Knowledge Map for Agriculture Information System

A proposal

4th March 2014 ARC & SENAS workshop

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The status quo

ARC:

➤ In the Web site only one conference's proceedings (N) where {Title, Authors, abstract, PDF, Date, Location}

➤ There were 2 volume of Journal (1998-1999) without search capability.

➤ What is the percentage of this effort with ARC treasure

The status quo

SENAS:

➤ SENAS's e-Library had { 33 Journal Issues from U of K, 8 Journals from Gezira University and 22 books}.

➤ { Hit statistics, Date, File to download, Scanned PDF, one Item no Bibliography data}

The status quo

FAO AGRIS:

➤ Number of records: **7,660,488**

➤ Searching using " Agricultural Research Corporation" result on: **936,449** records, and even when filtered by country as provider its **2,832** records.

➤ {Rich Bibliography data, RDF file, high search capability, Huge Database, Full text access}

➤ What we need to have in such Information system?

Information Management /Knowledge Management

➤ The high benefits of using Bibliography data { First step }.

➤ We are in the era of prefix "e-x" so we need to maximize the use of e-Library/Contents in the archiving our information material.

➤ STS and Linked pattern queries.

Information Management /Knowledge Management

➢ Infrastructure for a while are ready for information age, are we ready ?{ extensive capacity building program}

➢ Is it about data, information or Knowledge?.

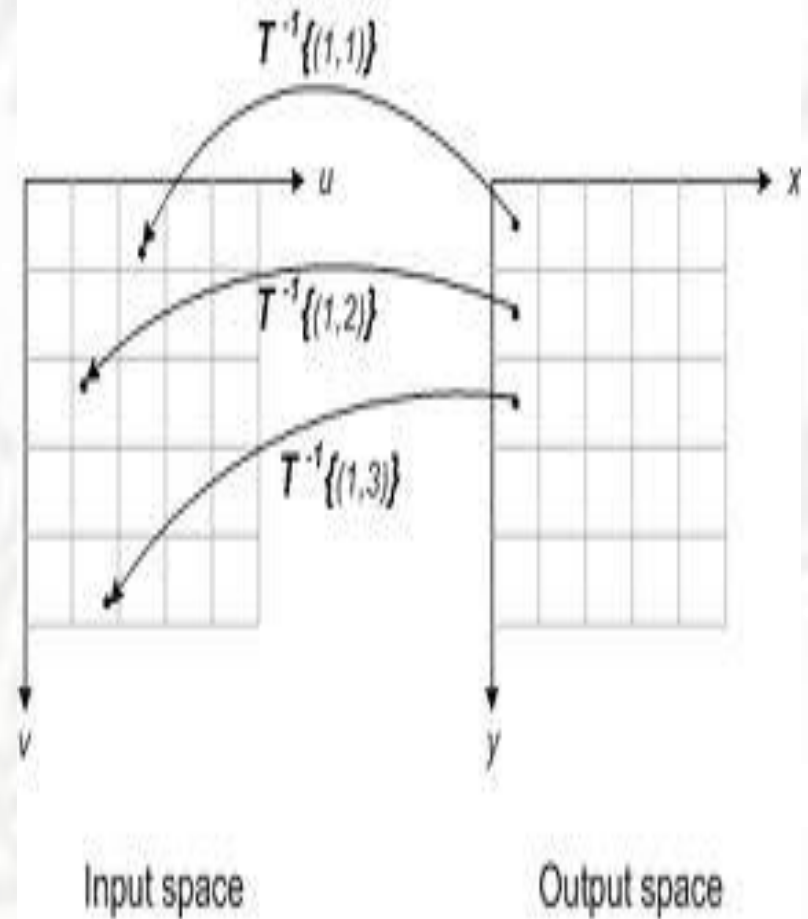➢ Metadata, Meta-information and Meta-knowledge
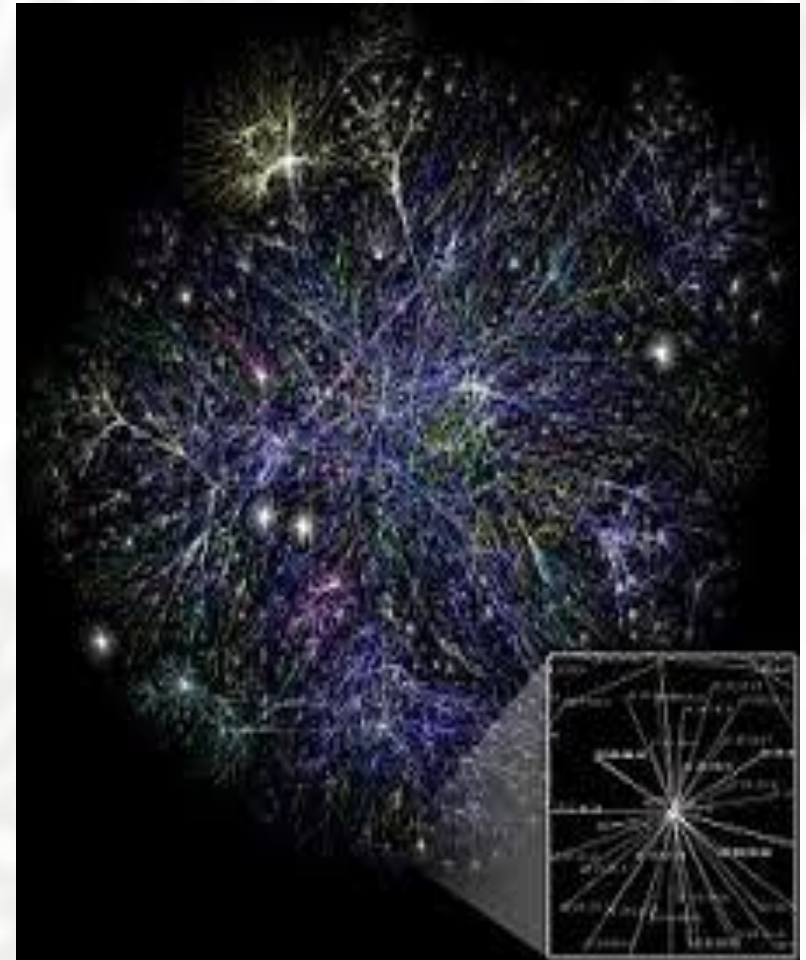
The Concept of Knowledge Map

➢ What is the map? Is there ever a map for Knowledge?.

➢ What about expert locator? Is the map and mapping working only with geo-data?

➢ What are the opinions of Mathematicians?

➢ What we really need to map regarding Knowledge ? And on what plane/Axis we need to map?
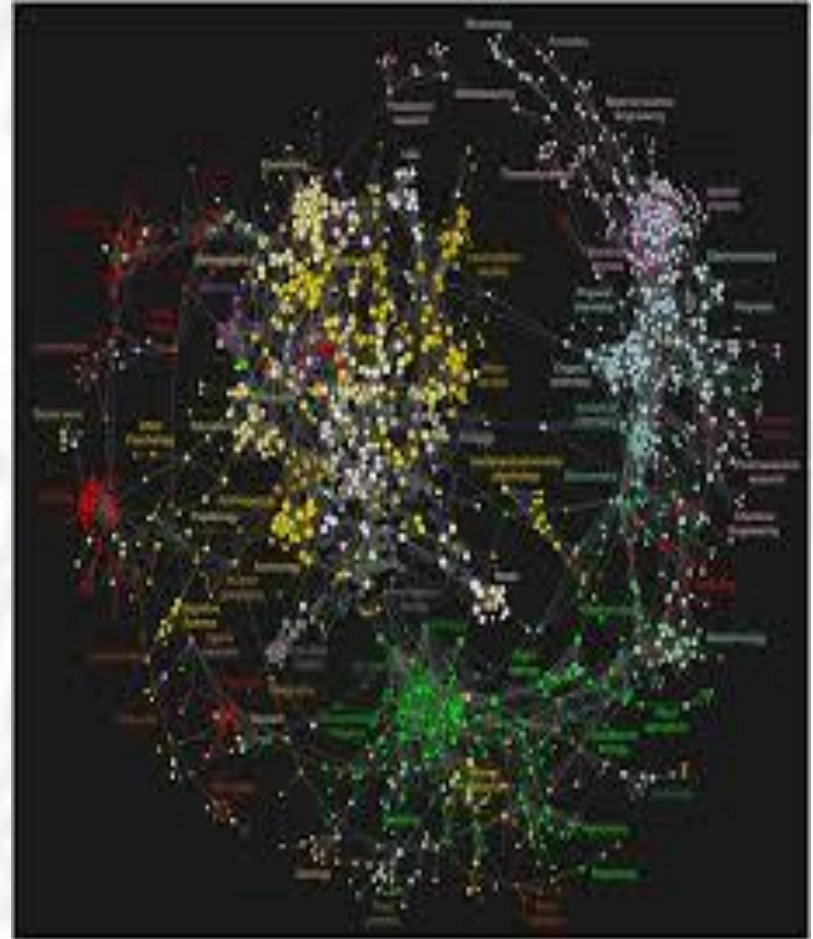
The Concept of Knowledge Map

A **map** is a visual representation of an area – symbolic depiction highlighting relationships between elements of that space such as objects, regions, and themes. Many maps are static two-dimensional, geometrically accurate (or approximately accurate) representations of three-dimensional space, while others are dynamic or interactive, even three-dimensional. Although most commonly used to depict geography, maps may represent any space, real or imagined, without regard to context or scale; e.g. brain mapping, DNA mapping and extraterrestrial mapping.

http://en.wikipedia.org/wiki/Map

$T^{-1}\{(1,1)\}$

u → x

$T^{-1}\{(1,2)\}$

$T^{-1}\{(1,3)\}$

v y

Input space   Output space

The Concept of Knowledge Map

"A knowledge map is a visual display of captured information and relationships, which enables the efficient communication and learning of knowledge by observers with differing backgrounds at multiple levels of detail. The individual items of knowledge included in such a map can be text, stories, graphics, models, or numbers. [...] „Knowledge mapping is defined as the process of associating items of information or knowledge (preferably visually) in such a way that the mapping itself also creates additional knowledge. "

The Concept of Knowledge Map

"Adopting the definition from information retrieval perspective, knowledge map is defined as the categorization of documents characterized by concepts contributed to communities of practice. Knowledge map links various concepts from shared documents contributed by community members. Specifically, document categories are built in the knowledge map to represent concept hierarchy, where learning paths can be traversed associated with the problem solving process"

➢ Dimensions of Knowledge Map (mapping process)

Mapping a Knowledge Map

- Classifying knowledge maps by intended purpose
- Classifying knowledge maps by graphic form.
- Diagrammatic format.
- Metaphoric format.
- classifying maps by their content:
- Classifying maps by the application level.
- classifying maps by their creation method

Mapping means simply to classify and interrelate with other domains(dimensions)

Metaknowledge K Map

> ➤ why traditional K Map not solve information overload problem?

> ➤ Could we retrieve a Knowledge rather than data or information?.

> ➤ How we can represent Knowledge {Ontology KB , Concept Map(Relations)}
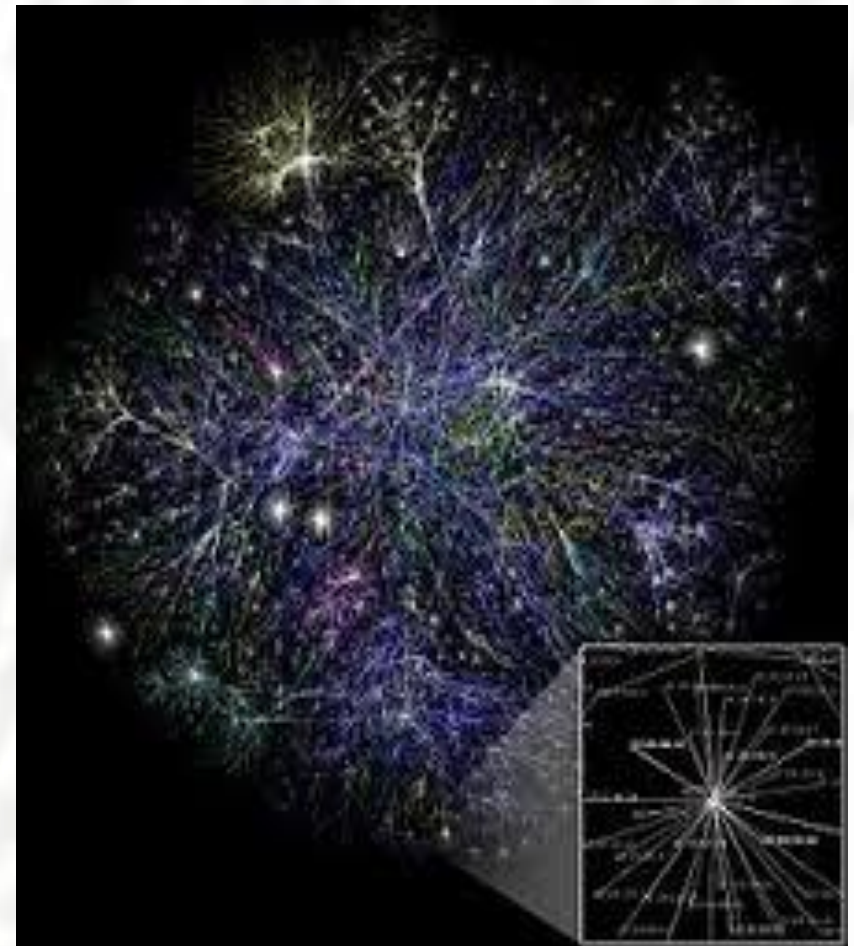
Cases illustrates different K-Map approaches

Cases illustrate K Map different approaches.

Three papers will shed the light about potentiality of K Map

➤ Intelligent bibliography creation and markup for authors

➤ Knowledge Map of Publications in Research Policy

➤ Research on civil servants' tacit knowledge management based on topic Map.

Intelligent bibliography creation and markup for authors

➢ Help authors create correct, complete, and annotated bibliographies.

➢ Automatic domain-model creation and bibliography construction using semantic markup of bibliographic metadata.

➢ System can be extended using AI to search contents and to learn from users

Knowledge Map of Publications in Research Policy

- Conduct keyword-based network analysis with aids of network properties, e.g. degree centrality, betweenness centrality, closeness centrality.

- The K Map is visualized by Keywords, Authors, Institutes and countries as network actors.

- A set of measures are developed and calculated

Research on civil servants' tacit KM based on topic Map.

- Topics, Associations, and Occurrences (TAO)
- Topic Maps to link resources anywhere, and to organize these resources according to a single ontology.
- Using **Ontopia** an open source tools for building, maintaining, and deploying topic map-based applications

K-Map proposal

➢ ARC and SENAS develop a mature Bibliography Metadata to capture important mapping dimensions {Dublin Protocol, Meaningful Bibliographic Metadata (M2B) FAO}.

➢ Conduct an extensive building capacity program and policy around committed templates of electronic submissions of all work depends on Metadata.

➢ Apply the concept backward to old treasure's work using OCR tools and Open Access philosophy (Open Access Project.

➢ Develop robust Tacit Knowledge Taxonomy based on the Topic

K-Map proposal

➢ Develop large coverage Tacit Knowledge topic taxnomy and use it in metadata.

➢ Expand the ICT staff by new employee and extensive training about Open Source eLibrary for content Management.

➢ Build Capacity about developing KB ontology, Concept Map and using of Open Source Tools that support online collaboration {cmap, Protégé}

➢ Adopt gradually Knowledge attribute from KB ontology and Cmap to be part of metadata.

➢ Based the software evolution on user's needs and compile this need to K Map mapping function.

• ….

Recommended Software and Tools

➢ Start with Meaningful Bibliographic Metadata (M2B) <http://aims.fao.org/metadata/m2b

➢ AgriDrupal, AgriOceanDSpace and AgriMetaMaker

➢ Protégé

➢ Cmap

➢ Ontopia

Thanks