known as EIAH's standards and policies.



Introduction to FIAH

- Goals and objective:
- Entry and Document
- •EIAH Information Architecture
- · EIAH Information Architecture
- · EIAH Cake
- · FIAH Information Architecture

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- The Mediator Leve
- -Controlled Vocabula
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- The Current Implementation
- Future Work

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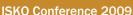
Standards and Policies

- Software Standard Policies
- Hardware and Network Standard Policies
- Technical Tracking Standard Policies
- Information Storage and Exchange Standard Policies
- Content Legal and licensing Standard Policies
- Security Standard Policies
- Resource Description and metadata Standard Policies

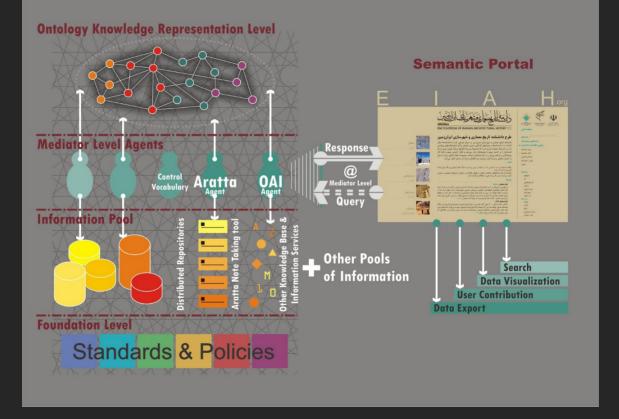


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- The Mediator Leve
- -Controlled Vocabula
- · Metadata Model
- Application Profile
- Semantic Portal
- Distributed Repositories
- Distributed
- The Current Implementation
- Future Work:



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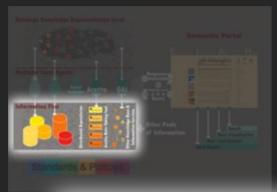


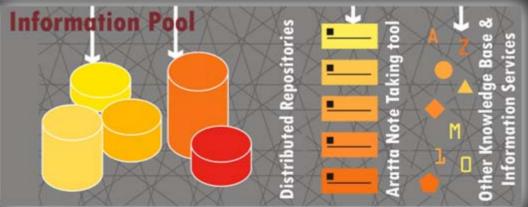


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- Goals and objectives
- Entry and Document
- •EIAH Information Architecture
- EIAH Information Architecture
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- EIAH Information Architecture
- Standards and Policies
- · Information Pool
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- · Semantic Fortai
- Distributed Repositorie
- OAL-PMH
- The Current Implementation
- Future Work







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- Entry and Documen
- EIAH Information Architecture
 Objectives
- EIAH Information Architecture
- EIAH Cake
- EIAH Information Architecture
- Standards and Policies

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- DSnace
- FIAH Ontology
- The Mediator Leve
- -Controlled Vocabular
- · Metadata Model
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- . Samantic Portal
- Distributed Repositories
- OAL-DAALI
- The Current Implementation
- Future Works

- A network of digital repositories, containing various types of resources related to Iranian architecture
- To establish the grid of digital repositories a powerful Open source solution was necessary.



Introduction to FIAM

- · Goals and objectives
- Entry and Documen
- EIAH Information Architecture
 Objectives
- · EIAH Information Architecture
- · EIAH Cake
- EIAH Information Architecture
- Standards and Policies
- Information Deal
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- · The Current Implementation
- Future Works

DSpace

- DSpace institutional repository platform was chosen after evaluating and reviewing twenty other solutions.
- EIAH customized and localized DSpace for the institution's needs. These modifications include Persian Calendar, Persian user interface and right to left text rendering.



- · Goals and objectives
- Entry and Documen
- •EIAH Information Architecture
- Objectives
- EIAH Information Architecture
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- EIAH Information Architecture
- Standards and Policies
- Information Pool
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- Metadata Mode
- . Samantic Portal
- · Distributed Repositorie
- 0.41.01.411
- · The Current Implementation
- Future Work:

DSpace

- Open Source Software
- The community around DSpace
- Using crosswalk plug-ins
- Can customize UI for end user
- Uses Java, JSP, servlet JSTL
- Uses Oracle and Postgresql
- Uses Apache Lucene





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 Objectives
- EIAH Information Architecture
- · EIAH Cake
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- Standards and Policies
- Information Pool
- · Illiottilation For

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- The Integrator perer
- . Matadata Mada
- Metadata Mode
- Application Profile
- Semantic Portal
- · Distributed Repositorie
- · OAL-PMH
- · The Current Implementation
- Future Works

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Aratta

- A collaborative research tool (semantic note taking tool)
- developed as a web-based research tool
- Semantic relations between notes
- Reference management services
- Deploys the conceptual model of the EIAH and defines its relational tags based on this model



EIAH Cake

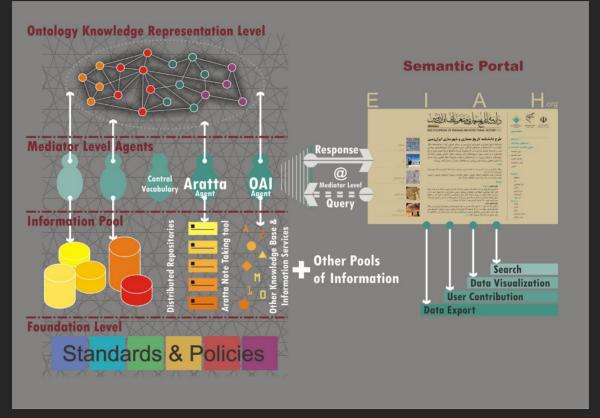
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- Goals and objectives
- Entry and Document
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- Objectives
- EIAH Information Architecture
- EIAH Cake
- EIAH Information Architecture
- Standards and Policie
- Information Dool
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- . DSnace
- Ontology

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- The Mediator Level
- Controlled Vocabulary
- Metadata Model
- Application Profile
- · Semantic Porta
- Distributed Repositories
- 0.11.01.111
- · The Current Implementation
- Future Works

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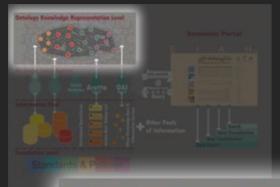
EIAH Data Model





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- Goals and objectives
- Entry and Documen
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- FIAH Cake
- EIAH Information Architecture
- Standards and Policie
- Information Dool
- . DSnace
- -/u acca
- Ontology
- · EIAH Untology
- The Mediator Level
- Controlled Vocabulary
- Metadata Model
- Application Profile
- · Semantic Portal
- Distributed Repositorie
- OAI-PMH
- The Current Implementation
- Future Works



Ontology Knowledge Representation Level



Ontology

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Ontology

- A specification of a conceptualization and a formal representation of a set of concepts within a domain and the relationships between those concepts (Tom Gruber, 1992).
- In Iranian architecture domain, the ontology gives us an overall picture of Iranian architectural history with all its concepts and all their relations.



Introduction to FLAM

- Goals and objectives
- Entry and Documen
- •EIAH Information Architecture
- Objectives
- EIAH Information Architecture
- EIAH Cake
- EIAH Information Architecture
- Standards and Policies
- Information Pool
- Deman
- Aratta
- ----

EIAH Ontology

- The Mediator Leve
- Controlled Vocabulary
- Metadata Model
- Application Profile
- · Semantic Portal
- · Distributed Repositories
- OAI-PMH
- The Current Implementation
- Future Work:

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EIAH Ontology

EIAH ontology

- Temporal
- Spatial
- Human (actors and actions)

Subclass

- Persons (as subclass of human entities),
- Works (monuments and sites) and Geographical Names (as subclass of spatial entities),
- Historical Periods and Events (as subclass of temporal entities),
- (Architectural) Terms (which is the abstract level of all classes).

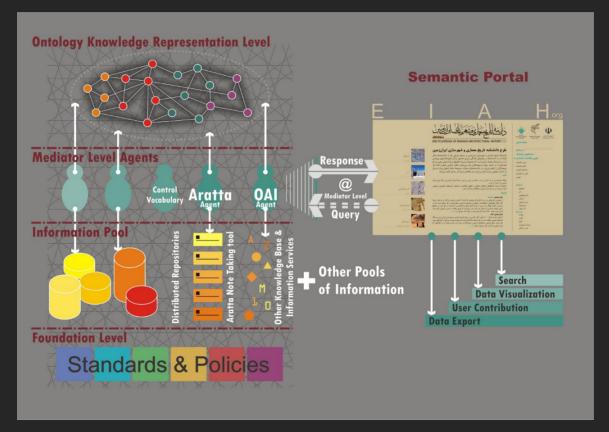


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- ·The Mediator Level







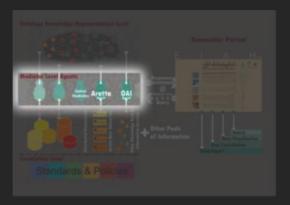


The Mediator Level

- Introduction to EIAH
- Goals and objectives
- Entry and Document
- -EIAH Information Architecture
- Objectives
- EIAH Information Architecture
- EIAH Cake
- EIAH Information Architecture
- Standards and Policies
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- Controlled Vocabulary
- Metadata Model
- Application Profile
- Samentic Portal
- Distributed Repositories
- · Distributed i
- The Current Implementation
- Future Works







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- Entry and Documen
- EIAH Information Architecture
 Objectives
- EIAH Information Architecture
- · EIAH Cake
- EIAH Information Architecture
- Standards and Policies
- . Information Dool
- · Illionnation Foc
- Denne
- •Aratta
-
- EIAH Ontology

·The Mediator Level

- Controlled Vocabulary
- · Metadata Model
- Application Profile
- · Semantic Portal
- Distributed Repositories
- · OAL-PMH
- · The Current Implementation
- Future Works

The Mediator Level

- Detects relations between two layers (ontology and repository)
- Collects and links resources to concepts (entries)
- Integrates data from other services (e.g. Aratta)
- Applies controlled vocabulary to improve search quality



Introduction to EIAH

- Goals and objectives
- Entry and Documen
- EIAH Information Architecture Objectives
- EIAH Information Architecture
- · EIAH Cake
- EIAH Information Architecture
- Standards and Policies
- . Information Dool
- Information Poc
- 5.6....
- -Aratta
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- The Atlantic and annual
- · The Integrator Level

Controlled Vocabulary

- · Metadata Model
- Application Profile
- · Semantic Portal
- Distributed Repositories
- · OAL-PMH
- · The Current Implementation
- Future Works

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Controlled Vocabulary

- Required for accurate search results (recall and precession)
- Needed for efficient resource description
- Expansion of users by multilingual controlled vocabularies.
- Promoting a broader global overview respecting translation / Culture
- Three main fields are in our focus: architectural terms, geographical names and united list of peoples name



- Introduction to EIAH
- Goals and objectives
- •Entry and Documen
- •EIAH Information Architecture
- EIAH Information Architecture
- · FIAH Cake
- FIAH Information Architecture
- Standards and Policies
- Information Deal
- · Information Pol
- Deven
- •Aratta
-
- The Ate distant over
- · The Iviediator Leve
- -Controlled Vocab
- Metadata Model
- Application Profile
- · Semantic Portal
- Distributed Repositories
- · OAI-PMH
- The Current Implementation
- Future Work:

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Metadata Model

- Customized and based on the Dublin Core (simple & qualified)
- Uses relational elements as refinements of subject
- Compliance with EIAH ontology
- Enables high semantic interoperability among

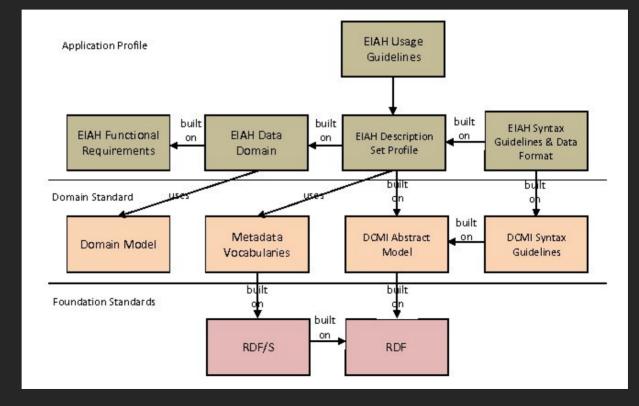
different services

Term Name: Is related to Geographical Name		Term Name: Is related to Historical Period	
URI	Http://eiah.org/en/Entries#Geogr aphical_Name	URI	Http://eiah.org/en/Entries#Histo rical_Period
Label:	Is related to Geographical Name	Label:	Is related to Historical
Definition:	An entity responsible for correlating a geographical name to the resource	Definition:	An entity responsible for correlating a historical period to the resource
Types of term:	Property	Types of term:	Property
Refines:	http://purl.org/dc/elements/ 1.1/subject	Refines:	http://purl.org/dc/elements /1.1/subject



Application Profile

- Introduction to EIAH
- Goals and objectives
- Entry and Document
- ·EIAH Information Architecture
- Objectives
- EIAH Information Architecture
- FIAH Cake
- FIAH Information Architecture
- Standards and Policie
-
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- Deven
- -Marra
- FIAH Ontologo
- The Mediator Laur
- -Controlled Vocabular
- Metadata Model
- · Application Profile
- . Samantic Ports
- Distributed Repositories
- OAL-DAALI
- The Current Implementation
- Future Works





Semantic Portal

- Introduction to EIAH
- Goals and objectives
- Entry and Document
- EIAH Information Architecture
- Objectives
- · EIAH Information Architec
- · EIAH Cake
- EIAH Information Architecture
- Standards and Policies
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- EIAH Ontology
- ·The Mediator Level
- ·Controlled Vocabulary
- · Metadata Mode
- Application Profile
- · Semantic Portal
- Distributed Repositorie
- HM9-IAO
- The Current Implementation
- Future Work

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Introduction to FLAM

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- Entry and Documen
- EIAH Information Architecture
 Objectives
- · EIAH Information Architecture
- EIAH Cake
- EIAH Information Architecture
- Standards and Policies
- Information Pool
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- The Madietas Lave
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- Application Profile
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· Distributed Repositories

- · OALDMH
- The Current Implementation
- Future Work:

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EIAH Data Model

- Widespread cultural heritage centers
- Huge amount of resources
- Promoting digital preservation



- OAI-PMH

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EIAH Data Model

OAI-PMH

HTTP and XML

Built-in for DSpace

Dublin Core friendly

Open Protocol for Metadata Harvesting



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- Goals and objectives
- Entry and Documen
- •EIAH Information Architecture
- · EIAH Information Architecture
- · EIAH Cake
- EIAH Information Architecture
- Standards and Policies
- . Information Dool
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- FIAU Ontolon
- The Mediator Leve
- -Controlled Vocabula
- Metadata Model
- Application Profile
- Semantic Portal
- Distributed Repositories
- OAI-PMH
- · The Current Implementation
- Future Works

The Current Implementation

- Repository Level: DSpace
- EIAH Metadata and Application Profile
- Ontology Level: Semantic Mediawiki tools
- Mediator Level: Semantic Mediawiki extensions



- Introduction to EIAH
- Goals and objective:
- •Entry and Document
- EIAH Information Architecture
 Objectives
- EIAH Information Architecture
- · EIAH Cake
- EIAH Information Architecture
- Standards and Policies
- Information Dool
- · Illiotination Foc
- Denne
- •Aratta
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- The Ate distant over
- · The Iviediator Level
- · Metadata Mode
- Application Profile
- Semantic Portal
- · Distributed Repositorie
- · OAL-PMH
- · The Current Implementation
- Future Works

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Future Works

- Launch of more digital repositories in other cultural heritage centers;
- Development of EIAH ontology;
- Development of EIAH controlled vocabulary;
- Implementing of DSpace XML UI framework (Manakin) to increase adaptability;
- Enhancement of EIAH application profile based on DCAP Singapore framework;
- Development of more data visualization tools.