Ontology-Based Knowledge Networks for User Training in Business Process Management

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Business Process Management

Business Process Modeling

Process Mining
- Discover process specifications to support design & redesign

Workflow Management
- Automate business processes and coordinate resources

Design new and analyze existing processes to improve work practices
Business Process Modeling

Place IS in its organizational context

Execution logic of business processes

Convert Tacit to Explicit
The three components of a business process

- Business Process
- Process Contents
- The Organization
Change users perception from function-oriented to process-oriented

Users are required to think of their activities as constituents of business processes and instil their knowledge and expertise in the definition and automation of business processes.
Enhance users’ participation through training

EXPLICIT KNOWLEDGE

COMBINATION

EXTERNALIZATION

INTERNALIZATION

EXPLICIT KNOWLEDGE

TACIT KNOWLEDGE

Users’ Training

SOCIALIZATION
Understanding can be modeled as a two stage process:

1. Analysis: The material to be studied is analyzed in its basic concepts and

2. Synthesis: Concepts are combined with other concepts in order to create complex structures (concept graphs)

John Sowa, 1984
Knowledge Networks: Combining ontologies with multimedia objects

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Why use an ontology

- Common understanding of domain of knowledge by human and software agents (software agents and semantic web services)

- Knowledge is reusable: (i) is recorded once and (ii) follows standards in order to enhance interoperability

- Knowledge about a domain of knowledge is separated from the business context
The top concepts of the Ontology (based on Sowa Categorization)
The Ontology

Aristomenis Macris

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A case study from the banking sector

A simple business process concerned with the asset management unit (AMU)’s marketing and sales activity is presented.

Each existing bank customer or a third party who satisfies certain criteria is considered as a prospective customer (PC) and is assigned a primary and a secondary customer relations officer (CRO). Then, the CRO conducts business activities (e.g. personal contacts, telephone calls) with each PC with the objective to propose him/her one or more investment opportunities that match the PC’s risk profile.

Each PC who accepts an investment opportunity offer becomes an AMU customer and an investment account is opened.
The Knowledge Network in detail

Process tasks:
1. Create PCs (task) ‘using’ Customer Selection Criteria (which ‘are defined by’ the AMU), ‘compares to’ Customer Characteristics (which ‘is about’ a Customer) and ‘creates’ a PC (who ‘is sub-concept of’ Customer), who (the PC) ‘is not an AMU customer and satisfies’ Customer Selection Criteria. The PC ‘is assigned to’ a Primary CRO, who ‘belongs to’ the AMU. The Secondary CRO ‘replaces when unable’ the Primary CRO and also ‘belongs to’ the AMU.

2. Collect PC data (task) ‘from’ a PC, ‘is performed by’ a Primary CRO and ‘creates’ PC characteristics, which ‘are about’ PCs.

3. To create a Sales Opportunity one must ‘examine’ Products (which ‘are offered by’ the AMU) and ‘compares to find a match in’ PC characteristics. A Sales Opportunity ‘is about’ a PC and ‘is performed by’ the primary CRO.

4. The Sales Opportunity ‘results in’ a Proposal/Quote which ‘is about a mix of’ Products. The Proposal/Quote ‘is about’ a PC and ‘is performed by’ the Primary CRO.

5. A Sale ‘refers to’ a Proposal / Quote, ‘is about a mix of’ Products and ‘is performed by’ the primary CRO. A Sale task ‘changes a PC to a Customer’.
Ontology-based knowledge networks

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The Semantic Web is a vision: the idea of having data on the web defined and linked in a way, so that it can be used by machines - not just for display purposes, but for using it in various applications.
The CULTOS tools and repositories

Clients

Converter

EMMO Viewer

EMMO Authoring

Ontology Authoring

Converter

EMMO2ANYTHI

EMMO2SM

Server APIs

SOAP based

MDB API

KDB API

OntDB API

Repositories

MDB

KDB

OntDB

 references

references

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Ontology-Based Knowledge Networks for User Training in Business Process Management
| The Import of media is necessary to make media available for the authoring tool |
| Only previously imported media is available in the Authoring Tool |
| In the Media Import Tool |
| Segments of media can be defined |
| Ontology concepts can be assigned to created Entities |
| Attributes can be filled in |
| This information is accessible via the Authoring Tool |

**Imported media must be compatible to Apple’s Quick Time**
Knowledge network authoring

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Ontology-Based Knowledge Networks for User Training in Business Process Management
EMMOs
Enhanced Multimedia Meta Objects
Transformers

EMMO (XML)
"self-contained" or online

Transformer A
External Authoring Tools
Director® etc.
CBT / WBT

Transformer D
External Editing Tools
InDesign® etc.

Transformer B
Print
(PDF)

Transformer C
E-journal

Transformer E
Presentation Tool
WWW

CDB (vers 1 - adopted)

KDB

ODB

CDB (vers 2 - accessed via references)

Thread
Advantages for the designer

- The knowledge about the domain of knowledge and its applications is captured and is reusable
- Each concept is recorded once and is used with the same name and attributes (synonyms, fields, relations, supportive multimedia etc.) in all knowledge networks
- Object inheritance
- Take advantage of the Semantic web
Advantages for the user

- Semantic search: Search is performed based on semantics and not grammar
- Knowledge navigation: Each concept is isolated and examined in relation with other concepts and the supportive multimedia.
- Knowledge dissemination: Through the capture of (a) the explicit knowledge represented by the knowledge network and (b) the tacit knowledge represented by the process flows (knowledge network) and the supportive multimedia.
- Enhanced users’ participation: Through active participation in business process management activities since they are equipped with an appropriate tool for acquiring a clear and an in depth understanding of a business process.